

5. Environmental Analysis

5.2 AIR QUALITY

This section of the DEIR evaluates the potential for the Sierra Madre General Plan Update (General Plan Update) to impact air quality in a local and regional context. The analysis in this section is based on land uses associated with the General Plan Update, as modeled using the California Emissions Estimator Model (CalEEMod) and trip generation provided in the Traffic Impact Study prepared by Fehr and Peers (see Appendix E). The air quality model output sheets are included in Appendix B of this DEIR.

5.2.1 Environmental Setting

5.2.1.1 SOUTH COAST AIR BASIN

The City of Sierra Madre lies within the western portion of the South Coast Air Basin (SoCAB), which includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semipermanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (SCAQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station that best represents the conditions of the City is the Sierra Madre Henzley Monitoring Station (ID 048210). The average low is reported at 45.1°F in January and the average high is 88.5°F in August (WRCC 2015).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier showers in the east and over the mountains. The City has a historical average annual rainfall 25.01 inches.

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. This "ocean effect" is dominant except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB (SCAQMD 2005).

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Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (SCAQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These inversions are the marine/subsidence inversion and the radiation inversion. The height of the base of the inversion at any given time is known as the “mixing height.” The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (SCAQMD 2005).

5.2.1.2 REGULATORY SETTING

Ambient air quality standards (AAQS) have been adopted at the state and federal levels for criteria air pollutants. In addition, both the state and federal government regulate the release of toxic air contaminants (TACs). The project site is in the SoCAB and is subject to the rules and regulations imposed by the South Coast Air Quality Management District (SCAQMD) as well as the California AAQS adopted by California Air Resources Board (CARB) and National AAQS adopted by the United States Environmental Protection Agency (EPA). Federal, State, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the project are summarized below.

Ambient Air Quality Standards

The Clean Air Act (CAA) was passed in 1963 by the U.S. Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state

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to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS.

The National and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect “sensitive receptors” most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both California and the federal government have established health-based AAQS for seven air pollutants, which are shown in Table 5.2-1. These pollutants are ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), coarse inhalable particulate matter (PM₁₀), fine inhalable particulate matter (PM_{2.5}), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Ozone (O ₃)	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.075 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO ₂)	Annual Average	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	*	0.030 ppm ²	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm ¹	
	24 hours	0.04 ppm	0.014 ppm ²	
Respirable Coarse Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion (e.g., wood burning), atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	24 hours	50 µg/m ³	150 µg/m ³	
Respirable Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	12 µg/m ^{3,3}	Dust and fume-producing construction, industrial, and agricultural operations, combustion (e.g., wood burning), atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m ³	

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Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Lead (Pb)	30-Day Average	1.5 µg/m ³	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarterly	*	1.5 µg/m ³	
	Rolling 3-Month Average	*	0.15 µg/m ³	
Sulfates (SO ₄)	24 hours	25 µg/m ³	*	Industrial processes.
Visibility-Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles ¹	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H ₂ S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2013a.

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter

* Standard has not been established for this pollutant/duration by this entity.

¹ When relative humidity is less than 70 percent.

² On June 2, 2010, a new 1-hour SO₂ standard was established and the existing 24-hour and annual primary standards were revoked. The 1971 SO₂ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

³ On December 14, 2012, EPA lowered the federal primary PM_{2.5} annual standard from 15.0 µg/m³ to 12.0 µg/m³. EPA made no changes to the primary 24-hour PM_{2.5} standard or to the secondary PM_{2.5} standards.

5.2.1.3 AIR POLLUTANTS OF CONCERN

Criteria Air Pollutants

The pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. Air pollutants are categorized as primary and/or secondary pollutants. Primary air pollutants are emitted directly from sources. CO, volatile organic compounds (VOC), NO₂, SO₂, PM₁₀, PM_{2.5}, and lead (Pb) are primary air pollutants. Of these, CO, SO₂, NO₂, PM₁₀, and PM_{2.5} are “criteria air pollutants,” which means that AAQS have been established for them. VOC and oxides of nitrogen (NO_x) are air pollutant precursors that form secondary criteria air pollutants through chemical and photochemical reactions in the atmosphere.

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Ozone (O_3) and NO_2 are the principal secondary pollutants. A description of each of the primary and secondary criteria air pollutants and their known health effects is presented below.

- **Carbon Monoxide (CO)** is a colorless, odorless gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005; EPA 2012a). The SoCAB is designated under the California and National AAQS as being in attainment of CO criteria levels (CARB 2014a).
- **Volatile Organic Compounds (VOC)** are composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of VOCs. Other sources of VOCs include evaporative emissions associated with paints and solvents, asphalt paving, and household consumer products such as aerosols (SCAQMD 2005). There are no ambient air quality standards established for VOCs. However, because they contribute to the formation of O_3 , SCAQMD has established a significance threshold for this pollutant.
- **Nitrogen Oxides (NO_x)** are a by-product of fuel combustion and contribute to the formation of ground-level O_3 , PM_{10} , and $PM_{2.5}$. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. The principal form of NO_2 produced by combustion is NO, but NO reacts quickly with oxygen to form NO_2 , creating the mixture of NO and NO_2 commonly called NO_x . NO_2 is an acute irritant and more injurious than NO in equal concentrations. At atmospheric concentrations, however, NO_2 is only potentially irritating. NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 exposure concentrations near roadways are of particular concern for susceptible individuals, including asthmatics, children, and the elderly. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects, including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between elevated short-term NO_2 concentrations and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma (SCAQMD 2005; EPA 2012a). The SoCAB is designated an attainment area for NO_2 under the National AAQS and California AAQS (CARB 2014a).
- **Sulfur Dioxide (SO_2)** a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and chemical processes at plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2 . When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_x). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. Current scientific evidence links short-term exposures to SO_2 , ranging from 5 minutes to 24 hours,

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with an array of adverse respiratory effects, including bronchoconstriction and increased asthma symptoms. These effects are particularly adverse for asthmatics at elevated ventilation rates (e.g., while exercising or playing.) At lower concentrations and when combined with particulates, SO₂ may do greater harm by injuring lung tissue. Studies also show a connection between short-term exposure and increased visits to emergency facilities and hospital admissions for respiratory illnesses, particularly in at-risk populations such as children, the elderly, and asthmatics (SCAQMD 2005; EPA 2012a). The SoCAB is designated attainment under the California and National AAQS (CARB 2014a).

- **Suspended Particulate Matter (PM₁₀ and PM_{2.5})** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM₁₀, include particulate matter with an aerodynamic diameter of 10 microns or less (i.e., ≤10 millionths of a meter or 0.0004 inch). Inhalable fine particles, or PM_{2.5}, have an aerodynamic diameter of 2.5 microns or less (i.e., ≤2.5 millionths of a meter or 0.0001 inch). Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. Both PM₁₀ and PM_{2.5} may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems. The EPA's scientific review concluded that PM_{2.5}, which penetrates deeply into the lungs, is more likely than PM₁₀ to contribute to health effects and at far lower concentrations. These health effects include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing) (SCAQMD 2005). There has been emerging evidence that even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.1 millionths of a meter or <0.000004 inch), known as ultrafine particulates (UFPs), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (SCAQMD 2013). However, the EPA or CARB have yet to adopt AAQS to regulate these particulates. Diesel particulate matter (DPM) is classified by CARB as a carcinogen. Particulate matter can also cause environmental effects such as visibility impairment,¹ environmental damage,² and aesthetic damage³ (SCAQMD 2005; EPA 2012a). The SoCAB is a nonattainment area for PM_{2.5} under California and National AAQS and a nonattainment area for PM₁₀ under the California AAQS (CARB 2014a).⁴
- **Ozone (O₃)** is commonly referred to as “smog” and is a gas that is formed when VOCs and NO_x, both by-products of internal combustion engine exhaust, undergo photochemical reactions in sunlight. O₃ is a secondary criteria air pollutant. O₃ concentrations are generally highest during the summer months when

¹ PM_{2.5} is the main cause of reduced visibility (haze) in parts of the United States.

² Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

³ Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

⁴ CARB approved the SCAQMD's request to redesignate the SoCAB from serious nonattainment to attainment for PM₁₀ under the National AAQS on March 25, 2010, because the SoCAB did not violate federal 24-hour PM₁₀ standards from 2004 to 2007. In June 2013, the EPA approved the State of California's request to redesignate the South Coast PM₁₀ nonattainment area to attainment of the PM₁₀ National AAQS, effective on July 26, 2013.

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direct sunlight, light winds, and warm temperatures create favorable conditions for its formation. O₃ poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O₃ can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O₃ also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O₃ also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O₃ harms sensitive vegetation, including forest trees and plants during the growing season (SCAQMD 2005; EPA 2012a). The SoCAB is designated extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2014a).

- **Lead (Pb)** is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood. The lead effects most commonly encountered in current populations are neurological effects in children and cardiovascular effects in adults (e.g., high blood pressure and heart disease). Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ (SCAQMD 2005; EPA 2012). However, in 2008 the EPA and CARB adopted more strict lead standards, and special monitoring sites immediately downwind of lead sources recorded very localized violations of the new state and federal standards.⁵ As a result of these violations, the Los Angeles County portion of the SoCAB is designated as nonattainment under the National AAQS for lead (SCAQMD 2012a, CARB 2014a). Because emissions of lead are found only in projects that are permitted by SCAQMD, lead is not a pollutant of concern for the General Plan Update.

Toxic Air Contaminants

Public exposure to TACs is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The California Health and Safety Code defines a TAC as “an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health.” A substance that is listed as a hazardous air pollutant pursuant to Section 112(b) of the federal Clean Air Act (42 United States Code § 7412[b]) is a TAC. Under state law, the California Environmental Protection Agency (Cal/EPA), acting through CARB, is authorized to identify a

⁵ Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 showed that the Trojan Battery Company and Exide Technologies exceed the federal standards (SCAQMD 2012a).

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substance as a TAC if it determines that the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics “Hot Spot” Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an “airborne toxics control measure” for sources that emit designated TACs. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions. To date, CARB has established formal control measures for 11 TACs that are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics “Hot Spot” Information and Assessment Act of 1987. Under AB 2588, toxic air contaminant emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public through notices and public meetings.

By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel particulate matter (DPM).

In 1998, CARB identified DPM as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particles are 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

SoCAB Multiple Air Toxics Exposure Study

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on ambient concentrations of TACs and estimated the potential health risks from air toxics in the SoCAB. In 2008, SCAQMD conducted its third update to the MATES study (MATES-III). The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the cancer risk (SCAQMD 2008a).

In October 2014, SCAQMD released the draft report of the fourth update to its study (MATES IV). The results showed that the overall monitored risk for excess cancer from a lifetime exposure to ambient levels of air toxics decreased to approximately 418 in one million. Compared to the previous update released in 2008 (MATES III), monitored excess cancer risks decreased by approximately 65 percent. Approximately 90 percent of the risk is attributed to mobile sources while 10 percent is attributed to TACs from stationary sources, such as refineries, metal processing facilities, gas stations, and chrome plating facilities. The largest

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contributor to this risk was diesel exhaust, accounting for approximately 68 percent of the air toxics risk. Compared to MATES III, MATES IV found substantial improvement in air quality and associated decrease in air toxics exposure. As a result the estimated basin-wide population-weighted risk decreased by approximately 57 percent compared to the analysis done for the MATES III time period (SCAQMD 2014).

It should be noted that the Office of Environmental Health Hazard Assessment (OEHHA) adopted updated methods for estimating cancer risks on March 6, 2015. The new method includes utilizing higher estimates of cancer potency during early life exposures. There are also differences in the assumptions on breathing rates and length of residential exposures. When combined together, SCAQMD estimates that risks for a given inhalation exposure level will be about 2.7 times higher using the updated methods identified in MATES IV (SCAQMD 2014).

5.2.1.4 AIR QUALITY MANAGEMENT PLANNING

SCAQMD is the agency responsible for assuring that the National and California AAQS are attained and maintained in the SoCAB. SCAQMD is responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2012 AQMP

On December 7, 2012, SCAQMD adopted the 2012 AQMP, which employs the most up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on- and off-road mobile sources, and area sources. It also addresses several state and federal planning requirements, incorporating new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and new meteorological air quality models. The 2012 AQMP builds upon the approach identified in the 2007 AQMP for attainment of federal PM and ozone standards and highlights the significant amount of reductions needed. It also highlights the urgent need to engage in interagency coordinated planning to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria air pollutant standards within the time frames allowed under the CAA. The 2012 AQMP demonstrates attainment of federal 24-hour PM_{2.5} standard by 2014 and the federal 8-hour ozone standard by 2023. It includes an update to the revised EPA 8-hour ozone control plan, with new commitments for short-term NO_x and VOC reductions. The plan also identifies emerging issues of ultrafine particulate matter (PM_{1.0}) and near-roadway exposure, and energy supply and demand.

Lead State Implementation Plan

In 2008, the EPA designated the Los Angeles County portion of the SoCAB as a nonattainment area under the federal lead classification due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in the City of Vernon and in the City of Industry exceeding the new standard in the 2007-to-2009 period. The remainder of the SoCAB, outside the Los Angeles County nonattainment area, remains in attainment of the new standard. On May 24, 2012, CARB approved the State Implementation Plan (SIP) revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the federal standard since December 2011. The SIP revision was submitted to the EPA for approval in June 2012.

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SoCAB Nonattainment Areas

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the SIP. Areas are classified as attainment or nonattainment areas for particular pollutants, depending on whether they meet the ambient air quality standards. Severity classifications for ozone nonattainment are marginal, moderate, and serious to severe, and extreme.

Transportation conformity for nonattainment and maintenance areas is required under the federal CAA to ensure that federally supported highway and transit projects conform to the SIP. The EPA approved California's SIP revisions for attainment of the 1997 8-hour O₃ National AAQS for the SoCAB in March 2012. Findings for the new 8-hour O₃ emissions budgets for the SoCAB and consistency with the recently adopted SCAG 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) were submitted to the EPA for approval.

The attainment status for the SoCAB is shown in Table 5.2-2. The SoCAB is designated in attainment of the California AAQS for sulfates. It will have to meet the new federal 8-hour O₃ standard by 2023 and the federal 24-hour PM_{2.5} standards by 2014 (with the possibility of up to a five-year extension to 2019, if needed). The SoCAB is designated a nonattainment area for lead (Los Angeles County only) under the National AAQS.

Table 5.2-2 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM ₁₀	Serious Nonattainment	Attainment/Maintenance
PM _{2.5}	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO ₂	Attainment	Attainment/Maintenance
SO ₂	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only) ¹
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2014a.

¹ The Los Angeles portion of the SoCAB was designated nonattainment for lead under the new federal and existing state AAQS as a result of large industrial emitters. Remaining areas within the SoCAB are unclassified.

5.2.1.5 EXISTING AMBIENT AIR QUALITY

Air Quality Monitoring Data

Existing levels of ambient air quality and historical trends and projections for the City are best documented by measurements made by SCAQMD. The City is primarily within Source Receptor Area 9 – East San Gabriel Valley. The Azusa Monitoring Station best represents the ambient air quality within the City. Because this station does not monitor SO₂, data from the Burbank – West Palm Avenue Monitoring Station was obtained. Data from these stations are summarized in Table 5.2-3. The data show that the area regularly exceeds the state and federal eight-hour O₃ standards and the state one-hour standard. The state PM₁₀ and

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federal PM_{2.5} standards are also regularly exceeded. The CO, SO₂, and NO₂ standards have not been exceeded in the last five years in the project vicinity.

Table 5.2-3 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Thresholds Were Exceeded and Maximum Levels during Such Violations				
	2009	2010	2011	2012	2013
Ozone (O₃)¹					
State 1-Hour $\geq$ 0.09 ppm	23	5	13	18	7
State 8-hour $\geq$ 0.07 ppm	31	8	19	20	15
Federal 8-Hour $>$ 0.075 ppm	17	3	12	10	6
Max. 1-Hour Conc. (ppm)	0.150	0.104	0.111	0.134	0.115
Max. 8-Hour Conc. (ppm)	0.107	0.081	0.092	0.095	0.085
Carbon Monoxide (CO)¹					
State 8-Hour $>$ 9.0 ppm	0	0	0	0	*
Federal 8-Hour $\geq$ 9.0 ppm	0	0	0	0	*
Max. 8-Hour Conc. (ppm)	1.67	1.38	1.36	1.13	*
Nitrogen Dioxide (NO₂)¹					
State 1-Hour $\geq$ 0.18 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.1000	0.0772	0.0795	0.0718	0.0768
Sulfur Dioxide (SO₂)²					
State 1-Hour $\geq$ 0.04 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.003	0.004	0.002	0.002	0.002
Coarse Particulates (PM₁₀)¹					
State 24-Hour $>$ 50 $\mu\text{g}/\text{m}^3$	7	5	8	6	6
Federal 24-Hour $>$ 150 $\mu\text{g}/\text{m}^3$	0	0	0	0	0
Max. 24-Hour Conc. ($\mu\text{g}/\text{m}^3$)	74.0	70.0	65.0	78.0	76.0
Fine Particulates (PM_{2.5})¹					
Federal 24-Hour $>$ 35 $\mu\text{g}/\text{m}^3$	6	1	2	1	0
Max. 24-Hour Conc. ($\mu\text{g}/\text{m}^3$)	72.0	44.4	94.6	39.6	29.6

Source: CARB 2014b.

Notes: ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

* Data not available.

¹ Data obtained from the Azusa Monitoring Station at 803 N. Loren Avenue Azusa in the City of Azusa.

² Data obtained from the Burbank – W. Palm Avenue Monitoring Station at 228 W. Palm Avenue in the City of Burbank.

Existing City of Sierra Madre Criteria Air Pollutant Emissions Inventory

Table 5.2-4 identifies the existing criteria air pollutant emissions inventory of the City of Sierra Madre using emission rates for year 2013 (current conditions) and year 2035 (future conditions). The inventories are based on existing land uses in the City. The Year 2013 inventory represents the projected emissions generated currently by the existing land uses using the baseline year 2013 emission factors for on-road vehicles. The Year 2035 inventory represents the projected emissions that the existing land uses would generate in the future utilizing year 2035 emission factors for on-road vehicles. To isolate the impacts related to the change in land uses proposed by the project, emissions related to the General Plan Update were based on the difference in emissions generated by the existing and proposed land uses under year 2035 conditions. This approach is

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taken as existing land uses would be subject to regulations that come into effect in the future that reduce mobile-source emissions. Thus, the level of emissions the existing land uses generate today would not be generated in perpetuity, but would be affected by these state regulations.

Table 5.2-4 Existing City of Sierra Madre Regional Criteria Air Pollutant Emissions Inventory

Sector	Criteria Air Pollutant Emissions (pounds per day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Year 2013						
Area	970	14	1,248	<1	120	120
Energy (natural gas use) ¹	4	36	16	<1	3	3
Mobile	356	583	3,723	6	465	130
Total	1,330	632	4,986	6	588	253
Year 2035						
Area	968	13	1,233	<1	120	120
Energy (natural gas use) ²	4	36	16	<1	3	3
Mobile	231	439	2,306	6	465	130
Total	1,204	487	3,555	7	588	253

Source: CalEEMod Version 2013.2.2. Based on highest winter or summer emissions using. Totals may not equal 100 percent due to rounding.

¹ Based on year 2013 emission rates.

² Based on year 2035 emission rates.

5.2.1.6 SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases.

Residential areas are also considered sensitive receptors 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. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial, commercial, retail, and office 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.

5.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

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

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- AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- AQ-3 Result in a cumulatively considerable net increase of 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).
- AQ-4 Expose sensitive receptors to substantial pollutant concentrations.
- AQ-5 Create objectionable odors affecting a substantial number of people.

5.2.2.1 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

The analysis of the General Plan Update's air quality impacts follows the guidance and methodologies recommended in SCAQMD's *CEQA Air Quality Handbook* and the significance thresholds on SCAQMD's website.⁶ CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. SCAQMD has established regional thresholds of significance. In addition to the regional thresholds, projects are also subject to the AAQS.

Regional Significance Thresholds

SCAQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB. Table 5.2-5, *SCAQMD Significance Thresholds*, lists SCAQMD's regional significance thresholds. There is growing evidence that although ultrafine particulates (UFPs) contribute a very small portion of the overall atmospheric mass concentration, they represent a greater proportion of the health risk from PM. However, the EPA or CARB have yet to adopt AAQS to regulate UFPs; therefore, SCAQMD has not developed thresholds for them at this time.

Table 5.2-5 SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Nitrogen Oxides (NO _x)	100 lbs/day	55 lbs/day
Sulfur Oxides (SO _x)	150 lbs/day	150 lbs/day
Particulates (PM ₁₀)	150 lbs/day	150 lbs/day
Particulates (PM _{2.5})	55 lbs/day	55 lbs/day

Source: SCAQMD 2011.

⁶ SCAQMD's Air Quality Significance Thresholds are current as of March 2011 and can be found at: <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>.

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Localized Significance Thresholds

SCAQMD developed LSTs to determine if emissions of NO₂, CO, PM₁₀, and PM_{2.5} generated at a project site (offsite mobile-source emissions are not included in the LST analysis) would expose sensitive receptors to substantial concentrations of criteria air pollutants. Table 5.2-6 shows the localized significance thresholds for projects in the SoCAB.

Table 5.2-6 SCAQMD Construction Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO ₂ Standard (CAAQS)	0.18 ppm
24-Hour PM ₁₀ Standard – Construction (SCAQMD) ¹	10.4 µg/m ³
24-Hour PM _{2.5} Standard – Construction (SCAQMD) ¹	10.4 µg/m ³
24-Hour PM ₁₀ Standard – Operation (SCAQMD) ¹	2.5 µg/m ³
24-Hour PM _{2.5} Standard – Operation (SCAQMD) ¹	2.5 µg/m ³

Source: SCAQMD 2011.

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter

¹ Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM₁₀ and PM_{2.5}, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

To assist lead agencies, SCAQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 5.2-6 for projects under five acres. LSTs represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent federal or state AAQS. LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor.

LST analysis is applicable to all projects of five acres and less and can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required. Operational phase LSTs for a five-acre site in Source Receptor Area 35 are shown in Table 5.2-7. In accordance with SCAQMD's LST methodology, construction LSTs are based on the acreage disturbed per day based on equipment use. However, an LST analysis for construction-related localized impacts can only be conducted at a project level, and quantification of LSTs is not applicable for this program-level environmental analysis.

Table 5.2-7 SCAQMD Screening Level Operational Phase Localized Significance Thresholds

Air Pollutant	Threshold (lbs/day)
Nitrogen Oxides (NO _x)	270
Carbon Monoxide (CO)	2,193
Coarse Particulates (PM ₁₀)	80
Fine Particulates (PM _{2.5})	42

Source: SCAQMD 2008b, Based on receptors within 82 feet (25 meters) of the planning area boundary in SRA 35 for a 5-acre site.

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CO Hotspots

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. Typically, for an intersection to exhibit a significant CO concentration, it would operate at level of service (LOS) E or worse without improvements (Caltrans 1997).

Health Risk Thresholds

Whenever a project would require use of chemical compounds that have been identified in SCAQMD Rule 1401; placed on CARB's air toxics list pursuant to AB 1807, the Air Contaminant Identification and Control Act (1983); or placed on the EPA's National Emissions Standards for Hazardous Air Pollutants, a health risk assessment (HRA) is required by the SCAQMD. Table 5.2-8 lists the SCAQMD's TAC incremental risk thresholds for operation of a project. Residential, commercial, and office uses do not use substantial quantities of TACs, so these thresholds are typically applied for new industrial projects. Although not officially adopted by SCAQMD, these thresholds are also commonly used to determine the air quality land use compatibility when major sources of TACs are within 1,000 feet of a proposed project.

Table 5.2-8 SCAQMD Toxic Air Contaminants Incremental Risk Thresholds

Maximum Incremental Cancer Risk	≥ 10 in 1 million
Hazard Index (project increment)	≥ 1.0
Source: SCAQMD 2011.	

5.2.3 Relevant General Plan Policies and Implementation Program Measures

The following are relevant policies and implementation measures of the Sierra Madre General Plan Update and Implementation Program, respectively, which are designed to reduce potential GHG emissions impacts associated with implementation of the General Plan Update.

General Plan Update Policies

Land Use Element

- **Policy L1.6:** Require that new residential development, substantial remodeling and additions comply with all adopted water conservation measures that reduce and minimize the impact on the City's water supply and its ability to serve its water customers.

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- **Policy L4.3:** Ensure that new development and the expansion of existing uses incorporate water conservation measures that reduce and minimize the impact on the City's water supply and its ability to serve its customers.
- **Policy L8.1:** Encourage the use of sustainable materials in the design and construction of structures and landscapes.
- **Policy L8.2:** Incorporate water conservation measures in the zoning development standards for new construction and substantial remodeling or building expansion, including but not limited to green building construction, the percentage of permeable ground surfaces, building floor area limitations, lot coverage, landscaping and irrigation, greywater plumbing requirements, rainwater capture, and design review.
- **Policy L8.3:** Consider a water impact fee to apply to new residential dwelling units and additions to existing development that increase water consumption, to fund water fixture retrofits of existing homes and other water conservation measures.
- **Policy L8.5:** Provide incentives for property owners to retrofit historically designated homes with water saving fixtures.
- **Policy L15.4:** Limit the use of irrigation systems in landscaping to comply with water conservation measures and provide for natural habitat and erosion control.
- **Policy L16.1:** Minimize the amount of grading and removal of natural vegetation.
- **Policy L16.2:** Require that home sites be planned, developed and designed to:
 - Eliminate fire hazards.
 - Prevent land instability.
 - Prevent exposure to geological and geotechnical hazards.
 - Provide adequate drainage controls to prevent flooding and landslides.
 - Prevent any other hazard or threat to the public health, safety, and welfare.
 - Use the minimum amount of water possible for landscaping and interior uses.
- **Policy L26.4:** Provide incentives for property owners to retrofit historically designated properties with water saving fixtures.
- **Policy L28.1:** Encourage adaptive reuse of the existing structures and prohibit the demolition and replacement of residential structures with development which contains commercial uses only.

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- **Policy L29.1:** Allow for existing structures to be converted to limited office and business use, but require that any new development (construction) include residential uses or both residential and limited business uses.
- **Policy L33.6:** Encourage the use of traditional building materials such as tile, textured concrete, color-tinted concrete, decorative masonry (brick, river rock), wood siding, and stucco.
- **Policy L41.2:** Allow for the expansion of existing institutional sites, including height and density beyond that allowed in adjacent commercial and residential areas, provided that a comprehensive master plan is approved by the City which demonstrates that the project:
 - Contains activities and functions which will be a significant asset for the City.
 - Adequately mitigates all impacts attributable to the increase in floor area ratio and height.
 - Conveys the village theme in its siting of structures, massing, scale, use of open space and architectural character.
 - Preserves historic structures to the maximum extent possible.
 - Provides additional benefits to the community above those which can be exacted to account for the direct impacts of the development. Such benefits can include making available parking to the public when not needed for the use, dedicating on-site recreational space or parkland facilities for public meetings, making day care available to the public, contributing to park site acquisition, and offsetting impacts to historic structures with monetary contribution to a preservation fund.
 - Will not displace or encroach into existing commercial uses.
 - Incorporates water conservation practices such as but not limited to greywater plumbing, permeable ground surfaces, drought tolerant landscaping, green building materials, rainwater capture devices, and low-flow fixtures.
- **Policy L49.7:** Improve pedestrian connections between the street and the public parking lots through signage, coordination with property owners, purchase of properties and other mechanisms.
- **Policy L49.9:** Encourage outdoor dining, sidewalk sales, street fairs, and other uses of the sidewalk which encourage pedestrian activity.
- **Policy L51.3:** Maintain existing facilities for bicyclists, pedestrians, and transit users.
- **Policy L51.4:** Explore the development of new facilities for bicyclists, pedestrians and transit users.
- **Policy L51.5:** Encourage and support the use of non ~~automobile~~ **automobile** throughout the City.

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- **Policy L51.6:** Encourage City staff, employees, residents and visitors to walk and bicycle as often as possible.
- **Policy L51.7:** Utilize non environmental sustainability and economic development. -automotive tra
- **Policy L51.8:** Prioritize improvements for non-vehicular modes like bicycles, pedestrians, and transit to eliminate the need for new or expanded roadways and intersection improvements like traffic signals.
- **Policy L52.1:** Ensure that all pedestrians, particularly seniors and the disabled, are able to travel safely and easily throughout the City.
- **Policy L52.2:** Prioritize opportunities to implement traffic calming techniques and limit new driveway curb cuts along roadways, such as Sierra Madre Boulevard and East Montecito.
- **Policy L52.3:** Provide safe travel routes for bicyclists including designated bicycle lanes on streets where these facilities can be accommodated.
- **Policy L52.4:** Evaluate the impact of any capital improvement project on the travel needs of bicycles, pedestrians, and vehicle users.
- **Policy L52.6:** Improve pedestrian crossing opportunities work to increase pedestrian safety, and eliminate painted crosswalks where they provide a false sense of security, and make a more concerted effort to enforce laws related to pedestrian safety.
- **Policy L52.7:** Create and implement a City bikeway plan.
- **Policy L52.8:** Require the incorporation of bicycle facilities into the design of land use plans and capital improvements, including bicycle parking within new multi-family and non-residential sites or publicly accessible bicycle parking.
- **Policy L52.9:** Explore the possibility of sidewalk continuity where feasible.

Resource Management Element

- **Policy R22.1:** Cooperate with the South Coast Air Quality Management District and incorporate the provisions of the Air Quality Management Plan.
- **Policy R22.2:** Prohibit the development of land uses and land use practices which would contribute significantly to poor air quality.
- **Policy R22.3:** Establish controls and monitor uses in the City which contain operations or materials characterized by air pollutants which individually or cumulatively could significantly add to the air basin's

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degradation (e.g., furniture manufacturers using paints and finishes, automobile repair, printing, and reproduction, and dry cleaners).

- **Policy R22.4:** Encourage and participate in regional initiatives and programs to improve the South Coast Air Basin's air quality.
- **Policy R22.5:** Publicize the incentives offered by the Southern California Air Quality Management District, such as leaf blower and lawnmower exchanges.
- **Policy R23.1:** Establish a transportation system management program to encourage the use of transit, carpooling, shuttles and other transportation options to reduce vehicle miles traveled and vehicle trips.
- **Policy R23.2:** Encourage public and school bus owners to convert to lower emission burning fuel, which is part of the Southern California Air Quality Management District Plan.
- **Policy R23.3:** Continue to purchase automobiles and other vehicles that use zero or low emission fuels for the City's fleet of vehicles.
- **Policy R23.4:** Allow for local job opportunities including home based businesses and telecommuting in Sierra Madre.
- **Policy R23.5:** Provide opportunities through appropriate zoning for the development of residential units in concert with commercial uses.
- **Policy R23.6:** Provide and enhance local transit service to reduce personal vehicle trips.
- **Policy R23.7:** Maintain links to the MTA Gold Line light rail system.
- **Policy R23.8:** Pursue funding sources for facilities and programs linked to regional transit.
- **Policy R24.1:** Continue to review guidelines from time to time regarding the use of gas-powered lawn equipment, and consider tightening the restrictions on the type of equipment, hours and duration of operation.
- **Policy R24.2:** Require dust abatement measures during grading and construction operations. This may include use of reclaimed water or other methods to control fugitive dust.
- **Policy R24.3:** Develop and enforce a fugitive dust control ordinance that regulates the following: visible dust emissions, soil stabilization, the carrying and tracking of dirt offsite, unpaved access and haul roads, storage piles and bulk materials, demolition, and dust control plans; the ordinance should include penalties to encourage compliance.

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- **Policy R25.1:** Consider developing an ordinance to address second-hand smoke and other indoor air pollutants in multiple-family dwelling units.

Community Services Element

- **Policy C26.1:** Explore other transit funding sources.
- **Policy C26.2:** Develop inter-jurisdictional coordination of the transportation program with Arcadia and/or Pasadena, thereby sharing the cost of the program.
- **Policy C26.4:** Continue to provide the free fixed route services for the community.
- **Policy C26.5:** Continue to coordinate discounted transit services for seniors, handicapped individuals, or low-income residents.
- **Policy C27.1:** Continue to provide comprehensive information to the transit user that is informative, accessible, and easy to understand.
- **Policy C28.1:** Continue to work with the Los Angeles County Metropolitan Transit Authority (Metro) to maintain the existing bus routes linking the City to the Gold Line train station in Pasadena and Arcadia.
- **Policy C30.6:** Offer bicycle safety and traffic courses for the community sponsored by the Police and Community Services Departments.

Implementation Program Measures

Land Use Implementation Program

- **Measure IM-3:** The City shall amend the Municipal Code as necessary to include a requirement for compliance with all adopted water conservation measures.
- **Measure IM-51:** The City shall amend the C (Commercial) Zoning Ordinance as necessary to prohibit new and the expansion of institutional facilities, allow a diversity of commercial uses for local residents and visitors, allow residential uses at the rear and above the first floor, and establish a minimum depth for commercial uses with residential at the rear.
- **Measure IM-53:** The City shall amend the M (Manufacturing) Zoning Ordinance as necessary to allow adaptive reuse of existing structures for mixed-use, light manufacturing that supports design-related industries, a diversity of craft-related businesses, entertaining/specialty stores, professional offices, live/work space, and housing units on the second level or to the rear of buildings.
- **Measure IM-56:** The City shall amend the M (Manufacturing) Zoning Ordinance to change the title to “Artisan Mixed Use” Zoning Ordinance and include regulations regarding commercial, light-manufacturing and residential uses, including maximum allowable floor area requirements.

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Economic Development Implementation Program

- **Measure IM-4:** The City shall develop a plan that addresses parking, walkability, and pedestrian activity in the core area.

Circulation Implementation Program

- **Measure IM-3:** The City shall continue to set aside sufficient budget to maintain facilities for bicyclists (such as signage and pavement marking), pedestrians and transit users. The City shall also consider whether additional funds are available to develop new facilities.
- **Measure IM-4:** The City shall prepare and implement a Citywide Sidewalk Master Plan, to include sidewalk maintenance and prioritization of sidewalk infill projects.
- **Measure IM-5:** The City shall analyze opportunities to provide bicycle facilities in the city and include them in the new bikeway plan where appropriate.
- **Measure IM-8:** The City shall review Municipal Code Sections relating to parking, crosswalks, and pedestrian safety and amend as necessary.
- **Measure IM-9:** The City shall publicize and encourage the use of public transportation programs, such as light rail, bus, and paratransit services.

Air Quality Implementation Program

- **Measure IM-1:** The City shall ensure that it complies with the South Coast Air Quality Management District Air Quality Management Plan, and other regional initiatives and programs to improve air quality.
- **Measure IM-2:** The City shall continue to assess the air quality impacts from proposed developments and land uses through the environmental review process.
- **Measure IM-3:** The City shall continue to enforce and abide by the requirements of the South Coast Air Quality Management District regarding air pollutant thresholds.
- **Measure IM-4:** Staff shall keep apprised of incentives offered by the South Coast Air Quality Management District and shall provide that information to the community.
- **Measure IM-5:** The City shall purchase low or zero emissions alternate-fuel vehicles for its fleet wherever possible.
- **Measure IM-6:** The City shall create a transportation brochure to provide the public with multiple options for reducing miles traveled and vehicle trips.
- **Measure IM-7:** The City shall continue home-based businesses pursuant to the Home Occupation Permit Ordinance.

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- **Measure IM-8:** The City shall continue to allow residential business above or at the rear of commercial uses in the Commercial Zone.
- **Measure IM-9:** The City shall continue to provide the fixed route local transportation services and provide increase social media marketing for greater public awareness.
- **Measure IM-10:** The City shall continue to partner with MTA and attend quarterly meetings to ensure access to the Gold Line light rail system.
- **Measure IM-11:** The City shall partner with regional transit providers to identify funding sources to expand transportation programs.
- **Measure IM-12:** The City shall continue to enforce the Noise Ordinance and amend as necessary with respect to the use of gas-powered lawn equipment.
- **Measure IM-13:** The City shall continue to enforce dust abatement measures during grading and construction.
- **Measure IM-14:** The City shall continue to enforce applicable City ordinances, as well as regional regulations pertaining to fugitive dust control.

Transit Services Implementation Program

- **Measure IM-4:** The City will maintain contractual agreements with the transit provider to continue to provide the fixed route service at no cost to users.
- **Measure IM-6:** The City will continue to attend Metro meetings to maintain services within Sierra Madre and access to the Goldline Station.
- **Measure IM-8:** The City will consider the availability of City parking lots to determine whether a Park-and-Ride lot is feasible.
- **Measure IM-12:** The City will develop a new program that teaches bicycle safety.

5.2.4 Environmental Impacts

Methodology

This air quality evaluation was prepared in accordance with the requirements of CEQA to determine if significant air quality impacts are likely to occur in conjunction with future development that would be accommodated by the General Plan Update. The analysis in this section is based on buildout of the proposed land uses of the General Plan Update, as modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2., for the following sectors:

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- **Transportation:** Mobile-source criteria air pollutant emissions are based on the trip generation provided in the Traffic Impact Study prepared by Fehr and Peers (see Appendix E).
- **Energy:** Criteria air pollutant emissions from natural gas use are based on the natural gas usage rate as provided in Appendix D of the CalEEMod User's Guide, Version 2013.2.2.
- **Area Sources:** Criteria air pollutant emissions are from use of landscaping equipment used for property maintenance.

Impact Analysis

The following impact analysis addresses thresholds of significance for which the Notice of Preparation (see Appendix A) disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

For the impact analysis of all thresholds below, it should be noted that the large infill opportunity site shown in Figure 3-5, *Infill Opportunity Sites*, just north of Carter Avenue, which is associated with the residential subdivision known as Stonegate, is an approved development project and was analyzed under separate environmental documentation in accordance with CEQA. The air-quality-related impact resulting from Stonegate were addressed and mitigated for in that environmental documentation. Also, all residential lots within Stonegate are subject to the provisions of the City's Municipal Code and the Hillside Management zone regulations (Chapter 17.52) of the City's Municipal Code, which requires that each residential development within Stonegate obtain approval of a hillside development permit.

For the purpose of the following analysis, it is also important to note that, based on the requirements of CEQA, this analysis is based on a comparison to existing land uses and does not address the differences that would result from a comparison with the existing General Plan land use map, from which there is little variation when compared to the proposed General Plan land use map.

Furthermore, it is important to note that while the General Plan Update establishes City-wide policy level guidance, includes a revision to the current land use map (see Figures 3-4, *Current Land Use Map*, and 3-6, *Proposed Land Use Map*), and modifies the development potential of certain parcels in the City (see Figure 3-5, *Infill Opportunity Sites*), it does not contain specific development project proposals. The General Plan Update is a regulatory document that sets forth the framework for future growth and development (e.g., infill development, redevelopment, and revitalization/restoration) in the City and does not directly result in development in and of itself. Before any development can occur in the City, all such development is required to be analyzed for conformance with the City's General Plan, zoning requirements, and other applicable local and state requirements; comply with the requirements of CEQA (e.g., preparation of site-specific environmental documentation in accordance with CEQA); and obtain all necessary approvals, clearances, and permits.

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Impact 5.2-1: Implementation of the General Plan Update would be consistent with the SCAQMD Air Quality Management Plan, as buildout of the General Plan Update would not exceed the current overall SCAG service population estimates and would not cumulatively contribute to the nonattainment designations of the SoCAB. [Threshold AQ-1]

Impact Analysis: CEQA requires that general plans be evaluated for consistency with the AQMP. A consistency determination plays an important role in local-agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision makers of the environmental effects of the project under consideration early enough to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to the clean-air goals in the AQMP. Only new or amended general plan elements, specific plans, and major projects need to undergo a consistency review. This is because the AQMP strategy is based on projections from local general plans.

The land-use designations in a general plan form, in part, the foundation for the emissions inventory for the SoCAB in the AQMP. The AQMP is based on projections in population, employment, and VMT in the SoCAB region projected by SCAG. Table 5.2-9 compares the population and employment generation of the General Plan Update compared to the existing conditions and projections based on SCAG forecasts.

Table 5.2-9 Comparison of Population and Employment Forecast

Scenario	Existing 2014 Land Uses	SCAG 2035 Forecast	General Plan Update 2035	Change from Existing	Increase Compared to the SCAG Forecast
Population	11,094	11,000	11,306	212	306
Employment	1,606	3,400	1,730	124	-1,670
Service Population	12,700	14,400	13,036	336	-1,364

As shown in Table 5.2-9, the General Plan Update would result in a slightly higher population although overall employment would be lower than SCAG projections. SCAG projections for the City are partially based on the current (1996) Sierra Madre General Plan. As a result, the growth projections that are based in SCAG's RTP/SCS and the associated emissions inventory in SCAQMD's AQMP do not include the additional population growth forecast in the General Plan Update. Thus, the 2012 AQMP does not consider the emissions of the additional population associated with the General Plan Update. However, employment growth forecasts associated with the General Plan Update would be lower compared to SCAG projections and overall growth (i.e., service population) projections would be 9.5 percent lower than SCAG forecasts. In addition, operation of the new land uses associated with the General Plan Update would not cumulatively contribute to the nonattainment designations of SoCAB. Therefore, the General Plan Update is considered to be consistent with the AQMP and impacts would not be significant.

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Impact 5.2-2: Construction activities associated with future development that would be accommodated under the General Plan Update would generate short-term emissions in exceedance of SCAQMD'S threshold criteria and cumulatively contribute to the nonattainment designations of the SoCAB. [Thresholds AQ-2 and AQ-3]

Impact Analysis: Construction activities associated with future development that would be accommodated under the General Plan Update would occur over the buildout horizon of the General Plan Update, which would cause short-term emissions of criteria air pollutants. The primary source of NO_x, CO, and SO_x emissions is the operation of construction equipment. The primary sources of particulate matter (PM₁₀ and PM_{2.5}) emissions are activities that disturb the soil, such as grading and excavation, road construction, and building demolition and construction. The primary source of VOC emissions is the application of architectural coating and off-gas emissions associated with asphalt paving. A discussion of health impacts associated with air pollutant emissions generated by construction activities is included in section 5.2.1, *Environmental Setting: Air Pollutants of Concern*.

Information regarding specific development projects, soil types, and the locations of receptors would be needed in order to quantify the level of impact associated with construction activity. Due to the scale of development activity associated with buildout of the General Plan Update, emissions could exceed the SCAQMD regional significance thresholds. In accordance with the SCAQMD methodology, emissions that exceed the regional significance thresholds would cumulatively contribute to the nonattainment designations of the SoCAB. The SoCAB is designated nonattainment for O₃ and particulate matter (PM₁₀ and PM_{2.5}). Emissions of VOC and NO_x are precursors to the formation of O₃. In addition, NO_x is a precursor to the formation of particulate matter (PM₁₀ and PM_{2.5}).

Air quality emissions related to construction must be addressed on a project-by-project basis. For this broad-based policy General Plan Update, it is not possible to determine whether the scale and phasing of individual development projects would exceed the SCAQMD's short-term regional or localized construction emissions thresholds. Construction activities associated with buildout of the General Plan Update are anticipated to occur sporadically over an approximately 20-year period or longer. Buildout would be comprised of multiple smaller development projects, each having its own construction timeline and activities. Development of multiple properties could occur at the same time. Construction activities would temporarily increase PM₁₀, PM_{2.5}, VOC, NO_x, SO_x, and CO regional emissions within the SoCAB.

In addition to regulatory measures (e.g., SCAQMD Rule 201 for a permit to operate, Rule 403 for fugitive dust control, Rule 1113 for architectural coatings, Rule 1403 for new source review, and CARB's Airborne Toxic Control Measures), mitigation imposed at the project level may include extension of construction schedules and/or use of special equipment. In addition to compliance with SCAQMD rules, policies (see Policies R22.1, R24.2, and R24.3) and implementation measures (Measures IM-1, IM-2, IM-3, IM-13, and IM-14) contained in the General Plan Update and Implementation Program, respectively, would also contribute in minimizing construction-related criteria air pollutant emissions. However, it is possible that some of the new development projects that would be accommodated by the General Plan Update could exceed the relevant SCAQMD significance thresholds. Thus, the General Plan Update would cumulatively contribute to the nonattainment designations of the SoCAB for O₃ and particulate matter (PM₁₀ and PM_{2.5}). Therefore,

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construction-related air quality impacts of developments associated with the General Plan Update would be significant.

It should be noted that the amount of emissions from a development project does not necessarily correspond to the concentrations of air pollutants. The concentration is required to calculate health risk from project implementation. Projects that exceed the regional significance thresholds will contribute to the current nonattainment designation for ozone and particulate matter. Because the nonattainment designation is based on the AAQS, which are set at levels of exposure that are determined to result in adverse health, the General Plan Update would cumulatively contribute to health impacts within the SoCAB. However, since it is not possible to translate the amount of emissions to a particular concentration, it is not possible to calculate the risk factor for a particular health effect. Known health effects related to ozone include worsening of bronchitis, asthma, and emphysema and a decrease in lung function. Particulate matter can also lead to a variety of health effects in people. These include premature death of people with heart or lung disease, heart attacks, irregular heartbeat, decreased lung function, and increased respiratory symptoms.

Regional emissions contribute to these known health effects. SCAQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS. However, because cumulative development within the City of Sierra Madre would exceed the regional significance thresholds, the General Plan Update could contribute to an increase in health effects in the basin until such time the attainment standard are met in the SoCAB. In addition to the AQMPs, SCAQMD has also developed and released the LSTs to address impacts from criteria air pollutants at a more localized level (discussed in Impact 5.2-4).

Impact 5.2-3: Implementation of the General Plan Update would not result in operational-phase criteria air pollutant emissions that would exceed SCAQMD's regional significance thresholds. [Thresholds AQ-2 and AQ-3]

Impact Analysis: The General Plan Update is a regulatory document that sets up the framework for growth and development and does not directly result in development in and of itself. Before development can occur, it is required to be analyzed for conformance with the City's General Plan, zoning requirements, and other applicable local and state requirements; comply with the requirements of CEQA; and obtain all necessary clearances and permits.

The General Plan Update guides growth and development within the City of Sierra Madre by designating land uses in the proposed land use map (see Figure 3-6, *Proposed Land Use Map*) and through implementation of its goals and policies. New development would increase air pollutant emissions in the City and contribute to the overall emissions inventory in the SoCAB. A discussion of health impacts associated with air pollutant emissions generated by operational activities is included in the *Air Pollutants of Concern* discussion in Section 5.2-1, *Environmental Setting*.

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General Plan Buildout

The emissions associated with the new land uses that would be accommodated by the General Plan Update under buildout conditions are shown in Table 5.2-10. As shown in the table, implementation of the General Plan Update would not result in generation of criteria air pollutant emissions that exceed the SCAQMD regional significance thresholds. Therefore, it is not anticipated that the General Plan Update would significantly contribute to the nonattainment designations of the SoCAB.

Table 5.2-10 Maximum Daily Regional Operational Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Existing						
Area	968	13	1,233	<1	120	120
Energy	4	36	16	<1	3	3
Transportation	231	439	2,306	6	465	130
Total	1,204	487	3,555	7	588	253
Project						
Area	978	13	1,243	<1	120	120
Energy	4	36	16	<1	3	3
Transportation	238	452	2,375	7	485	136
Total	1,221	501	3,635	7	608	258
Net Change						
Area	10	<1	10	<1	<1	<1
Energy	<1	1	<1	<1	<1	<1
Transportation	7	13	70	<1	20	6
Net Change	17	14	80	<1	20	6
SCAQMD Regional Threshold	55	55	550	150	150	55
Significant?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2. Based on highest winter or summer emissions using 2035 emission rates. Totals may not equal 100 percent due to rounding.

In addition, implementation of the policies and implementation measures of the General Plan Update and Implementation Program, respectively, would contribute in reducing air quality emissions. These policies (e.g., Policies L51.4, L51.5, L51.7, L51.8, L52.3, and R23.7) and implementation measures (e.g., Measures IM-3 and IM-5 under the Circulation Implementation Program) promote an increase in concepts and designs that would increase walking, bicycling, and use of public transit, which would contribute to reduced VMT. In addition, the policies under the Air Quality Section of the Resource Management Element would contribute to minimizing overall operation-related criteria air pollutant emissions and impacts. The air quality policies under this section (i.e., Policies R22.1 to R24.1) cover items such as permitting mixed-use development, conversion of the City's vehicle fleet mix to zero or low emission vehicles, and establishing a transportation system management program to increase use of transit, carpooling, and shuttles to reduce vehicle miles traveled. Therefore, overall, operational air quality impacts associated with future development of the General Plan Update are not considered significant.

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The amount of emissions from a project does not necessarily correspond to the concentrations of air pollutants. Projects that exceed the regional significance threshold contribute to the nonattainment designation. As the attainment designation is based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health, the General Plan Update would cumulatively contribute to health impacts within the SoCAB. Known health effects related to ozone include worsening of bronchitis, asthma, and emphysema and decreases in lung function. Particulate matter can also lead to a variety of health effects. These include premature death of people with heart or lung disease, heart attacks, irregular heartbeat, decreased lung function, and increased respiratory symptoms.

SCAQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS. As cumulative development within the City of Sierra Madre would not exceed the regional significance thresholds, the project is considered to not substantially cumulatively contribute to the nonattainment designations of SoCAB and contribute to an increase in health effects in the basin.

Impact 5.2-4: Implementation of the General Plan Update could result in new sources of criteria air pollutant emissions and toxic air contaminants that could expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: Operation of new land uses consistent with the General Plan Update land use map (see Figure 3-6, *Proposed Land Use Map*) would generate new sources of criteria air pollutants and TACs in the City from area/stationary sources and mobile sources.

Toxic Air Contaminants

Various light industrial and commercial processes (e.g., manufacturing, dry cleaning, gasoline-dispensing facilities) accommodated under the General Plan Update could generate new sources of TACs. Industrial land uses, such as chemical processing facilities, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities, have the potential to be substantial stationary sources that would require a permit from SCAQMD for emissions of TACs. Emissions of TACs from these types of facilities would be controlled by SCAQMD through permitting and would be subject to further study and health risk assessment prior to the issuance of any necessary air quality permits under SCAQMD Rule 1401. In addition to the SCAQMD permitting process for stationary sources, implementation of General Plan Update Policies R22.2 and R22.3 in addition to implementation measures IM-2 and IM-3 of the Air Quality Implementation Program would contribute in minimizing air quality impacts from stationary and area sources. However, until specific future development projects are proposed, the associated emissions cannot be determined or modeled at this time and impacts associated with new stationary sources of emissions are considered a significant impact.

In addition to stationary/area sources of TACs, new land uses in the City that use trucks and/or off-road equipment, could generate an increase in DPM that would contribute to cancer and noncancer health risk in the SoCAB. DPM accounts for approximately 84 percent of the excess cancer risk in the SoCAB (SCAQMD 2008). Development of these types of land uses would generally be limited to the Montecito Avenue

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corridor. However, this area is surrounded by existing sensitive receptors and development of these types of uses could potentially expose the sensitive receptors to substantial concentration of TACs. Furthermore, trucks would travel on regional transportation routes through the SoCAB, contributing to near-roadway DPM concentrations. Similar to stationary and area sources, implementation of General Plan Update Policies R22.2 and R22.3 in addition to implementation measures IM-2 and IM-3 of the Air Quality Implementation Program would contribute in minimizing air quality impacts from trucks and off-road equipment. However, until specific future development projects are proposed, the associated emissions cannot be determined or modeled at this time and impacts associated with new land uses that utilize trucks and off-road equipment in day-to-day operations are also considered to a significant impact.

Localized Significance Thresholds

LSTs are the amount of project-related emissions at which localized concentrations (ppm or $\mu\text{g}/\text{m}^3$) could exceed the AAQS for criteria air pollutants for which the SoCAB is designated nonattainment. Per the LST methodology, information regarding specific development projects and the locations of receptors would be needed in order to quantify the levels of impact associated with future development projects. Thus, as the General Plan Update is a broad-based policy plan, it is not possible to calculate individual project-related emissions at this time and to determine whether the scale and phasing of individual projects would result in the exceedance of localized emissions thresholds; and therefore contribute to health impacts. Air quality emissions would be addressed on a project-by-project basis as individual development projects are considered. Development activity associated with theoretical buildout of the General Plan Update, emissions could exceed the SCAQMD regional significance thresholds and therefore, in accordance with the SCAQMD methodology, may result in significant localized impacts and exceed the AAQS. Therefore, this is considered a significant impact of the General Plan Update.

CO Hotspots

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9.0 ppm. At the time of the 1993 Handbook, the SoCAB was designated nonattainment under the California AAQS and National AAQS for CO. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and in the state have steadily declined. In 2007, the SCAQMD was designated in attainment for CO under both the California and National AAQS. As identified within SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SoCAB were a result of unusual meteorological and topographical conditions and not a result of congestion at a particular intersection. A CO hotspot analysis was conducted at four busy intersections in Los Angeles at the peak morning and afternoon periods and did not predict a violation of CO standards.⁷ Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more

⁷ The four intersections were Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles and LOS E in the morning peak hour and LOS F in the evening peak hour.

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than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (BAAQMD 2011). As shown in Table 5.12-4, *Project Trip Generation Summary*, of Section 5.12, *Transportation and Traffic*, buildout of the General Plan Update would not produce the volume of traffic required to generate a CO hotspot. Therefore, CO hotspots are not an environmental impact of concern for the General Plan Update.

Impact 5.2-5: Buildout of the General Plan Update could site sensitive land uses in proximity to air pollution sources and expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: Because placement of sensitive land uses falls outside CARB jurisdiction, CARB developed and approved the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) to address the siting of sensitive land uses in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources.

CARB's recommendations for the siting of new sensitive land uses were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources. The key observation in these studies is that proximity to air pollution sources substantially increases both exposure and the potential for adverse health effects. Respiratory and cardiovascular problems including asthma, lung cancer, and premature death have been associated with living near major roadways and freeways (Balmes et al, 2009). Children who live near major roadways and freeways have been found to have higher asthma rates and reduced lung function (CARB 2013c). There are three carcinogenic toxic air contaminants that constitute the majority of the known health risks from motor vehicle traffic: DPM from trucks, benzene and 1,3 butadiene from passenger vehicles. Exposure to DPM accounts for more than 80 percent of the total carcinogenic risk in the SoCAB (SCAQMD 2008a). It has been found that outdoor concentrations are highest near the roadway and decrease with increasing distance downwind of the source (Zhu et al, 2002). CARB recommends avoiding siting new sensitive land uses within 500 feet of urban roads with more than 100,000 vehicles per day or rural roads with more than 50,000 vehicles per day (CARB 2005). Table 5.2-11 shows a summary of the other CARB recommendations for siting new sensitive land uses within the vicinity of air-pollutant sources. Recommendations in the table are based on data that show that localized air pollution exposures can be reduced by as much as 80 percent by following CARB minimum distance separations.

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Table 5.2-11 CARB Recommendations for Siting New Sensitive Land Uses

Source/Category	Advisory Recommendations
Freeways and High-Traffic Roads	Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day.
Distribution Centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units [TRUs] per day, or where TRU unit operations exceed 300 hours per week). Take into account the configuration of existing distribution centers and avoid locating residences and other sensitive land uses near entry and exit points.
Rail Yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within 1 mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks.
Refineries	Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult with the local air district. Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

Source: CARB 2005.

Stationary sources of TACs within the City of Sierra Madre include the stationary sources permitted by SCAQMD. The various permitted uses are generally concentrated along the Sierra Madre Boulevard, Montecito Avenue, and Baldwin Avenue (SCAQMD 2015). The majority of active permitted uses within and/or 1,000 feet of City's boundaries are for diesel or natural gas emergency generators. The other types of permitted uses include auto repair shops, a dry cleaner, and gas station. There are no local roadways with more than 100,000 average daily vehicle trips in the City (Fehr & Peers 2015).

If new sensitive receptors were sited within CARB's siting recommendations of other stationary sources, they may be exposed to significant concentrations of air pollutants. As shown in Figure 3-5, *Infill Opportunity Sites*, residential land uses that would be developed within the infill opportunity sites in proximity or within the City's downtown central core area would be near existing permitted sources or designated areas that would permit commercial and light-manufacturing land uses. Thus, new residential and other sensitive developments could be sited within the buffer distances to TAC sources as shown in Table 5.2-11. Therefore, air quality impacts from placement of sensitive uses near major pollutant sources are considered significant.

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Impact 5.2-6: Light-manufacturing land uses accommodated under the General Plan Update could create objectionable odors. [Threshold AQ-5]

Impact Analysis: Growth within the City of Sierra Madre could generate new sources of odors and place sensitive receptors near existing sources of odors. Nuisance odors from land uses in the SoCAB are regulated under SCAQMD Rule 402, Nuisance, which states:

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 shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

Industrial land uses have the potential to generate objectionable odors. Examples of industrial projects are wastewater treatment plants, compost facilities, landfills, solid-waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. While these types of uses would not be accommodated under the General Plan Update, light-manufacturing land uses would be permitted within the Artisan Mixed Use-designated areas (see Figures 3-5, *Infill Opportunity Sites*, and 3-6, *Proposed Land Use Map*). The areas proposed under this land use designation would primarily occur along Montecito Avenue and would be in close proximity to residential land uses. Although light-manufacturing land uses associated with the General Plan Update would be required to comply with SCAQMD Rule 402, additional measures may be necessary to prevent an odor nuisance. Therefore, light-manufacturing land uses associated with the General Plan Update may generate potentially significant odor impacts to a substantial number of people.

Residential and commercial land uses could result in generation of odors such as exhaust from landscaping equipment. However, unlike industrial land uses, these are not considered potential generators of odor that could affect a substantial number of people. Therefore, impacts from potential odors generated from residential and commercial land uses associated with the General Plan Update are considered less than significant.

During construction activities of future development that would be accommodated under the General Plan Update, construction equipment exhaust and application of asphalt and architectural coatings would temporarily generate odors. Any construction-related odor emissions would be temporary and intermittent. Additionally, noxious odors would be confined to the immediate vicinity of the construction equipment. By the time such emissions reached any sensitive receptor sites, they would be diluted to well below any level of air quality concern. Furthermore, short-term construction-related odors are expected to cease upon the drying or hardening of the odor-producing materials. Therefore, impacts associated with construction-generated odors are no considered significant.

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5.2.5 Existing Regulations

State

- **CARB Rule 2480 (13 CCR 2480):** Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools: limits nonessential idling for commercial trucks and school buses within 100 feet of a school.
- **CARB Rule 2485(13 CCR 2485):** Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling: limits nonessential idling to five minutes or less for commercial trucks.
- **CARB Rule 2449(13 CCR 2449):** In-Use Off-Road Diesel Idling Restricts: limits nonessential idling to five minutes or less for diesel-powered off-road equipment.
- **Building Energy Efficiency Standards (Title 24)**
- **Appliance Energy Efficiency Standards (Title 20)**
- **Motor Vehicle Standards (AB 1493)**

Regional (Air District)

- SCAQMD Rule 201: Permit to Construct
- SCAQMD Rule 402: Nuisance Odors
- SCAQMD Rule 403: Fugitive Dust
- SCAQMD Rule 1113: Architectural Coatings
- SCAQMD Rule 1186: Street Sweeping
- SCAQMD Rule 1403: Asbestos Emissions from Demolition/Renovation Activities

5.2.6 Level of Significance Before Mitigation

Upon compliance with the regulatory requirements and implementation of the General Plan Update policies and Implementation Program measures, the following impacts would be less than significant: 5.2-1 and 5.2-3.

Without mitigation, the following impacts would be **potentially significant**:

- **Impact 5.2-2** Construction activities associated with the General Plan Update would generate short-term emissions in exceedance of SCAQMD'S threshold criteria and cumulatively contribute to the nonattainment designations of the SoCAB.
- **Impact 5.2-4** Implementation of the General Plan Update could result in new sources of criteria air pollutant emissions and toxic air contaminants that could expose sensitive receptors to substantial pollutant concentrations.

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- **Impact 5.2-5** Buildout of the General Plan Update could site sensitive land uses in proximity to air pollution sources and expose sensitive receptors to substantial pollutant concentrations.
- **Impact 5.2-6** Light-manufacturing land uses accommodated under the General Plan Update could create objectionable odors.

5.2.7 Mitigation Measures

Impact 5.2-2

2-1 If, during subsequent project-level environmental review conducted for individual development projects, construction-related criteria air pollutants are determined to have the potential to exceed the South Coast Air Quality Management District (SCAQMD) adopted thresholds of significance, the City of Sierra Madre Planning and Community Preservation Department shall require that applicants for new development projects incorporate mitigation measures as identified in the CEQA document prepared for the project to reduce air pollutant emissions during construction activities. Mitigation measures that may be identified during the environmental review include but are not limited to:

- Using construction equipment rated by the United States Environmental Protection Agency as having Tier 3 (model year 2006 or newer) or Tier 4 (model year 2008 or newer) emission limits, applicable for engines between 50 and 750 horsepower.
- Ensuring construction equipment is properly serviced and maintained to the manufacturer's standards.
- Limiting nonessential idling of construction equipment to no more than five consecutive minutes.
- Water all active construction areas at least three times daily, or as often as needed to control dust emissions. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).
- Pave, apply water three times daily or as often as necessary to control dust, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

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- Sweep daily (with water sweepers using reclaimed water if possible), or as often as needed, all paved access roads, parking areas, and staging areas at the construction site to control dust.
- Sweep public streets daily (with water sweepers using reclaimed water if possible) in the vicinity of the project site, or as often as needed, to keep streets free of visible soil material.
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water three times daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).

Impact 5.2-4

Mitigation Measure 2-1 would also be applicable in reducing construction-related LST impacts.

Review of projects by SCAQMD for permitted sources of air toxics would ensure health risks are minimized. The following mitigation measure would ensure that mobile sources of TACs not covered under SCAQMD permits are considered during subsequent project-level environmental review.

- 2-2 Prior to future discretionary project approval, project applicants for new industrial or warehousing land uses that 1) have the potential to generate 100 or more diesel truck trips per day or have 40 or more trucks with operating diesel-powered transport refrigeration units, and 2) are within 1,000 feet of a sensitive land use (e.g., residential, schools, hospitals, or nursing homes), as measured from the property line of the project to the property line of the nearest sensitive use, shall prepare and submit a health risk assessment (HRA) to the City of Sierra Madre Planning and Community Preservation Department. The HRA shall be prepared in accordance with policies and procedures of the state Office of Environmental Health Hazard Assessment and the South Coast Air Quality Management District. If the HRA shows that the incremental cancer risk and/or noncancer hazard index exceeds the respective thresholds, as established by the South Coast Air Quality Management District (SCAQMD) at the time a project is considered, the project applicant will be required to identify and demonstrate that best available control technologies for toxics (T-BACTs), including appropriate enforcement mechanisms, are capable of reducing potential cancer and noncancer risks to an acceptable level. T-BACTs may include, but are not limited to, restricting idling onsite or electrifying warehousing docks to reduce diesel particulate matter, or requiring use of newer equipment and/or vehicles. T-BACTs identified in the HRA shall be identified as mitigation measures in the environmental document and/or incorporated into the project site development plan as a component of the project.

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Impact 5.2-5

2-3 Project applicants for sensitive land uses within the following distances, as measured from the property line of the project site to the property line of the source/edge of the nearest travel lane from these facilities, shall prepare and submit a health risk assessment (HRA) to the City of Sierra Madre Planning and Community Preservation Department prior to future discretionary project approval:

- Industrial facilities within 1000 feet
- Distribution centers (40 or more trucks per day) within 1,000 feet
- High volume roadways (100,000 or more vehicles per day) within 1,000 feet
- Dry cleaners using perchloroethylene within 500 feet
- Gasoline dispensing facilities within 300 feet

The HRA shall be prepared in accordance with policies and procedures of the state Office of Environmental Health Hazard Assessment (OEHHA) and the applicable air quality management district. The latest OEHHA guidelines shall be used for the analysis. If the HRA shows that the incremental cancer risk and/or noncancer hazard index exceeds the respective thresholds, as established by the South Coast Air Quality Management District (SCAQMD) at the time a project is considered, the project applicant will be required to identify that mitigation measures are capable of reducing potential cancer and non-cancer risks to an acceptable level (i.e., below ten in one million or a hazard index of 1.0), including appropriate enforcement mechanisms. Measures to reduce risk may include but are not limited to:

- Air intakes located away from high volume roadways and/or truck loading zones, unless it can be demonstrated to the City of Sierra Madre that there are operational limitations.
- Heating, ventilation, and air conditioning systems of the buildings provided with appropriately sized maximum efficiency rating value (MERV) filters.

Mitigation measures identified in the HRA shall be identified as mitigation measures in the environmental document and/or incorporated into the project site development plan as a component of the project. The air intake design and MERV filter requirements shall be noted and/or reflected on all building plans submitted to and verified by the City of Sierra Madre Planning and Community Preservation Department.

Impact 5.2-6

2-4 Prior to future discretionary approval, if it is determined that a development project has the potential to emit nuisance odors beyond the property line, an odor management plan shall be prepared by the project applicant, subject to review and approval by the City of Sierra Madre Planning and Community Preservation Department. Facilities that have the potential to generate nuisance odors include but are not limited to:

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- Wastewater treatment plants
- Composting, green waste, or recycling facilities
- Fiberglass manufacturing facilities
- Painting/coating operations
- Large-capacity coffee roasters
- Food-processing facilities

The odor management plan shall show compliance with the South Coast Air Quality Management District's Rule 402 for nuisance odors. The Odor Management Plan shall identify the best available control technologies for toxics (T-BACTs) that will be utilized to reduce potential odors to acceptable levels, including appropriate enforcement mechanisms. T-BACTs may include but are not limited to scrubbers (i.e., air pollution control devices) at the industrial facility. T-BACTs identified in the odor management plan shall be identified as mitigation measures in the environmental document and/or incorporated into the project site development plan as a component of the project.

5.2.8 Level of Significance After Mitigation

Impact 5.2-2

Mitigation Measure 2-1 would reduce criteria air pollutants generated from project-related construction activities. Buildout under the General Plan Update would occur over a period of approximately 20 years or longer. Construction time frames and equipment for individual site specific projects are not available and there is a potential for multiple developments to be constructed at any one time, resulting in significant construction-related emissions. Therefore, despite adherence to Mitigation Measures 2-1 in addition to the applicable policies and implementation measures of the General Plan Update and Implementation Program, respectively, Impact 5.2-2 would remain **significant and unavoidable**.

Impact 5.2-4

Buildout of the General Plan Update could result in new sources of criteria air pollutant emissions and/or toxic air contaminants near existing or planned sensitive receptors. Review of individual development projects by SCAQMD for permitted sources of TACs (e.g., industrial facilities, dry cleaners, and gasoline dispensing facilities) would ensure health risks from stationary (permitted) sources are minimized. Mitigation Measure 2-2 would ensure area and mobile sources of TACs not covered under SCAQMD permits are considered prior to issuance of building permits. Thus, development of future individual projects accommodated by the General Plan Update would be required to achieve the incremental risk thresholds established by SCAQMD. Therefore, TAC impacts identified under Impact 5.2-4 would be less than significant.

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Mitigation Measure 2-1 would reduce the project's regional construction emissions and therefore also reduce the project's localized construction-related criteria air pollutant emissions to the extent feasible. However, because existing sensitive receptors may be close to project-related construction activities, construction emissions generated by individual development projects have the potential to exceed SCAQMD's LSTs. Therefore, Impact 5.2-4 with respect to construction-related LST impacts would remain **significant and unavoidable**.

Impact 5.2-5

Placement of new sensitive receptors within the City of Sierra Madre near major sources of TACs could expose people to substantial pollutant concentrations. Policies and implementation measures are included in the General Plan Update and Implementation Program, respectively, which would contribute in minimizing TAC impacts to new developments. In addition, Mitigation Measure 2-3 would ensure that placement of sensitive receptors near major sources of air pollution would achieve the incremental risk thresholds established by SCAQMD. Therefore, Impact 5.2-5 would be less than significant.

Impact 5.2-6

Mitigation Measure 2-4 would ensure that odor impacts are minimized and future facilities would comply with SCAQMD Rule 402. Impact 5.2-6 would be less than significant.

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