4.3 AIR QUALITY

This section analyzes the potential air quality impacts resulting from the implementation of the 2050 RTP/SCS. This air quality analysis includes a description of the existing air quality conditions in the SANDAG region, the applicable air quality regulations, criteria for determining significant air quality impacts, the air quality impacts of project construction and operation, identification of any mitigation measures required and any significant impacts after mitigation, and cumulative air quality impacts.

4.3.1 EXISTING CONDITIONS

4.3.1.1 Climate and Meteorology

Air quality is affected by 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.

Topography

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east. Much of the topography in between consists of mesa tops intersected by canyon areas. The mountains to the east prohibit dispersal of pollutants to the east and help to trap them in temperature inversion layers.

Regional Climate

The climate of the San Diego region is characterized by warm, dry summers and mild winters. One of the main determinants of the San Diego Air Basin's (SDAB) climatology is a semipermanent, high-pressure area (the Pacific High) in the eastern Pacific Ocean that influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. In the summer, the Pacific High is located well to the north of Southern California, causing storm tracks to be directed north of California. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the Southern California region, causing widespread precipitation. In the San Diego region, the months of heaviest precipitation are November through April, averaging approximately 9 to 14 inches annually.

Temperature inversions affect air quality in San Diego. During an inversion, air temperatures, with increasing elevation, get warmer rather than cooler. Inversions occur as descending warm air associated with the Pacific High comes into contact with cool marine air. The boundary between the air masses represents a temperature inversion, which is located approximately 2,000 feet AMSL during the months of May through October, and approximately 3,000 feet AMSL during the winter months (November through April). The location of the inversion layer is an important determinant of local air quality because the layer inhibits the dispersion of pollutants, thus resulting in a temporary degradation of air quality.

4.3.1.2 Air Quality Standards

Federal and State Air Quality Standards

The Federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to establish primary and secondary[1] National Ambient Air Quality Standards (NAAQS) to protect the public health, safety, and welfare from the known or anticipated effects of air pollution. The NAAQS are revised when scientific evidence indicates a need. NAAQS are set for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead (Pb), and requires USEPA to ensure that each state meets NAAQS. These air pollutants are collectively referred to as "criteria air pollutants" because they are scientifically based upon human health and/or environmental criteria.

The California Clean Air Act (CCAA) requires the California Air Resources Board (ARB) to establish California Ambient Air Quality Standards (CAAQS) for the criteria pollutants. The CAAQS are generally more restrictive than NAAQS. ARB also established standards for additional pollutants of sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. NAAQS and CAAQS are shown in Table 4.3-1.

USEPA is creating a new national 1–hour standard for NO_2, which is an ozone precursor, along with new monitoring requirements along major roadways. The new 1-hour standard is 100 parts per billion (ppb) and more stringent than the CAAQS 1-hour standard of 180 ppb. By January 1, 2013, San Diego County must have two NO_2 monitors placed within 50 meters (approximately 150 feet) from the edge of the nearest traffic lane of the two roadways in the County with the highest average annual traffic volumes (APCD 2011a).

Regional Air Quality

San Diego County is located within the SDAB; the boundaries of the SDAB are coterminous with boundaries of the County. The San Diego Air Pollution Control District (APCD) is responsible to ARB for the management of air quality in the SDAB. APCD is responsible for protecting the public health and welfare through the administration of federal and state air quality laws and policies. APCD is responsible for monitoring air pollution, preparing and updating the SDAB portion of the State Implementation Plan (SIP), and promulgating its Rules and Regulations.

The SIP is not a single document but is actually a compilation of new and previously approved air quality management plans (AQMPs) for nonattainment and maintenance criteria pollutants. APCD's 8-hour Ozone Attainment Plan for SDAB (APCD 2007) was approved by ARB on May 24, 2007; however, USEPA never adopted this plan as an ozone SIP revision. Therefore, the 1-hour Ozone Maintenance Plan, approved by USEPA as an ozone SIP revision on July 28, 2003, still stands as the USEPA approved ozone SIP for the SDAB. The SDAB's CO SIP was approved by ARB and USEPA and became effective January 30, 2006. The SIP includes strategies and tactics to be used to attain the federal ozone standard and maintain the federal CO standard in the SDAB. SIP elements are taken from the Regional Air Quality Strategy (RAQS), which is APCD's plan for attaining the state ozone standard. APCD's Rules and Regulations include procedures and requirements to control the emission of pollutants and prevent significant adverse impacts.

[1] The primary standards protect the public health, while the secondary standards protect the public welfare.

Table 4.3-1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	National[a]		California[b]
		Primary[c, d]	Secondary[c, e]	Concentration[c]
Ozone	1 hour	—	Same as primary standard	0.09 ppm (180 µg/m^3)
	8 hour	0.075 ppm (147 µg/m^3)		0.070 ppm (137 µg/m^3)
Respirable particulate matter	24 hour	150 µg/m^3	Same as primary standard	50 µg/m^3
	Annual arithmetic mean	—		20 µg/m^3
Fine particulate matter	24 hour	35 µg/m^3	Same as primary standard	No separate state standard
	Annual arithmetic mean	15 µg/m^3		12 µg/m^3
Carbon monoxide	8 hour	9 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1 hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
	8 hour (Lake Tahoe)	—	—	6 ppm (7 mg/m^3)
Nitrogen dioxide	Annual arithmetic mean	0.053 ppm (100 µg/m^3)	Same as primary standard	0.030 ppm (57 µg/m^3)
	1 hour	0.100 ppm	None	0.18 ppm (339 µg/m^3)
Sulfur dioxide	Annual arithmetic mean	0.030 ppm (80 µg/m^3)	—	—
	24 hour	0.14 ppm (365 µg/m^3)	—	0.04 ppm (105 µg/m^3)
	3 hour	—	0.5 ppm (1,300 µg/m^3)	—
	1 hour	—	—	0.25 ppm (655 µg/m^3)
Lead[f]	30-day average	—	—	1.5 µg/m^3
	Calendar quarter	1.5 µg/m^3	Same as primary standard	—
	Rolling 3-month average[g]	0.15 µg/m^3		—
Visibility-reducing particles	8 hour	No national standards		Extinction coefficient of 0.23 per kilometer —visibility of 10 miles or more (0.07 to 30 miles for Lake Tahoe) because of particles when the relative humidity is less than 70%. Method: Beta attenuation and transmittance through filter tape.
Sulfates	24 hour			25 µg/m^3
Hydrogen sulfide	1 hour			0.03 ppm (42 µg/m^3)
Vinyl chloride[f]	24 hour			0.01 ppm (26 µg/m^3)

Notes: mg/m^3 = milligrams per cubic meter; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppm = parts per million; µg/m^3 = micrograms per cubic meter.

[a] National standards (other than those for ozone and 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 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact U.S. Environmental Protection Agency for further clarification and current federal policies.

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

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

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] The California Air Resources Board 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.

[g] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: ARB 2010

Ambient air pollutant concentrations in the SDAB are measured at 11 air quality monitoring stations operated by APCD. The purpose of these stations is to measure ambient concentrations of criteria pollutants in the SDAB and determine whether the ambient air quality in the SDAB meets the NAAQS and CAAQS. Not all 11 monitoring stations measure all of the criteria pollutants, but they are strategically located to collect the data most representative of the area in which they are located. The locations of the monitoring stations in the SDAB are shown in Figure 4.3-1.

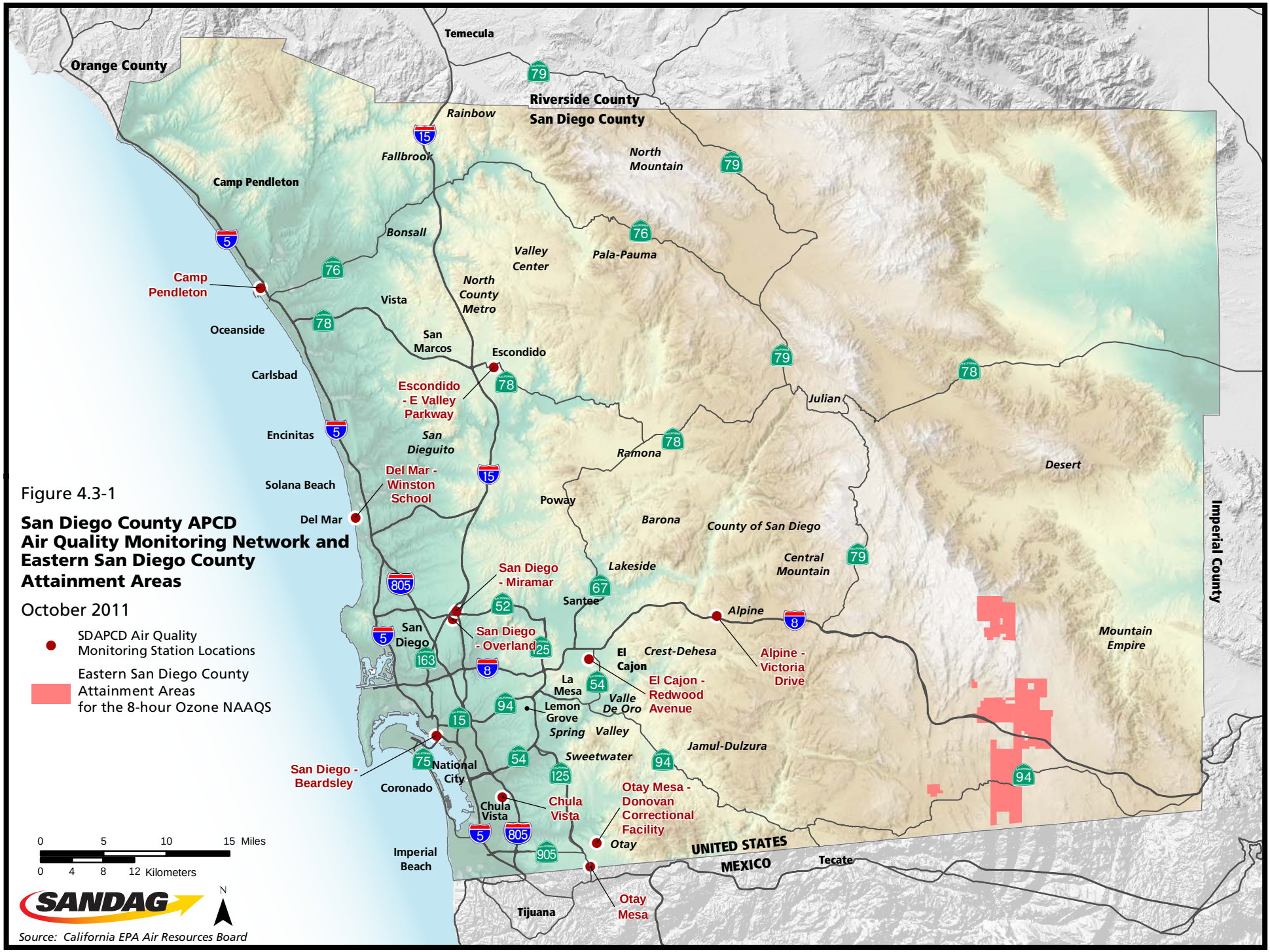
Annual a~~A~~ir quality data from the monitoring stations are summarized in APCD's Annual Reports. The most recently published report is the 2009 Annual Report (APCD 2010a), which provides information on the number of days in 2009 exceeding the NAAQS and CAAQS for each pollutant at each monitoring station that the pollutant is measured, and the maximum ambient concentrations measured in 2009. Air quality is commonly described by the number of days that air pollution levels exceed state and federal standards.

Recent ~~A~~annual ambient air quality data can be found on the ARB website (ARB 2011); the most recent available data, ~~for the years~~ 200~~5~~7 through 20~~09~~10 are shown in Table 4.3-2. As shown in Table 4.3-2, there were exceedances of the federal and state O_3, $PM_{2.5}$, and PM_{10} standards over the last ~~5~~4 years.

Table 4.3-2
Summary of Annual Ambient Air Quality Data (200~~5~~6–200~~9~~10) – San Diego Air Basin

Pollutant Standards	2007	2008	2009	2010
Carbon Monoxide (CO)				
Maximum concentration (8-hr, ppm)	5.18	5.51	3.24	2.46
Number of days state standard exceeded (8-hr)	0	0	0	0
Number of days national standard exceeded (8-hr)	0	0	0	0
Nitrogen Dioxide (NO_2)				
Maximum concentration (1-hr, ppm)	0.101	0.123	0.091	0.091
Number of days state standard exceeded (1-hr)	0	0	0	0
Annual Average (ppm)	0.015	0.015	0.016	0.013
Ozone (O_3)				
Maximum concentration (1-hr/8-hr, ppm)	0.134/0.092	0.139/0.109	0.119/0.097	0.107/0.088
Number of days state standard exceeded (1-hr/8-hr)	21/50	18/69	8/47	7/21
Number of days national standard exceeded (1-hr/8-hr)	1/27	2/27	0/127	0/14
Particulate Matter (PM_{10}) [a]				
Maximum concentration (µg/m^3)	394.0	158.0	126.0	108.0
Number of days state standard exceeded (1-hr/8-hr)	~~158~~27	~~163~~30	~~146~~25	22
Number of days national standard exceeded (1-hr/8-hr)	~~0~~1	~~0~~1	0	0
Annual average (µg/m^3)	58~~E~~.6	56~~E~~.0	~~54E~~53.6	46.6
Particulate Matter ($PM_{2.5}$) [a]				
Maximum concentration (µg/m^3)	126.2	44.0	78.3	48.4
Number of days national standard exceeded	~~11~~17	5	4	2
Annual average (µg/m^3)	~~11E~~13.3	14~~E~~.9	12.2	10.8

ppm = parts per million; µg/m^3 = micrograms per cubic meter
Source: ARB~~APCD~~ 2011~~a~~


Temecula
Orange County
Riverside County
San Diego County
Rainbow
Fallbrook
North Mountain
Camp Pendleton
Bonsall
Valley Center
Pala-Pauma
Camp Pendleton
North County Metro
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Escondido - E Valley Parkway
Julian
Encinitas
San Dieguito
Ramona
Desert
Del Mar - Winston School
Solana Beach
Poway
Del Mar
Barona
County of San Diego
Central Mountain
Lakeside
San Diego - Miramar
Santee
Alpine
San Diego - Overland
San Diego
Mountain Empire
El Cajon
Crest-Dehesa
Alpine - Victoria Drive
La Mesa
El Cajon - Redwood Avenue
Valle De Oro
Lemon Grove
Spring Valley
Jamul-Dulzura
Sweetwater
San Diego - Beardsley
National City
Coronado
Chula Vista
Otay Mesa - Donovan Correctional Facility
Otay
Imperial Beach
UNITED STATES
MEXICO
Tecate
Tijuana
Otay Mesa
Imperial County
Figure 4.3-1
San Diego County APCD Air Quality Monitoring Network and Eastern San Diego County Attainment Areas
October 2011
SDAPCD Air Quality Monitoring Station Locations
Eastern San Diego County Attainment Areas for the 8-hour Ozone NAAQS
0 5 10 15 Miles
0 4 8 12 Kilometers
N
SANDAG
Source: California EPA Air Resources Board

Both USEPA and ARB compare monitoring data from the stations with NAAQS and CAAQS, respectively, to designate the federal and state attainment status of the SDAB for criteria air pollutants. The purpose of these designations is to identify which criteria pollutants do not meet NAAQS and CAAQS in the SDAB, and to thereby initiate planning efforts to attain NAAQS and CAAQS. There are three basic designation classifications for each criteria pollutant: attainment (meets NAAQS/CAAQS), nonattainment (does not meet NAAQS/CAAQS), and unclassified (cannot classify based on available information as to meeting NAAQS/CAAQS). If a criteria pollutant, previously designated as nonattainment, is redesignated to attainment status, the CAA requires the pollutant be designated as a maintenance area and a maintenance plan prepared to demonstrate how the attainment status will be maintained for 10 years.

The SDAB is designated as a federal nonattainment area for the 8-hour O_3 standard (USEPA 2011b); several areas that are tribal lands in eastern San Diego County are excluded from the nonattainment designation for the federal 8-hour O_3 standard, as shown in Figure 4.3-1. Nonattainment designations for O_3 can be further classified by degrees of severity of nonattainment. For the federal 8-hour O_3 standard, the SDAB was previously classified as "basic" nonattainment (the least severe nonattainment classification), which is the designation USEPA assigns to regions in attainment for the previous 1-hour O_3 standard, but would be in nonattainment for the new 8-hour O_3 standard.

APCD submitted an air quality plan (8-Hour Ozone Attainment Plan) to USEPA in 2007 based on the "basic" nonattainment designation; the plan demonstrated how the federal 8-hour O_3 standard will be attained by 2009 (APCD 2007). However, USEPA was challenged on its justification for these "basic" nonattainment designations, and, in January 2009, published proposed reclassifications for all "basic" nonattainment areas, which resulted in the SDAB considered in "moderate" nonattainment for the 8-hour O_3 standard. Adoption of the new designations requires APCD to reevaluate its Ozone Attainment Plan to ensure compliance with the attainment requirements of "moderate" nonattainment areas (Reider 2009). Therefore, the 2007 8-Hour Ozone Attainment Plan is not expected to be approved by USEPA, but instead, USEPA, in response to a court decision, is expected to rule in 2011 that the SDAB basic nonattainment status for the 8-hour O_3 standard be reclassified as a Subpart 2 "serious" nonattainment area, with a mandatory statutory attainment date of June 15, 2013. Final USEPA action on this proposed reclassification has yet to be taken (SANDAG 2011). However, on May 13, 2008, USEPA found that the motor vehicle emission budgets included in the SIP were adequate for use in transportation conformity analyses (USEPA 2008). The USEPA adequacy determination was announced in the Federal Register on May 23, 2008, and was effective June 7, 2008

The SDAB is designated as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. For the state O_3 standard, the SDAB is currently classified as "serious" nonattainment. In response to the state nonattainment designation for ozone, APCD prepared and adopted the RAQS for attaining state ozone standards. The most recent version of the RAQS is the *2009 Regional Air Quality Strategy Revision*., dated April 22, 2009 (APCD 2009).

For the remaining criteria pollutants standards, the SDAB is designated as in federal and state attainment including federal maintenance area for CO; currently under a federal "maintenance plan" for CO following its 1998 redesignation for CO from a nonattainment to an attainment area. The SDAB's CO SIP was approved by ARB and USEPA and became effective January 30, 2006. The SDAB meets both the state and federal standards for lead (much due to the use of unleaded gasoline); however, in fall 2008, USEPA revised the NAAQS for lead from 1.5 to 0.15 micrograms per cubic meter, ~~, and monitoring for lead in the basin will resume in 2011 (APCD 2011a).~~

Local Air Quality

In addition to regional air quality, local pollutant concentrations are considered for some criteria pollutants (e.g., CO and PM "hotspots"), as well as local concentrations of toxic emissions. Substantial local concentrations of these pollutants, typically due to traffic congestions, and are of concern when in proximity to air quality sensitive receptors.

Local CO and PM_{10}/$PM_{2.5}$

Analysis of local CO and PM_{10}/$PM_{2.5}$ impacts is required to demonstrate conformity for federal nonattainment and/or maintenance areas. Since the SDAB is designated as a federal maintenance area for CO, analysis of CO impacts is performed in accordance with the Transportation Project-Level Carbon Monoxide Protocol (UCD ITS 1997).

Since the SDAB is a federal attainment area for PM_{10} and $PM_{2.5}$, no analyses of local PM_{10} and $PM_{2.5}$ impacts are required for federal conformity. However, the SDAB is designated as a state nonattainment area for PM_{10} and $PM_{2.5}$. Thus, to meet state requirements, the projects are assessed using the procedure outlined in the Transportation Conformity Guidance for Qualitative Hot-Spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (FHWA 2006a) (known as PM Guidance), which describes how to qualitatively evaluate a project's potential to cause a PM hot spot. The PM Guidance describes a qualitative hot-spot analysis method that does not involve dispersion modeling. This qualitative $PM_{2.5}$ and PM_{10} hot-spot analysis method involves a more streamlined review of local factors such as local monitoring data near a proposed project location.

Toxic Air Contaminants

In addition to criteria air pollutants, USEPA also regulates ~~T~~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. APCD further defines a TAC as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical; its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health (APCD 2010b). TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as particulate matter or as vapors (gases). TACs include metals, other particles, gases absorbed 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.

The public's exposure to TACs is a significant public health issue in California. APCD started sampling for TACs at the El Cajon and Chula Vista monitoring stations in the mid-1980s. These sites were chosen because they are located nearby and downwind of transportation, industrial, and other air pollutant

sources; in 2006, three more sites were added: Escondido, Otay Mesa, and downtown San Diego ~~(APCD 2011a)~~. Based on 2009 estimates from APCD, industrial, mobile, area, and natural sources[2] of TACs emit more than 64.9 million pounds of TACs annually ~~(APCD December 8, 2010)~~. Excluding diesel particulates (a designated TAC), there has been a 72 percent reduction in the ambient environmental cancer risk from air toxics measured in Chula Vista and a 73 percent reduction in El Cajon since 1989 (APCD ~~2011a~~2010b).

The Air Toxics "Hotspots" Information and Assessment Act is a state law requiring facilities to report emissions of TACs to the APCD. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting potential public health risk (significant public health risks are required to be reduced (APCD 2010).

~~*Mobile Source Air Toxics*~~

The State Air Toxics Program (AB 2588) identified over 200 TACs, including the 188 TACs in the federal CAA. USEPA has assessed this expansive list of toxics and identified ~~a group of~~ 21 TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. USEPA also extracted a subset of ~~this list of~~these 21 MSAT compounds that it now labels as the six priority MSATs~~:. These are~~ benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these six MSATs are considered the priority transportation toxics, USEPA stresses that the lists are subject to change and may be adjusted in future rules (FHWA 2006).

The California-specific transportation air quality analysis model, ~~CT-~~EMFAC, is designed to model MSATs at the project-level. Health effects from MSATs/TACs, i.e., cancer risks and chronic non-cancer risks from on-road traffic, have been associated primarily with diesel PM, benzene, and 1, 3- butadiene. ~~CT-~~EMFAC ~~will~~can be used to estimate diesel PM, benzene, and 1, 3-butadiene emissions. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient TAC risk, for which data are available, in California.
~~The impact would be considered significant if projected emissions of MSATs in 2020, 2035, and 2050 are greater than baseline emission levels.~~

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

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

[2] Mobile sources include on-road vehicles, off-road vehicles, trains, mobile equipment, and utility equipment. Area sources include residential and commercial non-point sources such as fuel combustion, entrained road dust, waste burning, solvent use, pesticide application, and construction and demolition. Natural sources include wildfires and windblown dust from agricultural operations and unpaved areas.

Aair dispersion

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

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

Diesel Particulate Matter (Diesel PM)

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

Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines; the on road diesel engines of trucks, buses and cars and the off road diesel engines that include locomotives, marine vessels and heavy duty equipment. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

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

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

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs, some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure in experimental animal inhalation studies have shown a range of dose dependent lung inflammation and cellular changes in the lung and immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely

carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings (USEPA 2011a).

EPA's National Scale Assessment uses several types of health hazard information to provide a quantitative "threshold of concern" or a health benchmark concentration at which it is expected that no adverse health effects occur at exposures to that level. Health effects information on carcinogenic, short and long term noncarcinogenic end points are used to establish selective protective health levels to compare to the modeled exposures levels. Unfortunately the exposure response data in human studies are considered too uncertain to develop a carcinogenic unit risk for EPA's use. There is a Reference Concentration (RFC) that is used as a health benchmark protective of chronic noncarcinogenic health effects but it is for diesel exhaust and not specifically set for diesel particulate matter. The RFC for diesel exhaust, which includes diesel particulate matter is 5 ug/m3 (USEPA 2011a). This value is similar to the National Ambient Air Quality Standard established for fine particulate matter (PM2.5), which is 15ug/m3.

Unlike ~~the~~ other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. ~~In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.~~

Diesel PM poses the greatest health risk among th~~ese 10~~ TACs mentioned. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in 2000 to be 720 excess cancer cases per million people in the SDAB. Since 1990, the diesel PM health risk in the SDAB has been reduced by one-third. Overall, levels of most TACs have gone down since 1990, except for *para*dichlorobenzene and formaldehyde ~~(ARB 2006b)~~.

Recent studies of the potential effect of diesel PM emissions on air quality sensitive receptors

Vehicle emissions contain a number of substances that can be harmful, including toxic air contaminants such as benzene and diesel PM. A growing body of scientific evidence shows that living or going to school near roadways with heavy traffic volumes is associated with a number of adverse effects. These include increased respiratory symptoms, increased risk of heart and lung disease, and elevated mortality rates (SCAQMD 2005).

While most of the initial studies were conducted in Europe, a number of research projects conducted in the United States and California are finding similar results. For example, as of 2005, the Children's Health Study, a 10-year study conducted by the USC School of Medicine, found strong evidence that exposure to pollutants related to vehicle emissions such as nitrogen dioxide and elemental carbon (or soot) is linked to a slowing of lung function growth. The researchers concluded that the resulting deficits in lung function are likely permanent and may increase the risk for respiratory and other diseases later in life. The study also found that the children in the study who lived nearest to roadways with heavy traffic, such as freeways, showed increased risk for having asthma (SCAQMD 2005).

The East Bay Children's Respiratory Health Study

The East Bay Children's Respiratory Health Study, conducted in 2001, included more than 1,100 students between the 3rd and 5th grades (ARB 2004). The study included 10 neighborhoods with school sites

located upwind and downwind from major roads. The bay area has strong prevailing winds, and this study found that downwind direction and proximity to major roads was an important determinant of increased exposure to traffic pollutants. This study found higher concentrations of black carbon, oxides of nitrogen (NO_X), and nitrogen oxide (NO) at schools located downwind from freeways as compared with those schools upwind or farther from major traffic sources.

For children residing at their current address for at least 1 year, investigators found a modest but significant increase of 5 to 8 percent in bronchitis and asthma symptoms in children in neighborhoods with higher concentrations of traffic pollutants.

California Office of Environmental Health Hazard Assessment (OEHHA) School Study

The OEHHA studied public schools in California, various socioeconomic factors, and their proximity to major roads. The study found that about 2 percent of all the public schools in California, incorporating about 150,000 students, are within 150 meters (500 feet)[3] of a very busy roadway. The study also provided recommendations on ways to mitigate exposure of students to traffic-related pollutants in the event that a school is located near busy roadways (SCAQMD 2007; OEHHA 2004a). The related fact sheet includes the following (OEHHA 2004b):

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

  Motor vehicles are part of our everyday lives. We breathe air with higher levels of traffic pollutants while:

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

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

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

Air Quality and Land Use Handbook

The studies described in the above paragraphs, along with other similar studies, were considered by the ARB in the preparation of the publication, *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005a). In the discussion of traffic emissions and health effects, the key health findings included the following:

[3] The unit of distance for this analysis is feet. Where reference studies use meters, the original metric distances are shown with the equivalent distance in feet.

- Reduced lung function in children was associated with traffic density, especially trucks, within 1,000 feet and the association was strongest within 300 feet (Brunekreef et al. 1997).

- Increased asthma hospitalizations were associated with living within 650 feet of heavy traffic and heavy truck volume (Lin et al. 2002).

- Asthma symptoms increased with proximity to roadways and the risk was greatest within 300 feet (Venn et al. 2001).

- Asthma and bronchitis symptoms in children were associated with proximity to high levels of traffic in a San Francisco Bay Area community with good overall regional air quality (Kim et al. 2004).

- A San Diego study found increased medical visits in children living within 550 feet of heavy traffic (English et al. 1999).

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

Childhood Asthma

A study published in 2006 examined the relationship of residence near a freeway and susceptibility to childhood asthma (McConnell et al. 2006). This study found residence within 75 meters (245 feet) of a major road was associated with an increased risk of lifetime asthma, prevalent asthma, and wheeze. The higher risk of asthma near a major road decreased to background rates at 150 to 200 meters (490 to 655 feet) from the road. In children with a parental history of asthma and in children moving to the residence after 2 years of age, there was no increased risk associated with exposure. A similar pattern of effects was observed with traffic-modeled exposure. These results indicate that residence near a major road is associated with asthma.

Traffic and Lung Development

One of the most recent studies was published in February 2007, *Effect of Exposure to Traffic on Lung Development from 10 to 18 Years of Age: A Cohort Study* (Gauderman et al. 2007). This study examined the pulmonary function of more than 3,500 children over a period of 8 years. The studies were conducted in 12 California communities. Health effects related to distance from freeways were divided into three groups: less than 500 meters (1,640 feet) from the freeway, 500 to 1,500 meters (1,640 to 4,920 feet) from the freeway, and greater than 1,500 meters (4,920 feet) from the freeway. The study shows that the residential proximity to freeway traffic is associated with substantial deficits in lung-function development in children. The effects were greater for those children who lived within 500 meters (1,640 feet) of a freeway than for those who lived at least 1,500 meters (4,920 feet) from a freeway. Since lung development is nearly complete by age 18 years, an individual with a deficit at this time will probably continue to have less than healthy lung function for the remainder of his or her life. The study did not find any evidence that traffic effects varied depending on background air quality, which suggests that even in an area with low regional pollution, children living near a major roadway are at increased risk of health effects. The results also suggest that children who live close to a freeway in a high pollution area experience a combination of adverse developmental effects because of both local and regional pollution (Gauderman et al. 2007).

Particulates at a Sacramento School Site

A multi-year study in the Sacramento area, described in a 2006 report, analyzed atmospheric particulate matter at a school site downwind of a busy secondary road (Cahill 2006). The study was not a health effects study. The study is of interest for the following reasons: (1) The study indicates that exhaust from automobiles may be a greater source of toxic pollutants than diesel exhaust, and (2) a barrier of dense vegetation can be one element in a pollutant mitigation strategy. The study also emphasizes that the most important mitigation for exposure near roadways is the distance from the road to the receptor.

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

Greenhouse Gas Emissions and Climate Change

Note to reader: Greenhouse gas emissions and climate change are addressed in Section 4.8, Greenhouse Gas Emissions and Climate Change.

4.3.1.2 Air Quality Management Plans

State Implementation Plan (SIP)

To ensure that NAAQS are met, the CAA requires that each state with a federal nonattainment area prepare a comprehensive, strategic, and enforceable air quality control plan with set deadlines for attaining NAAQS. These comprehensive plans are called SIPs, and they must be updated periodically to keep up with USEPA requirements and new control measures. The CCAA requires all local air districts in the state to achieve and maintain the CAAQS by the earliest practical date.

A SIP is not a single document but is actually a compilation of new and previously approved AQMPs prepared by air districts for pollutants that do not meet NAAQS. While individual air districts prepare the individual plans, ARB is the lead agency for each of these plans and oversees their preparation. After ARB approves each plan, it forwards the plan (also referred to as a SIP revision) to USEPA, which reviews each plan for conformance to the mandates of the CAA and determines whether its implementation will enable the air basin to meet NAAQS. Once USEPA determines that the plan meets these goals, it approves the revised SIP and publishes it in the Federal Register. Because emissions inventories, rules, and regulations for air quality management, and the ability of each air basin to attain NAAQS can change frequently, it is not unusual for ARB to be processing more than one AQMP/SIP revision with USEPA approval at any one time.

The SIP provides plans for attaining and maintaining the 8-hour NAAQS for O_3 and demonstrates how the SDAB would continue to maintain compliance with NAAQS for CO. The plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by USEPA and ARB, and the emissions and reduction strategies related to mobile sources, known as transportation control measures (TCMs) are considered in the SIP. TCMs are strategies to reduce motor vehicle trips, VMT, or vehicle idling and associated air pollution. TCMs are identified in CAA Section 108(f). There are four

federally approved TCMs that must be implemented in San Diego, which the SIP refers to as transportation tactics. They are:

- transit service improvements,
- traffic flow improvements,
- ridesharing services, and
- bicycle facilities and programs.

These TCMs were established in the 1982 SIP, which identified general objectives and implementing actions for each tactic. The TCMs have been fully implemented. Ridesharing, transit, bicycling, and traffic flow improvements continue to be funded, although the level of implementation established in the SIP has been surpassed.

ARB mobile source emission projections are based on population and vehicle trends and land use plans developed by the cities and by the County as part of the development of the County's General Plan. The SIP relies on this information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the SDAB. The SIP also includes the Rules and Regulations that have been adopted by APCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for O_3.

In response to the federal nonattainment designation for the 8-hour O_3 standard, APCD prepared and ARB approved and submitted the *Eight-Hour Ozone Attainment Plan for San Diego County* (~~May~~APCD 2007) to USEPA for approval. The Plan identifies control measures and associated emission reductions necessary to demonstrate attainment of the 8-hour O_3 NAAQS. However, the 2007 8-Hour Ozone Attainment Plan was not approved by USEPA as a revision to the zone SIP, but instead, USEPA, in response to a court decision, is expected to rule in 2011 that the SDAB basic nonattainment status for the 8-hour O_3 standard be reclassified as a Subpart 2 "serious" nonattainment area, with a mandatory statutory attainment date of June 15, 2013. Final USEPA action on this proposed reclassification has yet to be taken (SANDAG 2011). Therefore, the 1-hour Ozone Maintenance Plan, approved by USEPA as an ozone SIP revision on July 28, 2003, still stands as the USEPA approved ozone SIP for the SDAB. However, on May 13, 2008, USEPA found that the motor vehicle emission budgets included in the SIP were adequate for use in transportation conformity analyses. The USEPA adequacy determination was announced in the Federal Register on May 23, 2008, and was effective June 7, 2008.

The SDAB achieved the NAAQS for CO in 1993 and USEPA approved a 10-year Maintenance Plan in 1998. The current version of the maintenance plan is the *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas* (ARB 2004), which was approved as an SIP revision in January 2006.

Future development would be required to be consistent with the emission reduction strategies in SIPs in order to comply with APCD Rules and Regulations, and to obtain required APCD permits.

Regional Air Quality Strategy (RAQS)

The CCAA requires areas that are designated nonattainment of CAAQS for ozone, CO, SO_2, or NO_2 to prepare and implement plans to attain the standards by the earliest practicable date (H&SC Section 40911(a)). CAAQS for each of these pollutants have been attained in the SDAB. Currently, there is no requirement for PM_{10} and $PM_{2.5}$ attainment plans for state PM_{10} and $PM_{2.5}$ nonattainment areas. In response to the state nonattainment designation for ozone, APCD prepared and adopted RAQS for

attaining state ozone standards. The most recent version of the RAQS is the *2009 Regional Air Quality Strategy Revision*, dated April 22, 2009 (APCD 2009).

The RAQS addresses volatile organic compounds (VOCs) and oxides of nitrogen (NO_X), which are precursors to the formation of ozone. The RAQS is updated on every 3 years and is designed to meet the CCAA goal of reducing O_3 precursor emissions from stationary and area sources by 5 percent per year or, if that goal is not achievable, to develop an expeditious schedule for adopting every feasible control measure under APCD's purview. The 2009 RAQS revision incorporated additional control measures to address automobile refinishing, architectural coatings, solvent wipe cleaning, stationary combustion turbines, small boilers, medium boilers, and residential water heaters (APCD ~~2011a~~2009). Future development would be required to be consistent with the emission reduction strategies in the RAQS in order to comply with APCD rules and regulations and obtain required APCD permits.

4.3.2 REGULATORY SETTING

Air quality in the SDAB is regulated by the USEPA, ARB, and the APCD. Each of these agencies develops rules, regulations, and strategies to ensure that adopted ambient air quality standards are met. The following is a brief discussion of the applicable federal and state air quality laws, as well as specific responsibilities of the APCD.

4.3.2.1 Federal Regulations

Transportation Conformity

In addition to establishing the primary and secondary NAAQS and ensuring they are met through SIPs, the USEPA and the U.S. Department of Transportation (USDOT) are responsible for ensure that federally supported highway and transit project activities are consistent with ("conform to") the purpose and requirements of the SIP under CAA section 176(c). USEPA is responsible for implementing national air quality programs. Its air quality mandates are drawn primarily from the federal CAA, as amended.

Conformity currently applies to areas that are designated nonattainment, and those re-designated to attainment after 1990 ("maintenance areas") for the following transportation-related criteria pollutants: ozone, PM_{10} and $PM_{2.5}$, CO, and NO_X. 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. Conformity determinations for transportation plans, programs, and projects are based on the Transportation Conformity Rule issued in November 1993 and as amended.

Transportation conformity is analyzed by a forecasting and modeling process considering population growth, employment growth, trip generation, trip distribution, mode choice, and highway and transit assignment. Motor vehicle emissions are then modeled, and conformity is demonstrated by showing that emissions would be less than the budgeted emissions of the SIP.

Conformity also requires demonstration that TCMs in EPA-approved SIPs are implemented in a timely fashion. There are four federally-approved TCM's that must be implemented in San Diego, which the SIP refers to as transportation tactics. They include transit service improvements; traffic flow improvements; ridesharing services; and bicycle facilities and programs. These TCM's were established in the 1982 SIP, which identified general objectives and implementing actions for each tactic. The TCMs have been fully implemented. Ridesharing, transit, bicycling, and traffic flow improvements continue to be funded, although the level of implementation established in the SIP has been surpassed.

The transportation conformity analysis and findings for the 2050 RTP/SCS are addressed in a separate process from this EIR, and under EPA regulations, include extensive requirements for consultation with transportation and air quality agencies and the public. The transportation conformity analysis for the 2050 RTP/SCS was prepared by SANDAG as Appendix B to the 2050 RTP/SCS (SANDAG 2011). SANDAG and the USDOT must make a determination that the 2050 RTP/SCS conforms to the SIP (i.e., will not create new or worsen existing air quality violations, or delay the attainment of NAAQS). SANDAG's analysis was conducted for ROG and NO_X (ozone precursors) for which the SDAB is in federal nonattainment, and for CO, for which the SDAB is a federal maintenance area. SANDAG's analysis concluded that the 2050 RTP/SCS meets the applicable pollutant budgets and conforms to the applicable SIPs. SANDAG's analysis will be used to determine if the 2050 RTP/SCS would be consistent with the applicable air quality attainment plans.

In October 2011, the SANDAG Board of Directors will be asked to make a finding of conformity for the 2050 RTP/SCS and adopt this Plan. The USDOT will be asked to make its conformity determination following the SANDAG Board action. A detailed description of the conformity process may be found in Appendix B of the 2050 RTP/SCS.

4.3.2.2 State Regulations

California Clean Air Act

The CCAA requires that air pollution control districts implement regulations to reduce emissions from mobile sources through the adoption and enforcement of transportation control measures. The CCAA also requires that air districts not meeting state air quality standards prepare local air plans to demonstrate strategies for attainment of those standards.

ARB, which is within the California EPA (CalEPA), is responsible for implementing the federal and state air quality regulations in the state of California under the CCAA, which was adopted in 1988. The agency approves AQMPs/SIP revisions; monitors air quality throughout the state; determines and updates area attainment designations and maps; sets and enforces emission standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels; and implements CCAA. ARB, in coordination with air districts in the state, also develops air quality models to calculate stationary and mobile source air emissions from various land uses and activities.

Toxic Air Contaminant Regulations

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, by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. In 2000, ARB adopted a diesel risk reduction plan to reduce diesel particulate matter emissions and the associated health risk.

AB 1807 Program

Under AB 1807, 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)]. In 1993, the AB 1807 program was amended to

include the identification and control of TACs (AB 2728). Specifically, AB 2728 required the ARB to identify 188 hazardous air pollutants as TACs. Major sources of specific HAPs are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Program and require Title V permitting which requires implementation of Maximum Achievable Control Technologies (MACTs) to reduce emissions of HAPs.[4]

California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588)

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. 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.

Diesel Risk Reduction Plan

Typically, land development projects generate diesel emissions from construction vehicles during the construction phase, as well as some diesel emissions from small trucks during the operational phase. Diesel exhaust is mainly composed of particulate matter and gases, which contain potential cancer-causing substances. Emissions from diesel engines currently include over 40 substances that are listed by USEPA as HAPs and by ARB as TACs. On August 27, 1998, ARB identified particulate matter in diesel exhaust as a toxic air contaminant, based on data linking diesel particulate emissions to increased risks of lung cancer and respiratory disease.

In September 2000, ARB adopted a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles: *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 goal of the plan is to reduce diesel particulate matter emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020.

4.3.2.3 Local Plans and Policies

Local air districts are responsible for developing the overall attainment strategy for their jurisdictions which involve maintaining emission inventories; modeling of air pollutants; and developing, quantifying, and comparing emission reduction strategies. Air districts in state nonattainment areas are also responsible for developing and implementing transportation control measures (in cooperation with the regional transportation planning agencies) necessary to achieve local ambient air quality standards (APCD 2009). Districts have their own authority to regulate area sources of emissions.

APCD is the local agency responsible for the administration and enforcement of air quality regulations in San Diego County, and for protecting the public health and welfare through the administration of the federal and state CAAs. APCD and SANDAG are responsible for developing, implementing, and updating San Diego portion of the SIP, addressing federal requirements, and the San Diego RAQS, addressing state requirements. Both of these documents were discussed above in subsection 4.3.1.2, Air Quality Management Plans. ~~APCD is responsible~~

[4] Title V, a federal program created under a 1990 amendment to the Clean Air Act, is designed to standardize air quality permits and the permitting process for major sources of criteria pollutants and hazardous air pollutants across the country. Title V Operating Permits are legally enforceable documents that are issued after the source has begun to operate.

~~T~~APCD does not have thresholds or guidelines for assessing project impacts for construction or operations under CEQA. San Diego County and some cities, such as Chula Vista, have adopted emissions thresholds or guidelines for determinations of significance.

APCD Rules and Regulations

In addition to maintaining the 11~~0~~ monitoring stations, maintaining emissions inventories, developing emission reduction strategies, and preparing the SDAB portions of the SIP, and the RAQS, APCD adopts, promulgates, and enforces Rules and Regulations for achieving and maintaining NAAQS and CAAQS.

Since APCD only regulates non-mobile (stationary and some area) sources, only the stationary and area source control measures, identified in the RAQS and SIP, have been incorporated by APCD into its Rules and Regulations. The rules are developed to set limits on the amount of emissions from various types of sources and/or require specific emission control technologies. Following rule adoption, a permit system (e.g., Title V and New Source Review) is used to require air pollution controls on new and modified stationary sources and to ensure compliance with regulations by prescribing specific operating conditions, monitoring, record keeping, reporting, and emissions testing. APCD recently adopted Rule 55 to minimize dust released from soil during construction and demolition activities. Stationary sources are inspected by APCD on a regular basis to ensure compliance with all emissions, maintenance and operating requirements.

Local Toxic Air Contaminant Regulations

APCD Rule 1210

In San Diego County, APCD Rule 1210 implements the public notification and risk reduction requirements of AB 2588, and requires facilities to reduce risks to acceptable levels within five years. In addition, Rule 1200 establishes acceptable risk levels, and emission control requirements for new and modified facilities that may emit additional TACs.

4.3.3 SIGNIFICANCE CRITERIA

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (CEQA Section 21068). The 2050 RTP/SCS would have a significant impact on air quality if implementation were to:

AQ-1 Conflict with or obstruct implementation of the applicable Air Quality Attainment Plans.

AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

AQ-3 Result in a cumulatively considerable net increase of emissions of any criteria pollutant for which the project region is in nonattainment under applicable NAAQS or CAAQS.

AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

AQ-5 Expose a substantial number of people to objectionable odors.

4.3.4 IMPACT ANALYSIS

This section analyzes the air quality impacts associated with the implementation of the 2050 RTP/SCS. The analysis is organized in sections to address the main components of the 2050 RTP/SCS—regional growth and transportation system improvements. Analysis for each significance criteria will include a program-level discussion of anticipated impacts in the planning horizon years of 2020, 2035, and 2050. Significant impacts are identified and mitigation measures are provided where appropriate.

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY ATTAINMENT PLANS

The applicable federal air quality attainment plans are the 2007 *Eight-Hour Ozone Attainment Plan for San Diego County* for the federal 8-hour O_3 standard, and the corresponding California O_3 SIP. APCD's plan to attain the state O_3, standard is contained in the RAQS, with the most recent version being the 2009 Regional Air Quality Strategy Revision. Currently there is no requirement for PM_{10} and $PM_{2.5}$ attainment plans for state PM_{10} and $PM_{2.5}$ nonattainment areas. The applicable federal CO maintenance plan is the *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas.*

Under AQ-1, the 2050 RTP/SCS in 2020, 2035, and 2050 would have a significant air quality impact if the projected emissions of nonattainment and maintenance air pollutants in 2020, 2035, and 2050 would conflict with or obstruct implementation of applicable air quality attainment and maintenance plans for 2020, 2035, and 2050.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

The regional growth and land use change associated with the 2050 RTP/SCS in 2020 that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. The regional growth/land use change identified in the 2050 RTP/SCS in 2020 would have a significant air quality impact if the projected emissions of nonattainment and/or maintenance pollutants would conflict with or obstruct implementation of the applicable attainment and maintenance plans for 2020. The applicable air quality attainment plans are for the federal and state 8-hour O_3 standard and the federal CO standard; currently, there is no requirement for PM_{10} and $PM_{2.5}$ attainment plans for state PM_{10} and $PM_{2.5}$ nonattainment areas. Therefore, project emissions of ozone precursors (ROG and NO_X) and CO are of concern for AQ-1.

The RAQS relies on information from ARB and SANDAG, including projected growth in the County, and mobile, area source, and all other source emissions, in order to project future emissions and determine from that the strategies necessary for the reduction of emissions through regulatory controls. The ARB mobile source emission projections and SANDAG growth projections are typically based on population and vehicle trends and land use plans developed by the County, and the cities in the SANDAG region. As such, projects that propose development that is consistent with the growth anticipated by the adopted city and county general plans would be consistent with the applicable attainment and maintenance plans for 2020.

Regional growth and land use changes based on increased population by 2020 would generate future air emissions from the construction and use of new residential, commercial, industrial, and recreation land uses. To determine whether the emissions from the 2020 growth would be consistent with the applicable attainment and maintenance plans for 2020, the proposed 2020 development would need to be consistent with the growth anticipated by the adopted city and county general plans at that time, and thereby consistent with the applicable attainment and maintenance plans for 2020. In other words, the proposed housing development by 2020 (113,062 additional units) would need to be fewer units than the development capacity of the general plans at that time in the SANDAG region. Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2020 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ozone precursors (ROG and NO_X) and maintenance pollutants of CO would conflict with or obstruct implementation of these air quality ozone attainment and CO maintenance plans.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2020 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less-than-significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2020 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

Build-out of the development that would be accommodated by 2020 under the 2050 RTP/SCS provides the basis for emission estimates that would be included in the future RAQS and SIP attainment demonstrations for nonattainment and maintenance pollutants.

Transportation Network Improvements

Transportation network improvements are developed to accommodate the projected growth and increases in population, housing, and employment, as discussed above. The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In

addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Trolley Green Line would be extended to downtown San Diego.

The transportation network improvements of the 2050 RTP/SCS would generate future air emissions from the construction and use of the transportation improvements. Transportation conformity is required under the 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. In accordance with the requirements of the federal CAA, SANDAG and USDOT must make a determination that the 2050 RTP/SCS conforms to the SIP. Conformity to the SIP means that transportation activities will not create new air quality violations, worsen existing violations, or delay the attainment of NAAQS. SDAB's 8-hour Ozone Attainment Plan was approved by ARB on May 24, 2007; however, USEPA has not adopted this plan as an ozone SIP revision. Therefore, the 1-hour Ozone Maintenance Plan, approved by USEPA on July 28, 2003, as an ozone SIP revision, stands as the USEPA approved ozone SIP for the SDAB. However, on May 13, 2008, USEPA found that the motor vehicle emission budgets included in the SIP were adequate for use in transportation conformity analyses. The USEPA adequacy determination was announced in the Federal Register on May 23, 2008, and was effective June 7, 2008.The SDAB's CO SIP was approved by ARB and USEPA and became effective January 30, 2006.

The transportation conformity analysis performed by SANDAG is summarized below to assess the transportation network improvements impacts under significance criterion AQ-1. AQ-1 ~~impacts~~emissions are identified for the 2010 baseline and assessed for the target years of 2020, 2035, and 2050 in the following sections (emission were modeled by SANDAG using the EMFAC model). The EMFAC modeling also provides projected GHG emissions (CO2) associated with on-road transportation sources, based on emission factors and vehicle activity.

The results of the conformity analysis for emissions of O_3 precursors ROG and NO_X in years 2020, 2035, and 2050 scenarios (summer daily average) are shown in Table 4.3-3.

Table 4.3-3
Air Quality Conformity Analysis for 8-Hour Ozone
2020/2035/2050 Scenarios

Year	Average Weekday Vehicle Starts (1000s)	Average Weekday Vehicle Miles (1000s)	ROG		NO_X	
			SIP Emissions Budget (tons/day)	Scenario Emissions (tons/day)	SIP Emissions Budget (tons/day)	Scenario Emissions (tons/day)
2010	13,422	~~78,165~~78,001	53	~~38~~37.67	98	~~70~~70.38
2020	14,978~~9~~2	~~86,334~~86.155	53	~~24~~24.16	98	~~39~~38.43
2035	17,021	~~103,609~~103.178.	53	~~19~~18.80	98	~~30~~29.95
2050	18,942~~956~~	~~118,317~~117.825	53	~~19~~19.12	98	~~31~~30.70

Note: Emissions budgets from 2007 ~~SD~~APCD ~~Draft~~ 8-hour Ozone Attainment Plan for San Diego County.
Source: ~~SANDAG 2011,~~ Appendix B

The results of the conformity analysis for emissions of CO in years 2020, 2035, and 2050 scenarios (winter daily average) are shown in Table 4.3-4.

Table 4.3-4
Air Quality Conformity Analysis for CO
2020/2035/2050 Scenarios

Year	Average Weekday Vehicle Starts (1000s)	Average Weekday Vehicle Miles (1000s)	CO	
			SIP Emissions Budget (tons/day)	Scenario Emissions (tons/day)
2010	13,422	~~78,165~~78.001	730	~~387~~386.16
2020	~~14,978~~14,979	~~86,334~~86.155	730	~~207~~206.77
2035	17,021	~~103,609~~103.178	730	~~149~~148.59
2050	18,94~~2~~~~56~~	~~118,317~~117.825	730	~~157~~157.14

Note: Emissions budgets from 2007 ~~SD~~APCD ~~Draft~~ 8-hour Ozone Attainment Plan for San Diego County.
Source: ~~SANDAG 2011,~~ Appendix B

Transportation network improvements of the 2050 RTP/SCS by 2020 would generate future air emissions from the construction and use of the transportation improvements. As shown in Tables 4.3-3 and 4.3-4 above, the modeled emissions of O_3 precursors ROG and NO_X, and CO for 2020 are less than the conformity budget emissions for these pollutants, thereby demonstrating that by 2020, the transportation improvements of the 2050 RTP/SCS would not generate emissions greater than anticipated by the 8-hour O_3 attainment plan (the current O_3 SIP), and the CO SIP. Therefore, the impact would be less than significant.

Conclusion

The construction and use emissions from regional growth/land use changes in the 2050 RTP/SCS by 2020 and their impact significance as to conflicting with or obstructing the implementation of applicable attainment plans would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The 2050 RTP/SCS land use plan for 2020 would continue to focus on compact development in urban areas, which would reduce land disturbance and earth-moving activities during construction, and thereby reduce associated PM_{10} and $PM_{2.5}$ emissions.

~~The Emission Factors (~~EMFAC~~) -~~modeled emissions for the transportation improvements by 2020 (located in Appendix B and summarized in Tables 4.3-3 and 4.3-4) would be less than the conformity budget emissions; thereby, the emissions would not be greater than the emissions anticipated by the 8-hour O_3 attainment plan, the O_3 SIP, and the CO SIP. Therefore, implementation of the 2050 RTP/SCS by 2020 would result in less than significant impacts related to transportation network improvements.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figure 4.11-4, regional land use and development changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion;

and multiple north County planning areas along the I-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively. Areas of increased residential density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities. Also increased density would occur in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor.

In the northern portion of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The SR 78 corridor, from Escondido to I-5, would also experience growth and resulting land use density increases of both residential and commercial/office by 2035. As shown in Figure 4.11-4, single-family residential development would increase substantially along this corridor as well as additional commercial and industrial growth. The majority of this growth would be centered around the cities of Vista, San Marcos, and Escondido. The pattern of more dense growth along this segment of the SR 78 corridor is also apparent when comparing the existing housing density to 2035 housing density (see Figures 4.13.2 and 4.13-8 in Section 4.13, Population and Housing).

By 2035, some regional growth would be accommodated in the more eastern, rural areas of the region. Development in these areas would be centered mostly along highway corridors, such as SR 78, SR 67, I-8 east of El Cajon, and SR 94, and generally within San Diego County community planning areas. The unincorporated portions of San Diego County are currently undergoing population growth and expansion of residential land use as indicated by a population increase of 14 percent from 2000 to 2010 as shown in Table 4.11-2. When comparing the existing land uses and 2035 land uses in Figures 4.11-1 and 4.11-4, the 2035 land use pattern would generally involve additional residential development in areas that were previously undeveloped open space or at some time in agricultural use (as discussed in Section 4.2).

Regional growth and land use change associated with the 2050 RTP/SCS in 2035 that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. The regional growth/land use change identified in the 2050 RTP/SCS in 2035 would have a significant air quality impact if the projected emissions of nonattainment and/or maintenance pollutants would conflict with or obstruct implementation of the applicable attainment and maintenance plans for 2035.

Regional growth and land use changes based on increased population by 2035 would generate future air emissions from the construction and use of new residential, commercial, industrial, and recreation land uses. To determine whether the emissions from the 2035 growth would be consistent with the applicable attainment and maintenance plans for 2035, the proposed 2035 development would need to be consistent with the growth anticipated by the adopted city and county general plans at that time, and thereby consistent with the applicable attainment and maintenance plans for 2035. In other words, the proposed housing development by 2035 (268,094 additional units) would need to be fewer units than the development capacity of the existing general plans in the SANDAG region at that time. Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2035 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ozone precursors (ROG and NO_X) and maintenance pollutants of CO would conflict with or obstruct implementation of these air quality ozone attainment and CO maintenance plans for 2035.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2035 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2035 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

Build-out of the development that would be accommodated by 2035 under the 2050 RTP/SCS provides the basis for emission estimates that would be included in the future RAQS and SIP attainment demonstrations for nonattainment pollutants

In addition, in 2035, the 2050 RTP/SCS sustainable communities strategy, as described for 2020, would continue to focus on compact development in urban areas. Continued urban infill development, increased housing densities, and preserving open space in 2035 would reduce land disturbance and earth-moving activities during construction, and associated PM_{10} and $PM_{2.5}$ emissions, for which the San Diego region is a state nonattainment area.

Transportation Network Improvements

~~By 2035, transportation network improvements associated with the 2050 RTP/SCS would directly impact FMMP-designated lands by encroachment of the right-of-way for these improvements on these lands.~~ Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marcos, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Transportation network improvements of the 2050 RTP/SCS by 2035 would generate future air emissions from the construction and use of the transportation improvements. As shown in Tables 4.3-3 and 4.3-4 above, the modeled emissions by 2035 are less than the conformity budget emissions, thereby demonstrating that by 2035, the transportation improvements of the 2050 RTP/SCS would not generate emissions greater than anticipated by the 8-hour O_3 attainment plan, the O_3 SIP, and the CO SIP. Therefore, the impact would be less than significant.

Conclusion

The construction and use emissions from regional growth/land use changes in the 2050 RTP/SCS by 2035 and their impact significance as to conflicting with or obstructing the implementation of applicable attainment plans would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change would be a significant impact. The 2050 RTP/SCS land use plan for 2035 would continue to focus on compact development in urban

areas, which would reduce land disturbance and earth-moving activities during construction, and thereby reduce associated PM_{10} and $PM_{2.5}$ emissions.

The modeled emissions for the transportation improvements by 2035 (located in Appendix B and summarized in Tables 4.3-3 and 4.3-4) would be less than the conformity budget emissions; thereby, the emissions would not be greater than the emissions anticipated by the 8-hour O_3 attainment plan, the O_3 SIP, and the CO SIP. Therefore, implementation of the 2050 RTP/SCS by 2035 would result in less than significant impacts related to transportation network improvements.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035 would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east.

Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities.

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE.

Regional growth and land use change associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. The regional growth/land use change in 2050 identified in the 2050 RTP/SCS would have a significant air quality impact if the projected emissions of nonattainment and/or maintenance pollutants would conflict with or obstruct implementation of the applicable attainment and maintenance plans for 2050.

Regional growth and land use changes based on increased population by 2050 would generate future air emissions from the construction and use of new residential, commercial, industrial, and recreation land uses. To determine whether the emissions from the 2050 growth would be consistent with the applicable attainment and maintenance plans for 2050, the proposed 2050 development would need to be consistent with the growth anticipated by the adopted city and county general plans at that time, and thereby consistent with the applicable attainment and maintenance plans for 2050. In other words, the proposed housing development by 2050 (111,570 additional units) would need to be fewer units than the development capacity of the existing general plans in the SANDAG region at that time.

Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2050 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ozone precursors (ROG and NO_X) and maintenance pollutants of CO would conflict with or obstruct implementation of these air quality ozone attainment and CO maintenance plans for 2050.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2050 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2050 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

In addition, in 2050, the 2050 RTP/SCS land use plan, as described for 2020 and 2035, would continue to focus on compact development in urban areas. Continued urban infill development, increased housing densities, and preserving open space in 2050 would reduce land disturbance and earth-moving activities during construction, and associated PM_{10} and $PM_{2.5}$ emissions, for which the San Diego region is a state nonattainment area.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego ~~via~~ to El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to ~~Palomar Trolley Station~~ San Ysidro ~~in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-~~City, and National~~City, National City, and Chula Vista would be established.

Transportation network improvements of the 2050 RTP/SCS by 2050 would generate future air emissions from the construction and use of the transportation improvements. As shown in Tables 4.3-3 and 4.3-4 above, the modeled emissions by 2050 are less than the conformity budget emissions, thereby demonstrating that, by 2050, the transportation improvements of the 2050 RTP/SCS would not generate emissions greater than anticipated by the 8-hour O_3 attainment plan, the O_3 SIP, and the CO SIP. Therefore, the impact would be less than significant.

Conclusion

The construction and use emissions from regional growth/land use changes in the 2050 RTP/SCS by 2050 and their impact significance as to conflicting with or obstructing the implementation of applicable attainment plans would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The 2050 RTP/SCS land use plan for 2050 would continue to focus on compact development in urban areas, which would reduce land disturbance and earth-moving activities during construction, and thereby reduce associated PM_{10} and $PM_{2.5}$ emissions.

The EMFAC modeled emissions for the transportation improvements by 2050 (located in Appendix B and summarized in Tables 4.3-3 and 4.3-4) would be less than the conformity budget emissions; thereby, the emissions would not be greater than the emissions anticipated by the 8-hour O_3 attainment plan, the O_3 SIP, and the CO SIP. Therefore, implementation of the 2050 RTP/SCS by 2050 would result in less than significant impacts related to transportation network improvements.

AQ-2 VIOLATE ANY AIR QUALITY STANDARD OR CONTRIBUTE SUBSTANTIALLY TO AN EXISTING OR PROJECTED AIR QUALITY VIOLATION

The SDAB is a federal nonattainment area for ozone, and a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. Therefore, emissions of ozone precursors (ROG and NO_X), PM_{10}, and $PM_{2.5}$ of the 2050 RTP/SCS are evaluated to determine whether their emissions would contribute substantially to these existing air quality violations. For the remaining criteria pollutants, the SDAB is in attainment; the emissions of these pollutants of the 2050 RTP/SCS are evaluated to determine if their emissions would violate these remaining NAAQS and CAAQS in attainment, including for CO, under a federal maintenance plan.

Under AQ-2, the 2050 RTP/SCS would have a significant impact if the projected emissions of criteria air pollutants in 2020, 2035, and 2050 (located in Appendix B and summarized in Tables 4.3-4 and 4.3-4 would violate any air quality standard (NAAQS or CAAQS) or contribute to an existing or projected violation of NAAQS or CAAQS.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego

planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

The regional growth and land use change in 2020 associated with the 2050 RTP/SCS could impact regional and local air quality from new development and redevelopment to accommodate forecast population growth. Development would include residential, commercial, and industrial facilities. Air emissions from construction activities are typically estimated based on project-specific data regarding types and number of construction equipment used, amount of earthwork, etc. The principal sources of pollutants during construction are construction equipment exhaust emissions and dust generation during site preparation, excavation, and earth-moving activities. The pollutant of concern for regional emissions is NO_X, a major component of diesel exhaust. Pollutants of concern for both regional and local emissions are PM_{10}, and $PM_{2.5}$, principally generated from dust and earth moving. If construction activities are located near sensitive receptors, diesel PM may also be a pollutant of concern. Additionally, air emissions differ from year to year due to differences in construction fleet makeup. Use of constructed facilities would generate emissions such as from the combustion of natural gas for home heating and cooking, and occasional use of fireplaces.

Therefore, development construction and use emissions for 2020 would be described qualitatively; actual construction and use emissions for individual projects of the 2050 RTP/SCS would be analyzed during each project-level environmental review. APCD does not provide quantitative thresholds for construction and use emissions. However, APCD does specify Air Quality Impact Analysis (AQIA) trigger levels for new or modified stationary sources (APCD Rules 20.2 and 20.3). Although these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels may used to evaluate the increased emissions that would be discharged to the SDAB from proposed land development projects. CEQA lead agencies have the discretion to choose an appropriate threshold and determine significance of impacts. For example, APCD Rules 20.2 and 20.3 do not have AQIA thresholds for emissions of VOCs and PM2.5. Therefore, the County of San Diego recommends using the screening level for VOCs specified by the South Coast Air Quality Management District (SCAQMD). Construction activities, while continuing throughout the period of implementation of the 2050 RTP/SCS, would be a series of individual and differing shorter-term projects.

Therefore, emission analyses related to regional growth and land use change in 2020 would be analyzed at the project level to determine if the projected emissions of criteria air pollutants would violate any air quality standard (NAAQS or CAAQS) or contribute to an existing or projected violation of NAAQS or CAAQS.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2020 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2020 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions

of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Trolley Green Line would be extended to downtown San Diego.

Transportation network improvements of the 2050 RTP/SCS would generate air emissions from the construction and use of the transportation improvements. Highway construction projects are often very large undertakings that require concurrent operations of many pieces of diesel-engine-driven off-road and on-road equipment. These large projects often generate NO_X emissions in excess of the CEQA significance guidelines of local jurisdictions.

Emissions are considered separately for both construction and operation impacts; however, due to the program-level nature of the document, it would be infeasible to estimate the project-level details necessary to quantify program-level construction emissions. Operation emission impacts would be long term, resulting from changes in the transportation environment. Operational emissions include both on-road and off-road sources.

SANDAG developed the emission modeling results incorporated in this section. On-road mobile emissions of criteria air pollutants were calculated for the 2050 RTP/SCS for the 2010 baseline, 2020, 2035, and 2050 scenarios. The air quality modeling was based on the applicable version of ARB's EMFAC model. The EMFAC model contains emissions factors for calendar years up to 2040. Emission factors for 2040 will be used to provide a conservative estimate of 2050 emissions since emission factors decline in the future due to vehicle turnover and improvements in fuel efficiency. The modeling was based on transportation metrics such as total daily vehicle trips, VMT, and distribution of vehicle miles of travel by speed. This information was used to determine total emissions from transportation activity in the San Diego region. Operational impacts would be considered significant if projected emissions of criteria air pollutants in 2020, 2035, and 2050 are greater than 2010 baseline emission levels.

On-road mobile emissions of CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$ were calculated for the 2050 RTP/SCS for the 2020, 2035, and 2050 scenarios (annual daily average). Year 2010 was used as the baseline to capture the most accurate emissions of the existing transportation network. The forecast emissions are shown in Table 4.3-5.

Table 4.3-5
Forecast On-road Emissions for CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$ (in tons/~~year~~day)
2020/2035/2050 Scenarios

Year	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$
2010	~~387~~389.16	~~38~~36.93	~~70~~69.30	~~5~~4.48	3.11
2020	~~207~~208.62	~~24~~23.59	~~39~~40.18	~~5~~4.75	3.26
2035	~~149~~150.02	~~19~~18.05	~~30~~29.37	~~6~~5.69	43.89
2050	~~157~~158.69	~~19~~18.47	~~31~~30.08	~~7~~6.48	4.42

Emissions forecast by SANDAG, April 2010.
~~Note: Emission values rounded to nearest whole number~~

As shown in Table 4.3-5, the on-road emissions of CO, ROG, and NO_X in 2020 would be less than the 2010 baseline emissions; however, the emissions of PM_{10} and $PM_{2.5}$ would increase ~~by 0.23 and 0.15 tons/year, respectively (~~as shown in Appendix B). Therefore, the impact would be significant for PM_{10} and $PM_{2.5}$~~.~~ in 2020.

On-road emissions are a small part of the total emissions for the SDAB. Specific emissions data quantifying off-road emissions attributable to the 2050 RTP/SCS are not available. The principal sources of off-road emissions associated with 2050 RTP/SCS projects would be train operations; port activities, including materials handling equipment and ship operations; and construction.

SANDAG is responsible for ensuring that on-road mobile source emissions do not exceed the emission budgets. All other sources of emissions including off-road emissions (e.g., stationary sources, ships, airplanes, trains, construction) are either regulated or reported by APCD, ARB, or USEPA. These emissions are addressed in local AQMPs and associated environmental documents.

Conclusion

The regional growth and land use construction and use emissions by 2020 and their impact significance for AQ-2 would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The 2050 RTP/SCS land use plan for 2020 would continue to focus on compact development in urban areas, which would reduce land disturbance and earth-moving activities during construction, and thereby reduce associated PM_{10} and $PM_{2.5}$ emissions.

The modeled emissions of PM_{10}, and $PM_{2.5}$ for the transportation improvements by 2020 (located in Appendix B and summarized in Table~~s~~ 4.3-~~3~~5~~ and 4.3-4~~) would be greater than the 2010 baseline emissions of PM_{10} and $PM_{2.5}$, for which the area is designated as state nonattainment for PM_{10} and $PM_{2.5}$, and the impact would be significant. Therefore, when considered together, the 2020 regional growth/land use changes and transportation network improvements would be a significant impact.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figure 4.11-4, regional land use and development changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the I-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively. Areas of increased residential density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities. Also increased density would occur in more inland areas along the I-8 corridor

through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor.

In the northern portion of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The SR 78 corridor, from Escondido to I-5, would also experience growth and resulting land use density increases of both residential and commercial/office by 2035. As shown in Figure 4.11-4, single-family residential development would increase substantially along this corridor as well as additional commercial and industrial growth. The majority of this growth would be centered around the cities of Vista, San Marcos, and Escondido. The pattern of more dense growth along this segment of the SR 78 corridor is also apparent when comparing the existing housing density to 2035 housing density (see Figures 4.13.2 and 4.13-8 in Section 4.13, Population and Housing).

By 2035, some regional growth would be accommodated in the more eastern, rural areas of the region. Development in these areas would be centered mostly along highway corridors, such as SR 78, SR 67, I-8 east of El Cajon, and SR 94, and generally within San Diego County community planning areas. The unincorporated portions of San Diego County are currently undergoing population growth and expansion of residential land use as indicated by a population increase of 14 percent from 2000 to 2010 as shown in Table 4.11-2. When comparing the existing land uses and 2035 land uses in Figures 4.11-1 and 4.11-4, the 2035 land use pattern would generally involve additional residential development in areas that were previously undeveloped open space or at some time in agricultural use (as discussed in Section 4.2).

Regional growth and land use change in 2035 associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. Construction equipment produces exhaust emissions of NO_X, and dust generation of PM_{10} and $PM_{2.5}$ during site preparation, excavation, and earth-moving activities. Therefore, construction emissions for 2035 would be described qualitatively; actual construction emissions for individual projects of the 2050 RTP/SCS would be analyzed during the each project-level environmental review.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2035 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2035 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

In addition, in 2035, the 2050 RTP/SCS land use plan, as described for 2020, would continue to focus on compact development in urban areas. Continued urban infill development, increased housing densities, and preserving open space in 2035 would reduce land disturbance and earth-moving activities during construction, and associated PM_{10} and $PM_{2.5}$ emissions, for which the San Diego region is a state nonattainment area.

Transportation Network Improvements

~~By 2035, transportation network improvements associated with the 2050 RTP/SCS would directly impact FMMP-designated lands by encroachment of the right-of-way for these improvements on these lands.~~ Some key highway improvements in place by 2035 would include ~~continued widening along portions of~~

~~I-5;~~ additional HOV, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; ~~-~~and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marcos, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

As shown in Table 4.3-5, the on-road emissions of CO, ROG, and NO_X in 2035 would be less than the 2010 emissions; however, the PM_{10}, and $PM_{2.5}$ emissions would increase as shown~~by 1.18 and 0.79 tons/year, respectively~~. Therefore, the impact would be significant for PM_{10} and $PM_{2.5}$~~.~~ in 2035.

Conclusion

The regional growth construction and use emissions by 2035 and their impacts and significance would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact.

The modeled emissions of PM_{10}~~,~~ and $PM_{2.5}$ for the transportation improvements by 2035 would be greater than the 2010 emissions of PM_{10} and $PM_{2.5}$, for which the area is designated as state nonattainment for PM_{10} and $PM_{2.5}$, and the impact would be significant. Therefore, when considered together, the 2035 regional growth/land use changes and transportation network improvements would be a significant impact.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035 would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east.

Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the

goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities.

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE.

Regional growth and land use change in 2035 associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. Construction equipment produces exhaust emissions of NO_X, and dust generation of PM_{10} and $PM_{2.5}$ during site preparation, excavation, and earth-moving activities. Therefore, construction emissions for 2035 would be described qualitatively; actual construction emissions for individual projects of the 2050 RTP/SCS would be analyzed during the each project-level environmental review.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2050 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2050 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

In addition, in 2050, the 2050 RTP/SCS land use plan, as described for 2020 and 2035, would continue to focus on compact development in urban areas. Continued urban infill development, increased housing densities, and preserving open space in 2050 would reduce land disturbance and earth-moving activities during construction, and associated PM_{10} and $PM_{2.5}$ emissions, for which the San Diego region is a state nonattainment area.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley

lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego ~~via~~ to El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to ~~Palomar Trolley Station~~San Ysidro ~~in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

As shown in Table 4.3-5, the on-road emissions of CO, ROG, NO_X, in 2050 would be less than the 2010 emissions; however, the PM_{10}, and $PM_{2.5}$ emissions would increase as shown~~by 1.97 and 1.29 tons/year, respectively~~. Therefore, the impact would be significant for PM_{10} and $PM_{2.5}$ in 2050.

Conclusion

The regional growth construction and use emissions by 2050 and their impacts and significance would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The modeled emissions for the transportation improvements by 2050 would be greater than the 2010 emissions of PM_{10} and $PM_{2.5}$, for which the area is designated as state nonattainment for PM_{10} and $PM_{2.5}$, and the impact would be significant. Therefore, when considered together, the 2050 regional growth/land use changes and transportation network improvements would be a significant impact.

AQ-3 RESULT IN A CUMULATIVE CONSIDERABLE NET INCREASE OF EMISSIONS OF ANY CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NONATTAINMENT UNDER APPLICABLE NAAQS OR CAAQS

The SDAB is a federal nonattainment area for ozone, and a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. Therefore, emissions of ozone precursors (ROG and NO_X), PM_{10}, and $PM_{2.5}$ of the 2050 RTP/SCS are evaluated to determine whether their emissions of these nonattainment pollutants would result in a cumulatively considerable net increase of emissions of these nonattainment pollutants.

Under AQ-3, for construction and use emissions, if project emissions have a direct impact on air quality (exceeds 2010 baseline emissions of an applicable federal or state nonattainment air pollutant), the project would also have a significant cumulatively considerable net increase. If less than significant, the project still may have a cumulatively considerable impact if, in combination with other proposed projects in proximity, it would exceed thresholds.

For transportation emissions, cumulatively considerable net increases of mobile emissions are treated differently than construction and use emissions. The SDAB's RAQS, based on growth projections derived from the allowed General Plan densities, is updated every 3 years by ~~SD~~APCD and lays out the programs for attaining CAAQS and NAAQS. It is assumed that a project that conforms to an applicable General Plan, and does not have emissions exceeding its thresholds, will not create a cumulatively considerable net increase to ozone since the emissions were accounted for in the RAQS.

Under AQ-3, the 2050 RTP/SCS would have a significant impact if projected construction and use emissions of an applicable federal or state nonattainment air pollutant are greater than current 2010 emission levels, project emissions would also have a significant cumulatively considerable net increase; and if projected operational emissions of nonattainment pollutants do not conform to the RAQS and/or are greater than current 2010 emission levels.

Emissions are considered separately for both regional growth/land use change and transportation network improvements. Due to the program-level nature of this EIR, it would be infeasible to estimate the project-level details necessary to quantify program-level construction emissions and make a determination of considerable increase for regional growth and land use change.

AQ-3 impacts are assessed for the target years of 2020, 2035, and 2050 in the following sections.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

The regional growth and land use change in 2020 associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. Air emissions from construction activities are typically estimated based on project-specific data regarding types and number of construction equipment used and amount of earthwork... The principal sources of pollutants during construction are construction equipment exhaust emissions and dust generation during site preparation, excavation, and earth-moving activities. The pollutant of concern for regional emissions is NO_X, a major component of diesel exhaust. Pollutants of concern for both regional and local emissions are PM_{10}, and $PM_{2.5}$, principally generated from dust and earth moving. If construction activities are located near sensitive receptors, diesel PM may also be a pollutant of concern. Additionally, air emissions differ from year to year due to differences in construction fleet makeup. Use of constructed facilities would generate emissions such as from the combustion of natural gas for home heating and cooking.

Therefore, development construction and use emissions of the 2050 RTP/SCS for 2020 at the program level would be described qualitatively; actual construction and use emissions for individual projects of the 2050 RTP/SCS for 2020 would be analyzed during the each project-level environmental review. Since there are no APCD adopted thresholds for construction and use emissions, CEQA lead agencies would have the discretion to choose an appropriate threshold and determine significance of impacts. Construction activities, while continuing throughout the period of implementation of the 2050 RTP/SCS, would be a series of individual and differing shorter-term projects.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2020 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2020 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050

RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

In addition, the 2050 RTP/SCS land use pattern focuses housing growth in existing urbanized areas. As discussed in Section 4.11, Land Use, cities and other jurisdictions in the region have begun to integrate local and regional plans for accommodating the region's growing population, by preserving open space, and encouraging infill development and increased housing densities within incorporated areas. To ensure that the growth patterns and land use plan presented in the 2050 RTP/SCS were consistent with local planning documents, SANDAG worked closely with the individual jurisdictions throughout the entire planning process to gather information about adopted specific and master plans that have yet to be implemented to ensure that all anticipated development is consistent with the goals and policies of the 2050 RTP/SCS. Increased growth and land development contributes to an increase in direct emissions of particulate matter (PM_{10} and $PM_{2.5}$), for which the San Diego region is a state nonattainment area. Infill development and increased housing densities, and preserving open space would reduce land disturbance and earth-moving activities during construction, a primary generator of particulate emission.

Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2020 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would result in a cumulatively considerable net increase of emissions of these nonattainment pollutants. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact.

Transportation Network Improvements

Transportation network improvements are developed to accommodate the projected growth and increases in population, housing, and employment, as discussed above. The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Trolley Green Line would be extended to downtown San Diego.

On-road mobile emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were calculated for the 2050 RTP/SCS for 2020, 2035, and 2050. Year 2010 was used as the baseline to capture the most accurate emissions of the existing transportation network. The forecast emissions are shown in Table 4.3-5 above. As shown in Table 4.3-5, the on-road emissions of ROG and NO_X from 2010 to 2020 would decrease; however, on-road emissions of PM_{10} and $PM_{2.5}$ would increase, ~~and~~ exceeding 2010 baseline PM_{10} and $PM_{2.5}$ emissions.

In addition, conformance of the 2020 emissions with the RAQS would be based on whether the project conforms to the applicable General Plan, which would be determined at the project level. It is therefore concluded that at the program level the increase would result in a cumulatively considerable net increase of PM_{10} and $PM_{2.5}$, and the impact would be significant.

Conclusion

The construction and use emissions from regional growth/land use changes by 2020 and their impact significance would be determined at the individual project-level analysis. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The modeled increase of PM_{10} and $PM_{2.5}$ emissions for the transportation improvements from 2010 to 2020 would be a cumulatively considerable net increase and, therefore, a significant impact. When considered together, the 2020 regional growth/land use changes and transportation network improvements would result in a significant impact.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figure 4.11-4, regional land use and development changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the I-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively. Areas of increased residential density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities. Also increased density would occur in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor.

In the northern portion of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The SR 78 corridor, from Escondido to I-5, would also experience growth and resulting land use density increases of both residential and commercial/office by 2035. As shown in Figure 4.11-4, single-family residential development would increase substantially along this corridor as well as additional commercial and industrial growth. The majority of this growth would be centered around the cities of Vista, San Marcos, and Escondido. The pattern of more dense growth along this segment of the SR 78 corridor is also apparent when comparing the existing housing density to 2035 housing density (see Figures 4.13.2 and 4.13-8 in Section 4.13, Population and Housing).

By 2035, some regional growth would be accommodated in the more eastern, rural areas of the region. Development in these areas would be centered mostly along highway corridors, such as SR 78, SR 67, I-8 east of El Cajon, and SR 94, and generally within San Diego County community planning areas. The unincorporated portions of San Diego County are currently undergoing population growth and expansion of residential land use as indicated by a population increase of 14 percent from 2000 to 2010 as shown in Table 4.11-2. When comparing the existing land uses and 2035 land uses in Figures 4.11-1 and 4.11-4, the 2035 land use pattern would generally involve additional residential development in areas that were previously undeveloped open space or at some time in agricultural use (as discussed in Section 4.2).

Regional growth and land use change in 2035 associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. As for 2020, housing construction and use emissions for 2035 would be described qualitatively; actual construction and use emissions for individual projects of the 2050 RTP/SCS would be analyzed during the each project-level environmental review. Since there are no regionally adopted thresholds for construction and use emissions, CEQA lead agencies would have the discretion to choose an appropriate threshold and determine significance of impacts. Construction activities, while continuing throughout the period of implementation of the 2050 RTP/SCS, would be a series of individual and differing shorter-term projects.

In addition, the 2050 RTP/SCS land use pattern focuses housing growth in existing urbanized areas. As discussed for 2020, cities and other jurisdictions in the region have begun to integrate local and regional plans for accommodating the region's growing population, by preserving open space, and encouraging infill development and increased housing densities within incorporated areas, which is consistent with the goals and policies of the 2050 RTP/SCS. Increased growth and land development contributes to an increase in direct emissions of particulate matter (PM_{10} and $PM_{2.5}$), for which the San Diego region is a state nonattainment area. Infill development and increased housing densities, and preserving open space would reduce land disturbance and earth-moving activities during construction, a primary generator of particulate emission.

Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2035 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would result in a cumulatively considerable net increase of emissions of these nonattainment pollutants.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2035 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2035 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

Transportation Network Improvements

~~By 2035, transportation network improvements associated with the 2050 RTP/SCS would directly impact FMMP-designated lands by encroachment of the right-of-way for these improvements on these lands.~~ Some key highway improvements in place by 2035 would include additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of

Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

As shown in Table 4.3-5, the on-road emissions of ~~CO,~~ ROG~~,~~ and NO_X, from 2010 to 2035 would decrease ~~for ROG and NO_X~~; however, on-road emissions of PM_{10} and $PM_{2.5}$ would exceed 2010 baseline PM_{10} and $PM_{2.5}$ emissions. In addition, conformance of the 2020 emissions with the RAQS would be based on whether the project conforms to the applicable General Plan, which would be determined at the project level. It is therefore concluded that at the program level, the increase would result in a cumulatively considerable net increase of PM_{10} and $PM_{2.5}$ and would result in a significant impact.

Conclusion

The regional growth construction emissions from regional growth/land use changes by 2035 and their impact significance would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The modeled increase of PM_{10} and $PM_{2.5}$ emissions for the transportation improvements from 2010 to 2035 would be a cumulatively considerable net increase, and conformance of the 2020 emissions with the RAQS, would be determined at the project level and the impact at the program level would be significant. When considered together, the 2035 regional growth/land use changes and transportation network improvements would be result in a significant impact.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035 would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east.

Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities.

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE.

Regional growth and land use change in 2050 associated with the 2050 RTP/SCS that could impact regional and local air quality includes new development and redevelopment to accommodate forecasted population growth. As for 2020, housing construction and use emissions for 2050 would be described qualitatively; actual construction and use emissions for individual projects of the 2050 RTP/SCS would be analyzed during the each project-level environmental review. Since there are no regionally adopted thresholds for construction and use emissions, CEQA lead agencies would have the discretion to choose an appropriate threshold and determine significance of impacts. Construction activities, while continuing throughout the period of implementation of the 2050 RTP/SCS, would be a series of individual and differing shorter-term projects.

In addition, the 2050 RTP/SCS land use pattern focuses housing growth in existing urbanized areas. As discussed for 2020, cities and other jurisdictions in the region have begun to integrate local and regional plans for accommodating the region's growing population, by preserving open space, and encouraging infill development and increased housing densities within incorporated areas, which is consistent with the goals and policies of the 2050 RTP/SCS. Increased growth and land development contributes to an increase in direct emissions of particulate matter (PM_{10} and $PM_{2.5}$), for which the San Diego region is a state nonattainment area. Infill development and increased housing densities, and preserving open space would reduce land disturbance and earth-moving activities during construction, a primary generator of particulate emission.

Therefore, emission analyses related to regional growth and land use change of the 2050 RTP/SCS in 2050 would be analyzed at the project level to determine whether their emissions of the nonattainment pollutants of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would result in a cumulatively considerable net increase of emissions of these nonattainment pollutants.

While adherence to the existing laws, regulations, and programs discussed above would reduce air quality impacts in 2050 upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, project-specific information is not available to predict either the project-specific air quality impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such project-specific air quality impacts. Given the potential for land use changes in 2050 to cause substantial adverse changes in the significance of air quality impacts, implementation of the 2050 RTP/SCS would result in air pollutant emission activities related to land use changes that would cause a substantial adverse change in the significance of air quality impacts. This is a significant impact.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego ~~via~~to El Cajon Boulevard/Mid-City would be ~~constructed;~~extended to San Diego State University; and a line from University Town Center to ~~Palomar Trolley Station~~San Ysidro ~~in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

As shown in Table 4.3-5, the on-road emissions of ~~CO,~~ ROG~~,~~ and NO_X, from 2010 to 2050 would decrease for ROG and NO_X and increase for PM_{10} and $PM_{2.5}$. In addition, conformance of the 2050 emissions with the RAQS would be based on whether the project conforms to the applicable General Plan, which would be determined at the project level. It is therefore concluded that at the program level, the increase would result in a cumulatively considerable net increase of PM_{10} and $PM_{2.5}$ and result in a significant impact.

Conclusion

The regional growth construction emissions by 2050 and their impact significance would be determined at the individual project-level analysis at that time. At the program level of this EIR, emission impacts of regional growth and land use change are considered a significant impact. The modeled increase of PM_{10} and $PM_{2.5}$ emissions for the transportation improvements from 2010 to 2050 would be a cumulatively considerable increase at the program level, and the impact would be significant. When considered together, the 2050 regional growth/land use changes and transportation network improvements would result in a significant impact.

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS

Localized concentrations of some criteria pollutants and toxics would result in a significant impact if receptors sensitive to these pollutants (i.e., children and the elderly) are exposed to (i.e., in proximity to) substantial concentrations of these pollutants.

CO and PM Hotspots

CO hotspots may occur on major roadways at severely congested intersections. The potential for a significant local CO impact is when these congested intersections are located in proximity to sensitive receptors. Procedures and guidelines for use by agencies that sponsor transportation projects in evaluating the potential local level CO impacts of a project are contained in the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) (UCD ITS 1997). The CO Protocol provides a methodology for determining the level of analysis, if any, required on a project. The guidelines comply with the CAA, federal and state conformity rules, and CEQA. Transportation Performance Measures include measures to reduce traffic congestion on roadways and their intersections, which helps to reduce the potential for CO hotspots.

USEPA and FHWA published the Transportation Conformity Guidance for Qualitative Hot-Spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (FHWA 2006a) (known as PM Guidance), which described how to qualitatively evaluate a project's potential to cause a PM hot spot. In December 2010, USEPA released its final PM Guidance for quantitative hot-spot analyses for new or expanded highway projects with significant increase in diesel traffic in federal $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas (USEPA 2010). The SDAB is not a federally designated $PM_{2.5}$ and PM_{10} nonattainment or maintenance area, and, therefore, not subject to either guidance. However, the SDAB is designated as a state nonattainment area for $PM_{2.5}$ and PM_{10}. To meet state requirements, specific projects can be assessed qualitatively using the procedure outlined in the PM Guidance.

The PM Guidance describes a qualitative hot-spot analysis method that does not involve dispersion modeling. This qualitative $PM_{2.5}$ and PM_{10} hot-spot analysis method involves a more streamlined review of local factors such as local monitoring data near a proposed project location. The $PM_{2.5}$ and PM_{10} hot-spot analysis method in the PM Guidance involves two steps: determining whether a project is a "project of concern" and, if it is a "project of concern," preparing a qualitative (emissions analysis only), but more detailed, analysis of the project.

The PM Guidance defines the following types of projects as projects of air quality concern:

- New or expanded highway projects that have a significant number of, or significant increase in, diesel vehicles;
- Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location; or
- Projects in, or affecting locations, areas, or categories of, sites that are identified in the PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

A significant volume for a new highway or expressway is defined as an annual average daily traffic (AADT) volume of 125,000 or more, and a significant number of diesel vehicles is defined as 8% or more of that total AADT or more than 10,000 truck AADT. A significant increase in diesel truck traffic is usually considered to be approximately 10%.

As indicated in the PM Guidance, pursuant to 40 CFR 93.123(b)(i) and (ii), any new or expanded highway project that does not involve a significant number (greater than 8% of AADT) or increase in the number of diesel vehicles (greater than 10%) is a project that is not of air quality concern and, consequently, does not require a $PM_{2.5}$ or PM_{10} hot-spot analysis.

In all areas, as with carbon monoxide (CO), hot spot evaluation of projects is needed for environmental review (NEPA and CEQA) purposes. Information regarding EPA's requirements may be found at: http://www.epa.gov/otaq/stateresources/transconf/policy/420b10040.pdf

Toxics

As detailed in Section 4.3.1.2 Air Quality Standards (Toxic Air Contaminants), localized concentrations of toxic air contaminants (TACs) are known or suspected to cause serious health problems, but do not have a corresponding regional ambient air quality standard, such as for criteria pollutants. APCD states that a TAC may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic does not automatically create a health hazard. Other factors, such as the amount of TAC released, its toxicity, how it is released into the air, local topography, and the local weather conditions at the time of release (e.g., wind speed and direction), all influence whether the TAC emission could be hazardous to human health (APCD 2010b).

Human exposure to TACs 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. TACs~~/MSATs~~ may pose a threat to public health even at low concentrations due to their high toxicity. Therefore, there are no exposure levels that are considered safe for TACs~~/MSATs~~.

Public exposure to TACs is a significant public health issue in California. APCD samples for TACs at the various monitoring stations in the SDAB nearby and downwind of transportation, industrial, and other air pollutant sources. Based on 2009 estimates from APCD, industrial, mobile, area, and natural sources of TACs emit more than 64.9 million pounds of TACs annually. Excluding diesel particulates, there has been a 72 percent reduction in the ambient environmental cancer risk from air toxics measured at the Chula Vista station and a 73 percent reduction at the El Cajon station since 1989 (APCD 2010b). Overall, levels of most TACs have gone down since 1990, except for *para*dichlorobenzene and formaldehyde.

USEPA has identified 21 TACs as Mobile Source Air Toxics (MSATs), which are emitted from highway vehicles and nonroad equipment, and identified six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. Health effects from MSATs/TACs, i.e., cancer risks and chronic non-cancer risks from on-road traffic, have been associated primarily with diesel PM, benzene, and 1, 3- butadiene. USEPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines.

For federal highway projects, FHWA has established the following interim policy for the impact analysis of MSATs: "Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context." The California Office of Environmental Health Hazard Assessment (OEHHA) has established protocols and methods for performing health risk analyses (HRAs) for stationary sources and some area sources. The California-specific transportation air quality analysis model, EMFAC, is designed to model MSATs at the project-level.

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

Diesel Particulate Matter (Diesel PM)

The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines (diesel PM). Diesel PM poses the greatest health risk among the TACs mentioned. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Diesel exhaust is

composed of two phases, gas and particle, and both phases contribute to the health risk. Fine and ultra fine diesel particulates are of the greatest health concern. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

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

Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depends upon several factors including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure. There is limited information on exposure to just diesel particulate matter but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings (USEPA 2011a).

EPA's National Scale Assessment uses several types of health hazard information to provide a quantitative "threshold of concern" or a health benchmark concentration at which it is expected that no adverse health effects occur at exposures to that level. Health effects information on carcinogenic, short and long term noncarcinogenic end points are used to establish selective protective health levels to compare to the modeled exposures levels. Unfortunately the exposure response data in human studies are considered too uncertain to develop a carcinogenic unit risk for EPA's use. There is a Reference Concentration (RFC) that is used as a health benchmark protective of chronic noncarcinogenic health effects but it is for diesel exhaust and not specifically set for diesel particulate matter. The RFC for diesel exhaust, which includes diesel particulate matter is 5 ug/m3 (USEPA 2011a). This value is similar to the National Ambient Air Quality Standard established for fine particulate matter (PM2.5), which is 15ug/m3.

Unlike other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in 2000 to be 720 excess cancer cases per million people in the SDAB. Since 1990, the diesel PM health risk in the SDAB has been reduced by one-third (ARB 2006).

2050 RTP/SCS Localized Air Quality Index analysis

SANDAG conducted a localized "air quality index analysis" of the transportation network to determine how the 2050 RTP/SCS could affect adjacent low-income and minority (LIM) and non-LIM communities near major transportation corridors. ((A Low Income community of concern is one where 33% or more of the households are low income, and/or 10% or more of the households are severely overcrowded, and/or 25% of the population is in poverty. A Minority community of concern is any community which 65% or more of the population in non-white. See 2050 RTP/SCS Chapter 4 for full definition.)

Proximity to a major transportation corridor was selected as the determining factor for the air quality index analysis due to the increased likelihood of exposure to increases in localized concentrations of

vehicle emissions, especially from diesel truck traffic, containing particulate matter (diesel PM), and from high volume or congested roadways (potentially creating localized CO and PM hotspots). The analysis considers the proximity of highways with high traffic volumes, high truck traffic percentages, and congested roadway level of service to LIM and non-LIM communities located within 500 feet of the centerline of these facilities.

Although high traffic volumes, high truck traffic, and congested roadways generally can be associated with increased exposure to high CO and particulate concentrations, there are many local and site-specific factors (e.g., wind speed and direction, terrain, building design, etc.) that determine specific exposure levels for specific sensitive receptors; these specific exposure levels are determined through project-specific hot spot analyses and health risk assessments (HRAs).

Calculation of Air Quality Index. To rank potential for exposure of both LIM and non-LIM communities to high localized CO and PM concentrations, SANDAG developed an initial screening methodology that evaluates three factors: traffic volumes, percentage of traffic volume as truck traffic, and Level of Service (LOS). Freeway/highway segments were ranked as high, medium, or low exposure, using an air quality index that considers these three factors.

As shown in Table 4.3-6 below, each segment was assigned a score based on the index value for each variable. The index values for all three variables were then added to arrive at an Air Quality Index score for each segment. Air Quality Index scores range from a low of 3 to a high of 9.

Table 4.3-6
Air Quality Index Variables

Average Daily Traffic (ADT)		Percent Trucks (PT)		Level Of Service (LOS)	
Index Value, ADT_i	Data Range	Index Value, PT_i	Data Range	Index Value, LOS_i	Data Range
1	<50,000	1	0-5	1	A, B, C, D
2	50,000-100,000	2	5-10	2	E, F
3	>100,000	3	10-20	-	-
-	-	4	>20	-	-

Freeway/highway segments were then assigned a ranking of low, medium or high based on their Air Quality Index score, as shown in Table 4.3-7 below.

Table 4.3-7
Air Quality Index Ranking

Ranking	Score
Low	3
Medium	4-5
High	>5

The results of the Air Quality Index analysis are described for each horizon year under the heading Localized Air Quality Index Analysis.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

The regional growth and land use changes by 2020 of the 2050 RTP/SCS have the potential to expose sensitive receptors to substantial localized pollutant concentrations. However, the level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Analyses of localized pollutant emissions related to 2020 regional growth and land use change in the 2050 RTP/SCS would be addressed at the project level. ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* recommendation of avoiding siting new sensitive land uses within 500 feet of a freeway, is a general recommendation, without reference to specific traffic, site, or land use characteristics, which requires project-specific analysis. State of California Public Resources Code 21151.8A prohibits the siting of a school within 500 feet of a freeway unless "the school district determines, through analysis based on appropriate air dispersion modeling, that the air quality at the proposed site is such that neither short-term nor long-term exposure poses significant health risks to pupils." This would require project-specific analysis. Therefore, at the program level of this EIR, the localized pollutant concentration impact from 2020 regional growth and land use change would be considered significant.

Transportation Network Improvements

Transportation network improvements are developed to accommodate the projected growth and increases in population, housing, and employment, as discussed above. The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Trolley Green Line would be extended to downtown San Diego.

Transportation improvements from 2010 to 2020 of the 2050 RTP/SCS have the potential to expose sensitive receptors to substantial localized pollutant concentrations. Potential CO hotspots and health risk analyses for TACs related to transportation improvements in the 2050 RTP/SCS would be addressed at

the project level. The level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

Localized Air Quality Index Analysis

LIM and non-LIM communities exposed to a medium or high air quality index in 2010 and 2020 are shown in Figure 4.3-2 and Figure 4.3-3, respectively.

As is summarized in the Table 4.3-8, the percentage of freeway segments that rank high in the index increases over the horizon years of the plan. Conversely, the number of low and medium ranking segments decrease over the horizon years of the plan thereby potentially exposing more LIM and non-LIM communities to higher localized concentrations of toxics (diesel PM) and CO that are generated as traffic volumes increase, LOS decreases, and more truck traffic uses the highway network.

Table 4.3-8
Air Quality Index Analysis
Existing Conditions and Horizon Years of the 2050 RTP/SCS

	Percent of Total Network			
Air Quality Index	2010	2020	2035	2050
Low	25.22%	22.78%	19.00%	18.61%
Medium	53.08%	45.55%	34.00%	31.50%
High	21.70%	31.89%	47.92%	54.10%

While this analysis generally suggests that both LIM and non-LIM communities will potentially be exposed to increases in localized CO and PM concentrations and concomitant health risks over the horizon years of the plan, health risks to specific communities from specific projects can be determined only through project-specific analysis. Project-specific hot spot analysis and HRAs will be conducted at the project level to identify project hotspots and specific health risks, and mitigation measures to reduce health risks that would be suitable for each individual project. It should also be noted that based on the analysis, the potential for increased impacts to both LIM and non-LIM communities over time is similar and there is not a disparate impact on LIM communities when compared to non-LIM communities.

Further, the Air Quality Index may overstate future exposure to CO and particulates because CARB regulations (13 Cal. Code Regs. §2025 et seq.) are expected to greatly reduce future diesel vehicle emissions. Thus communities exposed to a given Air Quality Index future years would be exposed to lower levels of diesel particulate emissions than they would be in 2010. Again, health risks to *specific communities* can be determined only through project-specific hot spot analyses and HRAs that include project-specific assumptions about the timing of CARB diesel vehicle regulation phase-in.

The CARB regulation requires installation of PM retrofits beginning January 1, 2012 and replacement of older trucks starting January 1, 2015. By January 1, 2023, nearly all vehicles would need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. The regulation has provisions to provide extra credit for PM filters installed prior to July 2011, has delayed requirements for fleets with 3 or fewer vehicles, and provisions for agricultural vehicles and other situations. This regulation is stronger than the Environmental Protection Agency's (EPA) diesel vehicle regulations, and EPA has granted California a preemption waiver under Section 209(b) of the federal Clean Air Act.

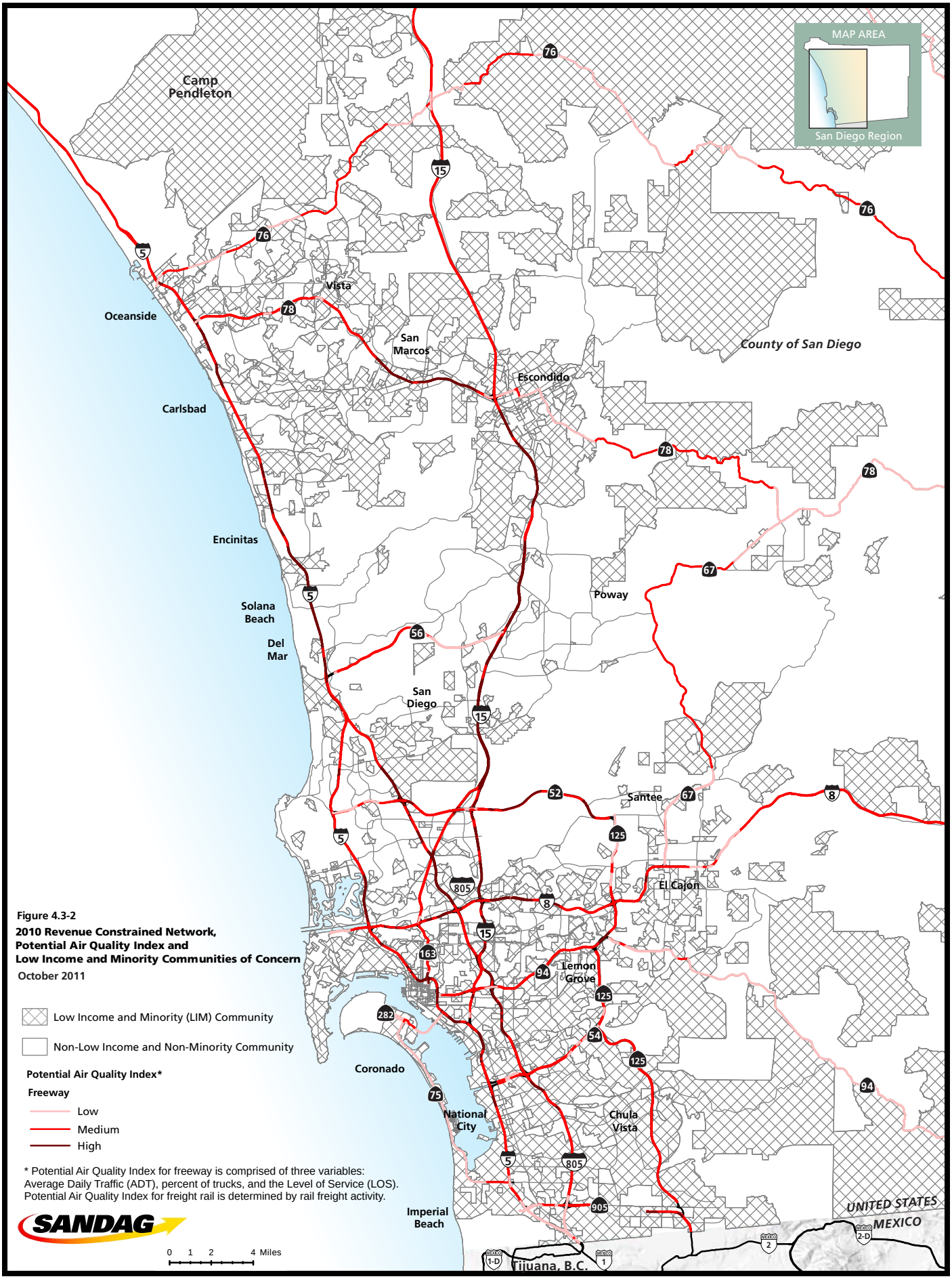


Figure 4.3-2
2010 Revenue Constrained Network, Potential Air Quality Index and Low Income and Minority Communities of Concern
October 2011


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
County of San Diego
Carlsbad
Encinitas
Solana Beach
Del Mar
San Diego
Poway
Santee
El Cajon
Lemon Grove
National City
Chula Vista
Coronado
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 4.3-3
2020 Revenue Constrained Network,
Potential Air Quality Index and
Low Income and Minority Communities of Concern
October 2011
Low Income and Minority (LIM) Community
Non-Low Income and Non-Minority Community
Potential Air Quality Index*
Freeway
Low
Medium
High
* Potential Air Quality Index for freeway is comprised of three variables:
Average Daily Traffic (ADT), percent of trucks, and the Level of Service (LOS).
Potential Air Quality Index for freight rail is determined by rail freight activity.
SANDAG
0 1 2 4 Miles

In summary, SANDAG's preliminary screening showed that LIM and non-LIM communities could potentially be exposed to increases in localized CO and particulate concentrations and concomitant health risks over the horizon years of the plan. More accurate forecasting regarding health risks to specific communities from specific projects, however, can be determined only through project-specific analysis.

Conclusion

~~Since the analysis of localized pollutant concentrations related to regional growth/land use and transportation improvements in the 2050 RTP/SCS would be completed at the project level, AQ-4 impacts in 2020 at the program level of this 2050 RTP/SCS are determined to be significant.~~ The level of ~~this~~ exposure of sensitive receptors to localized pollutant concentrations, including diesel particulates, can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figure 4.11-4, regional land use and development changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the I-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively. Areas of increased residential density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities. Also increased density would occur in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor.

In the northern portion of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The SR 78 corridor, from Escondido to I-5, would also experience growth and resulting land use density increases of both residential and commercial/office by 2035. As shown in Figure 4.11-4, single-family residential development would increase substantially along this corridor as well as additional commercial and industrial growth. The majority of this growth would be centered around the cities of Vista, San Marcos, and Escondido. The pattern of more dense growth along this segment of the SR 78 corridor is also apparent when comparing the existing housing density to 2035 housing density (see Figures 4.13.2 and 4.13-8 in Section 4.13, Population and Housing).

By 2035, some regional growth would be accommodated in the more eastern, rural areas of the region. Development in these areas would be centered mostly along highway corridors, such as SR 78, SR 67, I-8

east of El Cajon, and SR 94, and generally within San Diego County community planning areas. The unincorporated portions of San Diego County are currently undergoing population growth and expansion of residential land use as indicated by a population increase of 14 percent from 2000 to 2010 as shown in Table 4.11-2. When comparing the existing land uses and 2035 land uses in Figures 4.11-1 and 4.11-4, the 2035 land use pattern would generally involve additional residential development in areas that were previously undeveloped open space or at some time in agricultural use (as discussed in Section 4.2).

Regional growth and land use change by 2035 for the 2050 RTP/SCS has the potential to expose sensitive receptors to substantial localized pollutant concentrations. However, the level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Analyses of localized pollutant emissions related to 2035 regional growth and land use change would be addressed at the project level. Therefore, at the program level of this EIR, the localized pollutant concentration impact from 2035 regional growth and land use change would be considered significant.

Transportation Network Improvements

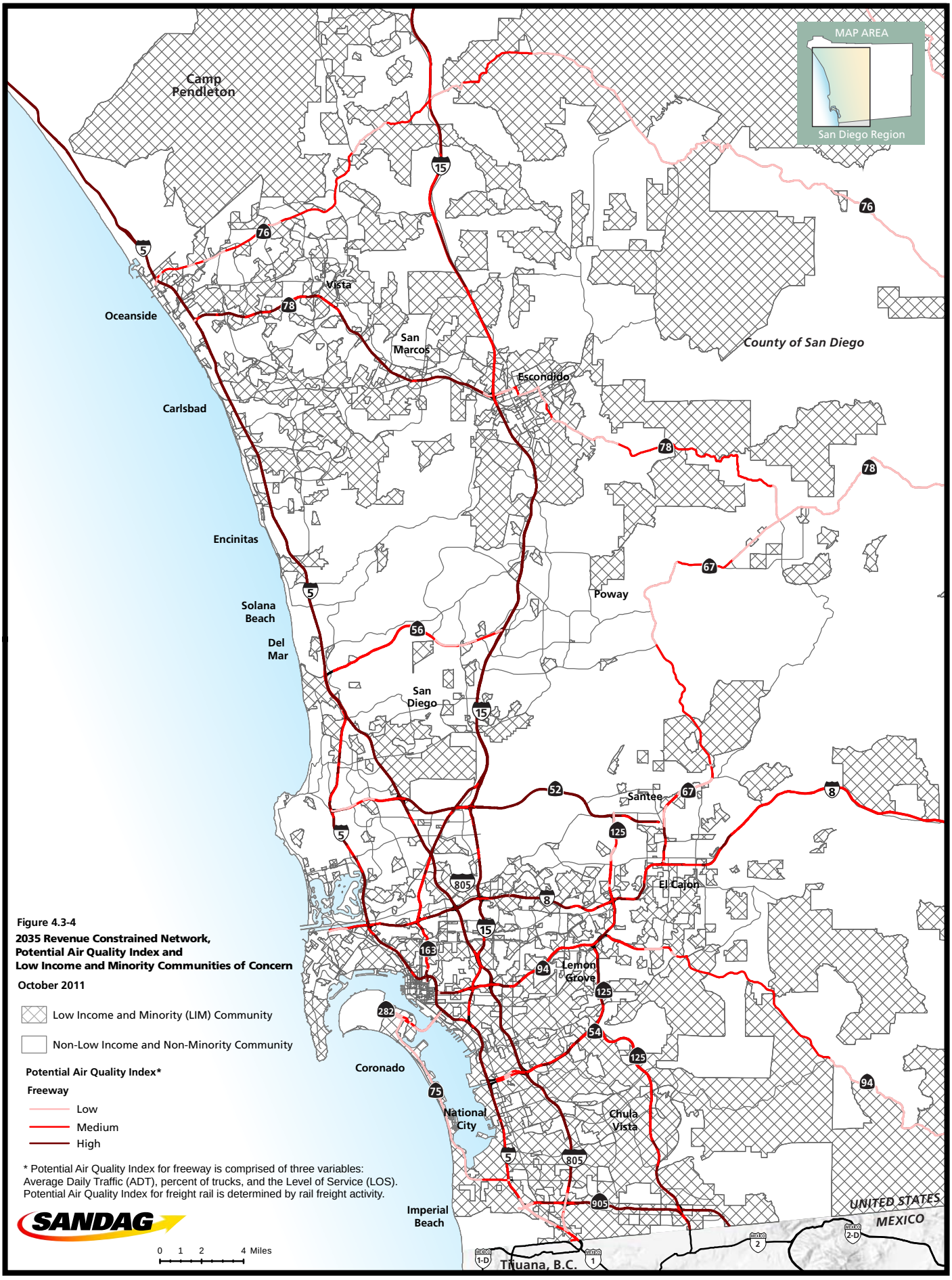
By 2035, transportation network improvements associated with the 2050 RTP/SCS would directly impact FMMP-designated lands by encroachment of the right-of-way for these improvements on these lands. Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marcos, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Transportation improvements from 2010 to 2035 of the 2050 RTP/SCS have the potential to expose sensitive receptors to substantial localized pollutant concentrations. Potential CO hotspots and health risk analyses for TACs related to the 2035 transportation improvements would be addressed at the project level, as this level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

Localized Air Quality Index Analysis

LIM and non-LIM communities exposed to a medium or high air quality index in 2035 are shown in Figure 4.3-4.

As summarized in the 2020 analysis above (Table 4.3-8), the percentage of freeway segments that rank high in the index increases over the horizon years of the plan. Conversely, the number of low and medium ranking segments decrease over the horizon years of the plan thereby potentially exposing more LIM and non-LIM communities to higher localized concentrations of toxics (diesel PM) and CO that are generated as traffic volumes increase, LOS decreases, and more truck traffic uses the highway network. Please refer to the detailed discussion of the localized Air Quality Index results in the 2020 analysis above.


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
County of San Diego
Carlsbad
Encinitas
Solana Beach
Del Mar
San Diego
Poway
Santee
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 4.3-4
2035 Revenue Constrained Network,
Potential Air Quality Index and
Low Income and Minority Communities of Concern
October 2011
Low Income and Minority (LIM) Community
Non-Low Income and Non-Minority Community
Potential Air Quality Index*
Freeway
Low
Medium
High
* Potential Air Quality Index for freeway is comprised of three variables:
Average Daily Traffic (ADT), percent of trucks, and the Level of Service (LOS).
Potential Air Quality Index for freight rail is determined by rail freight activity.
SANDAG
0 1 2 4 Miles

Conclusion

The level of exposure of sensitive receptors to localized pollutant concentrations, including diesel particulates, can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

~~*Conclusion*~~

~~Since the analysis of localized pollutant concentrations and determination of impact related to regional growth/land use and transportation improvements for 2035 in the 2050 RTP/SCS would be completed at the project level, AQ-4 impacts in 2035 cannot be determined at the program level of this 2050 RTP/SCS. The level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. The level of exposure of sensitive receptors to localized pollutant concentrations, including diesel particulates, can only be determined through project-level analysis once facility designs of individual projects are available Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.~~

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035 would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east.

Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities.

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would

have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE.

Regional growth and land use change by 2050 for the 2050 RTP/SCS has the potential to expose sensitive receptors to substantial localized pollutant concentrations. However, the level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Analyses of localized pollutant emissions from regional growth and land use change would be addressed at the project level. Therefore, at the program level of this EIR, the localized pollutant concentration impact from 2050 regional growth and land use change would be considered significant.

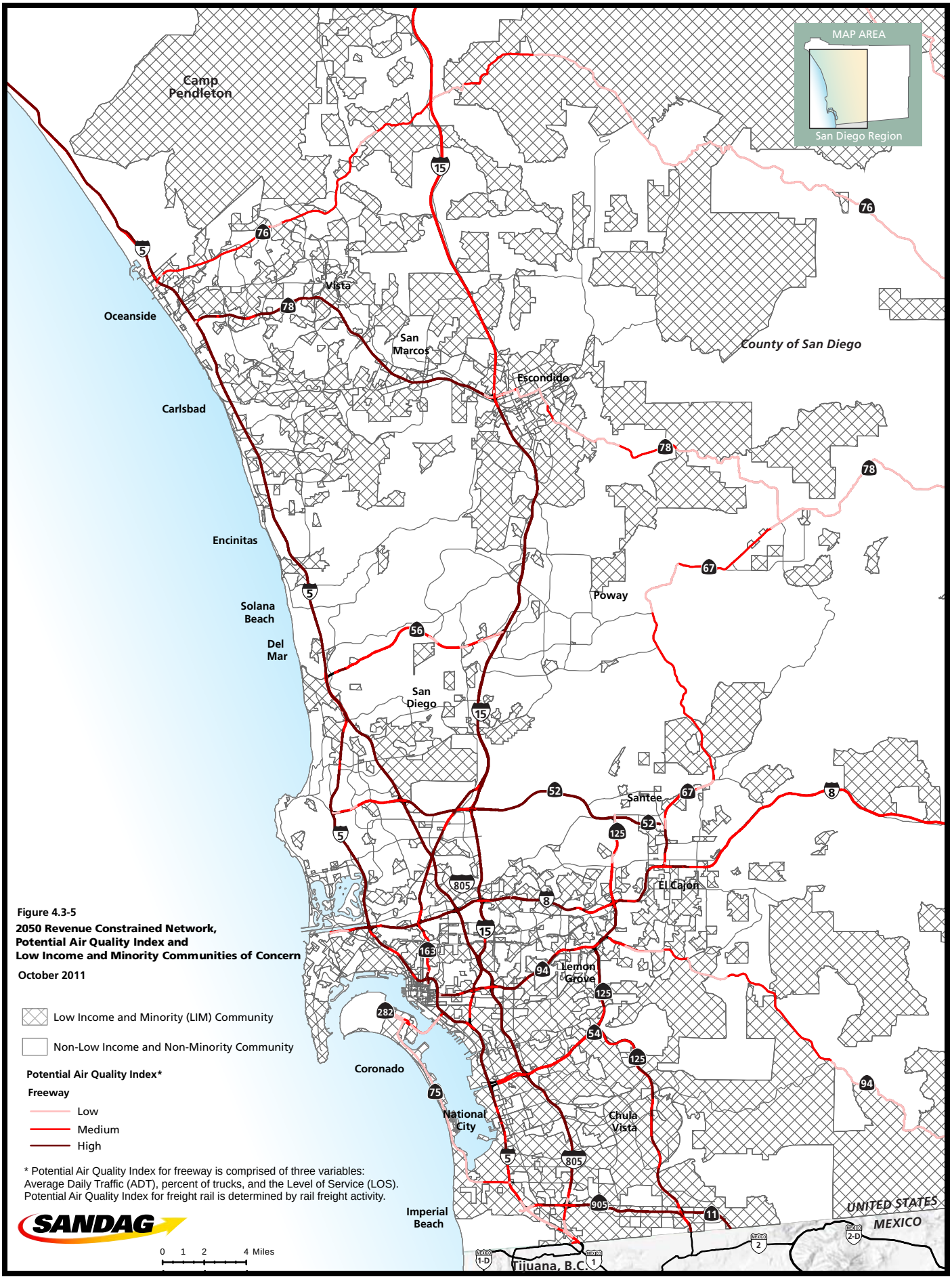
Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego ~~via~~ to El Cajon Boulevard/Mid-City would ~~be constructed~~extended be extended to San Diego State University; and a line from University Town Center to ~~Palomar Trolley Station~~San Ysidro ~~in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

Transportation improvements from 2010 to 2050 of the 2050 RTP/SCS have the potential to expose sensitive receptors to substantial localized pollutant concentrations. Potential CO hotspots and health risk analyses for TACs related to 2050 transportation improvements would be addressed at the project level. The level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

Localized Air Quality Index Analysis

LIM and non-LIM communities exposed to a medium or high air quality index in 2050 are shown in Figure 4.3-5.


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Escondido
County of San Diego
Carlsbad
Encinitas
Solana Beach
Del Mar
San Diego
Poway
Santee
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 4.3-5
2050 Revenue Constrained Network,
Potential Air Quality Index and
Low Income and Minority Communities of Concern
October 2011
Low Income and Minority (LIM) Community
Non-Low Income and Non-Minority Community
Potential Air Quality Index*
Freeway
Low
Medium
High
* Potential Air Quality Index for freeway is comprised of three variables:
Average Daily Traffic (ADT), percent of trucks, and the Level of Service (LOS).
Potential Air Quality Index for freight rail is determined by rail freight activity.
SANDAG
0 1 2 4 Miles

As summarized in the 2020 analysis above (Table 4.3-8), the percentage of freeway segments that rank high in the index increases over the horizon years of the plan. Conversely, the number of low and medium ranking segments decrease over the horizon years of the plan thereby potentially exposing more LIM and non-LIM communities to higher localized concentrations of toxics (diesel PM) and CO that are generated as traffic volumes increase, LOS decreases, and more truck traffic uses the highway network. Please refer to the detailed discussion of the localized Air Quality Index results in the 2020 analysis above.

Conclusion

The level of exposure of sensitive receptors to localized pollutant concentrations, including diesel particulates, can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.

~~*Conclusion*~~

~~Since the analysis of localized pollutant concentrations and determination of impact related to regional growth/land use and transportation improvements for 2050 in the 2050 RTP/SCS would be completed at the project level, AQ-4 impacts in 2050 cannot be determined at the program level of this 2050 RTP/SCS. The level of this exposure can only be determined through project-level analysis once facility designs of individual projects are available. The level of exposure of sensitive receptors to localized pollutant concentrations, including diesel particulates, can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, at the program level of this EIR, the localized pollutant concentration impact would be considered significant.~~

AQ-5 EXPOSE A SUBSTANTIAL NUMBER OF PEOPLE TO OBJECTIONABLE ODORS

The 2050 RTP/SCS would result in significant impacts if it would result in the emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

Odor sources within the SANDAG region, such as agricultural operations, wastewater treatment facilities, and landfills, are controlled by city and county odor policies enforced by APCD, including Rule 51 and County Code Sections 63.401 and 63.402, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San

Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

The regional growth and land use change for 2020 in the 2050 RTP/SCS that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, odor analyses related to regional growth and land use change in 2020 would be analyzed at the project level. However, regional growth and land use change projects in 2020 would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

Transportation Network Improvements

Transportation network improvements are developed to accommodate the projected growth and increases in population, housing, and employment, as discussed above. The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Trolley Green Line would be extended to downtown San Diego.

Transportation improvement projects that involve roadway expansions or realignments could result in the transfer of vehicle emissions and/or could result in odor emissions sources being located closer to receptors. In addition, some projects (e.g., rail stations) could result in localized traffic congestion that generates odor concentrations. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. Therefore, the odor analyses related to transportation improvements in 2020 for the 2050 RTP/SCS would be completed at the project level. However, transportation improvement projects in 2020 would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions: therefore, the impact is less than significant.

Conclusion

Odor analyses related to the 2020 regional growth/land use change and transportation improvements in the 2050 RTP/SCS would be completed at the project level, once facility designs of individual projects are available. However, these projects would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figure 4.11-4, regional land use and development changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the I-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

The increased density can be seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively. Areas of increased residential density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities. Also increased density would occur in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor.

In the northern portion of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The SR 78 corridor, from Escondido to I-5, would also experience growth and resulting land use density increases of both residential and commercial/office by 2035. As shown in Figure 4.11-4, single-family residential development would increase substantially along this corridor as well as additional commercial and industrial growth. The majority of this growth would be centered around the cities of Vista, San Marcos, and Escondido. The pattern of more dense growth along this segment of the SR 78 corridor is also apparent when comparing the existing housing density to 2035 housing density (see Figures 4.13.2 and 4.13-8 in Section 4.13, Population and Housing).

By 2035, some regional growth would be accommodated in the more eastern, rural areas of the region. Development in these areas would be centered mostly along highway corridors, such as SR 78, SR 67, I-8 east of El Cajon, and SR 94, and generally within San Diego County community planning areas. The unincorporated portions of San Diego County are currently undergoing population growth and expansion of residential land use as indicated by a population increase of 14 percent from 2000 to 2010 as shown in Table 4.11-2. When comparing the existing land uses and 2035 land uses in Figures 4.11-1 and 4.11-4, the 2035 land use pattern would generally involve additional residential development in areas that were previously undeveloped open space or at some time in agricultural use (as discussed in Section 4.2).

Odor analyses related to regional growth and land use change in 2035 would be assessed at the project level. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. However, regional growth and land use change projects in 2035 would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

Transportation Network Improvements

~~By 2035, transportation network improvements associated with the 2050 RTP/SCS would directly impact FMMP-designated lands by encroachment of the right-of-way for these improvements on these lands.~~ Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marcos, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Odor analyses related to transportation improvements in 2035 in the 2050 RTP/SCS would be completed at the project level. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. At the program level of this EIR, odor impacts of regional growth and land use change are considered a significant impact, but mitigable. However, transportation improvement projects in 2035 would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

Conclusion

Odor analyses related to the 2035 regional growth/land use change and transportation improvements in the 2050 RTP/SCS would be completed at the project level, once facility designs of individual projects are available. However, these projects would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035 would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east.

Urban centers in the western third of the San Diego region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities.

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE.

Odor analyses related to regional growth and land use change in 2050 would be assessed at the project level. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. However, regional growth and land use change projects in 2050 would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego ~~via~~ to El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State ~~Univeristy~~University; and a line from University Town Center to ~~Palomar Trolley Station~~San Ysidro in the South Bay via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

Odor analyses related to transportation improvements in 2050 in the 2050 RTP/SCS would be completed at the project level. The level of exposure and number of receptors affected can only be determined through project-level analysis once facility designs of individual projects are available. At the program level of this EIR, odor impacts of regional growth and land use change are considered a significant impact, but mitigable. However, transportation improvement projects in 2050 would not be expected to

result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

Conclusion

Odor analyses related to the 2050 regional growth/land use change and transportation improvements in the 2050 RTP/SCS would be completed at the project level, once facility designs of individual projects are available. However, these projects would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions; therefore, the impact is less than significant.

4.3.5 MITIGATION MEASURES

The following mitigation measures aim to reduce impacts related to air quality. Implementation of these measures would reduce contributions of federal nonattainment and maintenance pollutants of $O_3$and CO, respectively; and state nonattainment pollutants of O_3, PM_{10}, and $PM_{2.5}$ and reduce the severity of project impacts. These mitigation measures are general and programmatic in nature, and would be refined in project-specific CEQA documents.

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY ATTAINMENT PLANS

2020, 2035, 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts from regional growth and land use change at the program level; impact significance would be determined at the individual project-level analysis at that time. At the program level of this EIR, ozone precursor (ROG and NO_X) and CO emission impacts of regional growth and land use change in 2020, 2035, and 2050 are considered significant~~; however, mitigation measures at the program level is infeasible (see discussion below).~~ . Implementation of Mitigation Measure AQ-A1 would be required to reduce ozone precursor impacts at the project-level. Mitigation of CO impacts is addressed in Mitigation Measure AQ-C.

AQ-A1 For land use plans and projects, cities in the San Diego region and San Diego County can and should assess increases in ozone precursors during project-specific design and CEQA review, and mitigate significant increases to the extent feasible. Measures described in Mitigation Measure GHG-B would also generally be applicable to ozone precursors, since most measures reducing GHG emissions also reduce ozone precursor emissions.

Specifically, at the plan level, land use plans should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change (http://ag.ca.gov/globalwarming/pdf/GP_policies.pdf), including, but not limited to policies from that web page such as:

- Smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, incentives and fees, zoning, and public-private partnerships
- Create transit, bicycle, and pedestrian connections through planning, funding, development requirements, incentives and regional cooperation, and create disincentives for auto use

- Energy and water-efficient buildings and landscaping through ordinances, development fees, incentives, project timing, prioritization, and other implementing tools

In addition, they should also incorporate, when appropriate, policies to encourage implementation of the Attorney General's list of project specific mitigation measures available at the following web site: http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf, including, but not limited to measures from the web page such as:

- Adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation
- Build or fund a major transit stop within or near development
- Provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers
- Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments
- Require amenities for non-motorized transportation, such as secure and convenient bicycle parking.

They should also incorporate, when appropriate, planning and land use measures from additional resources listed by the California Attorney General at the following web page: http://ag.ca.gov/globalwarming/ceqa/resources.php.

AQ-2 VIOLATE ANY AIR QUALITY STANDARD OR CONTRIBUTE SUBSTANTIALLY TO AN EXISTING OR PROJECTED AIR QUALITY VIOLATION

2020, 2035, 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts ~~from transportation networks improvements~~ by contributing substantially in 2020, 2035, and 2050 to the existing state nonattainment for PM_{10} and $PM_{2.5.}$ Implementation of Mitigation Measure AQ-A2 for transportation network improvements would be required to reduce construction PM_{10} and $PM_{2.5}$ impacts at the project-level, by incorporating appropriate dust control measures into project specifications, including but not limited those listed in Mitigation Measure AQ-A2. Mitigation of growth-related and operational particulate emissions is addressed in Mitigation Measure AQ-C.

AQ-A2 During project-specific design and CEQA review, SANDAG shall and other implementing agencies can and should incorporate project-appropriate dust control measures into project specifications, including but not limited to the following:

- Minimize land disturbance.
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas.
- Suspend grading and earth moving when wind gusts exceed 25 mph unless the soil is wet enough to prevent dust plumes.

- Cover trucks when hauling dirt.
- Stabilize the surface of dirt piles if not removed immediately.
- Limit vehicular paths on unpaved surfaces and stabilize any temporary roads.
- Minimize unnecessary vehicular and machinery activities.
- Sweep paved streets at least once per day where there is evidence of dirt that has
- been carried on to the roadway.
- Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities.
- On Caltrans projects, Caltrans Standard Specifications 10-Dust Control, 17-Watering, and 18-Dust Palliative shall be incorporated into project specifications.

AQ-3 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF EMISSIONS OF ANY CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NONATTAINMENT UNDER APPLICABLE NAAQS OR CAAQS

2020, 2035, 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts from transportation network improvements by resulting in a cumulatively considerable net increase in emissions of the nonattainment pollutants of ozone precursors, PM_{10}, and PM_2. . For transportation network improvements,~~-~~ ~~Implementation~~implementation of Mitigation Measure AQ-A2, as described above, and AQ-B below, would be required to reduce impacts at the project-level , by incorporating appropriate measures into project specifications. Mitigation of growth-related ozone precursor impacts is addressed in Mitigation Measure AQ-A1, and mitigation of growth-related and operational particulate impacts is addressed in Mitigation Measure AQ-C.

AQ-B If project-level analysis demonstrates that NO_X emissions would be significant, during project-specific design and CEQA review, SANDAG shall and other implementing agencies can and should provide a plan, for approval by the implementing agency or jurisdiction, demonstrating that the heavy-duty (>50 horsepower) offroad vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will utilize all feasible measures to reduce the NO_X emissions to a less than significant level. Acceptable options for reducing emissions may include use of late model engines, low emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.

The project representative shall submit to the implementing agency or jurisdiction a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the

duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the implementing agency or jurisdiction with the anticipated construction timeline, including start date, and name and phone number of the project manager and on-site foreman.

~~If project-level analysis demonstrates that operational emissions would be significant, during project design and CEQA review, SANDAG and the implementing agencies would consider feasible operational mitigation measures for significant project-level impacts~~.

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS

2020, 2035, 2050

Implementation of the 2050 RTP/SCS would result in significant impacts at the program level in 2020, 2035, and 2050 by exposing sensitive receptors to substantial localized pollutant concentrations, including local CO, PM2.5 and PM10, and toxics.~~.; local CO impact significance would be determined at the individual project-level analysis at that time.~~ Implementation of Mitigation Measure AQ-~~D~~ C would be required to reduce these impacts.

AQ-C **Transportation Network Improvements**

~~During~~ For transportation network improvements, during project-specific design and CEQA review, SANDAG shall and other implementing agencies can and should evaluate the potential localized CO impacts of each project using procedures and guidelines contained in the CO Protocol (UCD ITS 1997) to determine the level of local CO "hot spot" analysis required (qualitative or quantitative) at the project level, if any, for the project. If required from the project analysis, mitigation measures ~~are~~ would be added to the project design concept or scope to reduce local CO emissions.

For transportation network improvements, during project-specific design and CEQA review, SANDAG shall and other implementing agencies can and should evaluate the potential localized particulate (PM10 and PM2.5) impacts and their health risks of project using procedures and guidelines for PM hotspot analysis consistent with USEPA (2010) PM guidance. If required from the project analysis, mitigation measures would be added to the project design concept or scope to reduce local particulate (PM10 and PM2.5) emissions. Per USEPA (2010) PM guidance, potential mitigation measures to be considered include but are not limited to: providing a retrofit program for older higher emitting vehicles, anti-idling requirements or policies, controlling fugitive dust, routing traffic away from populated zones, and replacing older buses with cleaner buses.

Land Use Plans and Development Projects

For land use plans and projects, cities in the San Diego region and San Diego County can and should assess health risks associated with CO and particulates during project-specific design and CEQA review, and mitigate them to the extent feasible. These assessments should focus on sensitive communities already experiencing high levels of air pollution and related diseases, and on other sensitive receptors.

For development projects, mitigation measures to reduce air pollution-related health risks include but are not limited to:

- Avoiding siting new sensitive land uses within 500 feet from the right of way of a freeway
- Implementing the construction mitigation measures listed in Mitigation Measures AQ-A2 and AQ-B
- Buffering residential, public assembly, and other sensitive land uses from industrial uses generating air pollutants that may pose public health risks
- Including landscaping, barriers, ventilation systems, and air filters or cleaners in project designs

Health Risk Assessments for Projects Involving Transportation Network Improvements or Land Use Plans and Development Projects

During project specific design and CEQA review, SANDAG shall and other implementing agencies can and should require, where warranted, the completion of health risk assessments using dispersion modeling. A health risk assessment (HRA) is the quantitative evaluation of the risk of cancer (and sometimes non-cancer health effects) that may result from human exposure to pollutants such as toxic air pollutants. HRAs are complex and typically involve emissions quantification, air dispersion modeling, and risk modeling. Dispersion modeling is a modeling tool capable of predicting concentrations of pollutants in air in the vicinity of the pollutant sources. It is typically used to predict PM concentrations at receptor locations around a source of PM. AERMOD and CALPUFF are two of several dispersion modeling tools.

Mitigation Found to Be Infeasible

~~To reduce significant impacts that would result both from regional growth/land use change at the program level, mitigation measures at the program level for AQ-1, AQ-2, and AQ-3 (regional ozone and CO emissions) and AQ-4 (local CO emissions) were considered, but found to be infeasible at the program level.~~

For AQ-1, AQ-2 and AQ-3, at the program level of this EIR, ozone precursor (ROG and NO_X) and CO emission impacts of regional growth and land use change in 2020, 2035, and 2050 are considered to remain significant post-mitigation. SANDAG must base its RTP/SCS growth forecast on current planning assumptions, and has no legal authority to modify local general plans or development projects to reduce growth-related air emissions. ~~; however, additional mitigation measures at the program level were found to be infeasible. To determine whether the project emissions from the 2020, 2035, and 2050 regional growth and land use changes would be consistent with the applicable attainment and maintenance plans in 2020, 2035, and 2050, the proposed project development would need to be consistent with the growth anticipated by the adopted city and county general plans at that time~~. Therefore, there are no additional feasible mitigation measures at the program level for ozone and CO emissions due to regional growth and land use change that can be proposed at this time.

For AQ-4, implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts at the program level post-mitigation; ~~further impact~~Impact significance for specific projects would be determined at the individual project-level analysis as projects are proposed, using the hot spot and health risk assessment procedures described in Mitigation Measure AQ-C . No additional mitigation measures are available at the program level.~~Potential localized CO impacts at the project level are~~

~~analyzed using procedures and guidelines contained in the CO Protocol (UCD ITS 1997) to determine the level of local CO "hot spot" analysis required (qualitative or quantitative). If required from the project analysis, mitigation measures are added to the project design concept or scope to reduce local CO emissions.~~

~~Applicable mitigation measures shall be accounted for in the project-level CO reviews only where there are written commitments from the project sponsor(s) and/or operator to the implementation of such measures. "Written commitments must also be obtained for project level mitigation…measures which are conditions for making conformity determinations for a transportation plan or TIP and are included in the project design concept and scope which is used in the regional emissions analysis…or used in the project level hot spot analysis" [40 CFR §§ 93.125(a) and 123(c)(4)]. Other issues concerning the enforceability of project level mitigation measures are contained in 40 CFR § 93.125(b) (d). The project sponsor(s) should consult these sections prior to making the final conformity determination (UCD ITS 1997). Therefore, there are no additional feasible local CO mitigation measures at the program level.~~

4.3.6 SIGNIFICANCE AFTER MITIGATION

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY ATTAINMENT PLANS.

2020, 2035, and 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts by conflicting with or obstructing implementation of applicable air quality attainment plans. Implementation of Mitigation Measure AQ-A1 would be required to reduce emissions of ozone precursors association with growth/land use change. This mitigation measure would be included in project-level planning, design, and CEQA reviews. Implementation of this mitigation measure would require project implementation agencies to follow comprehensive, proven procedures to assess the magnitude of impact anticipated on a project level, and avoid or substantially reduce ozone precursor impacts. ~~.~~ However, implementation of Mitigation Measure AQ-A1 would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measure AQ-A1 would fully mitigate the significant impact at the program level, the impact at the program level would remain significant and unavoidable. ~~This mitigation measure would be included in project-level planning, design, and CEQA reviews. Implementation of this mitigation measure would require project implementation agencies to follow comprehensive, proven procedures to assess the magnitude of impact anticipated on a project level, and avoid or substantially reduce ozon precursor impacts No mitigation proposed at the program level, as mitigation determined infeasible at the program level. Therefore, the impact at the program level would remain significant and unavoidable.~~

AQ-2 VIOLATE ANY AIR QUALITY STANDARD OR CONTRIBUTE SUBSTANTIALLY TO AN EXISTING OR PROJECTED AIR QUALITY VIOLATION

2020, 2035, and 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts by contributing substantially ~~in 2020~~ to the existing state nonattainment for PM_{10} and $PM_{2.5}$. Implementation of Mitigation Measure AQ-A2 would be required to reduce emissions of ozone precursors, PM_{10} and $PM_{2.5}$ and thus reduce the severity of fugitive dust impacts. ~~However, implementation of Mitigation~~

~~Measure AQ-A2 would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measure AQ-A2 would fully mitigate the significant impact at the program level, the impact at the program level would remain significant and unavoidable~~. This mitigation measure would be included in project-level planning, design, and ~~analysis, as appropriate~~ CEQA reviews. Implementation of this mitigation measure would require project implementation agencies to follow comprehensive, proven procedures to assess the magnitude of impact anticipated on a project level, and avoid or substantially reduce ozone precursor, PM_{10} and $PM_{2.5}$ impacts. However, implementation of Mitigation Measure AQ-A2 would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measure AQ-A2 would fully mitigate the significant impact at the program level, the impact at the program level would remain significant and unavoidable

AQ-3 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF EMISSIONS OF ANY CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NONATTAINMENT UNDER APPLICABLE NAAQS OR CAAQS

2020, 2035, and 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 would result in significant impacts at the program level of this EIR by potentially resulting in a cumulatively considerable net increase of emissions of nonattainment pollutants ROG, NO_X, PM_{10}, and $PM_{2.5}$. The actual project emissions would be determined at the individual project-level analysis. Implementation of Mitigation Measures AQ-A1, AQ-A2, AQ-B, and AQ-C would be required to reduce these emissions and thus reduce their severity of impacts. This mitigation measure would be included in project-level planning, design, and ~~analysis, as appropriate~~ CEQA reviews. Implementation of this mitigation measure would require project implementation agencies to follow comprehensive, proven procedures to assess the magnitude of impact anticipated on a project level, and avoid or substantially reduce air quality impacts. However, implementation of Measures AQ-A1, AQ-A2, AQ-B, and AQ-C would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measures AQ-A1, AQ-A2, AQ-B, and AQ-C would fully mitigate the significant impact, the impact would remain significant and be unavoidable.

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS

2020, 2035, and 2050

Implementation of the 2050 RTP/SCS in 2020, 2035, and 2050 at the program level would result in significant impacts by potentially exposing sensitive receptors to substantial local CO, particulate, and other toxic air contaminant ~~pollutant~~ concentrations in 2020, 2035, and 2050. Implementation of Mitigation Measure AQ-~~D~~ C would reduce local emissions of CO particulate, and other toxic air contaminant and thus reduce the severity of local CO impacts. ~~However, implementation of Mitigation Measure AQ-D C would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measure AQ-D would fully mitigate the significant impact at the program level, the impact at the program level would remain significant and unavoidable.~~ This mitigation measure would be included in project-level planning, design, and ~~analysis, as appropriate~~ CEQA reviews. Implementation of this mitigation measure would require project implementation agencies to follow comprehensive, proven procedures to assess the magnitude of impact anticipated on a project level, and avoid or substantially reduce local CO, particulate, and other toxic air contaminant

impacts. However, implementation of Mitigation Measure AQ-C would not guarantee that the impact would be reduced to less than significant. Thus, because it cannot be determined if Mitigation Measure AQ-C would fully mitigate the significant impact at the program level, the impact at the program level would remain significant and unavoidable.