5.3 AIR QUALITY

5.3.1 Environmental Setting

The City lies within the South Coast Air Basin (SCAB), a 6,600-square-mile coastal plain bounded by the Pacific Ocean to the southwest and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The SCAB includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The South Coast Air Quality Management District (SCAQMD) is the regional agency that regulates air quality in the SCAB.

Climate and Meteorological Conditions

The distinctive climate of the SCAB is determined by its terrain and geographic location. The general region lies in the semipermanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. Area climatological conditions are characterized by warm summers, mild winters, infrequent rainfall, moderate onshore daytime breezes, and moderate humidities. The average temperature in the region ranges from 58°F in the winter to 74°F during summer. Most precipitation in the area occurs during the winter months averaging about 8 inches (WRCC 2008). All seasons generally exhibit onshore flows during the day and offshore flows at night, after the land cools below the temperature of the ocean. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.

Winds in the planning area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by the daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling toward the sea. Local canyons can also alter wind direction, with wind tending to flow parallel to the canyons.

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semipermanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler, marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basinwide

occurrence of inversions at 3,500 feet above mean sea level or less averages 191 days per year (SCAQMD 1993).

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The low inversions, light winds, shallow vertical mixing, and extensive sunlight, in conjunction with topographical features such as adjacent mountain ranges that hinder dispersion of air pollutants, combine to create degraded quality, especially in inland valleys of the SCAB. On days without inversions, or on days of winds averaging over 15 miles per hour (mph), smog potential is greatly reduced.

Existing Air Quality

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the SCAB, and its meteorological conditions. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollution emissions and air quality.

Criteria Air Pollutants

Concentrations of the following air pollutants are used as indicators of ambient air quality conditions: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (PM) with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), fine particulate matter (PM) with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and because there is extensive documentation available on health-effects criteria for these pollutants, they are commonly referred to as "criteria air pollutants." **Tables 5.3-1** and **5.3-2** summarize the state and federal standards, and sources of criteria air pollutants, respectively.

Criteria air pollutant concentrations are measured at 35 monitoring stations in the SCAB. The Anaheim – Pampas Lane monitoring station is the closest, approximately 8 miles northwest of the planning area, with recent data for O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$. In general, the ambient air quality measurements from this station are representative of the air quality in the vicinity of the planning area. Table 5.3-3 summarizes the air quality for the most recent 5 years.

Both the California Air Resources Board (ARB) and the U.S. Environmental Protection Agency (EPA) use this type of monitoring data to designate areas according to their attainment status for

Table 5.3-1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3,5]	Secondary[4,5]	Concentration[5]
Ozone (O_3)[6]	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)
Carbon Monoxide (CO)	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 (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (57 µg/m^3)[8]
	1-Hour	-		0.18 ppm (339 µg/m^3)[8]
Sulfur Dioxide (SO_2)	Annual Average	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)
Respirable Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	-[9]		20 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)[10]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3
Lead (Pb)[7]	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 a.m. to 6 p.m., Pacific Standard Time)			Extinction coefficient of 0.23 per km-visibility of 10 miles or more (0.07/30 miles for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.
Vinyl Chloride[7]	24-Hour			0.01 ppm (26 µg/m^3)

[1] National Ambient Air Quality Standards (NAAQS) (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 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 one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, 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.

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

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

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

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

[8] The nitrogen dioxide ambient air quality standard was amended to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

[9] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard on December 17, 2006.

[10] Effective December 17, 2006, EPA lowered the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3.

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; km = kilometers
Source: ARB 2008b

Table 5.3-2
Criteria Air Pollutant Sources and Effects

Pollutant	Sources	Primary Effects
Ozone (O_3)	Atmospheric reaction of reactive organic gases (ROG) with oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. Sources of ROG are incomplete combustion and evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury, increase in the permeability of respiratory epithelia.
Carbon Monoxide (CO)	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, and natural events such as decomposition of organic matter.	Reduced tolerance for exercise, headaches, fatigue, dizziness, impairment of mental function, impairment of fetal development, death at high levels of exposure, aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust, high-temperature stationary combustion, atmospheric reactions.	Aggravation of respiratory illness, eye irritation, reduced visibility, reduced plant growth, formation of acid rain.
Sulfur Dioxide (SO_2)	Combustion of sulfur- containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes.	Aggravation of respiratory diseases (asthma, emphysema), reduced lung function, irritation of eyes, reduced visibility, plant injury, deterioration of metals, textiles, leather, finishes, coatings, etc.
Respirable Particulate Matter (PM_{10})	Stationary combustion of solid fuels, construction activities, fires, natural windblown dust, agricultural activities leading to dust suspension, industrial processes, industrial chemical reactions, atmospheric formation by condensation and transformation of SO_2 and ROG.	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility.
Fine Particulate Matter ($PM_{2.5}$)	Same as above.	Same as above.
Lead (Pb)	Metal processing, lead smelters, waste incinerators, utilities, lead-acid battery manufacture.	Increased body burden, impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Same as PM_{10} and $PM_{2.5}$.	Visibility impairment on days when relative humidity is less than 70 percent.
Sulfates (SO_4^{2-})	Combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. SO_2 is converted to sulfate compounds in the atmosphere.	Aggravation of respiratory symptoms, decrease in ventilatory function, aggravation of asthmatic symptoms, increased risk of cardiopulmonary disease, reduced visibility, damage to ecosystems, and materials and property.
Hydrogen Sulfide (HS)	Bacterial decomposition of sulfur-containing organic substances; HS is also present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.	Disagreeable odor.

Source: ARB 2005a

Table 5.3-3
Summary of Annual Ambient Air Quality Data (2003–2007)[a]

	2003	2004	2005	2006	2007
Ozone (O_3)					
Maximum concentration (1-hour/8-hour average, ppm)	0.136/0.087	0.120/0.097	0.095/0.077	0.113/0.088	0.127/0.099
Number of days state 1-hour/8-hour standard exceeded	11/16	14/50	1/8	6/5	2/7
Number of days national 1-hour/8-hour standard exceeded	2/11	0/29	0/2	0/3	1/1
Carbon Monoxide (CO)					
Maximum concentration (8-hour average, ppm)	3.89	4.09	3.27	2.90	2.91
Number of days state standard exceeded	0	0	0	0	0
Number of days national standard exceeded	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
Maximum concentration (1-hour average, ppm)	0.127	0.122	0.089	0.114	0.086
Number of days state standard exceeded	0	0	0	0	0
Respirable Particulate Matter (PM_{10})					
Maximum concentration ($\mu g/m^3$)	96.0	74.0	65.0	104.0	489.0
Number of days state standard exceeded (measured[b])	6	7	3	7	6
Number of days national standard exceeded (measured[b])	0	0	0	0	1
Fine Particulate Matter ($PM_{2.5}$)					
Maximum concentration ($\mu g/m^3$)	115.5	58.9	54.7	56.2	79.4
Number of days national standard exceeded (measured[b])	25	20	13	7	14

Notes:
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; ppm = parts per million

[a] Measurements from the Anaheim – Pampas Lane monitoring station.

[b] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Source: ARB 2008c

criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

The SCAB is currently classified as a federal and state nonattainment area for O_3 (severe-17 [federal]), PM_{10} (serious [federal]), and $PM_{2.5,}$ and a federal attainment/maintenance area for CO (EPA 2008). The SCAB is classified as a state attainment area for CO; the SCAB currently meets the federal and state standards for NO_2, SO_2, and lead and is classified as an attainment area for these pollutants (ARB 2008a).

As seen in Table 5.3-3, air quality standards have been exceeded in the planning area for PM_{10}, $PM_{2.5}$, and O_3. Monitoring data for existing conditions is discussed below with the exception of SO_2, HS, Pb, and SO_4^2. The monitoring station does not mention these pollutants. Therefore, the monitoring data is not presented below. This is consistent with the entire SCAB's classification as nonattainment for PM_{10}, $PM_{2.5}$, and O_3.

Ozone (O_3). During the 2003 to 2007 monitoring period, the state 1-hour O_3 standard was exceeded between 1 and 14 times annually at the Anaheim – Pampas Lane monitoring station. The station also recorded multiple exceedances of the state 8-hour standard, ranging between 5 and 50 for the 2003 to 2007 monitoring period. Consequently, national 1-hour and 8-hour standards were also exceeded at the station during this period. The highest recorded 1-hour concentration of O_3 was 0.136 parts per million (ppm) (2003).

Carbon Monoxide (CO). The Anaheim – Pampas Lane monitoring station did not record an exceedance of the state 1-hour or 8-hour CO standards from 2003 to 2007. The highest recorded 8-hour concentration was just over 4 ppm (2004).

Nitrogen Dioxide (NO_2). The Anaheim – Pampas Lane monitoring station did not record an exceedance of the NO_2 standard between 2003 and 2007. The highest recorded 1-hour concentration was 0.127 ppm (2003).

Respirable Particulate Matter (PM_{10}). The Anaheim – Pampas Lane monitoring station recorded multiple exceedances of the state PM_{10} standard but has not exceeded the federal standard since 2003. The high PM_{10} value recorded in 2007 is due to the wildfires that occurred

in October of that year. With the exception of 2007, the highest recorded 24-hour concentration was 104 micrograms per cubic meter ($\mu g/m^3$) (2006). The state 24-hour standard was exceeded between 3 and 7 times annually.

Fine Particulate Matter ($PM_{2.5}$). The Anaheim – Pampas Lane monitoring station recorded multiple exceedances of the federal $PM_{2.5}$ standard. The highest recorded 24-hour concentration was 115.5 $\mu g/m^3$ (2003) and was exceeded between 7 and 25 times annually.

Emissions Sources

Sources of criteria air pollutants in the City include stationary, area, and mobile sources. According to the 2006 emissions inventory for Orange County, the majority of reactive organic gases (ROG) and oxides of nitrogen (NO_X) emissions are attributable to mobile sources, while areawide sources are the greatest contributor of PM emissions (ARB 2008d).

Stationary Sources

Major stationary sources of criteria air pollutant emissions within the City include industrial processes, fuel combustion from electric utilities and other processes, waste disposal, surface coating and cleaning, petroleum production, and other sources. SCAQMD issues permits to various types of stationary sources, which must demonstrate implementation of best available control technologies (BACT).

Areawide Sources

Areawide sources of emissions include consumer products, application of architectural coatings, residential fuel combustion, farming operations, construction and demolition, road dust, fugitive dust, landscaping, fires, and other miscellaneous sources. Paved road dust is the largest contributor to PM emissions within the City.

Mobile Sources

On-road and other mobile sources are the largest contributors of ozone precursor emissions within the City. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles, while off-road vehicles and other mobile sources comprise heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment. Major roadways in the City include I-5. Major state routes include SR-57, SR-55, SR-22, SR-91, and SR-241. High volume arterial

streets in the planning area include Lincoln Avenue, Taft Avenue, Katella Avenue, Chapman Avenue, Main Street, and Tustin Street among others.

Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs), are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2008e), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from 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. 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.

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, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene. ARB estimates that 78 percent of the known statewide cancer risk from these 10 TACs is attributable to diesel PM alone. The other 9 TACs are not expected to be emitted in significant quantities due to implementation of the proposed General Plan. Since these compounds represent a lower fraction of the risk and are not associated with the proposed land uses, a detailed discussion is not provided.

Diesel PM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in the SCAB in 2000 to be 720 excess cancer cases per million people. Although the health risk is higher than the statewide average, it represents a 33 percent drop between 1990 and 2000 (ARB 2008e).

Existing sources of TAC emissions in the City include the Orange Metrolink station, also known as the Santa Fe Depot/Orange Transportation Center that is served by the Amtrak and Metrolink rail systems. The railroad operations in the City are categorized into three types: commuter rail, passenger rail, and freight rail. Metrolink, the commuter rail service for the City, is provided by the Southern California Regional Rail Authority (SCRRA) and the Orange County Transportation Authority. The passenger rail service is offered by Amtrak while the freight rail is provided by Union Pacific Railroad and Burlington Northern Santa Fe (BNSF). Vehicles on I-5, SR-57, SR-55, SR-22, SR-91, and SR-241 and high traffic volumes on City arterials are sources of diesel PM and other TACs associated with vehicle exhaust. In addition, please refer to the City of Orange General Plan's land use policy map (Figure 3-3 in the Project Description) for areas currently designated as industrial (i.e., areas most likely to be stationary sources of emissions). Industrial uses are located primarily in the northwestern portion of the City.

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather are defined as sensitive receptors by SCAQMD.

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

There are numerous types of these receptors throughout the City. Please refer to the General Plan's land use policy map (Figure 3-3 in the Project Description) for areas with designations that accommodate residential, public institution, and open space uses (i.e., areas most likely to contain sensitive land uses such as residences, day care centers, senior facilities, hospitals, and parks).

Regulatory Setting

Criteria Air Pollutants

Federal Plans, Policies, Regulations, and Laws

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish National Ambient Air Quality Standards (NAAQS). As shown in Table 5.3-1, EPA has established primary and secondary NAAQS for the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIPs are required to be modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA must review all state SIPs to determine whether they conform to the mandates of the CAA and the amendments thereof, and to determine whether implementing them will achieve air quality goals. If EPA determines an SIP to be inadequate, a federal implementation plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may cause sanctions to be applied to transportation funding and stationary air pollution sources in an air basin.

The project is located in the SCAB, which has been designated a federal nonattainment area for certain criteria pollutants. The SCAB fails to meet the federal standard for 8-hour O_3, PM_{10}, and $PM_{2.5}$. Deadlines for meeting the NAAQS within the SCAB have been set as 2023 for 8-hour O_3 and 2014 for $PM_{2.5}$. The attainment deadline for PM_{10} was set as 2006 (SCAQMD 2006b). The SCAB has met the PM_{10} standards at all stations except western Riverside where the annual PM_{10} standard has not been met as of 2006. Additional efforts, through localized programs, are under way to ensure compliance with this standard.

State Plans, Policies, Regulations, and Laws

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish the California Ambient Air Quality Standards (CAAQS) (Table 5.3-1). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing PM, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with California and federal laws; approving local air quality plans; submitting the SIP to EPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

California is divided into 35 Air Pollution Control Districts (APCDs) and Air Quality Management Districts (AQMDs), which are also called air districts. These agencies are county or regional governing authorities that have primary responsibility for controlling air pollution from various sources in the regions under their jurisdiction.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for O3 and $PM_{2.5}$. California's adopted 2007 State Strategy was submitted to EPA as a revision to the 2003 SIP in November 2007 (ARB 2008f).

Local Plans, Policies, Regulations, and Laws

South Coast Air Quality Management District. SCAQMD attains and maintains air quality conditions in the SCAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the SCAQMD includes the preparation of plans for the attainment of ambient air

quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. SCAQMD also inspects stationary sources of air pollution and responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the CAA, CAAA, and CCAA. Air quality plans applicable to the proposed project are discussed below.

Air Quality Management Plan. SCAQMD and Southern California Association of Governments (SCAG) are responsible for preparing the air quality management plan (AQMP), which addresses federal and state CAA requirements. The AQMP details goals, policies, and programs for improving air quality in the SCAB. Two versions (2003 and 2007) of the AQMP are in different stages of approval. The 2003 AQMP is an update to the 1997 AQMP. The 2003 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The 2003 AQMP proposes policies and measures to achieve federal and state standards for healthy air quality in the SCAB. The 2003 AQMP updates the demonstration of attainment for the federal O_3 and PM_{10} standard; replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the SCAB has met since 1992. The 2003 AQMP was adopted by SCAQMD in August 2003 and approved, with modifications, by ARB in October 2003 (SCAQMD 2006a). ARB submitted the South Coast SIP to EPA on January 9, 2004; however, this SIP has not been approved, and the 1997 AQMP with 1999 amendments remains the federally approved AQMP.

A draft version of the 2007 AQMP was released to the public, and public workshops were held in October, November, and December 2006 (SCAQMD 2006b). The 2007 AQMP was adopted by the SCAQMD Governing Board on June 1, 2007. The purpose of the 2007 AQMP for the SCAB is to set forth a comprehensive program that will lead the region into compliance with federal 8-hour O_3 and $PM_{2.5}$ air quality standards. ARB adopted the State Strategy for the 2007 SIP, and the 2007 AQMP as part of the SIP on September 27, 2007. On November 28, 2007, ARB submitted an SIP revision to EPA for O_3, $PM_{2.5}$, CO, and NO_2 in the SCAB; this revision is identified as the 2007 South Coast SIP. The 2007 AQMP/2007 South Coast SIP demonstrates attainment of the federal $PM_{2.5}$ standard in the SCAB by 2014, and attainment of the federal 8-hour O_3 standard by 2023. The SIP also includes a request of reclassification of the O_3 attainment designation from "severe" to "extreme" (ARB 2007). On February 1, 2008, ARB submitted additional technical information relative to the 2007 South Coast SIP to EPA (ARB 2008f).

The $PM_{2.5}$ strategy outlined in the AQMP is of interest. Since $PM_{2.5}$ in the SCAB is overwhelmingly formed secondarily, the overall draft control strategy focuses on reducing precursor emission of sulfur oxides (SO_X), directly emitted $PM_{2.5}$, NO_X, and volatile organic compounds (VOC) instead of fugitive dust (SCAQMD 2006b). Based on the SCAQMD's modeling sensitivity analysis, SO_X reductions, followed by directly emitted $PM_{2.5}$ and NO_X reductions, provide the greatest benefits in terms of reducing the ambient $PM_{2.5}$ concentrations.

As a result of state and local control strategies, the SCAB has not exceeded the federal CO standard since 2002. In March 2005, SCAQMD adopted a CO Redesignation Request and Maintenance Plan that provides for maintenance of the federal CO air quality standard until at least 2015 and commits to revising the Redesignation Request and Maintenance Plan in 2013 to ensure maintenance through 2025 (SCAQMD 2005). The SCAQMD also adopted a CO emissions budget that covers 2005 through 2015. On February 24, 2006, ARB transmitted the Redesignation Request and Maintenance Plan (including the CO budgets) to EPA for approval. On June 11, 2007, EPA redesignated the SCAB as attainment for the federal CO standard and approved the maintenance plan amendment to the SIP for the SCAB (Federal Register 2007).

The 2007 AQMP is the current ARB-approved plan while the 1997 AQMP is the current EPA-approved plan. The 2003 and 2007 AQMPs have not been approved by EPA. This EIR uses the 2007 AQMP for analysis of consistency.

SCAQMD Rules and Regulations. All projects are subject to SCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include, but are not limited to the following.

Rule 401 – Visible Emissions. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.

Rule 402 – Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The provisions of this rule do not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

Rule 403 – Fugitive Dust. This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions. Rule 403 applies to any activity or man-made condition capable of generating fugitive dust.

Rule 1113 – Architectural Coatings. No person shall apply or solicit the application of any architectural coating within SCAQMD, with VOC content in excess of the values specified in a table incorporated in the Rule.

Toxic Air Contaminants

Air quality regulations also focus on TACs. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 5.3-1). Instead, EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions at the source. These, in conjunction with additional rules set forth by SCAQMD, establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Programs

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAPs). The NESHAPs may be different for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any HAP or more than 25 tpy of any combination of HAPs; all other sources are considered area sources. The CAAA called on EPA to promulgate emissions standards in two phases. In the first phase (1992 through 2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk-based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAAA required the use of reformulated gasoline in selected areas with the most severe O_3 nonattainment conditions to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act) (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Diesel PM was added to the ARB list of TACs in 1998.

Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions (e.g., the airborne toxic control measure limits truck idling to 5 minutes [13 CCR Chapter 10 Section 2485]).

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel-exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule. Current and future milestones include the low-sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks (by 2007) and off-road diesel equipment (by 2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels

of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated year-2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005b), which provides guidance concerning land use compatibility with TAC sources. While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help protect children and other sensitive populations.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under SCAQMD Regulation XIV (Toxics and Other Non-Criteria Pollutants), and in particular Rule 1401 (New Source Review), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. SCAQMD limits emissions and public exposure to TACs through a number of programs. SCAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

5.3.2 Threshold for Determining Significance

For the purposes of this EIR, the following thresholds of significance, as identified by the State CEQA Guidelines (Appendix G) and SCAQMD, have been used to determine whether implementation of the General Plan would result in significant air quality impacts. Based on Appendix G, an air quality impact is considered significant if implementation of the General Plan would do any of the following:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

The NOP/IS concluded that the proposed General Plan does not have the potential to create objectionable odors. Therefore this issue is not discussed further in this EIR.

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. SCAQMD has established thresholds, as shown in Table 5.3-4. SCAQMD's significance thresholds approximately correlate to the reduction requirements to ensure that a project does not contribute to an existing or projected air quality violation (such as those shown in Table 5.3-3), create new violations, or result in a cumulatively considerable net increase in nonattainment criteria pollutant or ozone precursor concentrations.

Table 5.3-4
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction** [b]	**Operation**
NO_X	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM_{10}	150 lb/day	150 lb/day
$PM_{2.5}$	55 lb/day	55 lb/day
SO_X	150 lb/day	150 lb/day
CO	550 lb/day	550 lb/day
Lead	3 lb/day	3 lb/day
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and noncarcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Ambient Air Quality for Criteria Pollutants [c]	
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards for ambient air quality: 0.25 ppm (state) 0.053 ppm (federal)
PM_{10} 24-hour average annual geometric average annual arithmetic mean	SCAQMD is in nonattainment; project is significant if it causes or contributes to an exceedance of the following attainment standard for ambient air quality: 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$ 20 $\mu g/m^3$
$PM_{2.5}$ 24-hour average	SCAQMD is in nonattainment; project is significant if it causes or contributes to an exceedance of the following attainment standard for ambient air quality: 10.4 $\mu g/m^3$ (construction)[d] & 2.5 $\mu g/m^3$ (operation)
Sulfate 24-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standard for ambient air quality: 1 $\mu g/m^3$
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)

[a] Source: SCAQMD 2008a

[b] Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea Air Basin and Mojave Desert Air Basin).

[c] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

[d] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lb/day = pounds per day
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
≥ greater than or equal to

5.3.3 Environmental Impact

Analysis Methodology

Regional and local emissions of criteria air pollutants and precursors, and TACs during project construction and operations consistent with the proposed General Plan were assessed in accordance with the methodologies described below.

Development pursuant to the proposed General Plan land use policy would result in an increase of approximately 23,478 dwelling units and 35.7 million square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 57,844 persons is also anticipated at buildout according to the proposed General Plan. Air quality impacts from future development allowed by the General Plan can be divided into two types, short-term impacts and long-term impacts. Short-term impacts are associated with construction activities, and long-term impacts are associated with the continued operation of developed land uses and the associated increase in vehicular trips.

Construction-related emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (ROG and NO_X) were assessed in accordance with methodologies recommended by ARB and SCAQMD. Where quantification was required, emissions were modeled using the URBEMIS 2007 Version 9.2.4 computer model. Project-specific data (e.g., construction equipment types and number requirements, and maximum daily acreage disturbed) were not available at the level of the proposed General Plan for modeling purposes. Modeled construction-related emissions were compared with applicable SCAQMD thresholds to determine significance.

Regional operational emissions of criteria air pollutants and precursors (e.g., mobile and area sources) were also quantified using the URBEMIS 2007 Version 9.2.4 computer model. Modeling was based on buildout assumptions in the proposed General Plan and information about vehicle trip generation from the traffic analysis prepared for this project (see Section 5.14, Transportation in this EIR).

Other air quality impacts (i.e., local emissions of CO, and construction- and operation-related TACs) were assessed in accordance with methodologies recommended by ARB and SCAQMD.

b) - d) Short-Term Impacts

Construction-related emissions are described as short term or temporary in duration and have the potential to represent a significant impact with respect to air quality. Buildout of the proposed General Plan is dependent on individual housing decisions, employment opportunities, provision of services for housing and supporting commercial uses, land use decisions of the City and other public agencies, regional transportation planning decisions, the decisions of financial institutions related to development projects, and other similar factors.

Construction-related activities would result in emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (e.g., ROG and NO_X) from site preparation (e.g., excavation, grading, and clearing); exhaust from off-road equipment, material delivery trucks, and worker commute vehicles; vehicle travel on paved and unpaved roads; and other miscellaneous activities (e.g., building construction, asphalt paving, application of architectural coatings, and trenching for utility installation).

Emissions of Ozone Precursors and Criteria Air Pollutants

Emissions of ozone precursors are associated primarily with exhaust from off-road construction equipment. Worker commute trips and other construction-related activities also contribute to short-term increases in such emissions.

Emissions of fugitive PM dust (e.g., PM_{10} and $PM_{2.5}$) are associated primarily with ground disturbance activities during site preparation (e.g., grading) and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled (VMT) on- and off-site. Exhaust emissions from diesel equipment and worker commute trips also contribute to short-term increases in PM_{10} emissions, but to a much lesser extent (see Table 5.3-5). Construction-related activities would result primarily in project-generated emissions of fugitive PM_{10} and $PM_{2.5}$ dust from site preparation (e.g., excavation, grading, and clearing). It is assumed that the construction would be performed in accordance with SCAQMD Rule 403, Fugitive Dust. Therefore, emissions reductions consistent with this rule have been included in the estimate of construction emissions.

Construction-related emissions were modeled using the ARB-approved URBEMIS 2007 Version 9.2.4 computer program. URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Detailed phasing and construction information (e.g., construction equipment type and number requirements,

maximum daily acreage disturbed, number of workers, hours of operation) is not possible to determine at the level of the proposed General Plan.

Table 5.3-5
Summary of Modeled Construction-Related Daily Exhaust Emissions of Criteria Air Pollutants and Precursors—5 Percent of Buildout of the proposed General Plan in the Worst-Case Year (2010)

	Emissions (lb/day)					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Phase 1—Site Preparation[1]						
Grading	14.5	127.9	62.9	<0.1	671.4	144.2
Phase 2—Building Construction						
Building Construction	15.6	85.7	294.5	0.4	6.2	4.6
Asphalt Paving	5.1	25.1	13.9	<0.1	2.0	1.8
Architectural Coatings	209.5	0.2	4.1	<0.1	<0.1	<0.1
Trenching	4.2	35.5	18.4	<0.1	1.8	1.6
Total Unmitigated Maximum Emissions per Phase	**234.4**	**146.5**	330.9	0.4	**671.4**	**144.2**
SCAQMD Significance Threshold (lb/day)	***75***	***100***	***550***	***150***	***150***	***55***

Notes:
Bold indicates an exceedance of the respective threshold.
lb/day = pounds per day; CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROG = reactive organic gases; SO_X = oxides of sulfur; SCAQMD = South Coast Air Quality Management District
[1] No emissions were modeled for demolition activities. Existing land uses to be demolished are unknown at this time.
Refer to Appendix D for detailed input parameters and modeling results.
Source: Modeling performed by EDAW in 2008

Modeling was performed assuming a 20-year planning horizon. It is assumed that 1/20 or roughly 5 percent of the proposed uses would be constructed during any given year over a 20-year time frame. Modeling was conducted for the year 2010 because this is assumed to be the earliest possible year during which construction could occur. If construction would not occur until future years, emission factors associated with off-road construction equipment would be lower because of the regulatory trend of stricter equipment emissions by the state and the implementation of more stringent emissions standards. As older models of equipment are replaced by newer models with cleaner engines, fleetwide emission factors decrease. Therefore, for purposes of this analysis, 2010 is identified as the "worst-case" year.

Table 5.3-5 summarizes the estimated construction-related emissions of criteria air pollutants and ozone precursors from site preparation (e.g., grading) and building construction activities for buildout of the proposed General Plan. Construction-related air quality effects were determined by comparing these modeling results with applicable SCAQMD significance thresholds. Refer to Appendix D for detailed modeling input parameters and results.

As depicted in Table 5.3-5, construction-related activities associated with the buildout of the worst-reasonable-case year (2010) would result in annual unmitigated emissions of approximately 234 lb/day of ROG, 147 lb/day of NO_X, 671 lb/day of PM_{10}, and 144 lb/day of $PM_{2.5}$.

Based on the modeling conducted, construction-related activities would result in emissions of ROG, NO_X, PM_{10} and $PM_{2.5}$ that exceed SCAQMD's significance thresholds. SCAB is already in nonattainment for these pollutants. Thus, construction-related emissions of ozone precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations.

Because of the large amount of development and potential for simultaneous construction of multiple sites, the nonattainment status of the SCAB, and modeled emissions that exceed applicable thresholds (**Table 5.3-5**), implementation of the proposed General Plan could result in or substantially contribute to an air quality violation. As a result, this impact would be **potentially significant.**

The proposed General Plan includes an Implementation Plan that identifies specific Implementation Programs to achieve the goals, policies, and plans. Where a potentially significant environmental impact exists, the Implementation Program also functions as programmatic mitigation measures.

Compliance with proposed General Plan policies, relevant SCAQMD rules, and implementation of mitigation measures 5.3-1 and 5.3-7 would reduce short-term, construction-related emissions, but not to a less than significant level. Construction-related emissions of criteria air pollutants and precursors would still exceed significance thresholds; for this reason such emissions could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would remain **significant and unavoidable.** Individual development projects will be required to undergo project-specific environmental review. If project-level significant impacts are identified, specific mitigation measures will be required.

b) - d) Long-Term Impacts

Area- and Mobile-Source Emissions

Regional area- and mobile-source emissions of criteria air pollutants and ozone precursors were modeled using the URBEMIS 2007 Version 9.2.4 computer program, which is designed to estimate emissions for land use development projects (SCAQMD 2008b). URBEMIS allows land use data entries that include project location specifics and trip generation rates. URBEMIS accounts for area-source emissions from the use of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trip generation. Regional area- and mobile-source emissions were modeled based on proposed land use types and sizes (see Chapter 3, "Project Description"), the increase in trip generation from the traffic analysis prepared for this project (see Section 5.14, Transportation), and default settings and parameters attributable to analysis period and site location.

Modeled operational emissions are summarized in Table 5.3-6 for 2030 buildout conditions, assuming that the entire proposed General Plan would be constructed over a 20-year planning horizon. As shown in Table 5.3-6, operational activities would result in worst-case daily unmitigated emissions of approximately 6,672 lb/day of ROG, 2,460 lb/day of NO_X, 25,491 lb/day of CO, 9,646 lb/day of PM_{10}, and 3,099 lb/day of $PM_{2.5}$ under full buildout conditions.

Based on the modeling conducted, operational activities would result in emissions of ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ that exceed SCAQMD's applicable thresholds. Thus, operational emissions of these ozone precursors and particulate matter could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. This is a **potentially significant** impact.

Stationary-Source Emissions

The proposed General Plan could accommodate stationary sources of pollutants that would be required to obtain permits to operate in compliance with SCAQMD rules. These sources could include but not be limited to diesel-engine or gas turbine generators for emergency power generation; central-heating boilers for commercial, industrial, or large residential buildings; process equipment for light-industrial uses; kitchen equipment at restaurants and schools; service-station equipment; and dry-cleaning equipment. The permit process would ensure that

these sources would be equipped with the required emission controls, and that, individually, these sources would not cause a significant environmental impact. There is no available methodology to reliably estimate these emissions; nonetheless, the emissions from these sources would be additive to the estimated area-source and mobile-source emissions described above.

Table 5.3-6
Summary of Modeled Operational Emissions of Criteria Air Pollutants and Precursors—2030 Conditions upon Buildout of the Proposed General Plan

Source	Emissions (lb/day)[1]					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Sources[2]	5,201.8	775.8	10,554.7	28.8	1,596.1	1,536.5
Mobile Sources[3]	1,469.7	1,684.4	14,946.5	41.1	8,049.4	1,562.5
Total Unmitigated Emissions	**6,671.5**	**2,460.2**	**25,491.2**	**69.9**	**9,645.5**	**3,099.0**
SCAQMD Significance Threshold	***55***	***55***	***550***	***150***	***150***	***55***

Notes:
SCAQMD = South Coast Air Quality Management District; lb/day = pounds per day; CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROG = reactive organic gases; SO_X = oxides of sulfur.
[1] Emissions modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on trip generation rates obtained from the analysis prepared for this project and proposed land uses identified in Chapter 3, Project Description, and Section 5.14, Transportation, of this EIR.
[2] For this estimate, default model assumptions were used for the number of residences that would contain hearth features.
[3] Trip generation rates were obtained from the traffic analysis for the respective land uses (see Section 5.14, Transportation).
Refer to Appendix D for detailed assumptions and modeling output files.
Source: Data modeled by EDAW in 2008

Policies in the proposed General Plan include a variety of regulations and incentives aimed at improving air quality in the planning area. Specific policies related to air quality include:

- Plan, build, and maintain an integrated, hierarchical, and multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City. (Circulation and Mobility Element Policy 1.1)
- Encourage the use of regional rail, transit, bicycling, carpools, and vanpools for work trips to relieve traffic congestion. (Circulation and Mobility Element Policy 2.6)
- Work with the OCTA and other agencies to assess City public transportation needs and to ensure delivery of services when and where they are needed. (Circulation and Mobility Element Policy 3.1)

- Enhance and encourage provision of convenient and attractive transit amenities and streetscapes to encourage use of public transportation (e.g., benches, trash cans, shelters, and lighting). (Circulation and Mobility Element Policy 3.2)
- Require incorporation of transit-oriented design features within major commercial and employment areas as well as medium density residential and mixed use development areas. (Circulation and Mobility Element Policy 3.3)
- Create a comprehensive bicycle network that is integrated with other transportation systems by establishing complementary on-street and off-street facilities as identified in the City of Orange *Bikeways Master Plan* and OCTA *Commuter Bikeways Strategic Plan*, including Santiago Creek, the Santa Ana River, and the proposed Tustin Branch Trail. (Circulation and Mobility Element Policy 4.1)
- Improve citywide awareness of automobile and bicycle safety. (Circulation and Mobility Element Policy 4.3)
- Encourage use of the bikeway system by providing adequate signage, trail markings, and other amenities. (Circulation and Mobility Element Policy 4.4)
- Ensure that pedestrian sidewalks, trails, and bikeways are safe environments through the use of defensive trail design features, lighting where appropriate, access for emergency vehicles, and links to the roadway signal system. (Circulation and Mobility Element Policy 4.5)
- Explore opportunities to convert abandoned rail corridors into segments of the City's bikeway and pedestrian trail system. (Circulation and Mobility Element Policy 4.6)
- Provide accessible sidewalks and pedestrian amenities throughout the City. (Circulation and Mobility Element Policy 4.7)
- Cooperate with SCAQMD and other regional agencies to implement and enforce regional air quality management plans. (Natural Resources Element Policy 2.1)
- Support alternative transportation modes and technologies, and bicycle- and pedestrian-friendly neighborhoods to reduce emissions related to vehicular travel. (Natural Resources Element Policy 2.2)
- Encourage sustainable building and site designs for new construction and renovation projects. (Natural Resources Element Policy 2.6)

- Coordinate with energy suppliers to ensure adequate supplies to meet community needs, and to promote energy conservation and public education programs for that purpose. (Natural Resources Element Policy 2.7)
- Encourage development that incorporates pedestrian- and transit-oriented design and landscape elements. (Natural Resources Element Policy 2.8)
- Encourage development of mixed use projects to revitalize older commercial areas throughout the City and industrial areas surrounding the historic Santa Fe Depot. (Land Use Element Policy 2.1)
- Encourage mixed use projects that contain a mixture of compatible uses, and provide necessary supporting public and community facilities. (Land Use Element Policy 2.1)
- Encourage linkage in and around mixed use areas using a multimodal circulation network, particularly transit, bicycle and pedestrian sidewalk, path, paseo, and trail systems. (Land Use Element Policy 2.6)
- Ensure that the architecture, landscape design, and site planning of mixed use projects are of the highest quality, and emphasize a pedestrian orientation and safe and convenient access between uses. (Land Use Element Policy 2.7)
- Encourage mixed use development to include ground floor retail. (Land Use Element Policy 2.9)
- Discourage commercial and industrial enterprises that have significant adverse soil, air, water, or noise impacts. (Land Use Element Policy 3.4)
- Protect residents and the environment from potential adverse soil, air, water, and noise impacts of industrial operations. (Land Use Element Policy 4.3)
- Ensure positive benefits for Orange from regional transportation, land use, air quality, waste management and disposal, and habitat conservation plans. Land Use Element Policy 7.4)
- Work with and encourage other agencies and service providers to minimize potential visual and environmental impacts of their facilities on Orange. (Land Use Element Policy 7.5)
- Enhance and maintain safe pedestrian and bicycle movement through the integration of traffic control devices, crosswalks, and pedestrian-oriented lighting, into the design of

streets, sidewalks, trails, and school routes throughout Orange. (Public Safety Element Policy 9.1)

- Identify and attempt to remove all barriers to pedestrian and bicycle access including those associated with rail, street, freeway and waterway crossings, and poorly marked or maintained pathways and sidewalks. (Public Safety Element Policy 9.3)

The proposed General Plan includes an Implementation Plan that identifies specific Implementation Programs to achieve the goals, policies, and plans. Where a potentially significant environmental impact exists, the Implementation Program also functions as programmatic mitigation measures.

With adherence to and implementation of the proposed policies and regulations, and implementation of mitigation measures 5.3-1 through 5.3-7, operational impacts at a programmatic level would be reduced, but not to a less than significant level. As a result, this impact would remain **significant and unavoidable**. Individual development projects will be required to undergo project-specific environmental review. If project-level significant impacts are identified, specific mitigation measures will be required.

a) SCAQMD Air Quality Management Plan

Future changes to emissions in the City were computed based on trip generation estimates and proposed land use types and sizes. The ARB motor vehicle emissions model (EMFAC2007) emission factors, as contained in the ARB-approved URBEMIS 2007 (Version 9.2.4) computer model, were used along with trip generation estimates from the traffic analysis prepared for this project (see Section 5.14, Transportation of this EIR) to calculate emissions in units of lb/day for future (2030) conditions upon buildout of the proposed General Plan. Daily air pollutant emissions are shown in Table 5.3-6.

Emissions of criteria air pollutants and ozone precursors (ROG and NO_X) associated with new growth under the proposed General Plan are treated as new to the City. This is a conservative [worst-case] assumption because many "new vehicle trips" may actually be moved from one part of the region to another partly as a result of the proposed General Plan. For the purpose of this analysis, it is assumed that all trips and associated emissions would be new to the City.

In preparation of the AQMP, SCAQMD and SCAG rely on population growth projections in the region to forecast, inventory, and allocate regional emissions from land use and development-

related sources. For purposes of analyzing consistency with the AQMP, it may be assumed that if the General Plan would accommodate population growth substantially greater than anticipated in the AQMP, then the proposed project would conflict with the AQMP. According to SCAG projections, the population in Orange will increase to 153,522 in 2030. The proposed General Plan, however, could accommodate a population of 194,543 post 2030.

Because the proposed General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment, and would increase population (and thus VMT) beyond that anticipated by SCAG (see Section 5.9, Land Use and Planning and Section 5.11, Population and Housing) (SCAG 2004), this would conflict with SCAQMD air quality planning efforts.

Mitigation measure 5.3-6 requires the City to work with the SCAQMD and SCAG to ensure consistency with the AQMP. As outlined in the previous section, the proposed General Plan contains numerous goals, policies, and programs intended to reduce per-capita VMT and resulting air pollution. The proposed General Plan accommodates growth primarily through the land use focus areas in already developed areas of the City. Many of the focus areas are adjacent to existing transit services and within walking distance of commercial services. Additionally, the development in these areas would primarily be mixed use development. These factors could lead to a reduction in VMT. However, even with implementation of these goals, policies, and programs, and mitigation measure 5.3-6 anticipated population and development consistent with the proposed General Plan under the proposed project could lead to operational (mobile-source and area-source) emissions that exceed thresholds. Therefore, this impact would be **significant and unavoidable**.

d) Impacts to Sensitive Receptors

Toxic Air Contaminants

With implementation of the proposed General Plan, new or modified sources of TACs could be placed near existing sensitive receptors, and new sensitive receptors could be developed near existing sources of TACs. Emissions of TACs during project construction consistent with the proposed General Plan (e.g., emissions from heavy-duty diesel equipment) and from project operation under the Plan (e.g., emissions from area, stationary and mobile sources) are discussed and the resulting levels of TAC exposure and of sensitive receptors are analyzed separately below.

Construction-Related Emissions

Construction-related activities would result in short-term emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment for site preparation (e.g., excavation, grading, and clearing), paving, application of architectural coatings, and other miscellaneous activities. Diesel PM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003).

It is important to note that emissions from construction equipment would be reduced over the period of buildout of the proposed General Plan. In January 2001, EPA promulgated a final rule to reduce emissions standards for heavy-duty diesel engines in 2007 and subsequent model years. These emissions standards represent a 90 percent reduction in NO_X emissions, 72 percent reduction of nonmethane hydrocarbon emissions, and 90 percent reduction of PM emissions in comparison to the emissions standards for the 2004 model year. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and PM starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines.

More specifically, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period and duration of activities associated with the project, in this case the proposed General Plan (Salinas, personal communication, 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary and would combine with the highly dispersive properties of diesel PM (Zhu et al. 2002), further reductions in exhaust emissions would occur, and construction-related activities would be typical to similar development-type projects, construction-related TAC emissions would not expose sensitive receptors to substantial emissions of TACs. It is also important to

note that compliance with the construction dust mitigation requirements would also reduce PM exhaust emissions. As a result, this impact would be **less than significant**.

Operational Emissions

Stationary Sources. Besides construction of primarily mixed use development in the land use focus areas, the proposed General Plan anticipates construction of industrial and commercial land uses, which may potentially include stationary sources of TACs, such as dry-cleaning establishments, gasoline-dispensing facilities, and diesel-fueled backup generators. These types of stationary sources, in addition to any other stationary sources that may emit TACs, would be subject to SCAQMD's rules and regulations. Thus, as discussed above, SCAQMD would analyze such sources (e.g., health risk assessment) based on their potential to emit TACs. If it is determined that the sources would emit TACs in excess of SCAQMD's applicable significance threshold, MACT or BACT would be implemented to reduce emissions. If the implementation of MACT or BACT would not reduce the risk below the applicable threshold, SCAQMD would deny the required permit. As a result, given compliance with applicable rules and regulations, operation of stationary sources would not result in the exposure of sensitive receptors to TACs at levels exceeding SCAQMD's significance thresholds, and this impact would be **less than significant**.

Furthermore, the stationary sources of TAC emissions in the City would be required to be permitted and regulated to prevent new land use compatibility conflicts. Therefore, there would be no incompatibility of proposed land uses with major existing stationary sources of TAC emissions. This impact would also be **less than significant**.

Mobile Sources. The proposed General Plan includes a mix of land uses, including commercial, industrial, and residential uses. The ARB guidance document (2005b) recommends avoiding the placement of new sensitive land uses (e.g., residences and schools) within 500 feet of major freeways (those with 100,000+ vehicles per day, such as I-5, SR-57, SR-55, SR-22, SR-91, and SR-241). The guidance document reports that health risk attributable to proximity to a freeway was seen within 1,000 feet and was strongest within 300 feet in traffic-related studies. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet. The proposed General Plan contains goals and policies designed to reduce exposure of sensitive receptors to concentrations of TACs from mobile sources. However, because it is not specified under law that sensitive receptors are to be placed a minimum of 500 feet from major roadways, the residential land uses proposed in the proposed General Plan could result in the location of sensitive receptors adjacent to major roadways. Several of the land use focus areas in the

proposed General Plan, where primarily mixed use development will occur, are adjacent to or in proximity to major roadways.

Sensitive receptors could also be sited within 500 feet of a major freeway, and risk associated with implementation of the proposed General Plan would exceed ARB's (and subsequently SCAQMD's) recommendation. Thus, this impact would be **significant and unavoidable** despite implementation of mitigation measure 5.3-7 and policies in the proposed General Plan aimed at improving air quality described in the previous sections.

Implementation of the proposed General Plan could also place commercial/industrial land uses near sensitive receptors. In those cases, on-site mobile sources of TACs would be associated primarily with the operation of heavy-duty diesel trucks used for proposed on-site commercial/industrial activities (e.g., unloading/loading). According to the ARB guidance document (2005b), ARB recommends avoiding the siting of new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences). The ARB guidance document is advisory, not regulatory. Operational activities that require the use of diesel-fueled vehicles for extended periods, such as commercial trucking facilities or delivery/distribution areas, may generate diesel PM emissions that could expose sensitive receptors to diesel PM emissions. Although commercial and industrial uses that would be developed under the proposed General Plan have not been identified, some of the tenants would require large delivery and shipping trucks that use diesel fuel. The diesel exhaust PM emissions generated by these uses would be produced primarily at single locations on a regular basis (e.g., loading dock areas). Idling trucks, including TRUs, increase diesel PM levels at these locations. Occupants of nearby existing and proposed residences may be exposed to diesel exhaust PM emissions on a reoccurring basis.

ARB has adopted an idling restriction airborne toxic control measure (ATCM) for large commercial diesel-powered vehicles, which became effective February 1, 2005. In accordance with this measure, affected vehicles are required to limit idling to no longer than 5 minutes under most circumstances. ARB is currently evaluating additional ATCMs intended to further reduce TACs associated with commercial operations, including a similar requirement to limit idling of smaller diesel-powered commercial vehicles.

It is unknown at this time whether the concentration of diesel PM at any sensitive receptor locations might exceed the threshold for acceptable cancer risk for the maximally exposed individual. It is also unclear what effect ARB's new diesel-engine emission standards and diesel

PM regulations would have on the level of emissions from any one facility. Therefore, because of uncertainty with respect to determination of tenants, frequency of diesel-fueled trucks visiting the proposed land uses, and distances between trucking activities and sensitive receptors at final buildout of the proposed General Plan and associated mobile emissions of diesel exhaust, this impact would be **significant and unavoidable** despite implementation of mitigation measure 5.3-7 and policies in the proposed General Plan aimed at improving air quality described in the previous sections.

Long-Term Off-Site Rail Traffic Sources. The railroad operations in the City are categorized into three types: commuter rail, passenger rail, and freight rail. Metrolink, the commuter rail service for the City is provided by SCRRA and OCTA. The passenger rail service is offered by Amtrak while the freight rail is provided by Union Pacific Railroad (UPRR) and BNSF.

Metrolink operates two commuter lines, which connect the City, via the Orange Transportation Center, to other important destinations in the region. The two lines are the Orange County Line and Inland Empire-Orange County Line. The Orange County Line offers direct connections to Los Angeles Union Station to the north and Oceanside to the south. The existing number of weekday trips on the Orange County Line is as follows:

- Orange to Union Station (Northbound) – 10
- Union Station to Orange (Southbound) – 9
- Orange to Oceanside (Southbound) – 6
- Oceanside to Orange (Northbound) – 6

The Inland Empire-Orange County Line offers direct connections to Riverside/San Bernardino to the east and Oceanside to the south. The existing number of weekday trips on this line is as follows:

- Orange to Riverside/San Bernardino (Eastbound) – 6
- Riverside/San Bernardino to Orange (Westbound) – 6
- Orange to Oceanside (Southbound) – 6
- Oceanside to Orange (Northbound) – 6

Amtrak operates the Pacific Surfliner passenger rail between San Diego and Paso Robles, which also connects several coastline communities along its route. It makes one stop daily at the

Orange Transportation Center with the southbound train departing Los Angeles Union Station at 2:00 p.m.

UPRR and BNSF operate freight rail services through the City. The services offered include transporting containers, trailers, and chemical/oil tankers. The major intermodal cargo loading facilities are located in ports of San Diego, Long Beach, and Los Angeles.

In October 2004, ARB released a study that provided a health risk characterization and assessment of the diesel PM from locomotives at the J. R. Davis Rail Yard in Roseville, California (ARB 2004). The study indicated that locomotive-related activities at the rail yard would result in the exposure of sensitive receptors near the yard to a cancer risk level in excess of the applicable threshold. However, the UPRR rail lines in the City are used specifically for passenger and freight service and currently experience extremely light daily rail traffic relative to the traffic occurring at the rail yard in Roseville. In 2005, OCTA approved the Metrolink Service Expansion Program to provide train service every 30 minutes throughout the day between certain stations, including the Orange station. Increased weekday service will begin in early 2010. Unlike the locomotives passing through the City of Orange, the locomotives at the Roseville rail yard undergo engine testing, and they idle for extended periods of time, so emissions are higher and persist in one localized area for greater amounts of time. The rail yard study describes conditions that are unlike those associated with the rail lines through the City. Therefore, planned residential, transit-oriented, and mixed use development near the Santa Fe Depot/Orange Metrolink station within the Old Towne/Depot General Plan focus area would not expose sensitive receptors to diesel PM concentrations that would result in a health risk in excess of the threshold. This impact would be **less than significant**.

Local CO Impacts

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and under certain meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools, and hospitals. As a result, SCAQMD recommends analysis of CO emissions at a local as well as a regional level.

An appropriate qualitative screening procedure is provided in the procedures and guidelines contained in *Transportation Project-Level Carbon Monoxide Protocol* (the Protocol) to determine whether a project poses the potential for a CO hotspot (UCD ITS 1997). A CO

hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. According to the Protocol, projects may worsen air quality if they significantly increase the percentage of vehicles in cold start modes by 2 percent or more; significantly increase traffic volumes (by 5 percent or more) over existing volumes; or worsen traffic flow, defined for signalized intersections as increasing average delay at intersections operating at Level of Service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F.

The project's traffic analysis (see Section 5.14, Transportation) indicates that some of the signalized intersections that were analyzed would operate at LOS E or LOS F under cumulative conditions without and with the project. While mitigation measures such as capital project infrastructure improvements have been proposed that would alleviate the congestion, the lack of adequate funding leads to the conclusion that the mitigation measures may not be in place prior to roadways experiencing LOS E or F. Therefore, further investigation of potential CO impacts is warranted.

Localized CO concentrations at the worst intersections were computed using the Caline4 computer model. The worst intersections were chosen based on operating LOS under cumulative conditions and peak traffic volumes. CO concentrations at the intersections chosen following the above criteria are shown in Table 5.3-7. As indicated in Table 5.3-7, operations-related, local mobile-source emissions of CO generated by the project over the long term would not violate or substantially contribute to a violation of the CAAQS or NAAQS, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered **less than significant**.

5.3.4 Mitigation Measures

Mitigation is required to reduce short-term construction-related and long-term operations-related impacts. Policies within the General Plan Natural Resources Element will facilitate continued City cooperation with SCAQMD and SCAG to achieve regional air quality improvement goals, encourage alternative transportation modes, and implement transportation demand management strategies. Implementation of the following mitigation measures, derived from the proposed General Plan Implementation Program, will reduce potential impacts at this Program EIR level of analysis, but not to a less than significant level. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts to air quality.

Table 5.3-7
Summary of Carbon Monoxide Hot Spot Screening Level Analysis

Averaging Time	AM[1]		PM[2]	
	1-Hour	8-Hour	1-Hour	8-Hour
Concentration (ppm)[3]	6.6	4.6	6.3	4.4
NAAQS	35	9.0	35	9.0
CAAQS	20	9.0	20	9.0
Exceed standards?	No	No	No	No

[1] Peak hour concentrations in the AM hour were calculated at the Jamboree Road and Chapman Avenue intersection.
[2] Peak hour concentrations in the PM hour were calculated at the Main Street and La Veta Avenue intersection.
[3] 8-hour concentration assumed to be 0.7 times 1-hour concentration.
Please refer to Section 5.14, Transportation for details on peak hour volumes at the above intersections.
Sources: Data compiled by EDAW 2008

5.3-1 Comply with all provisions of CEQA. In addition to thresholds that may be established or adopted by the City in the future, utilize the following thresholds and/or procedures for CEQA analysis of proposed projects, consistent with policies adopted within the General Plan:

- **Circulation**
  - LOS D (volume to capacity [V/C] ratio less than or equal to 0.90) shall be the lowest acceptable level of service for both roadway segments and peak-hour intersection movements.
  - Orange County's Congestion Management Plan (CMP) specifies LOS E (V/C ratio less than or equal to 1.00) as the operating standard for roadways on the CMP highway system.
  - Projects that increase V/C by 0.01 or more on affected roadway segments or intersections experiencing LOS E or F conditions without the proposed project are considered to create significant impacts, and mitigation is required.

All future development proposals shall be reviewed by the City for potential regional and local air quality impacts per CEQA. If potential impacts are identified, mitigation will be required to reduce the impact to a level less than significant, where technically and economically feasible. (**Implementation Program III-1; Responsible Party –**

Community Development Department, Public Works Department, Community Services Department; Timeframe – Ongoing)

5.3-2 Require major employers of 100 persons or more to institute TDM Plans. Such plans establish incentives to encourage employees to carpool, take public transportation, bicycle, or use some means other than private automobiles to get to and from work. (**Implementation Program III-5; Responsible Party – Community Development Department, Public Works Department; Timeframe – Ongoing)**

5.3-3 The City strongly encourages new development and major renovation projects to employ green building techniques and materials. Encourage proposed development projects throughout the City to use Leadership in Energy and Environmental Design (LEED®) Standards developed by the U.S. Green Building Council or similar third-party verified program. Encourage building orientations and landscaping that enhance natural lighting and sun exposure. Prepare guidelines for sustainable development to encourage incorporation of these practices in new development. These guidelines will include measures to maximize soil permeability to address related storm water and surface-water runoff issues.

Require compliance with State Title 24 building construction standards and Energy Star conservation standards for all development projects.

Climate change mitigation measures identified in the General Plan EIR shall be incorporated as implementation programs and applied to new development projects upon adoption of the General Plan. (**Implementation Program III-11; Responsible Party – Community Development Department, Public Works Department; Timeframe – Ongoing)**

5.3-4 Use public education activities to accomplish the following objectives:

- Educate residents regarding air and water quality, including the effects of urban runoff;
- Raise public awareness about the importance of "green building" techniques; and
- Educate the public regarding the benefits of recycling and waste reduction.

Coordinate education activities and make materials available to residents. Utilize all available media including forums, flyers, brochures, email, videos, interpretive displays,

workshops, and the City's website and cable television channel to accomplish these objectives. Fully utilize the resources of the Orange Public Library to disseminate this information. Explore partnerships with local schools and educators to develop various educational programs related to historic preservation, personal and community safety, and environmental awareness. (**Implementation Program IV-3; Responsible Party – Community Development Department, Public Works Department, Fire Department, Police Department, Library Services Department, Community Services Department; Timeframe – Ongoing)**

5.3-5 Participate in regional efforts to implement TDM requirements and support implementation of the employer TDM provisions of the SCAQMD AQMP by working with the SCAQMD to identify employers within Orange most suitable for participation in the TDM programs to achieve major reduction of VMT. (**Implementation Program IV-6; Responsible Party – Community Development Department, Public Works Department; Timeframe – Ongoing)**

5.3-6 Work with SCAQMD and SCAG to implement the AQMP and meet all federal and state air quality standards for pollutants. Participate in any future amendments and updates to the AQMP. (**Implementation Program V-10; Responsible Party – Community Development Department; Timeframe – Ongoing)**

5.3-7 The City shall require each project applicant to implement the following measures to reduce the exposure of sensitive receptors to TACs from mobile sources, as a condition of project approval:

- Activities involving idling trucks shall be oriented as far away from and downwind of existing or proposed sensitive receptors as feasible.
- Strategies shall be incorporated to reduce the idling time of main propulsion engines through alternative technologies such as IdleAire, electrification of truck parking, and alternative energy sources for TRUs to allow diesel engines to be completely turned off.
- Proposed developments shall incorporate site plans that move sensitive receptors as far as feasibly possible from major roadways (100,000+ average daily trips).

- Projects containing sensitive receptors (such as residences, schools, day care centers, and medical facilities) on sites within 500 feet of a freeway must demonstrate that health risks relating to diesel particulates would not exceed acceptable health risk standards prior to project approval.

  Responsible Party – Community Development Department, Public Works Department; Timeframe – Ongoing)

5.3.5 Impact after Mitigation

Compliance with relevant SCAQMD rules and implementation of mitigation measures 5.3-1 and 5.3-7 would reduce short-term, construction-related emissions, but not to a less than significant level. Construction-related emissions of criteria air pollutants and precursors would still exceed significance thresholds; for this reason such emissions could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would remain **significant** and unavoidable.

With adherence to and implementation of the proposed policies and regulations, and implementation of mitigation measures 5.3-2 through 5.3-7, operational impacts and conflict with the AQMP at a programmatic level would be reduced but not to a less than significant level. As a result, this impact would remain **significant** and unavoidable. Individual development projects will be required to undergo project-specific environmental review. If project-level significant impacts are identified, specific mitigation measures will be required.

Implementation of mitigation measure 5.3-7 would reduce the potential for exposure to TACs from mobile sources. However, the only measure available to completely mitigate this impact—completely separating emissions sources (diesel vehicles associated with commercial trucking activities at commercial and industrial land uses, rail operations, stationary sources) by 1 to 2 miles from all sensitive receptors—is not feasible; therefore, no feasible mitigation is available to reduce the impact to a less than significant level. The City will coordinate with SCAQMD as implementation of the proposed General Plan occurs to assess situations in which toxic risk from diesel PM may occur and to review methodologies that may become available to estimate the risk. However, this impact would remain **significant** and unavoidable.