3.3 AIR QUALITY

This section of the Program Environmental Impact Report (PEIR) describes air quality within the SCAG region, identifies the regulatory framework with respect to laws and regulations that affect air quality, and analyzes the potential impacts of the Connect SoCal Plan ("Connect SoCal"; "Plan"). In addition, this PEIR provides regional-scale mitigation measures as well as project-level mitigation measures to be considered by lead agencies for subsequent, site-specific environmental review to reduce identified impacts as appropriate and feasible.

3.3.1 DEFINITIONS

Air Dispersion*:* Air dispersion is defined as how air pollutants travel through ambient air. Toxic Air Contaminants/Mobile Source Air Toxics (TACs/MSATs) impact those located closest to the emission sources more than those located further away. A California law passed in 2003 (Public Resources Code Section 21151.8) prohibits the siting of a school within 500 feet of a freeway unless "the school district determines, through analysis based on appropriate air dispersion modeling, that the air quality at the proposed site is such that neither short-term nor long-term exposure poses significant health risks to pupils." The U.S. EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines.

Concentrations: The amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The following discussion identifies the pollutants included in this analysis.

Criteria Pollutants: Criteria air pollutants are defined as pollutants for which the federal and State governments have established ambient air quality standards for outdoor concentrations. The federal and State standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). These pollutants are discussed below. [1]

- Carbon Monoxide (CO) is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. It is emitted primarily from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of emissions. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient concentrations generally

[1] U.S. Environmental Protection Agency. *NAAQS*. Available online at: https://www.epa.gov/criteria-air-pollutants/naaqs-table, accessed November 6, 2019.

follow the spatial and temporal distributions of vehicular traffic. Concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. Inversions are an atmospheric condition in which a layer of warm air traps cooler air near the surface of the earth, preventing the normal rising of surface air. The highest concentrations occur during the colder months of the year when inversion conditions are more frequent. CO is a health concern because it competes with oxygen, often replacing it in the blood and reducing the blood's ability to transport oxygen to vital organs. Excess CO exposure can lead to dizziness, fatigue, and impair central nervous system functions.[2]

- Ozone (O_3) is a colorless gas that is formed in the atmosphere when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; rather, it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of ROG and NO_X, the components of O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O_3 formation. Ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. The greatest source of smog-producing gases is the automobile. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.[3]

- Nitrogen Dioxide (NO_2) like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM10. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a

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2 U.S. Environmental Protection Agency. *Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution*. Available online at: https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#What is CO, accessed November 6, 2019.

3 U.S. Environmental Protection Agency. *Ground-level Ozone Basics*. Available online at: https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#wwh, accessed November 6, 2019.

relationship between NO_2 and chronic pulmonary fibrosis. Some increase of bronchitis in children (2-3 years old) has been observed at concentrations below 0.3 parts per million (ppm).[4]

- Sulfur Dioxide (SO_2) is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries. Generally, the highest levels of SO_2 are found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.[5]

- Particulate Matter (PM) consists of small liquid and solid particles floating in the air, including smoke, soot, dust, salts, acids, and metals and can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Fine particulate matter, or PM2.5, is roughly 1/28 the diameter of a human hair and results from fuel combustion (e.g. motor vehicles, power generation, industrial facilities), residential fireplaces, and wood stoves. In addition, PM2.5 can be formed in the atmosphere from gases such as SO_2, NO_X, and VOC. Inhalable particulate matter, or PM10, is about 1/7 the thickness of a human hair. Major sources of PM10 include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

  PM2.5 and PM10 pose a greater health risk than larger-size particles. When inhaled, they can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM2.5 and PM10 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body. These substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Whereas PM10 tends to collect in the upper portion of the respiratory system, PM2.5 is so tiny that it can

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4 U.S. Environmental Protection Agency. *Basic Information about NO_2*. Available online at: https://www.epa.gov/no2-pollution/basic-information-about-no2, accessed November 6, 2019.

5 U.S. Environmental Protection Agency. *Sulfur Dioxide Basics*. Available online at: https://www.epa.gov/so2-pollution/sulfur-dioxide-basics, accessed November 6, 2019.

penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.[6]

- Lead (Pb) in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturers of batteries, paint, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95 percent. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities have become lead-emission sources of greater concern.

  Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. [7]

- Toxic Air Contaminants (TAC) are airborne pollutants that may increase a person's risk of developing cancer or other serious health effects. TACs include more than 700 chemical compounds that are identified by State and federal agencies based on a review of available scientific evidence. In California, TACs are identified through a two-step process established in 1983 that includes risk identification and risk management.[8]

Diesel Particulate Matter (DPM)*:* According to the California Air Resources Board (CARB), most toxic air emissions are from motor vehicles and the particulate matter from the exhaust of diesel-fueled engines.[9] In 1998, the OEHHA completed a comprehensive health assessment of diesel exhaust. This assessment formed the basis for a decision by the CARB to formally identify particles in diesel exhaust as a TAC that may pose a threat to human health.[10]

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6 U.S. Environmental Protection Agency. *Particulate Matter (PM) Basics*. Available online at: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics, accessed November 6, 2019.

7 U.S. Environmental Protection Agency. *Basic Information about Lead Air Pollution*. Available online at: https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution, accessed November 6, 2019.

8 OEHHA. 2019. *Toxic Air Contaminants*. Available online at: https://oehha.ca.gov/air/toxic-air-contaminants, accessed November 6, 2019.

9 California Air Resources Board. Accessed 8 September 2015. *Reducing Toxic Air Pollutants in California's Communities*. Available at: http://www.arb.ca.gov/toxics/brochure.pdf

10 Office of Environmental Health Hazard Assessment. Accessed 8 September 2015. *Health Effects of Diesel Exhaust*. Available at: http://oehha.ca.gov/public_info/facts/dieselfacts.html

DPM is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is commonly found throughout the environment and is estimated by EPA's National Scale Assessment to contribute to the human health risk in New England. Diesel exhaust is composed of two phases, either gas or particle, and both phases contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particle phase also has many different types of particles that can be classified by size or composition. The size of diesel particulates that are of greatest health concern are those that are in the categories of fine, and ultra-fine particles. The composition of these fine and ultrafine particles may be composed of elemental carbon with absorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines: the on-road diesel engines of trucks, buses, and cars and the off-road diesel engines that include locomotives, marine vessels, and heavy-duty equipment.[11] People living and working in urban and industrial areas are more likely to be exposed to this pollutant. Those spending time on or near roads and freeways, truck loading and unloading operations, operating diesel-powered machinery, or working near diesel equipment face exposure to higher levels of diesel exhaust and face higher health risks.[12]

The most common exposure pathway is breathing the air that contains the DPM. The fine and ultrafine particles are respirable, which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. In the National Scale Assessment, there are several steps used to characterize public health risks. For diesel particulate matter, not all of the steps could be completed but a qualitative assessment was provided that provided modeling estimates of population exposures. The estimated population exposure concentrations for diesel particulate matter were the highest exposure concentrations in all of the New England states. EPA has medium confidence in the overall NATA estimate for diesel particulate exposure based on the emissions and exposure modeling. Exposure to DPM comes from both on road and off-road engine exhaust that is either directly emitted from the engines or aged through lingering in the atmosphere.[13]

Diesel exhaust causes health effects from both short-term or acute exposures and also long-term chronic exposures, such as repeated occupational exposures. The type and severity of health effects depends upon several factors including the amount of chemical you are exposed to and the length of time you are

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11 U.S. Environmental Protection Agency. 24 April 2014. *Diesel Particulate Matter*. April 24, 2014. Available at: http://www.epa.gov/region1/eco/airtox/diesel.html

12 Office of Environmental Health Hazard Assessment. Accessed 8 September 2015. *Health Effects of Diesel Exhaust*. Available at: http://oehha.ca.gov/public_info/facts/dieselfacts.html

13 U.S. Environmental Protection Agency. 24 April 2014. *Diesel Particulate Matter*. April 24, 2014. Available at: http://www.epa.gov/region1/eco/airtox/diesel.html

exposed. Individuals also react differently to different levels of exposure. There is limited information on exposure to just diesel particulate matter but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects.[14]

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat, and lungs and some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure in experimental animal inhalation studies have shown a range of dose-dependent lung inflammation and cellular changes in the lung, and there are also diesel exhaust immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.[15] The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks and premature deaths among those suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. For the average Californian, 70 percent of cancer risk from breathing toxic air pollutants stem from diesel exhaust particles.[16]

EPA's National Scale Assessment uses several types of health hazard information to provide a quantitative "threshold of concern" or a health benchmark concentration at which it is expected that no adverse health effects occur at exposures to that level. Health effects information on carcinogenic, short- and long term non-carcinogenic end points are used to establish selective protective health levels to compare to the modeled exposures levels. The exposure response data in human studies are considered too uncertain to develop a carcinogenic unit risk for EPA's use. There is a Reference Concentration (RFC) that is used as a health benchmark protective of chronic noncarcinogenic health effects, but it is for diesel exhaust and not specifically set for DPM, which is what was modeled in NATA. The RFC for diesel

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14 U.S. Environmental Protection Agency. 24 April 2014. *Diesel Particulate Matter*. April 24, 2014. Available at: http://www.epa.gov/region1/eco/airtox/diesel.html

15 U.S. Environmental Protection Agency. 24 April 2014. *Diesel Particulate Matter*. April 24, 2014. Available at: http://www.epa.gov/region1/eco/airtox/diesel.html

16 Office of Environmental Health Hazard Assessment. Accessed 8 September 2015. *Health Effects of Diesel Exhaust*. Available at: http://oehha.ca.gov/public_info/facts/dieselfacts.html

exhaust, which includes DPM is 5 μg/m^3. This value is similar to the National Ambient Air Quality Standard established for fine particulate matter, which is 15 μ/m^3.[17]

Emissions: The quantity of pollutants released into the air, measured in pounds per day (ppd) or tons per day (tpd).

GHG Greenhouse Gases – Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

Visibility*:* With the exception of Lake County, which is designated in attainment, all of the air districts in California are currently designated as unclassified with respect to the California Ambient Air Quality Standards (CAAQS) for visibility reducing particles. (A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.)

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers. The standard was changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles. The visibility standard is based on the distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter. Visibility degradation occurs when visibility reducing particles are produced in sufficient amounts such that the extinction coefficient is greater than 0.23 inverse kilometers (to reduce the visual range to less than 10 miles) at relative humidity less than 70 percent, 8-hour average (from 10:00 a.m. to 6:00 p.m.) according to the state standard.

3.3.2 ENVIRONMENTAL SETTING

The SCAG region encompasses a population exceeding 19 million persons in an area of more than 38,000 square miles within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

Air quality in the four air basins in the SCAG region—South Coast Air Basin (SCAB), Mojave Desert Air Basin (MDAB), Salton Sea Air Basin (SSAB), and South Central Coast Air Basin (SCCAB) (Ventura

[17] U.S. Environmental Protection Agency. 24 April 2014. *Diesel Particulate Matter*. April 24, 2014. Available at: http://www.epa.gov/region1/eco/airtox/diesel.html

County portion)—is a function of the topography, climate, population, and land use. While improved from the 1970s, Southern California consistently ranks as some of the worst air quality in the nation. The American Lung Association's *State of the Air Report 2018*, ranks the Los Angeles-Long Beach metropolitan area as seventh worst in the nation for people at risk for 24-hour PM2.5, fourth worst for annual PM2.5, and worst for most ozone-polluted cities.[18]

Topography, Climate, and Meteorology

The SCAG region has a greatly varied topography from lakes to mountains, valleys, hills, basins, and urban areas. The topography and meteorological conditions define the climate of the region because air quality is a function of the rate and location of pollutant emissions. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, influence the movement and dispersal of pollutants and thereby provide the link between air pollutant emissions and air quality. Southern California has strong temperature inversions in the lower atmosphere that can trap pollutants near the surface. Meteorology affects air quality trends that may mask emission reduction benefits. Meteorology also affects different pollutants differently. Warm and sunny weather, which is typical of Southern California, leads to higher ozone days because sunlight aids the chemical reactions that form ozone. On the other hand, windy weather will spread primary particulate matter from direct emissions leading to high PM concentrations in the air. Secondary PM, including particulate nitrates and sulfates, is more prevalent in the air during cold, calm, and humid weather conditions. Rain and wind reduce PM concentration in the air.[19] The local topography and climate conditions are described in greater detail specific to each air basin as listed below. These air basins are geographically defined because the travel of air pollution can be trapped by natural barriers like mountains unless the prevailing winds are powerful enough to disperse it to other areas.[20]

South Coast Air Basin (SCAB)

The SCAB incorporates approximately 12,000 square miles, consisting of Orange County and the urbanized areas of San Bernardino, Riverside, and Los Angeles Counties. In May 1996, the boundaries of the SCAB were changed by CARB to include the Beaumont-Banning area. The distinctive climate of the

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18 American Lung Association. 2018. *State of the Air 2018*. Available online at: https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf, accessed March 25, 2019.

19 The California Almanac of Emissions and Air Quality. 2013. *The California Almanac of Emissions and Air Quality*. Available online at: http://www.arb.ca.gov/aqd/almanac/almanac13/almanac2013all.pdf, accessed March 25, 2019.

20 South Coast Air Quality Management District. *Southern California Air Basins.* Available online at: http://www.aqmd.gov/docs/default-source/default-document-library/map-of-jurisdiction.pdf, accessed March 25, 2019.

SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.[21]

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basin-wide occurrence of inversions at 3,500 feet above sea level or less averages 191 days per year.[22]

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour, smog potential is greatly reduced.[23]

Mojave Desert Air Basin (MDAB)

The MDAB encompasses approximately 21,480 square miles and includes the desert portions of San Bernardino County, Palo Verde Valley, Palmdale, and Lancaster in the Antelope Valley. The MDAB is bordered by the SCAB and the Riverside County line to the south, Kern County line to the west, the Arizona and Nevada borders to the north and east, and the eastern portion of Riverside County to the southeast.[24] The Kern County portion of MDAB is not in the SCAG region.

The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes.[25] Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the

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21 South Coast Air Quality Management District. April 1993. CEQA Air Quality Handbook. P. A8-1.

22 Ibid.

23 Ibid.

24 California Air Resources Board, *California Air Basin Map.* Available online at: https://ww3.arb.ca.gov/ei/maps/statemap/abmap.htm, accessed August 9, 2019.

25 Mojave Desert Air Quality Management District. August 2016. *CEQA and Federal Conformity Guidelines*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=192, accessed August 23, 2019.

valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB. The MDAB is separated from the Southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevada in the north by the Tehachapi Pass (3,800 feet elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet). The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (the Morongo Valley).

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

During the summer, the MDAB is generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time the reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation).[26] The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least three months have maximum average temperatures over 100.4 degrees Fahrenheit (°F).

Salton Sea Air Basin (SSAB)

The SSAB includes Imperial County and the desert portion of Riverside County between the SCAB and the MDAB (known as the Coachella Valley). Imperial County extends over 4,284 square miles in the southeastern corner of California, bordering on Mexico to the south, Riverside County to the north, San Diego County on the west, and the State of Arizona on the east. The Salton Trough runs northwest to southeast through the center of Imperial County and extends into Mexico. The elevation in Imperial

26 County of Riverside. 2015. *County of Riverside General Plan Air Quality Element*. Available online at: https://planning.rctlma.org/Portals/14/genplan/general_plan_2018/elements/Ch09_AQE_071718.pdf, accessed March 25, 2019.

County ranges from about 230 feet below sea level at the Salton Sea in the north to more than 2,800 feet on the mountain summits to the east.[27]

Climatic conditions in the SSAB are governed by the large-scale sinking and warming of air in the semi-permanent subtropical high-pressure center of the Pacific Ocean. The high-pressure ridge blocks out most mid-latitude storms except in the winter when the high is weakest and farthest south. The coastal mountains prevent the intrusion of any cool, damp marine air found in California coastal environs. Because of the weakened storms and the orographic barrier, the SSAB experiences clear skies, very low humidity, extremely hot summers, mild winters, and little rainfall. The flat terrain of the valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection.[28]

The combination of subsiding air, protective mountains, and distance from the ocean severely limits precipitation. Rainfall is highly variable, with heavy precipitation occurring from single storms followed by periods of dry air. Humidity is typically low throughout the year, ranging from 28 percent in summer to 52 percent in winter.[29]

The wind in Imperial County follows two general patterns. Prevailing winds are from the west-northwest through southwest. Also evident is a secondary flow maximum from the southeast. The prevailing winds from the west and northwest occur seasonally from fall through spring and are known to be from the Los Angeles area. Imperial County experiences periods of extremely high wind speeds. Wind speeds can exceed 31 miles per hour, and this occurs primarily during April and May. However, wind speeds of less than 6.8 miles per hour account for more than half of the observed wind measurements.[30]

South Central Coast Air Basin (SCCAB)

The SCAG region includes the Ventura County portion of the SCCAB. Ventura County is made up of coastal mountain ranges, the coastal shore, the coastal plain, and several inland valleys.[31] The northern half of the county (Los Padres National Forest) is extremely mountainous with altitudes up to 8,800 feet. Consequently, the climate in the northern half of the county varies a great deal depending on elevation.

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27 Imperial County Air Pollution Control District. 2017. *Imperial County 2017 State Implementation Plan for the 2008 8-Hour Ozone Standard.* September.

28 Ibid.

29 Ibid.

30 Ibid.

31 Ventura County Air Pollution Control District. 2017. *Final 2016 Ventura County Air Quality Management Plan*. Available online at: http://www.vcapcd.org/pubs/Planning/AQMP/2016/Final/Final-2016-Ventura-County-AQMP.pdf, accessed September 6, 2019.

Therefore, the climatological and meteorological description presented for Ventura County focuses on the southern half of the county where violations of federal and state ozone standards occur. In the winter, low-pressure systems originating in the northern Pacific Ocean bring clouds, rain, and wind into Ventura County.

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

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

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

Regional Air Quality

In Southern California, the American Lung Association consistently gives counties within the SCAG region failing grades in the amount of ozone and particulate pollution in the air. The American Lung Association has assigned grades to each of the Counties in the SCAG region for 2018 (**Table 3.3-1,**

American Lung Association Report Card for SCAG Region). Grades were calculated from a weighted average based on the total number of days in each air quality index level. The weighted average was derived by counting the number of days in each unhealthful range in each year (2014–2016), multiplying the total in each range by the assigned standard weights, and calculating the average. All six counties in the SCAG region received a failing grade for ozone, which means there were a significant number of unhealthy air days relative to the ozone standard. For ozone, an "F" grade was set to generally correlate with the number of unhealthy air days that would place a county in nonattainment for the ozone standard. For short-term particle pollution, fewer unhealthy air days are required for an F than for nonattainment under the PM2.5 standard. For PM2.5, the national standard allows 2 percent of days in a three-year period to exceed 35 μg/m3, which is roughly 21 unhealthy days in three years, but the American Lung Association uses a more restrictive 1 percent or 99th percentile limit to protect the public from short term spikes in pollution.

Table 3.3-1
American Lung Association Report Card for SCAG Region

County	Ozone Grade	Particle Pollution Grade
Imperial	F	F
Los Angeles	F	F
Orange	F	D
Riverside	F	F
San Bernardino	F	F
Ventura	F	A

Source: American Lung Association. 2018. State of the Air 2018. Available at: https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf

Particle Pollution

In December 2009, the U.S. EPA linked fine particle pollution (PM2.5) to public health impacts. The U.S. EPA determined that fine particle pollution could cause early death, cardiovascular harm, respiratory harm, cancer, and reproductive and developmental harm. In the short term, particle pollution reduces lung function and increases lung tissue inflammation in young, healthy adults. Short-term exposure increases emergency room visits for patients with acute respiratory illnesses, increases number of heart attacks, increases school absenteeism, increases hospitalization of children with asthma, and can even result in deaths on days of high levels of particle pollution.[32] Asthma in the SCAG region ranges from 32

[32] American Lung Association. 2018. *State of the Air 2018*. Available online at: https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf, accessed March 25, 2019.

to 89 per 10,000 people (**Table 3.3-2, Population-Weighted Asthma Rate per 10,000**). Asthma rates are a good indicator of population sensitivity to environmental stressors because asthma is both caused by and exacerbated by pollutants.

Table 3.3-2
Population Weighted Asthma Rate per 10,000

County	Asthma Rate per 10,000
Imperial	89
Los Angeles	52
Orange	32
Riverside	47
San Bernardino	67
Ventura	38
SCAG region	**49**

Source: CalEnviroScreen3.0 - age-adjusted rate of emergency department (ED) visits for asthma per 10,000 (2018 Update).

In 2014, the World Health Organization's International Agency for Research on Cancer linked long-term exposure to particle pollution to increased risk of developing lung cancer.[33] Other studies have shown long-term particle pollution exposure increases hospitalization of children with asthma living near busy roads with heavy truck traffic, reduces lung function in children and teenagers, damages small airways of the lungs, increases risk of death from cardiovascular disease, and increases risk of lower birth weight and infant mortality.[34]

Particle pollution particularly has a detrimental effect on sensitive populations including children, elderly, and those with respiratory or cardiovascular illnesses. In March 2015, the Office of Environmental Health Hazard Assessment (OEHHA) amended their Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments to consider the impact of age, breathing rates, and exposure levels into their cancer risk calculation methodology.[35]

Particulate matter pollution is anticipated to increase due to climate change, which can lead to worsening asthma symptoms, chronic obstructive pulmonary disease (COPD), and respiratory infections associated

33 World Health Organization International Agency for Research on Cancer. 2014. *World Cancer Report 2014*.

34 American Lung Association. 2018. *State of the Air 2018*. Available online at: https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf, accessed March 25, 2019.

35 Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program: Risk Assessment Guidelines for Guidance Manual for Preparation of Health Risk Assessments*. Available online at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed March 25, 2019.

to premature mortality. Increasing temperatures due to climate change are also anticipated to lead to an increase in wildfires across California. Wildfires are a significant source of smoke and particulate matter exposure. The risk from fires persists even after a wildfire is extinguished because particulate matter from fire ash can be picked up by the winds.[36]

Figure 3.3-1, Annual Average Concentration of PM2.5, shows the average annual exposure to PM2.5 in the SCAG region for years 2012 to 2014. South Los Angeles County, northeast Orange County, southwest San Bernardino County, and northwest Riverside County experienced the highest average annual exposure to PM2.5. The metropolitan area by El Centro and Calexico in Imperial County also show high average annual exposure to PM2.5. Average concentrations in these high exposure areas range from 10.1 to 14.6 micrograms of PM2.5 per cubic meter of air. This is below the federal 15 μg/m3 standard, but above the state standard of 12 μg/m3.

Ozone

Ozone is formed when sunlight reacts with NO_x, VOCs, and/or CO. These compounds are typically found in vehicle exhaust but can also be released into the atmosphere from other sources like chemical solvents, power plants, gas stations, paints, and refineries. In February 2013, the U.S. EPA published the "Integrated Science Assessment for Ozone and Related Photochemical Oxidants." The report concluded that ozone pollution causes respiratory harm, is likely to cause early death and cardiovascular harm, may cause harm to the central nervous system, and may cause reproductive and developmental harm.[37] High levels of ozone can result in premature death and stroke, acute breathing problems like shortness of breath, wheezing, and coughing, asthma attacks, increase in risk of respiratory infection, increase susceptibility to pulmonary inflammation, and increase in hospitalization and emergency room visits for those with asthma, chronic obstructive pulmonary disease, cardiovascular disease and lung disease. Long term ozone exposure is connected to higher risk of death from respiratory diseases, higher risk of hospitalization for children with asthma especially those that are also low income, higher risk of developing asthma, lower birth weight and decreased lung function in newborns.[38] Similar to particle pollution, ozone has a detrimental effect on sensitive populations including children, elderly, and those with respiratory or cardiovascular illnesses.

Figure 3.3-2, Maximum 8-Hour Ozone Concentrations (ppm), shows the average daily O_3 exposure in the SCAG region that is in excess of the national 8-hour standard (0.070 ppm) in the SCAG region for years 2012 to 2014. Although the region largely experiences average daily ozone exposure exceeding the

36 Southern California Association of Governments. 2019. *Public Health Draft Technical Report*.

37 Ibid.

38 Ibid.

federal standard, the highest concentration of ozone exposure can be seen mostly in southwest San Bernardino and northwest Riverside Counties, and also in northwest Los Angeles County.

Sensitive Receptors

There are many sensitive receptors located throughout the SCAG region. Some persons, such as those with respiratory illnesses or impaired lung function due to other illnesses, people with cardiovascular diseases or diabetes, the elderly over 65 years of age, and children under 14 years of age, can be particularly sensitive to emissions of criteria pollutants. These are the populations most at risk to poor air quality. Facilities and structures where sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses identified by SCAQMD in the CEQA Air Quality Handbook to be sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Attainment Status

NAAQS

The federal CAA sets NAAQS for the main criteria air pollutants: NO_x, VOC, PM2.5, PM10, SO_x, CO, and lead. Attainment and nonattainment of the NAAQS is variable throughout the counties within the SCAG region (**Table 3.3-3, 2019 Nonattainment in Counties in the SCAG Region for All Criteria Pollutants by County by NAAQS**).

CAAQS

CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. California has set standards for certain pollutants, such as particulate matter and ozone, which are more protective of public health than respective federal standards. California has also set standards for some pollutants that are not addressed by federal standards such as visibility reducing particles and vinyl chloride (**Table 3.3-4, CAAQS Area Designations**).

Table 3.3-3
2019 Nonattainment Areas in the SCAG Region
for all Criteria Pollutants by County by NAAQS

Imperial County	
PM-10 (1987)	Imperial Valley, CA - (Serious)
PM-2.5 (2006)	Imperial Co, CA - (Moderate)
PM-2.5 (2012)	Imperial Co, CA - (Moderate)
8-Hr Ozone (2015)	Imperial Co, CA - (Marginal)
Los Angeles County	
Lead (2008)	Los Angeles County-South Coast Air Basin, CA
PM-2.5 (1997)	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	Los Angeles-South Coast Air Basin, CA - (Moderate)
8-Hr Ozone (2015)	Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hr Ozone (2015)	Los Angeles-South Coast Air Basin, CA - (Extreme)
Orange County	
PM-2.5 (1997)	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	Los Angeles-South Coast Air Basin, CA - (Moderate)
8-Hr Ozone (2015)	Los Angeles-South Coast Air Basin, CA - (Extreme)
Riverside County	
PM-10 (1987)	Coachella Valley, CA - (Serious)
PM-2.5 (1997)	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	Los Angeles-South Coast Air Basin, CA - (Moderate)
8-Hr Ozone (2015)	Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hr Ozone (2015)	Riverside Co, (Coachella Valley), CA - (Severe 15)
San Bernardino County	
PM-10 (1987)	San Bernardino Co, CA - (Moderate)
PM-10 (1987)	Trona, CA - (Moderate)
PM-2.5 (1997)	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	Los Angeles-South Coast Air Basin, CA - (Moderate)
8-Hr Ozone (2015)	Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hr Ozone (2015)	Los Angeles-South Coast Air Basin, CA - (Extreme)
Ventura County	
8-Hr Ozone (2015)	Ventura County, CA - (Serious)

Source:
U.S. Environmental Protection Agency. 2019. U.S. EPA Green Book. Current nonattainment counties for all criteria pollutants. Available online at: https://www.epa.gov/green-book, accessed March 27, 2019.

Table 3.3-4
CAAQS Area Designations

Air Basin	Ozone	PM2.5	PM10	CO	NO_2	SO_2	Sulfates	Hydrogen Sulfide (HS)	Pb	Visibility Reducing Particles
Mojave Desert	Nonattainment	San Bernardino County portion of federal Southeast Desert Modified AQMA for Ozone (N); Remainder of Air Basin (U)	Nonattainment	Kern County (MDAB) (U); Los Angeles County (MBAB) (A); Riverside County (MDAB) (U); San Bernardino County (MDAB) (A)	Attainment	Attainment	Attainment	Kern County (MDAB) (U); Los Angeles County (MDAB)(U); Riverside County (MDAB)(U); San Bernardino County Searles Valley Planning Area (MDAB)(N)	Attainment	Unclassified
Salton Sea	Nonattainment	City of Calexico (N), Remainder of County (A)	Nonattainment	Attainment	Attainment	Attainment	Attainment	Unclassified	Attainment	Unclassified
South Central Coast (Ventura County)	Nonattainment	Attainment	Nonattainment	Attainment	Attainment	Attainment	Attainment	Unclassified	Attainment	Unclassified
South Coast	Nonattainment	Nonattainment	Nonattainment	Attainment	Attainment	Attainment	Attainment	Unclassified	Attainment	Unclassified

Source: California Air Resources Board. 2017. Area Designations (Activities and Maps). Available online at: http://www.arb.ca.gov/desig/changes.htm#summaries, accessed March 27, 2019.

Existing Criteria Pollutant Emissions

The existing conditions (base year 2019) of the criteria pollutant emissions for the six counties in the SCAG region are shown in **Table 3.3-5, Criteria Pollutant Emissions by County—Existing Conditions (2019)**.

Table 3.3-5
Criteria Pollutant Emissions by County—Existing Conditions (2019)

County	(Tons/Day)								
	ROG		NOx			CO	PM10	PM2.5	SOx
	Summer	Annual	Summer	Annual	Winter	Winter	Annual	Annual	Annual
Imperial	3	3	6	7	7	19	0.5	0.2	0.0
Los Angeles	52	50	88	95	93	397	14.2	6.3	1.1
Orange	15	15	22	23	23	111	4.7	2.1	0.3
Riverside	14	12	32	34	34	87	3.9	1.7	0.3
San Bernardino	16	14	38	40	39	99	4.1	1.8	0.3
Ventura	4	4	6	7	7	30	1.1	0.5	0.1

Source: SCAG Transportation Modeling, 2019.

The SCAG region is encompassed by CARB's air quality monitoring program. The air monitoring stations collect ambient level measurements for criteria pollutants. The data generated are used to define the nature and severity of pollution in California; determine which areas of California are in attainment or non-attainment; identify pollution trends in the state; support agricultural burn forecasting; and develop air models and emission inventories.[39] There are 64 active air monitoring stations in the SCAG region: nine in Imperial County, 15 in Los Angeles County, five in Orange County, 15 in Riverside County, 14 in the San Bernardino County, and six in Ventura County. These monitoring stations are shown in **Figure 3.3-3, Air Quality Basins and Monitoring Stations**.[40]

Health Risk Assessment

The Health Risk Assessment (HRA) (**Appendix 3.3**) assesses the potential carcinogenic risk to persons potentially exposed to harmful diesel exhaust emissions near freeways within the SCAG region. Using EMFAC2014, exhaust diesel particulate matter (DPM, modeled as PM2.5 and PM10) is modeled because DPM has carcinogenic health effects. Cancer risk is used as a proxy for overall health effects in this

39 California Air Resources Board. 2015. *Ambient Air Quality Monitoring*. Available online at: http://www.arb.ca.gov/aaqm/aaqm.htm, accessed March 25, 2019.

40 California Air Resources Board. *Quality Assurance Air Monitoring Site Information*. Available online at: https://ww3.arb.ca.gov/qaweb/site.php, accessed March 20, 2019.

assessment. Discussed in more detail in **Appendix 3.3** and **Chapter 4.0, Alternatives**, of this PEIR, the model simulates five conditions: existing conditions, 2045 No Project, 2045 under Connect SoCal, and 2045 under project alternatives (Local Input, Intensified Land Use) alternative scenarios containing variations on land use and transportation projects and strategies. Comparison between the existing conditions and the Plan is described in **Section 3.3.4, Environmental Impacts.**

Emissions and cancer risk are evaluated along 16 transportation corridors. The corridors were determined in prior RTP/SCS PEIRs primarily based on highest traffic volumes, highest heavy duty diesel truck volumes (HDDT) as well as proximity to sensitive receptors. Quantitative modeling of the entire length of each freeway corridor (some of which extend more than 90 miles) is impractical and therefore representative high-volume segments were selected.

For this analysis, 16 transportation segments (previously evaluated in the 2016 RTP/SCS PEIR) were evaluated. By selecting the same 16 segments as evaluated in 2016, it affords an opportunity to view progress since the adoption of the 2016 RTP/SCS. Eight of the sixteen segments were also previously evaluated in the 2012 RTP/SCS. When selecting the additional eight segments for analysis in 2016, SCAG ranked potential transportation segments by the volume of HDDT traffic. Segments were then ranked again based on the density of sensitive receptors. Using these rankings, one segment was chosen in each county and an additional two segments in Los Angeles and Riverside Counties were chosen based on heavy-duty diesel traffic. These sixteen segments were then quantitatively modeled for increased cancer risk (see **Table 3.3.-16, Summary Maximum Exposed Individual Residential 30-Year Exposure Cancer Risk**).

HDDT comprise the majority of DPM emissions. An AERMOD dispersion model was used to calculate the anticipated DPM concentrations at identified receptors out to 1,000 meters away from each freeway segment. Risk calculations were undertaken for worker, residential, and school sensitive receptors. **Table 3.3-17, Summary Maximum Exposed Individual Residential 30-year Exposure Cancer Risk** presents a summary of the cancer risk per million exposed persons for each of the six scenarios and 16 freeway segments. The HRA (see **Appendix 3.3**) also includes a discussion comparing the health risk calculations at each segment under Connect SoCal as well as the plans from the 2012 RTP/SCS and 2016 RTP/SCS.

Ambient Air Quality

The five air districts in the SCAG region each monitor air quality conditions in their region. The characterization of the ambient air quality in relation to criteria pollutants was based on peak readings of criteria pollutants in the SCAG air basins (**Table 3.3-6, Peak Criteria Pollutants Readings for the SCAG Region Air Basins**). The data shows that O_3, PM2.5, and PM10 readings consistently exceeded the standards in each of the air basins.

Table 3.3-6
Peak Criteria Pollutants Readings for the SCAG Region Air Basins

Pollutant	Period	Pollutant Standards		2016 Peak Criteria Reading		Days in Excess of Standards 2016		2017 Peak Criteria Reading		Days in Excess of Standards 2017		2018 Peak Criteria Reading		Days in Excess of Standards 2018	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
South Coast Air Basin															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m³)	—	0.163		83	10	0.158		109	14	0.142		84	7
	8-hour	0.07 ppm (137 µg/m³)	0.07 ppm (137 µg/m³)	0.121		132	132	0.136		148	145	0.125		141	141
Respirable Particulate Matter (PM10)	24-hour	50 µg/m³	150 µg/m³	CA 277.8	Federal 277.0	152 (Estimated)	1*	CA 137.6	Federal 258.2	115	2	CA 126.0	Federal 230.2	139	1
Fine Particulate Matter (PM2.5)	24-hour	—	35 µg/m³	CA 110.5	Federal 58.8	—	10	CA 109.6	Federal 85.4	—	18	CA 111.0	Federal 103.8	—	17
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m³)	9 ppm (10 mg/m³)	3.96		0	0	0		0	0	—		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	CA 95	Federal 95.3	0	0	CA115	Federal 115.5	0	1	CA 90	Federal 90.3	0	0

Pollutant	Period	Pollutant Standards		2016 Peak Criteria Reading		Days in Excess of Standards 2016		2017 Peak Criteria Reading		Days in Excess of Standards 2017		2018 Peak Criteria Reading		Days in Excess of Standards 2018	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
Mojave Desert Air Basin															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m3)	—	0.132		34	3	0.156		47	4	0.126		39	1
	8-hour	0.07 ppm (137 µg/m³)	0.07 ppm (137 µg/m³)	CA 0.110	Federal 0.109	103	98	CA 0.119	Federal 0.118	103	99	CA 0.107	Federal 0.107	129	123
Respirable Particulate Matter (PM10)	24-hour	50 µg/m³	150 µg/m³	CA 203.5	Federal 246.9	19	2	CA 85.7	Federal 262.3	10*	1*	CA 103.2	Federal 165.2	19*	1
Fine Particulate Matter (PM2.5)	24-hour	—	35 µg/m³	CA 64.8	Federal 64.8	—	3	CA 29.3	Federal 27.2	—	0	CA 40.4	Federal 40.4	—	3
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m³)	9 ppm (10 mg/m³)	0		0	0	1.83		0	0	—		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	CA 223	Federal 223.1	2	4	CA 61	Federal 61.3	0	0	CA 59	Federal 59.2	0	0
Salton Sea Air Basin															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m³)	—	0.108		6	0	0.122		18	0	0.111		11	0
	8-hour	0.07 ppm (137 µg/m³)	0.07 ppm (137 µg/m³)	CA 0.092	Federal 0.092	61	58	CA 0.097	Federal 0.097	78	73	CA 0.099	Federal 0.099	81	77

Pollutant	Period	Pollutant Standards		2016 Peak Criteria Reading		Days in Excess of Standards 2016		2017 Peak Criteria Reading		Days in Excess of Standards 2017		2018 Peak Criteria Reading		Days in Excess of Standards 2018	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
Respirable Particulate Matter (PM10)	24-hour	50 µg/m³	150 µg/m³	CA 265.8	Federal 732.9	136	18	CA 410.2	Federal 477.6	152	5	CA 419.0	Federal 422.3	176	2
Fine Particulate Matter (PM2.5)	24-hour	—	35 µg/m³	CA 57.9	Federal 57.9	—	6	CA 187.5	Federal 49.1	—	6	CA 90.6	Federal 90.6	—	6
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m³)	9 ppm (10 mg/m³)	4.47		0	0	0		0	0	—		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	CA 84	Federal 84.5	0	0	CA 73	Federal 73.6	0	0	CA 73	Federal 73.0	0	0
South Central Coast Air Basin															
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m³)	—	0.096		1	0	0.111		4	0	0.103		3	0
	8-hour	0.07 ppm (137 µg/m³)	0.07 ppm (137 µg/m³)	CA 0.088	Federal 0.088	20	16	CA 0.095	Federal 0.094	29	25	CA 0.093	Federal 0.092	21	19
Respirable Particulate Matter (PM10)	24-hour	50 µg/m³	150 µg/m³	CA 263.9	Federal 436.1	77	10	CA 410.0	Federal 399.8	99	10	CA 208.4	Federal 209.0	55	2
Fine Particulate Matter (PM2.5)	24-hour	—	35 µg/m³	CA 35.3	Federal 35.2	—	0	CA 557.0	Federal 557.0	—	13	CA 46.8	Federal 46.8	—	4

Pollutant	Period	Pollutant Standards		2016 Peak Criteria Reading		Days in Excess of Standards 2016		2017 Peak Criteria Reading		Days in Excess of Standards 2017		2018 Peak Criteria Reading		Days in Excess of Standards 2018	
		CA	Federal			CA	Federal			CA	Federal			CA	Federal
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	1.11		0	0	0		0	0	—		0	0
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (338 µg/m^3)	100 ppb (190 µg/m^3)	CA 52	Federal 52.1	0	0	CA 46	Federal 46.0	0	0	CA 49	Federal 49.0	0	0

Source:
California Air Resources Board. Accessed 1 October 2019. Top 4 summary: select pollutant, years, & area. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php
** Insufficient data available to determine the value. Measured days equal to* number presented.

3.3.3 REGULATORY FRAMEWORK

3.3.3.1 Federal

Federal Clean Air Act

Congress passed the first major Clean Air Act (CAA) in 1970 (42 U.S. Code [USC] Sections 7401 et seq.). This Act gives the EPA broad responsibility for regulating motor vehicle emissions from many sources of air pollution from mobile to stationary sources. Pursuant to the CAA, the EPA is authorized to regulate air emissions from mobile sources like heavy-duty trucks, agricultural and construction equipment, locomotives, lawn and garden equipment, and marine engines; and stationary sources such as power plants, industrial plants, and other facilities. The CAA sets National Ambient Air Quality Standards (NAAQS) for the six most common air pollutants to protect public health and public welfare. These pollutants include particulate matter, ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. For each pollutant, the EPA designates an area as attainment for meeting the standard or nonattainment for not meeting the standard. A maintenance designation entails an area that was previously designated as nonattainment but is currently designated as attainment. The CAA directs states to develop state implementation plans (SIPs), applicable to appropriate industrial sources in the state, in order to achieve these standards.[41]

CAA Section 112(f) and 112(d): National Emission Standards for Hazardous Air Pollutants (NESHAPs)

Section 112 of the CAA addresses emissions of hazardous air pollutants. Prior to 1990, CAA established a risk-based program under which only a few standards were developed. The 1990 CAAA revised Section 112 to first require issuance of technology-based standards for major sources and certain area sources. "Major sources" are defined as a stationary source or group of stationary sources that emit or have the potential to emit 10 tons per year or more of a hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An "area source" is any stationary source that is not a major source.[42]

For major sources, Section 112 requires that EPA establish emission standards that require the maximum degree of reduction in emissions of hazardous air pollutants. These emission standards are commonly referred to as "maximum achievable control technology" or MACT standards. Eight years after the technology-based MACT standards are issued for a source category, EPA is required to review those

41 U.S. Environmental Protection Agency. *Summary of the Clean Air Act 42 U.S.C. §7401 et seq. (1970).* Available online at: https://www.epa.gov/laws-regulations/summary-clean-air-act, accessed August 23, 2019.

42 Ibid.

standards to determine whether any residual risk exists for that source category and, if necessary, revise the standards to address such risk.[43]

The Risk and Technology Review (RTR) is a combined effort to evaluate both risk and technology as required by the CAA after the application of MACT standards. Section 112(f) of the CAA requires EPA to complete a report to Congress that includes a discussion of methods the EPA would use to evaluate the risks remaining after the application of MACT standards. These are known as residual risks. EPA published the Residual Risk Report to Congress (PDF) in March 1999. Section 112(f)(2) directs EPA to conduct risk assessments on each source category subject to MACT standards, and to determine if additional standards are needed to reduce residual risks. Section 112(d)(6) of the CAA requires EPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes and control technologies.[44]

National Ambient Air Quality Standards (NAAQS)

The federal CAA required the U.S EPA to establish NAAQS. The NAAQS set primary standards and secondary standards for specific air pollutants**.** Primary standards define limits for the intention of protecting public health, which include sensitive populations such as asthmatics, children, and the elderly. Secondary Standards define limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation, and buildings. A summary of the federal ambient air quality standards is shown in **Table 3.3-7, National Ambient Air Quality Standards**.

43 Ibid.

44 Ibid.

Table 3.3-7
National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level
Carbon Monoxide		Primary	8 hours	9 ppm
			1 hour	35 ppm
Lead		Primary and secondary	Rolling 3-month average	0.15 μg/m^3
Nitrogen dioxide		Primary	1 hour	100 ppb
		Primary and secondary	Annual	0.053 ppm
Ozone		Primary and secondary	8 hours	0.070 ppm
Particulate Matter	PM2.5	Primary	Annual	12 μg/m^3
		Secondary	Annual	15 μg/m^3
		Primary and secondary	24 hours	35 μg/m^3
	PM10	Primary and secondary	24 hours	150 μg/m^3
Sulfur dioxide		Primary	1 hour	75 ppb
		Secondary	3 hours	0.5 ppm

Source: California Air Resources Board. May 2016. Ambient Air Quality Standards. Available online at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed November 16, 2018.

State Implementation Plan (SIP)/ Air Quality Management Plans (AQMPs)

A SIP is required by the EPA to ensure compliance with the NAAQS. States must develop a general plan to maintain air quality in areas of attainment and a specific plan to improve air quality for areas of nonattainment. SIPs are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. The SIP verifies that the state has a proper air quality management program that adheres to or strives to reach the most up to date emissions requirements.[45] The 1990 amendments to the federal CAA set deadlines for attainment based on the severity of an area's air pollution problem. In adherence to CAA Section 172, states must adopt additional regulatory programs for nonattainment areas.[46] Particularly in California, the SIP not only complies with NAAQS, but also the more stringent CAAQS.

AQMPs are required to ensure compliance with the state and federal requirements. AQMPs contain scientific information and use analytical tools to demonstrate a pathway towards achieving attainment for the criteria air pollutants. Within the SCAG region, five air districts—SCAQMD, Mojave Desert Air

45 U.S. Environmental Protection Agency. *Basic Information about Air Quality SIPs*. Available online at: https://www.epa.gov/sips/basic-information-air-quality-sips, accessed August 23, 2019.

46 U.S. Environmental Protection Agency. *The Clean Air Act – Highlights of the 1990 Amendments*. Available online at: https://www.epa.gov/sites/production/files/2015-11/documents/the_clean_air_act_-_highlights_of_the_1990_amendments.pdf, accessed August 23, 2019.

Quality Management District (MDAQMD), Imperial County Air Pollution Control District (ICAPCD), Antelope Valley Air Quality Management District (AVAQMD), and the Ventura County Air Pollution Control District (VCAPCD)—are responsible for developing the AQMPs.[47] The approval process begins when the regional air districts submit their AQMPs to the CARB. CARB is the lead agency and responsible agency for submitting the SIP to the EPA. CARB forwards SIP revisions to the EPA for approval and publication in the Federal Register. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220, lists all of the items included in the California SIP.[48]

Transportation Conformity

Transportation conformity is required under federal CAA Section 176(c) to ensure that federally supported highway and transit project activities are consistent with ("conform to") the purpose and requirements of the SIP. Conformity currently applies to areas that are designated nonattainment, and those redesignated to attainment after 1990 ("maintenance areas" with plans developed under CAA Section 175A) for the following transportation-related criteria pollutants: ozone, particulate matter (PM2.5 and PM10), CO, and NO_2. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. The transportation conformity regulation is found in 40 CFR Part 93. Conformity requires reporting on the timely implementation of Transportation Control Measures (TCMs) in ozone nonattainment areas designated as serious or worse, thus reinforcing the link between AQMP/SIPs and the transportation planning process. TCMs are expected to be given funding priority and to be implemented on schedule, and in the case of any delays, any obstacles to implementation have been or are being overcome. In the SCAG region, there are two areas for which the ozone SIPs contain TCMs: SCAB and the Ventura County portion of SCCAB. (It is noted that the Ventura County SIP does not claim emission reduction credits from TCM projects. They have been included to assist transportation and air quality agencies to identify projects that have the potential of reducing vehicle emissions, vehicle trips, and vehicle miles traveled.)[49]

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47 Southern California Association of Governments. *Air Quality Management Plans*. Available online at: http://www.scag.ca.gov/programs/Pages/ManagementPlans.aspx, accessed November 12, 2018.

48 Government Publishing Office. *40 CFR 52.220*. Available online at: https://www.govinfo.gov/app/details/CFR-2013-title40-vol3/CFR-2013-title40-vol3-sec52-220, accessed August 23, 2019.

49 U.S. Environmental Protection Agency. 2009. *Guidance for Implementing the Clean Air Act Section 176(c)(8) Transportation Control Measure Substitution and Addition Provision*. Available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1002W66.PDF?Dockey=P1002W66.PDF, accessed August 23, 2019.

Federal CAA Rules

The mobile and stationary sources of emissions are subject to different rules and regulations. For the mobile sources, the rules apply to cars, trucks, buses, recreational vehicles, engines, generators, farm and construction machines, lawn and garden equipment, marine engines, and locomotives. In addition, the compositions of fuels used to operate mobile sources are regulated to help reduce harmful emissions. For stationary resources including factories and chemical plants, pollution control equipment are installed to meet specific emission limits set under the CAA. The New Source Review (NSR) and Prevention of Significant Deterioration (PSD) require large industrial operators such as coal-fired power, acid, glass, and cement plants and petroleum refineries to make modifications to existing facilities or install new controls resulted in emissions of pollutants on new facilities to reduce degradation and harm against public health. EPA works with its federal partners through CAA to ensure compliance with rules through active monitoring and to make sure that the regulated community obeys environmental laws/regulations through on-site inspections and record reviews that lead to enforcement in order to meet environmental regulatory requirements.[50]

Clean Air Act Waiver for California's GHG Emission Standards for New Motor Vehicles

Due to the unique topography and rapid population increase within the Los Angeles basin, federal standards may not be effective enough to meet clean air standards, therefore the state was granted the ability to create stricter standards than set by the CAA. Utilizing the ability to set stricter emission standards, California was granted a waiver of the CAA in July 2009 so that the state may set its own vehicle emission standards for new motor vehicles in order to reduce GHG and ozone emissions.[51] In 2018, the Trump administration announced that the government would ease the federal vehicle fuel standards. As a response, and as a result of the autonomy provided by this waiver, California along with four major antimanufacturing companies pledged to produce vehicle fleets averaging approximately 50 miles per gallon (mpg) by 2026.

On September 19, 2019, under the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule, the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHSTA) and the U.S. EPA issued the final "One National Program Rule." The rule states that federal law preempts state and local laws regarding tailpipe GHG emissions standards, zero emissions vehicle mandates, and fuel

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50 U.S. Environmental Protection Agency. 2019. *New Source Review (NSR) Permitting*. Available online at: https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information, accessed August 23, 2019.

51 Federal Register. 2009. *Environmental Protection Agency: California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles; Notice*. Available online at: https://www.govinfo.gov/content/pkg/FR-2009-07-08/pdf/E9-15943.pdf, accessed September 18, 2019.

economy for automobiles and light duty trucks. The rule revokes California's Clean Air Act waiver and preempts California's Advanced Clean Car Regulations and may potentially impact SCAG's Connect SoCal and transportation projects in the SCAG region.[52, 53] On September 20, 2019, a lawsuit was filed by California and a coalition of 22 other states, and the cities of Los Angeles, New York and Washington, D.C., in the United States District Court for the District of Columbia (Case 1:19-cv-02826) challenging the SAFE Rule and arguing that EPA lacks the legal authority to withdraw the California waiver. At the time of this PEIR, it is unclear whether the SAFE Rule will remain in place.[54]

Mobile Source Air Toxics (MSAT) Modeling and Programs

MOVES2014. In 2010, the EPA released the emission model, the Motor Vehicle Emissions Simulator (MOVES). On February 8, 2011, EPA issued guidance on "Using the MOVES and Emission Factors (EMFAC) Models in NEPA Evaluation" that recommended a two-year grace period be applied to project-level emissions analysis for NEPA purposes. At the end of this grace period, that is, beginning December 20, 2012, Lead Agencies should use MOVES to conduct emissions analysis for NEPA purposes. To prepare for this transition, FHWA is updating the September 2009 Interim Guidance to incorporate the analysis conducted using MOVES. Based on FHWA's analysis using MOVES2010 diesel particulate matter (diesel PM) has become the dominant MSAT of concern. MOVES2014, the latest version of MOVES, was released in October 2014, and incorporates the Tier 3 Rule and other EPA rulemakings since the last MOVES release.

The U.S. EPA has adopted several mobile source emission control programs such as:[55]

Control of Hazardous Air Pollutants from Mobile Sources. In February 2007, EPA finalized this rule to reduce hazardous air pollutants from mobile sources. The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and gas cans. EPA estimates that in 2030 this rule would

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52 U.S. Department of Transportation and U.S. EPA. 2019. *One National Program Rule on Federal Preemption of State Fuel Economy Standards*. Available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100XI4W.pdf, accessed October 29, 2019.

53 Southern California Association of Governments. 2019. *Final Federal Safer, Affordable, Fuel-Efficient Vehicles Rule Part I (Supplemental Report).* Available online at: http://www.scag.ca.gov/committees/CommitteeDocLibrary/EEC_Item8_RC_Item10%20Supplemental%20Report.pdf, accessed October 29, 2019.

54 If the SAFE Rule remains in place, the state and region would have to develop other means of achieving the NAAQS.

55 U.S. Environmental Protection Agency. *Mobile Source Pollution and Related Health Effects.* Available online at: https://www.epa.gov/mobile-source-pollution, accessed November 12, 2018.

reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and PM2.5) by over 1 million tons.[56]

Heavy-Duty Onboard Diagnostic Rule (74 FR 8310). In February 2009, the EPA published a final rule, requiring that these advanced emissions control systems be monitored for malfunctions via an onboard diagnostic system (OBD), similar to those systems that have been required on passenger cars since the mid-1990s. This final rule will require manufacturers to install OBD systems that monitor the functioning of emission control components and alert the vehicle operator to any detected need for emission related repair.[57]

Small SI and Marine SI Engine Rule (73 FR 25098). Published October 2008, these exhaust emission standards applied starting in 2010 for new marine spark-ignition (SI) engines, including first-time EPA standards for sterndrive and inboard engines. The exhaust emission standards applied starting in 2011 and 2012 for different sizes of new land based, spark-ignition engines at or below 19 kilowatts (kW). These small engines are used primarily in lawn and garden applications. Estimated annual nationwide reductions are anticipated to be 604,000 tons of volatile organic hydrocarbon emissions, 132,200 tons of NO_x emissions, and 5,500 tons of directly emitted particulate matter (PM2.5) emissions.[58]

Locomotive and Commercial Marine Rule (66 FR 5002). Published May 2008, the controls apply to all types of locomotives, including line-haul, switch, and passenger, and all types of marine diesel engines below 30 liters per cylinder displacement, including commercial and recreational, propulsion and auxiliary. The near-term program, which started in 2009, includes new emission limits for existing locomotives and marine diesel engines that apply when they are remanufactured, and take effect as soon as certified remanufacture systems are available. The long-term emissions standards for newly built locomotives and marine diesel engines are based on the application of high-efficiency catalytic after-

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56 U.S. Environmental Protection Agency. 2007. *Control of Hazardous Air Pollutants from Mobile Sources; Final Rule*. Available online at: https://www.govinfo.gov/content/pkg/FR-2007-02-26/pdf/E7-2667.pdf, accessed August 23, 2019.

57 U.S. Environmental Protection Agency. 2009. *Control of Air Pollution from New Motor Vehicle Engines; Final Rule*. Available online at: https://www.govinfo.gov/content/pkg/FR-2009-02-24/pdf/E9-2405.pdf, accessed August 23, 2019.

58 U.S. Environmental Protection Agency. 2008. *EPA Finalizes Emission Standards for New Nonroad Spark-Ignition Engines, Equipment, and Vessels*. Available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P10017GK.PDF?Dockey=P10017GK.PDF, accessed August 29, 2019.

treatment technology. These standards take effect in 2015 for locomotives and in 2014 for marine diesel engines.[59]

Clean Air Nonroad Diesel Rule (65 FR 6698). Published June 2004, this comprehensive national program regulates nonroad diesel engines and diesel fuel as a system. New engine standards took effect in the 2008 model year, phasing in over a number of years. These standards are based on the use of advanced exhaust emission control devices.[60]

Heavy-duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (66 FR 5002). Published January 2001, the EPA established a comprehensive national control program to regulate the heavy-duty vehicle and its fuel as a single system. As part of this program, new emission standards took effect in model year 2007, and apply to heavy-duty highway engines and vehicles. These standards are based on the use of high-efficiency catalytic exhaust emission control devices or comparably effective advanced technologies.[61]

New Source Performance Standards (NSPS) for Stationary Engines. Nonroad diesel engines are used in excavators and other construction equipment, farm tractors and other agricultural equipment, heavy forklifts, airport ground service equipment, and utility equipment such as generators, pumps, and compressors.[62] EPA has adopted multiple tiers of emission standards, including reducing emissions from nonroad diesel engines by integrating engine and fuel controls as a system. To meet these Tier 4 emission standards, engine manufacturers will produce new engines with advanced emission control technologies.[63]

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59 U.S. Environmental Protection Agency. 2008. *Control of Emissions of Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder*. Available online at: https://www.govinfo.gov/content/pkg/FR-2008-06-30/pdf/R8-7999.pdf, accessed August 23, 2019.

60 U.S. Environmental Protection Agency. 2004. *Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel*. Available online at: https://www.govinfo.gov/content/pkg/FR-2004-06-29/pdf/04-11293.pdf, accessed August 23, 2019.

61 U.S. Environmental Protection Agency. 2001. *Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. Available online at: https://www.govinfo.gov/content/pkg/FR-2001-01-18/pdf/01-2.pdf, accessed August 23, 2019.

62 U.S. Environmental Protection Agency. *Regulations for Emissions from Heavy Equipment with Compression-Ignition (Diesel) Engines*. Available online at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-heavy-equipment-compression, accessed November 13, 2018.

63 Ibid.

3.3.3.2 State

California Clean Air Act of 1988

The California CAA of 1988 (Chapter 1568, Statutes of 1988) requires all air pollution control districts in the state to aim to achieve and maintain state ambient air quality standards for ozone, carbon monoxide, and nitrogen dioxide by the earliest practicable date and to develop plans and regulations specifying how the districts will meet this goal. There are no planning requirements for the state PM10 standard. The CARB, which became part of the California Environmental Protection Agency (Cal/EPA) in 1991, is responsible for meeting state requirements of the federal CAA, administrating the California CAA, and establishing the CAAQS. The California CAA, amended in 1992, requires all AQMDs in the state to achieve and maintain the CAAQS. The CAAQS are generally stricter than national standards for the same pollutants, but there is no penalty for nonattainment. California has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards.[64]

California Ambient Air Quality Standards

The federal CAA permits states to adopt additional or more protective air quality standards if needed. California has set standards for certain pollutants, such as particulate matter and ozone, which are more protective of public health than respective federal standards. California has also set standards for some pollutants that are not addressed by federal standards.[65] The state standards for ambient air quality are summarized in **Table 3.3-8, California Ambient Air Quality Standards**.

64 Sacramento Metropolitan Air Quality Management District. *State Planning*. Available online at: http://www.airquality.org/businesses/air-quality-plans/state-planning, accessed September 3, 2019.

65 CARB. *California Ambient Air Quality Standards (CAAQS)*. Available online at: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards, accessed August 23, 2019.

Table 3.3-8
California Ambient Air Quality Standards

Pollutant		Averaging Time	Level
Carbon monoxide		8 hours	9 ppm
		1 hour	20 ppm
Lead		30-day average	1.5 μg/m^3
Nitrogen dioxide		1 hour	0.180 ppm
		Annual	0.030 ppm
Ozone		8 hours	0.070 ppm
		1 hour	0.09 ppm
Particulate matter	PM2.5	Annual	12 μg/m^3
	PM10	24 hours	50 μg/m^3
		Annual	20 μg/m^3
Sulfur dioxide		1 hour	0.25 ppm
		24 hours	0.04 ppm
Sulfates		24 hours	25 μg/m^3
Hydrogen sulfide		1 hour	0.03 ppm
Vinyl chloride		24 hours	0.01 ppm

Source:
California Air Resources Board. 2016. Ambient Air Quality Standards. May. Available online at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed November 16, 2018.

California Health and Safety Code

Under the California Health and Safety Code, Division 26 (Air Resources), the ARB is authorized to adopt regulations to protect public health and the environment through the reduction of TACs and other air pollutants with adverse health effects. ARB has promulgated several mobile and stationary source airborne toxic control measures (ATCMs) pursuant to this authority. For instance, effective as of July 2003, ARB approved an ATCM that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns (13 CCR Chapter 10 Section 2480). This ATCM is intended to reduce diesel PM and other TACs and air pollutants from heavy-duty motor vehicle exhaust. It applies to school buses, transit buses, school activity buses, youth buses, general public paratransit vehicles, and other commercial motor vehicles. This ATCM focuses on reducing public exposure to diesel PM and other TACs, particularly for children riding in and playing near school buses and other commercial motor vehicles, who are disproportionately exposed to pollutants from these sources.[66] In addition, effective February 2005, the ARB approved an ATCM to limit the idling of diesel-fueled commercial

66 CARB. *Amended Regulation: Airborne Toxic Control Measure to Limit School Bus Idling at Schools*. Available online at: https://ww3.arb.ca.gov/toxics/sbidling/sbvidling.pdf, accessed August 23, 2019.

motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds, regardless of the state or country in which the vehicle is registered (13 CCR Chapter 10 Section 2485).[67]

Toxic Air Contaminant Identification and Control Act

The Toxic Air Contaminant Identification and Control Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) created the California Air Toxics Program in 1983. It established a two-step process of risk identification and risk management to address potential health effects associated with public exposure to toxic substances in the air. In the risk identification step, CARB and the OEHHA determine if a substance should be formally identified, or "listed," as a TAC in California. Since inception of the program, a number of such substances have been identified and listed. In 1993, legislative amendments were enacted for the program to identify the 189 federal hazardous air pollutants (HAPs) as TACs.

In the risk management step, CARB reviews emission sources of an identified TAC to determine whether regulatory action is needed to reduce the risk. Based on results of that review, CARB has promulgated a number of airborne toxic control measures (ATCMs), both for mobile and stationary sources. In 2004, CARB adopted an ATCM to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel PM and other TACs. The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given time. These diesel-related measures are critical in reducing the statewide cancer risk and creating healthier communities.[68]

CARB Air Toxics "Hot Spots" Information and Assessment Act of 1987

The California Air Toxics Program is supplemented by the Air Toxics "Hot Spots" program, which became law (AB 2588, Statutes of 1987) in 1987. In 1992, the AB 2588 program was amended by Senate Bill 1731 to require facilities that pose a significant health risk to the community to perform a risk reduction audit and reduce their emissions through implementation of a risk management plan. Under this program, which is required under the Air Toxics "Hot Spots" Information and Assessment Act (Section 44363 of the California Health and Safety Code), facilities are required to report their air toxics emissions, assess health risks, and notify nearby residents and workers of significant risks when present.[69] In March 2015, the OEHHA adopted "The Air Toxics Hot Spots Program Guidance Manual for Preparation of

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67 CARB. *§2485. Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling*. Available online at: https://ww3.arb.ca.gov/msprog/truck-idling/13ccr2485_09022016.pdf, accessed August 23, 2019.

68 CARB. 2019. *California Air Toxics Program – Background*. Available online at: https://ww3.arb.ca.gov/toxics/background.htm, accessed August 23, 2019.

69 Ibid.

Health Risk Assessments" in accordance with the Health and Safety Code, Section 44300. The Final Guidance Manual incorporates the scientific basis from three earlier developed Technical Support Documents to assess risk from exposure to facility emissions. The 2015 OEHHA Final Guidance has key changes including greater age sensitivity in particular for children, decreased exposure durations, and higher breathing rate profiles. Because cancer risk could be up to three times greater using this new guidance, it may result in greater mitigation requirements, more agency backlog, and increased difficulty in getting air permits. Regardless of the change in calculation methodology, actual emissions and cancer risk within South Coast Air Basin has declined by more than 50 percent since 2005. [70]

The CARB provides a computer program, the Hot Spots Analysis and Reporting Program (HARP), to assist in a coherent and consistent preparation of an HRA. HARP2, an update to HARP, was released in March 2015. HARP2 has a more refined risk characterization in HRA and CEQA documents and incorporates the 2015 OEHHA Final Guidance. [71]

Multiple Air Toxics Exposure Study (MATES-IV)

To date, the most comprehensive study of air toxics in the South Coast Air Basin (SCAB) is the Multiple Air Toxics Exposure Study (MATES-IV), conducted by Southern California Air Quality Management District (SCAQMD) in 2015. MATES combines monitoring of ambient air toxics, emissions inventories, and computer modeling to estimate the cancer risk from air pollution. The monitoring program measured over 30 air pollutants, including both gases and particulates. SCAQMD's MATES IV found that the average cancer risk from air pollution across the region declined from 1,194 in 1 million during MATES III in 2005 to 418 in 1 million in 2012–2013 using similar methods of analysis. The risk reduction follows a trend of declining toxic emissions in the region since the first MATES study was conducted in 1987. MATES IV found that mobile sources are responsible for 90 percent of the risk.[72]

The SCAQMD proposes the MATES V study as a follow up to the MATES IV study. The purpose of MATES V fixed monitoring is to characterize long-term regional air toxics levels in residential and

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70 OEHHA. 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines*. Available online at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed August 23, 2019.

71 CARB. *Hotspots Analysis and Reporting Program (HARP)*. Accessed online at: https://ww3.arb.ca.gov/toxics/harp/harp.htm, accessed August 23, 2019.

72 SCAB. May 2015. *Final Report Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES-IV*. Available online at: https://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7, accessed August 23, 2019.

commercial areas. The MATES V study proposes to study air toxics for a one-year period at ten fixed sites beginning in January 2019.[73]

Senate Bill 656 (Chapter 738, Statues of 2003)

In 2003, the Legislature enacted Senate Bill (SB) 656 (Chapter 738, Statutes of 2003), codified as Health and Safety Code Section 39614, to reduce public exposure to PM10 and PM2.5. SB 656 required ARB, in consultation with local air pollution control and air quality management districts (air districts), to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be employed by ARB and the air districts to reduce PM10 and PM2.5 (collectively referred to as PM).[74]

The legislation established a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for PM2.5, and provided new direction on PM reductions in those areas not subject to federal requirements for PM. Measures adopted as part of SB 656 complement and support those required for federal PM2.5 attainment plans, as well as for State ozone plans. This ensures continuing focus on PM reduction and progress towards attaining California's more health protective standards. This list of air district control measures was adopted by the ARB on November 18, 2004. ARB also developed a list of State PM control measures for mobile and stationary sources, including measures planned for adoption as part of ARB's Diesel Risk Reduction Plan. The lists are at the following web site: http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm.

California Air Resources Board Mobile Source Programs

Emission Reduction Plan for Ports and Goods Movement

The CARB approved the 2006 Emission Reduction Plan for Ports and Goods Movement in California. The Plan is an essential component of California's effort to reduce community exposure to air pollution and to meet new federal air quality standards for ozone and fine particulate matter (PM2.5). The plan's goals are to:[75]

1. Reduce total statewide international and domestic goods movement emissions to the greatest extent possible and at least back to 2001 levels by year 2010.

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73 South Coast Air Quality Management District. *MATES V Multiple Air Toxics Exposure Study*. Available online at: http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v, accessed September 30, 2019.

74 California Legislative Information. 2003. *Senate Bill No. 656, Chapter 738*.

75 California Air Resources Board. 2006.. *Emission Reduction Plan for Ports Goods Movement in California*. April. Available online at: https://www.arb.ca.gov/planning/gmerp/plan/final_plan.pdf, accessed November 19, 2018.

2. Reduce the statewide diesel PM health risk from international and domestic goods movement 85 percent by year 2020.

3. Reduce NO_x emissions from international goods movement in the South Coast 30 percent from projected year 2015 levels, and 50 percent from projected year 2020 levels based on preliminary targets for attaining federal air quality standards.

4. Apply the emission reduction strategies for ports and goods movement statewide to aid all regions in attaining air quality standards.

5. Make every feasible effort to reduce localized risk in communities adjacent to goods movement facilities as expeditiously as possible.

Goods Movement Emission Reduction Program

In June 2015, CARB released the Proposition 1B: Goods Movement Emission Reduction Program Final 2015 Guidelines for Implementation. This program is designed to reduce diesel exhaust emissions from trucks, locomotives, ships, harbor craft, and cargo handling equipment. The guidelines shall include, at a minimum, all of the following: [76]

- An application process for funds, and any limits on administration costs.
- Requirements that local agencies identify the useful life of the project and project delivery milestones as part of the application process.
- Criteria for selection of local and State agency projects and equipment projects.
- Requirements for match funding.
- The method by which ARB will consider the air basin's status in achieving State and federal air quality standards.
- Requirements that grant agreements between ARB and local agencies, and interagency agreements with other State agencies, identify project milestones, and remedies for failure to meet project milestones.

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76 California Air Resources Board. 2015. *Proposition 1B: Goods Movement Emission Reduction Program 2015 Guidelines for Implementation.* June. Available online at: https://ww3.arb.ca.gov/bonds/gmbond/docs/prop_1b_goods_movement_2015_program_guidelines_for_implementation.pdf, accessed August 23, 2019.

- Accountability and auditing requirements, including provisions for Program reviews or fiscal audits of project expenditures and outcomes.

ARB Staff shall evaluate the progress of the Program and any changes needed to improve its effectiveness, plus advances in technology and updated equipment costs that create a need to revise the list of equipment project options. These guidelines are designed and intended to effectuate the provisions of SB 88, AB 201, and AB 892.[77]

CARB Small Off-road Engine (SORE) Exhaust Emission Standards

SORE engines include off-road spark-ignition engines that produce 19 kW gross power or less (less than 25 horsepower), including lawn and garden, industrial, logging, airport ground support, and commercial utility equipment; golf carts; and specialty vehicles. These emission standards apply to HC, NO_x, CO, and PM emissions with increasingly stricter standards from 1995 to 2013.[78]

CARB Off-road Compression-Ignition Diesel Engine Exhaust Emission Standards

These engines include new compression-ignition engines (a.k.a. diesel engines) that are found in a wide variety of off-road applications such as farming, construction, and industrial. Some familiar examples include tractors, excavators, dozers, scrapers, portable generators, transport refrigeration units (TRUs), irrigation pumps, welders, compressors, scrubbers, and sweepers. This category, however, does not include locomotives, commercial marine vessels, marine engines over 37 kW, or recreational vehicles.[79]

CARB On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation

This regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. In 2014, to void the flexibility options provided in the 2014 amendments to the Truck and Bus regulation, John R.

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77 Ibid.

78 California Air Resources Board. *Small Off-Road Engine Exhaust Emission Standards*. Available online at: https://www.arb.ca.gov/msprog/offroad/sore.pdf, accessed November 19, 2018.

79 California Air Resources Board. *New Off-Road Compression Ignition (Diesel) Engines and Equipment*. Available online at: https://www.arb.ca.gov/msprog/offroad/orcomp/orcomp.htm, accessed November 19, 2018.

Lawson Rock and Oil of Fresno and the California Trucking Association sued the California Air Resources Board. On January 31, 2018 the court ruled to void the 2014 amendments.[80]

CARB Smartway/Phase I Heavy Duty Vehicle Greenhouse Gas Regulation

This regulation applies to GHG emissions from heavy-duty trucks and engines sold in California. It establishes GHG emissions limits on truck and engine manufacturers and harmonizes with the recently adopted U.S. EPA rule for new trucks and engines nationally. Existing heavy-duty vehicle regulations in California include engine criteria emission standards, tractor-trailer GHG requirements to implement SmartWay strategies (i.e., the Heavy-Duty Tractor-Trailer Greenhouse Gas Regulation), and in-use fleet retrofit requirements such as the Truck and Bus Regulation.[81] Executive Order (EO) B-32-15 and Sustainable Freight Action Plan

On July 17, 2015, Governor Brown issued Executive Order B-32-15, which directs the Secretary of the California State Transportation Agency, the Secretary of Cal/EPA, and the Secretary of the Natural Resources Agency to lead other relevant state departments in developing an integrated action plan that will improve freight efficiency, transition to zero-emission technologies, and increase competitiveness of California's freight system. The plan is informed by existing state agency strategies, including the California Freight Mobility Plan, Sustainable Freight Pathways to Zero and Near-Zero Emissions, and the Integrated Energy Policy Report.[82]

The Action Plan is intended to integrate investments, policies, and programs across several State agencies to help realize a singular vision for California's freight transport system. This integrated approach will serve to coordinate State agency priorities and timing on actions to influence freight transportation and energy infrastructure, vehicle and equipment technologies, and facility and operations efficiency, rather than the traditional and separate planning efforts for transportation, environment, and energy. The Action Plan includes recommendations on:[83]

- A long-term 2050 Vision and Guiding Principles for California's future freight transport system
- Targets for 2030 to guide the State toward meeting the Vision

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80 California Air Resources Board. *Truck and Bus Regulation*. Available online at: https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation, accessed September 3, 2019. https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm, accessed November 19, 2018.

81 California Air Resources Board. *Phase 1 GHG*. Available online at: https://www.arb.ca.gov/msprog/onroad/phaselghg/phaselghg.htm, accessed November 19, 2018.

82 California Department of Transportation. *The California Sustainable Freight Action Plan*. Available online at: http://dot.ca.gov/hq/tpp/offices/ogm/cs_freight_action_plan/main.html, accessed November 19, 2018.

83 Ibid.

- Opportunities to leverage State freight transport system investments
- Actions to initiate over the next five years to make progress towards the Targets and the Vision
- Pilot projects to achieve on-the-ground progress in the near-term
- Additional concepts for further exploration and development, if viable

Diesel Risk Reduction Plan

In August 1998, the ARB identified particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants, based on data linking diesel PM emissions to increased risks of lung cancer and respiratory disease. Following the identification process, the ARB was required to determine if there was a need for further control, which led to creation of the Diesel Advisory Committee to assist in the development of a risk management guidance document and risk reduction plan. In September 2000, the ARB adopted the Diesel Risk Reduction Plan, which recommends control measures to reduce the risks associated with diesel PM and achieve a goal of 75 percent diesel PM reduction by 2010 and 85 percent by 2020.[84]

Specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles will be evaluated and developed. The goal of these regulations is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

California Wellness Plan (2014)

The California Department of Public Health published a statewide Wellness Plan in 2014. The Plan acknowledges that many factors contribute to an individual's health. These factors include the physical environment (housing, neighborhood, healthy food access and environment), educational attainment and employment, economic status, social support, social norms and attitudes, culture, literacy, race/ethnicity. The physical environment is also an indicator of exposure to toxins and transportation where individuals are affected on a daily basis by the air quality of their surroundings.[85]

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84 CARB. 2000. *Final Diesel Risk Reduction Plan with Appendices*. Available online at: https://ww3.arb.ca.gov/diesel/documents/rrpapp.htm, accessed August 23, 2019.

85 California Department of Public Health. 2014. *California Wellness Plan 2014*. February. Available online at: https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/CDCB/CDPH%20Document%20Library/CDPH-CAWellnessPlan2014_FINAL%202-27-14_PDF%204.3%20MB.pdf, accessed November 27, 2018.

CARB Air Quality and Land Use Handbook

In April 2005, the California Air Resources Board published the Air Quality and Land Use Handbook as a informational and advisory guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. Reducing diesel particulate emissions is one of CARB's highest public health priorities and the focus of a comprehensive statewide control program that is reducing diesel PM emissions each year. This document highlights the potential health impacts associated with proximity to air pollution sources so planners explicitly consider this issue in planning processes. The Air Quality and Land Use Handbook includes advisories on where to site new sensitive land uses. Regarding freeways and high-traffic roads, CARB states, "[A]void siting new sensitive land uses within 500 feet of a freeway urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day."[86]

3.3.3.3 Local

The SCAG region is comprised of four air basins and five air districts. The four air basins are SCAB, MDAB, SSAB, and the Ventura County portion of SCCAB. The five air districts are MDAQMD, AVAQMD, VCAPCD, SCAQMD, and ICAPCD.

MDAQMD Federal 75 ppb Ozone Attainment Plan (Western Mojave Desert Nonattainment Area)

The Western Mojave Desert nonattainment area (as defined in 40 CFR 81.305) was designated nonattainment for the NAAQS for ozone by USEPA effective on July 20, 2012. The MDAQMD has experienced ambient ozone concentrations in excess of the 8-hour ozone NAAQS. This plan (1) demonstrates that the MDAQMD will meet the primary required Federal ozone planning milestone, attainment of the 75 ppb 8-hour ozone NAAQS, by July 2027; (2) presents the progress the MDAQMD will make towards meeting all required ozone planning milestones; and (3) discusses the 2015 70 ppb 8-hour ozone NAAQS, preparatory to an expected non-attainment designation for the new NAAQS.[87]

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86 California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Available online at: https://ww3.arb.ca.gov/ch/handbook.pdf, accessed October 3, 2019.

87 Mojave Desert Air Quality Management District. 2016. *MDAQMD Federal 75 ppb Ozone Attainment Plan (Western Mojave Desert Nonattainment Area).* Available online at: https://www.arb.ca.gov/planning/sip/planarea/wmdaqmp/2016sip_mdplan.pdf, accessed November 27. 2018.

AVAQMD Federal 75 ppb Ozone Attainment Plan (2017)

The AVAQMD has adopted a single attainment plan for ozone. The AVAQMD Federal 8-hour Ozone Attainment Plan, adopted in March 2017, demonstrates that the AVAQMD will meet the primary required federal ozone planning milestones by June 2027, presents the progress the AVAQMD will make towards meeting all required ozone planning milestones, and discusses the 75 part per million 8-hour ozone NAAQS.[88]

VCAPCD Air Quality Management Plan

The 2016 Ventura County Air Quality Management Plan (AQMP) presents Ventura County's: 1) strategy to attain the 2008 federal 8-hour ozone standard; 2) attainment demonstration for the federal 8-hour ozone standard; and, 3) reasonable further progress demonstration for the federal 8-hour ozone standard.[89]

SCAQMD 2016 Air Quality Management Plan (AQMP)

The 2016 AQMP seeks to achieve multiple goals in partnership with other entities promoting reductions in criteria pollutant, greenhouse gases, and toxic risk, as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP includes the integrated strategies and measures needed to meet the National Ambient Air Quality Standards (NAAQS). SCAQMD recently approved on March 3, 2017 the 2016 AQMP that demonstrates attainment of the 1-hr and 8-hr ozone NAAQS as well as the latest 24-hr and annual PM2.5 standards.[90]

ICAPCD Air Plans

At a public meeting held on May 25, 2018, CARB approved the Imperial County 2018 Annual PM2.5 State Implementation Plan (SIP). At a public meeting held on November 13, 2018, the Imperial County 2018 Redesignation Request and Maintenance Plan for PM10. SIPs in the region are utilized to demonstrate

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88 Antelope Valley Air Quality Management District. 2017. *Federal 75 ppb Ozone Attainment Plan (Western Mojave Desert Attainment Plan*. Available online at: http://www.scag.ca.gov/programs/Documents/AQMPSIP/AVAQMD_2017SIP.pdf, accessed August 29, 2019.

89 Ventura County Air Pollution Control District. 2016. *2016 Ventura County Air Quality Management Plan*. Available online at: http://www.vcapcd.org/pubs/Planning/AQMP/2016/Final/Final-2016-Ventura-County-AQMP.pdf, accessed November 27, 2018.

90 South Coast Air Quality Management District. 2016. *Air Quality Management Plan (AQMP)*. Available online at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan, accessed November 27, 2018.

that the County is in attainment of previous PM goals, as well as to set new emissions reduction guidelines, goals, and methodologies.[91]

Fugitive Dust Regulations: SCAQMD, AVAQMD, and MDAQMD Rule 403; VCAPCD Rule 55, Fugitive Dust; ICAPCD Rule 800, ICAPCD Rule 801

The SCAQMD, AVAQMD, and MDAQMD have adopted Rule 403, Fugitive Dust, which requires the implementation of best available fugitive dust control measures during construction and operational activities capable of generating fugitive dust emissions from on-site earth-moving activities, construction/demolition activities, and mobile equipment traveling on paved and unpaved roads.[92] Similarly, VCAPCD has adopted Rule 55, Fugitive Dust,[93] and ICAPCD has adopted Rule 800, General Requirements for Control of Fine Particulate Matter (PM10),[94] and Rule 801, Construction and Earthmoving Activities, to reduce fugitive dust.[95]

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91 California Air Resources Board. 2018. *Imperial County Air Quality Management Plans*. Available at: https://www.arb.ca.gov/planning/sip/planarea/imperial/imperialsip.htm, accessed November 27, 2018.

92 AQMD. *Rule 403. Fugitive Dust.* Available online at: https://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-403.pdf?sfvrsn=4, accessed August 23, 2019.

93 VCAPCD. 2008. *Rule 55 – Fugitive Dust*. Available online at: http://www.vcapcd.org/Rulebook/Reg4/RULE%2055.pdf, accessed August 23, 2019.

94 ICAPCD. 2012. *Rule 800 General Requirements for Control of Fine Particulate Matter (PM-10).* Available online at: https://www.co.imperial.ca.us/AirPollution/RULEBOOK/RULES/1RULE800.pdf, accessed August 23, 2019.

95 ICAPCD. 2005. *Rule 801 Construction and Earthmoving Activities*. Accessed online at: https://www.co.imperial.ca.us/AirPollution/RULEBOOK/RULES/1RULE801.pdf, accessed August 23, 2019.

SCAQMD, AVAQMD Rule 1401;[96] [97] MDAQMD Rule 1320;[98] VCAPCD Rule 36;[99] ICAPCD Rule 207[100] and SCAQMD, AVAQMD Rule 1402;[101,102] MDAQMD Rule 1520;[103] VCAPCD Rule 73;[104] ICAPCD Rule 403[105]

The SCAQMD has adopted two rules for TACs to limit cancer and non-cancer health risks from facilities located within its jurisdiction. Rule 1401, New Source Review of Toxic Air Contaminants, regulates new or modified facilities; and Rule 1402, Control of Toxic Air Contaminants from Existing Sources, regulates facilities that are already in operation. Rule 1402 incorporates requirements of the AB 2588 program, including implementation of risk reduction plans for significant risk facilities. In 2015, SCAQMD revised Rule 1401 and 1402 to include more equipment types and industry categories. Under the revised Rule 1401, no permit would be issued for new and modified equipment unless the cancer risk is less than ten in a million using Toxics Best Available Control Technology (TBACT) or less than one in a million without TBACT or if near a school. For Rule 1402, existing facilities under AB 2588 must reduce facility-wide risk if maximum individual cancer risk is greater than 25 in a million. AVAQMD, MDAQMD, VCAPCD, and ICAPCD have adopted similar rules to limit health risks from toxic air contaminants from new, modified, and existing sources.

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96 SCAQMD. 2017. *Rule 1401. New Source Review of Toxic Air Contaminants*. Accessed online at: http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1401.pdf, accessed August 23, 2019.

97 AVAPCD. 2006. *Rule 1401 New Source Review for Toxic Air Contaminants*. Available online at: https://avaqmd.ca.gov/files/8e1294bb5/AV1401.pdf, accessed August 23, 2019.

98 CARB. 2016. *Rule 1320 New Source Review for Toxic Air Contaminants*. Available online at: https://ww3.arb.ca.gov/drdb/moj/curhtml/r1320.pdf, accessed August 23, 2019.

99 VCAPCD. 1998. *Rule 36 – New Source Review – Hazardous Air Pollutants*. Available online at: http://www.vcapcd.org/Rulebook/Reg2/RULE%2036.pdf, accessed August 23, 2019.

100 ICAPCD. 2018. *Rule 207 New and Modified Stationary Source Review*. Available online at: https://ww3.arb.ca.gov/drdb/imp/curhtml/r207.pdf, accessed August 23, 2019.

101 SCAQMD. *Rule 1402. Control of Toxic Air Contaminants from Existing Sources*. Available online at: http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1402.pdf, accessed August 23, 2019.

102 AVAQMD. 2002. *Rule 1402 Control of Toxic Air Contaminants from Existing Sources*. Available online at: https://avaqmd.ca.gov/files/c9aa6c271/AV1402.pdf, accessed August 23, 2019.

103 MDAQMD. 2001. *Rule 1520 Control of Toxic Air Contaminants from Existing Sources*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=504, accessed August 23, 2019.

104 VCAPCD. 2008. *Rule 73 – National Emission Standards for Hazardous Air Pollutants (NESHAPS)*. Available online at: http://www.vcapcd.org/Rulebook/Reg4/RULE%2073.pdf, accessed August 23, 2019.

105 IPAPCD. 2004. *Rule 403 – General Limitations on the Discharge of Contaminants*. Available online at: https://ww3.arb.ca.gov/drdb/imp/curhtml/r403.pdf, accessed August 23, 2019.

3.3.4 ENVIRONMENTAL IMPACTS

3.3.4.1 Thresholds of Significance

The impacts related to air quality from the proposed project would be considered significant if they would exceed the following significance criteria, in accordance with Appendix G of the *State CEQA Guidelines*:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Air Quality Thresholds for Criteria Air Pollutants

As previously discussed, the SCAG region is located within the SCAQMD, VCAPCD, MDAQMD, AVAPCD, and ICAPCD. Per *CEQA Guidelines* §15064.7 each air district is encouraged to develop and publish significance thresholds that the agency can use in the determination of the significance of environmental effects. Each of the air district's significance thresholds are discussed below.[106] These thresholds are generally recommended by each air district to be used to determine if further discussion of air quality impacts is needed in an environmental document. If emissions of criteria pollutants are below these levels, then air quality impacts are generally considered to be less than significant.

South Coast Air Quality Management District Thresholds

SCAQMD prepared air quality significance thresholds to compare the mass daily emissions in pounds per day (lbs/day) from construction and operation for NOx, VOC, PM10, PM2.5, SOx, CO, and Lead.

106 CEQA Guidelines §15064.7.

SCAQMD's thresholds are summarized in **Table 3.3-9, SCAQMD Air Quality Significance Thresholds**.[107]

Table 3.3-9
SCAQMD Air Quality Significance Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NOx	100	55
VOC	75	55
PM10	150	150
PM2.5	55	55
Sox	150	150
CO	550	550
Lead	3	3

Source:
South Coast Air Quality Management District. 2019. South Coast AQMD Air Quality Significance Thresholds. Available online at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, accessed October 2, 2019.

Ventura County Air Pollution Control District Thresholds

VCAPCD published the Ventura County Air Quality Assessment Guidelines in October 2003 that include the District's recommended significance thresholds. According to the Guidelines, operational ROG and NOx emissions have a threshold of 5 pounds per day in the Ojai Planning Area and 25 pounds per day in the remainder of Ventura County.[108] For all other criteria air pollutants, the District uses the ambient air quality standards as thresholds.[109]

Mojave Desert Air Quality Management District Thresholds

MDAQMD published the *MDAQMD CEQA and Federal Conformity Guidelines* in August 2016 that includes the District's recommended air quality significance thresholds for CO, NOx, VOC, SOx, PM10, PM2.5, Hydrogen Sulfide (H_2S), and Lead in mass daily and annual emissions. The MDAQMD and

107 South Coast Air Quality Management District 2019. South Coast AQMD Air Quality Significance Thresholds. Available online at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, accessed October 2, 2019.

108 The City of Simi Valley, within the VCAPCD, uses a threshold of 13.7 tons/year for ROG and NOx emissions.

109 Ventura County Air Pollution Control District. 2003. *Ventura County Air Quality Assessment Guidelines*. Available online at: http://www.vcapcd.org/pubs/Planning/VCAQGuidelines.pdf, accessed October 2, 2019.

AVAPCD have set the same annual and daily thresholds, which are summarized in **Table 3.3-10, MDAQMD and AVAPCD Air Quality Significance Thresholds**.[110]

Antelope Valley Air Pollution Control District Thresholds

AVAPCD published the *AVAPCD CEQA and Federal Conformity Guidelines* in August 2016 that includes the District's recommended air quality significance thresholds for CO, NOx, VOC, SOx, PM10, PM2.5, Hydrogen Sulfide (H_2S), and Lead in mass daily and annual emissions.[111] **Table 3.3-10** summarizes the air quality thresholds for both the AVAPCD and MDAQMD, as their annual and daily thresholds are the same.

Table 3.3-10
MDAQMD and AVAPCD Air Quality Significance Thresholds

Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
CO	100	548
NOx	25	137
VOC	25	137
Sox	25	137
PM10	15	82
PM2.5	12	65
H_2S	10	54
Lead	0.6	3

Source:
Mojave Desert Air Quality Management District. 2016. MDAQMD CEQA and Federal Conformity. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=192, accessed October 2, 2019.
Antelope Valley Air Quality Management District. 2016. AVAQMD CEQA and Federal Conformity Guidelines. Available online at: https://avaqmd.ca.gov/files/e5b34d385/AV+CEQA+Guides+2016.pdf, accessed October 2, 2019.

Imperial County Air Pollution Control District Thresholds

ICAPCD prepared their final *CEQA Air Quality Handbook* in December 2017, which includes operational air quality thresholds for Tier I and Tier II projects.[112] Tier I projects do not exceed thresholds and, as a result, would not be required to prepare a Comprehensive Air Quality Analysis as emissions would be

110 Mojave Desert Air Quality Management District. 2016. *MDAQMD CEQA and Federal Conformity*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=192, accessed October 2, 2019.

111 Antelope Valley Air Pollution Control District. 2016. *AVAPCD CEQA and Federal Conformity Guidelines.* Available online at: https://avaqmd.ca.gov/files/e5b34d385/AV+CEQA+Guides+2016.pdf, accessed October 2, 2019.

112 ICAPCD recommends that individual projects qualitatively address construction emissions and are required to implement the District's standard mitigation measures for constriction equipment and fugitive PM2.5.

less than significant. Tier II projects have the potential to exceed these thresholds and would be required to implement all standard and discretionary mitigation measures and must, at a minimum, prepare a Comprehensive Air Quality Analysis.[113] **Table 3.3-11, ICAPCD Operational Air Quality Significance Thresholds,** summarizes the District's operational thresholds.

Table 3.3-11
ICAPCD Operational Air Quality Significance Thresholds

Pollutant	Tier I	Tier II
NOx and ROG	Less than 137 lbs/day	137 lbs/day and greater
PM10 and SOx	Less than 150 lbs/day	150 lbs/day and greater
CO and PM2.5	Less than 550 lbs/day	550lbs/day and greater
Level of Significance	Less than Significant	Significant Impact

Source:
Imperial County Air Pollution Control District. 2017. CEQA Air Quality Handbook. Available online at: https://www.co.imperial.ca.us/AirPollution/PlanningDocs/CEQAHandbk.pdf, accessed October 2, 2019.

Air Quality Threshold for Toxic Air Contaminants

TACs are hazardous air pollutants that may reasonably cause cancer, development effects, or other serious or irreversible acute or chronic health effects in humans. In the analysis below, DPM, a type of TAC, is evaluated to determine the cancer risk posed to sensitive groups in the SCAG region. The SCAQMD,[114] VCAPCD,[115] MDAQMD,[116] and AVAPCD[117] have all recommended a significance threshold of 10 in one million.[118] As a result, if an individual's probability of contracting cancer over

113 Imperial County Air Pollution Control District. 2017. *CEQA Air Quality Handbook*. Available online at: https://www.co.imperial.ca.us/AirPollution/PlanningDocs/CEQAHandbk.pdf, accessed October 2, 2019.

114 South Coast Air Quality Management District 2019. South Coast AQMD Air Quality Significance Thresholds. Available online at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, accessed October 2, 2019.

115 Ventura County Air Pollution Control District. 2003. *Ventura County Air Quality Assessment Guidelines*. Available online at: http://www.vcapcd.org/pubs/Planning/VCAQGuidelines.pdf, accessed October 2, 2019.

116 Mojave Desert Air Quality Management District. 2016. *MDAQMD CEQA and Federal Conformity*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=192, accessed October 2, 2019.

117 Antelope Valley Air Pollution Control District. 2016. *AVAPCD CEQA and Federal Conformity Guidelines.* Available online at: https://avaqmd.ca.gov/files/e5b34d385/AV+CEQA+Guides+2016.pdf, accessed October 2, 2019.

118 IPAPCD does not have a quantified cancer risk threshold, instead individual projects that meet Tier II would be required to prepare a health risk assessment which should be prepared in consultation of APAPCD staff.

their lifetime **increases** by 10 or more chances in one million **as a result of a project's emissions**, the project would have a significant impact.[119]

3.3.4.2 Methodology

This section describes the air quality in the SCAG region, discusses the potential impacts of Connect SoCal on air quality, identifies mitigation measures for potential impacts, and evaluates residual impacts in accordance with Appendix G of the *CEQA Guidelines*. Air quality within the SCAG region was evaluated at a programmatic level of detail, in relation to the Air Quality Management Plans for the five air quality districts and the general plans of the six counties and 191 cities within the SCAG region, a review of published and unpublished literature germane to the SCAG region, as well as a review of SCAG's 2016 RTP/SCS PEIR.[120] This analysis focuses on air pollution from on-road motor vehicles in two perspectives: daily emissions and pollutant concentrations. The analysis is based upon air quality modeling, performed by SCAG, using EMFAC2014.[121] Air quality modeling that produces criteria pollutant emissions for the SCAG region and by county is based on SCAG's transportation modeling and network built for the existing conditions and the Plan.

The methodology for determining the significance of air quality impacts compares existing conditions to the expected future air quality with the Plan, as required in CEQA Section 15126.2(a). The criteria above were applied to compare current conditions to the 2045 Plan conditions.

Analysis of the potential air quality impacts of the Plan was conducted based on SCAG's Regional Travel Demand Model, evaluation of relevant AQMPs/SIPs, and a mobile-source health risk analysis (HRA) (**Appendix 3.3**) to determine whether or not there will be a significant impact. The analysis of cancer risk was evaluated using the United States Environmental Protection Agency (U.S. EPA) AERMOD dispersion model and the Hot Spots Analysis and Reporting Program Version 2 (HARP2) Risk Assessment Standalone Tool (RAST) model, consistent with the guidance provided by the California Office of Environmental Health Hazard Assessment (OEHHA) for Human Health Risk Assessment (HRA) based on DPM emission estimates from CARB's EMFAC2014 model. EMFAC2014 was developed

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119 *See e.g.*, SCAQMD Air Quality Significance Thresholds, http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, accessed November 11, 2019.

120 Southern California Association of Governments. 2016. *Final Program Environmental Report for the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy.* Available online at: http://scagrtpscs.net/Pages/FINAL2016PEIR.aspx, accessed March 25, 2019.

121 EMFAC 2014 model was the most recent, EPA-approved version at the time SCAG released the Conformity Assumptions for this analysis (EMFAC2017 had not been approved). Additionally, EMFAC2017 had not been approved at the time of releasing the NOP. On August 15, 2019, EPA approved EMFAC2017 for use; however, EPA provided a two-year grace period in which SCAG is not required to use EMFAC2017. The grace period runs through August 16, 2021.

in order to estimate emissions from mobile sources and includes County-specific data, such as fleet mix in order to estimate criteria air pollutants. See **Appendix 3.3, Health Risk Assessment Technical Report,** for more detail.

In *California Building Industry Association (CBIA) vs. Bay Area Air Quality Management District (BAAQMD)*, the California Supreme Court ruled that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project's future users or residents unless the proposed project risks exacerbating those environmental hazards or conditions that already exist.[122] Therefore, emissions from the existing transportation network, including freeways, are generally not considered impacts under CEQA unless the project exacerbates the existing environmental conditions.[123] Since Connect SoCal includes transportation projects, including freeway improvements, that could occur within 500 feet of sensitive receptors (thereby exacerbating an existing condition), this section analyses the risk posed from existing freeways on sensitive receptors.

The mitigation measures in the PEIR are divided into two categories: SCAG mitigation and project-level mitigation measures. SCAG mitigation measures shall be implemented by SCAG over the lifetime of the Plan. For projects proposing to streamline environmental review pursuant to SB 375, SB 743, or SB 226 (as described in **Chapter 1.0, Introduction**), or for projects otherwise tiering off this PEIR, the project-level mitigation measures described below (or comparable measures) can and should be considered and implemented by Lead Agencies and Project Sponsors during the subsequent, project- or site-specific environmental reviews for transportation and development projects as applicable and feasible. However, SCAG cannot require implementing agencies to adopt mitigation, and it is ultimately the responsibility of the implementing agency to determine and adopt project-specific mitigation.

3.3.4.3 Impacts and Mitigation Measures

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

Less than Significant Impact.

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122 See *Cal. Building Industry Assn. v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369; see also *Cal. Building Industry Assn. v. Bay Area Air Quality Management District* (2016) 2 Cal.App.5th 1067.

123 Note that as discussed in **Section 3.15.3, Public Services – Schools**, CEQA review of school construction generally does require an evaluation of the effects of existing air quality exposure on pupils, and to the extent the health risk is unacceptable, the school would not be built. CEQA also provides limited protection and requires analysis of impacts of the existing environment on certain housing development projects exercising exemptions under Pub. Res. Code §§ 21159.21(f), (h), 21159.22(a), (b)(3), 21159.23 (a)(2)(A), 21159.24(a)(1), (3), and 21155.1(a)(4, (6).

Connect SoCal would result in a less than significant impact to air quality related to the potential to conflict with or obstruct implementation of the adopted SIPs/AQMPs/Attainment Plans in the SCAG region because the projected long-term emissions are in alignment with the local SIPs/AQMPs as demonstrated in the transportation conformity analysis, found in the Conformity Technical Report for the Plan.[124] The emissions resulting from the Plan are within the applicable emissions budgets as stated in the SIPs/AQMPs for each nonattainment or maintenance area for all milestone, attainment, and planning horizon years.

As described in the Regulatory Framework, when a region is in nonattainment for any of the six criteria air pollutants relative to the NAAQs, the federal CAA requires states to develop SIPs to achieve the federal standard. The AQMPs are required as part of the SIP. Within the SCAG region, the 8-hour federal ozone standard is designated as nonattainment for all six counties. San Bernardino, Riverside, Orange, Los Angeles, and Imperial Counties are all designated as nonattainment for PM2.5. Additionally, San Bernardino, Riverside, and Imperial Counties are designated as nonattainment for PM10. As a result, all the SIPs in the SCAG region focus on reducing ozone emissions and may also focus on particulate matter pollution. The following air quality plans are applicable to Connect SoCal: 2016 SCAQMD Air Quality Management Plan (AQMP), AVAQMD Federal 75 ppb Ozone Attainment Plan (2017), MDAQMD Federal 75 ppb Ozone Attainment Plan (2017), 2016 Ventura County Air Quality Management Plan, and Imperial County 2018 Annual PM2.5 State Implementation Plan.

The goals of the air quality management plans and attainment plans are to establish a strategy for achieving the standards by a set date by listing all feasible control measures, including transportation control measures. These control measures help advance the attainment date and are financially, economically, and socially feasible. As standards become more stringent over time, achieving the standards becomes a moving target that the air quality districts, and air-related plans must continue to chase. At this current snapshot of time (2019), the Plan would not conflict with the existing air-related plans since it will align with feasible Transportation Control Measures (TCMs). SCAG coordinates with air districts in the region to ensure that air quality management plans (and air pollution control plans) are consistent and comprehensively address air pollution from all sources (as appropriate) in the SCAG region. For example, the 2016 SCAQMD AQMP was developed in alignment with the 2016 RTP/SCS, incorporating the latest scientific, technological, and regulatory information and planning assumptions as of January 17, 2017.[125]

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124 Southern California Association of Governments. 2019. *Transportation Conformity Analysis Draft Technical Report*.

125 SCAQMD. 2015. *2016 AQMP Updates Coordination with SCAG & CARB*. Available online at: http://www.aqmd.gov/docs/default-source/Agendas/STMPR-Advisory-Group/stmpr_073015_5.pdf, accessed October 29, 2019.

Connect SoCal includes new transportation projects and refined land use strategies compared to the 2016 RTP/SCS. With respect to achieving emission reductions, Connect SoCal would further reduce emissions compared to the 2019 RTP/SCS as it has a greater emphasis on compact development, additional transportation projects and strategies including more integrated strategies for active transportation, additional investments for transit and passenger rail, and a greater emphasis improving the public health and ensuring the quality of life (as discussed in **Chapter 2.0, Project Description**). This is evident by the Plan's transportation project types that allocate funding and planning efforts on trail access, regional greenway network, regional and local bikeway network, and pedestrian improvements by using a "complete street" approach; transit (rail, bus) improvements and new facilities; rideshare/vanpool programs; high-occupancy vehicle (HOV) lanes; traffic calming and signal improvements; and streetscape/landscape projects. Implementation of transportation projects (See **Appendix 2.0, Plan Project List**) would reduce emissions in both mobile and stationary sources by increasing density and reducing VMT per capita (See **Section 3.8, Greenhouse Gas Emissions** for additional discussion on VMT per capita reduction). Additionally, land use strategies proposed in the Plan seek to balance the region's strategic transportation investments and land use choices and are coordinated with the committed and projected transportation investments in the region that emphasize system preservation and enhancement, active transportation, and land use integration. These efforts are in alignment with the attainment plans and air quality management plans' goals to reduce emissions of pollutants in nonattainment areas. Therefore, the Plan is expected to have a less than significant impact as it would not conflict with or obstruct implementation of applicable air quality plans, and the consideration of mitigation measures is not warranted.

The determination of significance under CEQA is based on the comparison to existing conditions, as required. The following comparison to the No Project scenario is provided here for informational purposes to understand the effects of the Plan as compared to a scenario where the Plan is not implemented. Under a No Project scenario, investments in VMT reduction projects and infill and compact land use strategies would not occur to the same degree as the Plan. This scenario would result in increased emissions of ozone precursors and particulate matter and likely would not meet Conformity or the AQMPs target emission reductions.

Impact AQ-2 **Potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation.**

Significant and Unavoidable – Mitigation Required.

At the regional level, criteria pollutant emissions would be mostly reduced compared to existing conditions and the region would meet air quality standards. In 2045, when compared to existing

conditions, on-road mobile-source PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties and mobile-source PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties due to increasing traffic. On-road mobile-source particulate matter emissions would remain the same or decrease from existing conditions in the other counties. Within the SCAB (which is likely indicative of the region as a whole), SCAQMD indicates that total pollutant emissions are being reduced through at least 2031, except for small increases in SOx and PM2.5.

Construction Emissions

Over the lifetime of the Plan, various transportation and development projects would be constructed. These construction activities would result in ongoing emissions of air pollutants including ROG, NO_x, PM10, PM2.5, and fugitive dust. Emissions associated with each individual project are generally short-term and are limited to the project construction phase. The sources associated with these emissions include construction equipment, employee and vendor vehicles, demolition, grading and other ground-disturbing activities, application of paint and other coatings, paving, and others. Typically, larger projects are associated with larger emissions during construction.

While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed localized and daily thresholds. As stated above, the five air districts in the SCAG region have set mass daily or annual construction and/or operational emissions thresholds. Furthermore, all the air districts in the SCAG region have relevant fugitive dust rules that apply to construction activities. While these thresholds are to be applied to individual construction projects, the air districts do not provide a threshold for use with regional planning documents such as the RTP/SCS. However, SCAQMD does account for estimated construction emissions from off-road construction equipment within the 2016 AQMP. As demonstrated in the 2016 AQMP, and discussed below, total regional emissions of criteria pollutants including from construction sources would generally decline through at least 2031 with the exception of small increases in PM2.5 and SOx. In addition, at the individual project level there is the potential for local exceedances.

Operational Emissions

As noted in **Chapter 2.0, Project Description**, as part of the process for developing Connect SoCal, SCAG is responsible for ensuring that mobile source on-road emissions meet NAAQS and CAAQS for the SCAG region, as well as SB 375 GHG targets. The air quality management and air pollution control districts are responsible for addressing all other sources of air pollution in the SCAG region (stationary sources, construction equipment, airplanes, trains and ships) and ensuring that standards are met.

On-road mobile-source emissions evaluated in Connect SoCal by SCAG include passenger vehicles, light-duty trucks, medium trucks and heavy-duty trucks. CARB identifies emissions standards for these

sources. Off-road vehicles generally refer to construction equipment. In the AQMP, off-road vehicles refer to locomotives, ocean going vessels, off-highway recreational vehicles, cargo handling equipment, farm equipment, and aircraft. CARB is responsible for implementing the AQMP with respect to emissions standards for construction equipment sold within the state. The U.S. EPA implements the AQMP with respect to regulating airplanes, trains, and ships emissions.

As mentioned above, air quality management and air pollution control districts are responsible for addressing air pollution from stationary sources, construction equipment, airplanes, trains, and ships within the SCAG region. These air quality and air pollution control districts include SCAQMD, MDAQMD, VCAPCD, AVAPCD, and ICAPCD. The SCAQMD includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.[126] Therefore, SCAQMD's 2016 AQMP's analysis of the emissions resulting from stationary sources, construction equipment, airplanes, trains, and ships is discussed below as a proxy for these emissions throughout the entire SCAG region.

In addition to on-road mobile sources provided by SCAG, SCAQMD's 2016 AQMP provides emission estimates for stationary, and off-road mobile sources from 2019 to 2031, see **Table 3.3-12, 2016 AQMP Forecast of Annual Average Total Emissions in SCAB Through 2031**. Stationary sources include both point and area sources. Point stationary sources include permitted facilities, such as power plants and refineries, with one or more emission sources. Area stationary sources include small emission sources, such as residential water heaters, architectural coatings, consumer products, and smaller permitted sources. Off-road mobile sources include construction equipment, locomotives, ocean-going vessels, aircraft, cargo handling equipment, and farm equipment. SCAQMD does not forecast out to 2045, but the general trend of most pollutants decreasing is not expected to change.

As shown in **Table 3.3-12**, in the SCAB region total VOC, NOx, and CO emissions are anticipated to decrease between 2019 to 2031. Comparing emission estimates from 2019 to 2031, SOx, and PM2.5 emissions are expected to increase by 1 ton/day each. Increases in SOx and PM2.5 are expected to occur due to increases in population and activity that will outpace the emissions reductions expected to occur from newer and cleaner equipment and vehicles. VOC and NOx emissions are expected to decrease due to existing regulations, such as on- and off-road equipment regulations and vehicle emissions standards.[127]

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126 South Coast Air Quality Management District. Map of Jurisdiction. Available online at: http://www.aqmd.gov/docs/default-source/default-document-library/map-of-jurisdiction.pdf, accessed October 2, 2019.

127 SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. Available online at: https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed November 6, 2019.

Table 3.3-12
2016 AQMP Forecast of Annual Average Total Emissions in SCAB Through 2031

Year	Tons/Day						Summer Planning	
	VOC	NOx	CO	SOx	PM2.5	NH_3	VOC	NOx
2019	376	353	1,447	17	64	74	398	347
2022	362	290	1,325	17	64	73	383	287
2023	359	257	1,298	17	64	72	379	255
2025	353	241	1,247	17	64	72	372	239
2031	345	214	1,188	18	65	73	362	214

Source: South Coast Air Quality Management District. 2017. 2016 Air Quality Management Plan. Available online at: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, *accessed October 2, 2019.*

The 2016 AQMP identifies the top ten source categories for VOC, NOx, SOx, and PM2.5 for the years 2012, 2019, 2022, 2023, 2025, and 2031. Review of these data demonstrates that in 2019, passenger cars, light-duty trucks, and medium duty trucks are anticipated to be the top ten contributors of VOC emissions in the SCAG region. By 2031, VOC emissions from on-road mobile sources are anticipated to substantially decrease due to more stringent on-road standards and only passenger cars and light-duty trucks are anticipated to be within the top ten contributors to VOC emissions. Throughout the entire AQMP planning year, heavy-duty trucks, off-road construction equipment, and ships and commercial boats will be the top contributors of NOx emissions, although the emission rates will decline over the years. Regarding SOx emissions, ships and commercial boats and aircrafts are the highest contributors in the SCAB region and are anticipated to fluctuate over the AQMP planning years. Finally, heavy-duty diesel trucks, light duty trucks, and passenger cars are the only mobile-sources in the top ton polluters for PM2.5 emissions in the SCAB region. From 2019 to 2031, passenger car and light duty trucks PM2.5 emissions remain constant while the heavy-duty PM2.5 emissions continuously decrease.[128]

Other air basins in the SCAG region include the South Central Coast Air Basin (SCCAB), Salton Sea Air Basin (SSAB), and the Mojave Desert Air Basin (MDAB). As demonstrated in **Table 3.3-4**, similar to SCAB, all three air basins are in nonattainment for ozone and PM10. The SCCAB and portions are the SSAB are also in nonattainment for PM2.5. Each of these air basins has an AQMP to plan the basin's

128 SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. Available online at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed October 29, 2019.

attainment status pursuant to the federal CAA Amendment. P to address nonattainment of ozone in the southwestern desert portion of the basin.[129]

On-Road Mobile Source Emissions

Under Connect SoCal, mobile-source air emissions were estimated for 2045 with the Plan and compared to the existing conditions (2019). The calculated emissions were compiled for ROG, NO_x, CO, PM10, PM2.5, and SO_x for each county in the SCAG region. The only pollutants expected to increase with implementation of Connect SoCal are PM10 annual emissions in Imperial, Orange, Riverside, and San Bernardino Counties as well as PM2.5 in Imperial, Riverside, and San Bernardino Counties. Annual PM10 and PM2.5 emissions in the remaining counties, and annual SOx emissions in every county will decrease or not change from the existing emissions to 2045. ROG, NOx, and CO emissions in every county are expected to decrease with implementation of the Plan (**Table 3.3-13, On-Road Mobile-Source Criteria Air Pollutant Emission by County – Existing Conditions [2019] vs Plan [2045]**).

As shown in **Table 3.3-13**, the Plan will mostly reduce emissions from existing conditions (2019). In part, the reduction is due to vehicle emissions reductions required by federal and states rules and policies (see 3.3.2 Regulatory Framework). In 2045, when compared to existing conditions, on-road mobile-source PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties and mobile-source PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties due to increasing vehicle miles travelled. Mobile-source particulate matter emissions would remain the same or decrease from existing conditions in the other counties. Particulate matter is generated by tires on roadways and therefore, unlike other pollutants that can be regulated through tailpipe emission controls, particulate matter is difficult to address without simply reducing VMT.

The Plan includes transportation projects and strategies aimed at reducing the VMT across the region. One result of these investments is a decline in per capita VMT compared to existing conditions (although total VMT would increase). As further discussed in **Section 3.17, Transportation, Traffic and Safety**, total VMT is expected in increase between 2019 and 2045 in all counties, however per capita VMT would increase only in Imperial County. At the regional level, on-road mobile source emissions would generally decrease (with the exception of small increases in PM10 and PM2.5 in some counties) and per capita VMT would decrease. However, it is possible that individual projects, particularly development projects that generate many vehicle trips (i.e., high VMT) would result in localized air quality impacts.

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129 MDAQMD. 2017. *Federal 75 ppb Ozone Attainment Plan (Western Mojave Desert Nonattatinment Plan*. Available online at: https://ww3.arb.ca.gov/planning/sip/planarea/wmdaqmp/2016sip_mdplan.pdf, accessed November 5, 2019.

Table 3.3-13
On-Road Mobile-Source Criteria Air Pollutant Emissions by County – Existing Condition (2019) vs Plan (2045)

County		(Tons/day)								
		ROG	ROG	NOx	NOx	NOx	CO	PM10	PM2.5	SOx
		Summer	Annual	Summer	Annual	Winter	Winter	Annual	Annual	Annual
Imperial	Existing	3	3	6	7	7	19	0.5	0.2	0.0
	Plan	2	2	4	4	4	17	0.7	0.3	0.1
	Difference	-1	-1	-2	-2	-3	-3	0.3	0.1	0.0
Los Angeles	Existing	52	50	88	95	93	397	14.2	6.3	1.1
	Plan	22	21	33	35	34	145	14.2	5.8	0.8
	Difference	-30	-29	-55	-60	-59	-252	0.0	-0.5	-0.3
Orange	Existing	15	15	22	23	23	111	4.7	2.1	0.3
	Plan	7	7	7	8	7	45	4.7	1.9	0.2
	Difference	-8	-8	-14	-16	-15	-66	0.1	-0.1	-0.1
Riverside	Existing	14	12	32	34	34	87	3.9	1.7	0.3
	Plan	7	6	12	13	13	39	4.7	1.9	0.3
	Difference	-7	-6	-20	-21	-21	-48	0.9	0.2	0.0
San Bernardino	Existing	16	14	38	40	39	99	4.1	1.8	0.3
	Plan	7	6	18	19	18	42	5.2	2.1	0.3
	Difference	-8	-7	-20	-21	-21	-57	1.2	0.3	0.0
Ventura	Existing	4	4	6	7	7	30	1.1	0.5	0.1
	Plan	1	1	2	2	2	10	1.1	0.5	0.1
	Difference	-3	-3	-4	-5	-5	-20	0.0	0.0	0.0

As shown in **Table 3.17-15, Population and VMT (2019 and 2045),** VMT per capita under the Plan would be less than existing conditions. As shown in **Table 3.17-14, Total VMT 2019 and 2045**, total VMT would be less under the Plan than the No Project. Therefore, emissions will be less with the Plan as compared to No Project.

Off-Road Mobile Sources

According to the SCAQMD 2016 AQMP, when compared to the 2012 AQMP, mobile-source emissions from airplane, train, and ship transportation sources have decreased VOC, NOx, CO, and PM2.5 emissions in the SCAB region and will continue to decrease to 2031,[130] see **Table 3.3-14, AQMP Forecast of Annual Average Off-Road Mobile Emissions in SCAB.**

130 SCAG acknowledges that AQMD, nor the other air districts in the region, has not identified emissions beyond 2031. However, due to the overall downward trajectory and the substantial state requirements, it is assumed that emissions will continue to decline through 2045.

Table 3.3-14
AQMP Forecast of Annual Average Off-Road Mobile Emissions in SCAB

Year	Tons/Day						Summer Planning	
	VOC	NOx	CO	SOx	PM2.5	NH_3	VOC	NOx
2019	79	124	697	5	6	0	98	133
2022	74	113	715	5	6	0	92	120
2023	73	110	721	6	6	0	90	117
2025	71	104	731	6	5	0	87	110
2031	66	94	766	7	5	0	81	100

Source: South Coast Air Quality Management District. 2017. 2016 Air Quality Management Plan. Available online at: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, *accessed October 2, 2019.*

As shown in **Table 3.3-14,** emissions from off-road mobile VOC, NOx, CO, and PM2.5 emissions within the SCAB region are anticipated to decrease. SO_x emissions from off-road mobile are anticipated to increase and NH_3 emissions will remain constant (near zero level).

Stationary Sources

According to the SCAQMD 2016 AQMP, when compared to the 2012 AQMP, stationary-source emissions from NOx will decrease in the SCAB region by approximately 17%. All other pollutants from stationary sources are anticipated to increase by 2031, see **Table 3.3-15, AQMP Forecast of Annual Average Off-Road Mobile Emissions in SCAB.**

As shown in **Table 3.3-15**, stationary source emissions from all criteria air pollutants, except NOx, are anticipated to increase when 2019 conditions are compared to 2031.

Table 3.3-15
AQMP Forecast of Annual Average Stationary Source Emissions in SCAB

Year	Tons/Day						Summer Planning	
	VOC	NOx	CO	SOx	PM2.5	NH_3	VOC	NOx
2019	214	62	111	10	47	60	213	59
2022	220	53	112	10	48	60	220	50
2023	222	52	112	10	48	60	220	50
2025	224	52	112	10	49	60	223	49
2031	231	51	113	10	50	61	231	50
2019 vs. 2031	7.9%	-17.7%	1.8%	0.00%	6.3%	1.7%	8.5%	-15.3%

Source: South Coast Air Quality Management District. 2017. 2016 Air Quality Management Plan. Available online at: www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15*, accessed October 2, 2019.*

Wildfire

SCAQMD accounts for most sources of pollutants in their AQMP. However, in recent years wildfires have added substantial amounts of pollutants to the SCAB that are unaccounted for in the AQMP. According to the U.S. EPA's Exceptional Events Rule, wildfires are not to be considered for NAAQS attainment status.[131]

However, wildfire emissions are likely to result in significant air quality and health impacts in the future. According to SCAG's Public Health Draft Technical Report, wildfires are going to become more prevalent as climate change leads to drier, hotter conditions in Southern California. The SCAQMD and MDAQMD include information regarding active wildfires, resulting air quality impacts, and the health risks of wildfires on their websites.[132,133]

Summary

Total emissions in the SCAB region (as indicated in 2016 AQMP) and likely across the SCAG region are expected to generally decline through at least 2031 except for small increases in PM 2.5 and SOx (**Table**

131 Federal Register. *Treatment of Data Influenced by Exceptional Events*. Available online at: https://www.epa.gov/sites/production/files/2016-09/documents/exceptional_events_rule_revisions_2060-as02_final.pdf, accessed November 6, 2019.

132 SCAQMD. *Wildfire Smoke & Ash Health & Safety Tips*. Available online at: http://www.aqmd.gov/home/air-quality/wildfire-health-info-smoke-tips, accessed November 6, 2019.

133 MDAQMD. *Wildfires*. Available online at: http://mdaqmd.ca.gov/air-quality/wildfires, accessed November 6, 2019.

3.3-12). SCAG is responsible for assessing on-road mobile source emissions through 2045. In general, in 2045, when compared to existing conditions, on-road mobile-source PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties and mobile-source PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties due to increasing traffic (see **Table 3.3-13**).

While the SCAG region may see an increase in PM2.5, PM10 and SOx emissions, the SCAQMD, AVAPCD, ICAPCD, and MDAQMD have not established regional thresholds to determine significance. The air districts within the SCAG region have only established project-level thresholds (see **Table 3.3-9, Table 3.3-10,** and **Table 3.3-11**). Therefore, individual projects must compare anticipated project emissions to the thresholds for the air district within which they are located in order to determine significance on the project-level. Because mobile source emissions of PM10 and PM2.5 will increase (PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties and PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties), largely as a result of increased total VMT, and SOx would increase in the region at least through 2031, the Plan could contribute to an air quality violation. Further, there is the potential for individual projects to exceed local standards during construction and/or operation for several pollutants. Therefore, this impact is considered to be significant.

Health Implications

In accordance with the *Sierra Club v. County of Fresno* (i.e., *Friant Ranch*) decision, when air quality impacts are found to be significant, the health implications of the significant emissions should be disclosed. Modeling and analyzing health consequences requires a substantial amount of data. A detailed health risk assessment of on-road mobile-source emissions was undertaken for the Plan (see discussion of Impact AQ-4 below).

The main health concerns associated with PM10 and PM2.5 include worsening of symptoms in sensitive patients with respiratory disease and excess seasonal declines in pulmonary function, especially in children. This can include an increase in the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body. These substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Whereas PM10 tends to collect in the upper portion of the respiratory system, PM2.5 is much smaller and it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility. **Table 3.3-6, Peak Criteria Pollutants Readings for the SCAG Region Air Basins,** above indicates that the applicable PM10 and

PM2.5 State standards were exceeded multiple times between 2016 and 2018. The Plan's increase in PM10 and PM2.5 emissions could worsen the health concerns listed above or result in Air Quality Index values that are unhealthy for sensitive groups and other populations. On unhealthy days, persons are recommended to avoid both prolonged and heavy-exertion outdoor activities.[134]

As noted earlier, NOx and ROG are ozone precursors and the SCAG region is currently in nonattainment for PM2.5, PM10, and ozone under NAAQS and CAAQS. The main health concern regarding exposure to ground-level ozone is its effects on the respiratory system, particularly on lung function. Several factors influence these health impacts, including the concentration of ground-level ozone in the atmosphere, the duration of exposure, the average volume of air breathed per minute, the length of intervals between short-term exposures; and the sensitivity of the person to the exposure.[135,136]

The SCAQMD, in its amicus brief to the California Supreme Court in *Friant Ranch*, stated that from a scientific standpoint, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire air basin, and provided evidence from its 2012 AQMP that showed that if the daily emissions of NOx and ROG were reduced in amounts of 432 and 187 tons per day respectively, the ozone concentrations at SCAQMD's monitoring site would go down by only 9 parts per billion as compared to ozone readings without these ROG and NOx reductions.[137] For all these reasons, it is difficult to estimate the change in ozone concentrations that would result from the decrease in ozone precursors (ROG and NOx). **Table 3.3-12, 2016 AQMP Forecast of Annual Average Total Emissions in SCAB Through 2031,** demonstrates there will be overall decreases in ROG and NOx from mobile and stationary sources in the SCAB region. Therefore, it can be assumed that the total amount of ozone would also decrease, however the exact amount cannot be accurately quantified.

Both ozone and particulate matter are known to have negative public health impacts especially for sensitive populations, like children, the elderly, and those with respiratory or cardiovascular health problems. Therefore, the potential for Connect SoCal to adversely affect public health was evaluated using cancer risk from diesel particulate matter as a proxy for respiratory health (see **Appendix 3.3**)

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134 U.S. Environmental Protection Agency, Air Quality Index, A Guide to Air Quality and Your Health, February 2014, www.epa.gov/airnow/aqi_brochure_02_14.pdf, accessed October 31, 2019.

135 The World Bank Group, Pollution Prevention and Abatement Handbook 1998: Toward Cleaner Production, pp. 227–230, 1999, http://documents.worldbank.org/curated/en/758631468314701365/pdf/multi0page.pdf, accessed February 11, 2019.

136 U.S. EPA, Air Quality Guide for Ozone, March 2015b, https://airnow.gov/index.cfm?action=pubs.aqiguideozone, accessed February 11, 2019.

137 SCAQMD. 2015. *Application of the South Coast Air Quality Management District for Leave to File Brief of Amicus Curiae in Support of Neither Party and [Proposed] Brief of Amicus Curiae.* April. https://www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf, accessed April 9, 2019.

Similarly, the analysis acknowledges applicable California legislation and initiatives to improve public health, particularly respiratory health in light of *Research Results on Land Use, Transportation, and Community Design:*[138]

- Residents in walkable neighborhoods are more likely to meet physical activity guidelines. Public transit users are more likely to meet Surgeon General recommendations for physical activity. Greater health benefits can be achieved by increasing the amount (duration, frequency, or intensity) of physical activity.

Connect SoCal plans to increase active transportation in communities, as these projects provide opportunities for physical activity, which has been shown to improve chronic disease rates. [139] Consistent with the environmental justice analysis in Connect SoCal, this PEIR considers the potential benefits and impacts on sensitive receptors including low-income and minority populations located in the vicinity of transportation facilities (e.g., the potential to increase or decrease diesel particulate emissions).

ROG and NOx emissions contribute to the development of ozone; therefore, reductions of ROG and NOx emissions would also lead to a reduction in ozone. Excess NOx emissions can also lead to increases in physician and emergency room visits as well as hospitalization and more school days missed by school-aged children living in the air basin. Implementation of Connect SoCal, when compared to existing conditions, would decrease on-road mobile-source ROG and NOx emissions. (**Table 3.3-13, On-Road Mobile-Source Criteria Air Pollutant Emissions by County – Existing Conditions [2019] vs Plan [2045]**). Additionally, within the SCAB area NOx emissions are anticipated to decrease through at least 2031 from off-road vehicle and stationary sources (**Table 3.3-14, AQMP Forecast of Annual Average Off Road Mobile Emissions in SCAB,** and **Table 3.3-15 AQMP, Forecast of Annual Average Stationary Source Emissions in SCAB**). Through at least 2031, ROG emissions are expected to decrease from off-road vehicle emissions (**Table 3.3-14, AQMP Forecast of Annual Average Off Road Mobile Emissions in SCAB**) but will increase from stationary sources (**Table 3.3-15, AQMP Forecast of Annual Average Stationary Source Emissions in SCAB**). Overall, the total ROG and NOx emissions from on-road, off-road vehicle, and stationary sources are expected to decrease in the SCAB area through at least 2031 (**Table 3.3-12, 2016 AQMP Forecast of Annual Average Total Emissions in SCAB Through 2031**).SCAB was re-designated as in attainment of federal standards for CO in June 2017 and the last exceedance of state standards within the region for CO was in 2015. CO presents a significant health risk as it can interfere with oxygen transport within the body. Compared to existing conditions, mobile-source CO

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138 Active Living Research. 2011. *Research Results on Land Use, Transportation, and Community Design.* Available online at: http://activelivingresearch.org/land-use-transportation-and-community-design-research-summary-slides, accessed March 25, 2019.

139 Southern California Association of Governments. 2019. *Active Transportation Technical Report*.

emissions in the future with implementation of Connect SoCal would decrease between now and 2045 despite increasing traffic, as a result of stringent emissions controls. (**Table 3.3-13, On-Road Mobile-Source Criteria Air Pollutant Emissions by County – Existing Condition [2019] vs Plan [2045]**).

In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel. Compared to existing conditions, mobile-source SO_x emissions would not change substantially despite increasing traffic (**Table 3.3-13, On-Road Mobile-Source Criteria Air Pollutant Emissions by County – Existing Conditions [2019] vs Plan [2045]**). Most of the counties within the SCAG region are emitting negligible amounts of on-road mobile-source SO_x; however, the AQMP does indicate that SOx (primarily from ship-related emissions) are expected to increase slightly at least through 2031 (see **Table 3.3-12, 2016 AQMP Forecast of Annual Average Total Emissions in SCAB Through 2031**).[140]

The 2016 AQMP undertook a detailed evaluation of health effects associated with the 2016 AQMP (which considers all sources of pollutants). That evaluation is contained within Appendix I of the Final 2016 AQMP (and is hereby incorporated by reference). It concludes the following:

> *A large body of scientific evidence shows that the adverse impacts of air pollution on human and animal health are clear. A considerable number of population-based and laboratory studies have established a link between air pollution and increased morbidity and, in some instances, premature mortality. Importantly, the health effects of air pollution extend beyond respiratory effects, and there is substantial evidence that air pollution (including particulate matter and ozone) exposures cause cardiovascular morbidity and mortality. Some air pollutants, such as diesel PM, lead, and several other air toxics, have been linked to increased cancer risk. Health studies have also identified populations who may be more susceptible to the adverse effects of air pollution, such as children, older adults, low SES communities, people with certain pre-existing health conditions, and people with certain genetic factors. Understanding the impacts of air pollution on these more susceptible populations can help inform policies that better protect public health, for example, in setting standards for criteria air pollutants, and in the development of methods to evaluate air toxics health risks. Continued research on the effects of specific PM constituents and ultrafine particles will be important in furthering the understanding of how these pollutants affect human health.*

140 Los Angeles County is estimated to emit approximately 1-ton SOx annually under existing conditions and will continue to emit 1-ton annually in 2040 with implementation of the Plan.

As the scientific methods for the study of air pollution health effects have progressed over the past decades, adverse effects have been shown to occur at lower levels of exposure. For some pollutants, no clear thresholds for effects have been demonstrated. The new findings have, in turn, led to the revision and lowering of National Ambient Air Quality Standards (NAAQS) which, in the judgment of the Administrator of the U.S. EPA, are necessary to protect public health. Chapter 8 of the draft 2016 AQMP provides an overview of the extensive, multi-year, public process involved in setting federal air quality standards. Assessments of the scientific evidence from health studies is an important part of the process, and has helped inform revisions to the federal air pollution standards. Figures [included in the AQMP] are meant to convey some of the historical context to recent revisions to the NAAQS for ozone and for particulate matter, with regard to key developments in the understanding of the health effects of these pollutants.

Mitigation Measures

SCAG Mitigation Measures

SMM-AQ-1: SCAG shall develop the Southern California Disadvantaged Communities Planning Initiative which would provide funds to selected applicants to develop a low-cost, high-impact model which leverages SCAG's staff, data, and outreach resources to deliver context-sensitive plans in high-need, low-resourced active transportation infrastructure and frameworks. As part of the initiative, the model will be operationalized through the development of plans in six communities and refined to provide a sustainable resource for SCAG staff partner with local agencies to develop local active transportation plans.

SMM-AQ-2: SCAG shall continue its commitment to analyze public health outcomes as part of Connect SoCal. As part of the public health analysis for the Plan, SCAG shall continue to analyze the Plan's impacts on air quality through its Public Health Working group and continue to support policy change at the city and country level through education programs.

SMM-AQ-3: SCAG shall continue to conduct air quality-related technical analyses on the region, specifically in vulnerable areas that are typically environmental justice areas. For example, SCAG staff conducted technical analysis of emissions impacts on populations within 500 feet of freeways and highly travelled corridors in the Connect SoCal Environmental Justice Appendix. SCAG staff shall also continue to work with districts and relevant stakeholders to be informed of any updates new and/or changes to air quality issue areas through various forums like the Environmental Justice Working Group.

Project Level Mitigation Measures

PMM-AQ-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to violating air quality standards. Such measures may include the following or other comparable measures identified by the Lead Agency:

a) Minimize land disturbance.

b) Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes.

c) Cover trucks when hauling dirt.

d) Stabilize the surface of dirt piles if not removed immediately.

e) Limit vehicular paths on unpaved surfaces and stabilize any temporary roads.

f) Minimize unnecessary vehicular and machinery activities.

g) Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.

h) Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities.

i) On Caltrans projects, Caltrans Standard Specifications 10-Dust Control, 17-Watering, and 18-Dust Palliative shall be incorporated into project specifications.

j) Require contractors to assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that could be used an aggregate of 40 or more hours for the construction project. Prepare a plan for approval by the applicable air district demonstrating achievement of the applicable percent reduction for a CARB-approved fleet.

k) Ensure that all construction equipment is properly tuned and maintained.

l) Minimize idling time to 5 minutes—saves fuel and reduces emissions.

m) Provide an operational water truck on-site at all times. Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas. Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.

n) Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.

o) Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.

p) As appropriate require that portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain CARB Portable Equipment Registration with the state or a local district permit. Arrange appropriate consultations with the CARB or the District to determine registration and permitting requirements prior to equipment operation at the site.

q) Require projects within 500 feet of residences, hospitals, or schools to use Tier 4 equipment for all engines above 50 horsepower (hp) unless the individual project can demonstrate that Tier 4 engines would not be required to mitigate emissions below significance thresholds.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce each of the impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of anticipated regional increases in certain criteria pollutant emissions and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to violating air quality standards or contributing substantially to an existing or projected air quality violation could be significant and unavoidable even with implementation of mitigation.

Impact 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.**

Significant and Unavoidable Impact – Mitigation Required.

The analysis of the Plan is essentially a cumulative analysis of air quality impacts resulting from the growth within the SCAG region. At the regional level, projects that are considered cumulative to and similar to the Plan are other regional-scale projects, e.g., other RTPs/SCSs for adjacent jurisdictions and AQMPs. The air quality analysis focuses on emissions associated with mobile sources as that is the primary responsibility of the RTP; the AQMP addresses stationary sources as well as airplane, trains, ship and construction emissions. The AQMP's emissions estimates from mobile-sources, including on-road as well as airplane, trains, and ships and stationary sources are summarized in **Impact AQ-2.**

In 2045, when compared to existing conditions, on-road mobile-source PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties and mobile-source PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties due to increasing traffic. Mobile-source particulate matter emissions would remain the same or decrease from existing conditions for all other pollutants (see **Table 3.3-13, On-Road Mobile-Source Criteria Air Pollutant Emissions by County – Existing Conditions [2019] vs Plan [2045]**).

The state of California is made up of 18 MPO's. SCAG's jurisdiction makes up the majority of the Southern California region and is surrounded by three other MPO's including San Diego Association of Government (SANDAG) to the south, Kern Council of Governments (KCOG) north of Ventura and Los Angeles Counties, and Santa Barbara County Association of Governments (SBCAG) north of Ventura County.[141,142] Each of these MPO's prepared a RTP/SCS to develop transportation and land use strategies within their region. SANDAG's 2050 RTP/SCS EIR concluded that on-road vehicle emissions would decrease for CO, ROG, and NOx pollutants from 2010 to 2050, with minimal increases of 0.23 and 0.15 tons/year for PM10 and PM2.5, respectively. The San Diego Air Pollution Control District (SDAPCD) maintains air plans for ozone and CO for the San Diego Air Basin (SDAB). [143] Therefore, the growth in the San Diego region under the SANDAG's plan would not increase emissions for which the area is in non-attainment.

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141 The area north of San Bernardino County is a non-MPO, rural area.

142 Institute for Local Government. *California's 18 Metropolitan Planning Organizations*. Available online at: https://www.ca-ilg.org/post/californias-18-metropolitan-planning-organizations, accessed October 29, 2019.

143 San Diego Association of Governments. 2011. *SANDAG 2050 RTP/SCS EIR, 4.3 Air Quality*. Available online at: https://www.sandag.org/uploads/2050RTP/EIR43.pdf, accessed October 29, 2019.

KCOG's 2018 RTP PEIR similarly concluded that by 2042, implementation of the RTP would reduce ROG, NOx, and CO emissions, however PM10 and PM2.5 emissions would increase. The KCOG's PEIR determines that these increases in particulate matter are likely due to the increases in VMT which would increase roadway, brake, and tire particulate matter dust. The KCOG region includes the Eastern Kern Air Pollution Control District (EKAPCD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD is in non-attainment for federal and state ozone and PM2.5 as well as state PM10 standards. The Eastern Kern Air Pollution Control District is in a moderate nonattainment area for the national, state 8-Hour, and state 1-Hour ozone standard. Growth in the KCOG region would result in decreases in ozone precursors but result in slight increases in particulate matter for which SJVAPCD is in non-attainment for.[144]

Finally, the SBCAG 2040 RTP/SCS's (called Fast Forward 2040) Final Supplemental EIR concluded that daily ROC, NOx, and PM10 emissions would decrease within the SBCAG region from 2014 to 2040, therefore resulting in a less than significant impact. Santa Barbara County is in non-attainment for state 8-hour ozone and state PM10 standards, therefore, SBCAG would reduce pollutants for which the area is in non-attainment. [145]

Pursuant to the U.S. EPA's Transportation Conformity Regulations, the regional emissions tests are met if plan emissions are within the applicable emissions budgets for each nonattainment or maintenance area for all milestone, attainment, and planning horizon years and, if no emissions budgets have been established, if Plan emissions are less than the no-build emissions or the base-year emissions. The emissions budgets that were established in the AQMPs/SIPs in the SCAG region and have been approved by the U.S. EPA function as the applicable emission budgets for the conformity analysis for the respective nonattainment and maintenance areas. Federal conformity regulations also require the regional emissions analysis to be based on the Latest Planning Assumptions that include the latest vehicle data (fleet, age, activity) and latest socioeconomic growth forecast. A conformity determination must be made for each nonattainment and maintenance area in the region. In addition to the regional emissions analysis, the Plan is also required to pass (1) the timely implementation of the Transportation Control Measures (TCM) test, (2) the Financial Constraint test, and (3) the Interagency Consultation and Public Involvement test. The regional emissions analysis serves as a reasonable analysis of cumulative air

144 Kern Council of Governments. 2018. *2018 Regional Transportation Plan Program Environmental Impact Report*. Available online at: https://www.kerncog.org/wp-content/uploads/2018/05/2018-Public-Draft-PEIR.pdf, accessed October 29, 2019.

145 Santa Barbara County Association of Governments. 2017. *Fast Forward 2040 Regional Transportation Plan & Sustainable Communities Strategy Final Supplemental EIR.* Available online at: http://www.sbcag.org/uploads/2/4/5/4/24540302/ff2040_seir.pdf, accessed December 2, 2019.

quality impacts of the Plan. Connect SoCal meets the regional emissions tests for each nonattainment and maintenance area and for all milestone, attainment, and planning horizon years.

The Plan will meet the targets and emissions reduction milestones for on-road mobile-source emissions set in each of the AQMPs/SIPs within the SCAG region and are in compliance with federal conformity requirements. Additionally, implementation of the Plan will reduce on-road mobile criteria air pollutants and thus reduce the overall health effects to the surrounding community. Total emissions within the SCAB region, which makes up a large portion of the SCAG area, are expected to decrease as well through 2031 according to the 2016 AQMP with the exception of increases in PM2.5 and SOx. In addition, the Plan would decrease all criteria air pollutant emissions, except for small increases in PM2.5 in Imperial, Riverside, and San Bernardino Counties and PM10 in Imperial, Orange, Riverside, and San Bernardino Counties. Reductions in ROG, NOx, and CO are consistent with the RTP/SCS for the SANDAG, KCOG, and SBCAG planning areas. The KCOG and SANDAG region are also anticipated to result in increases in particulate matter in the future. However, because emissions would increase in some counties (PM10 would increase in Imperial, Orange, Riverside, and San Bernardino Counties and PM2.5 would increase in Imperial, Riverside, and San Bernardino Counties), largely as a result of increased total VMT, and SOx would increase in the region at least through 2031, the SCAG region would add to emissions of neighboring MPO's. Moreover, as discussed in AQ-2, individual project emissions may result in significant construction and/or operational emissions as compared to thresholds of significance identified by each air district. Therefore, the Plan could contribute to cumulative impacts from adjacent MPO's and therefore this impact is considered significant, and mitigation is required.

See discussion above in **Impact AQ-2** regarding health effects.

Mitigation Measures

SCAG Mitigation Measures

See **SMM AQ-1, SMM AQ-2, SMM**, and **SMM AQ-3.**

Project Level Mitigation Measures

See **PMM-AQ-1.**

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce each of the impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures

consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the anticipated regional increase in certain criteria pollutant emissions and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment could be significant and unavoidable even with implementation of mitigation.

Impact AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

Significant and Unavoidable Impact – Mitigation Required.

Construction-Related Emissions

Over the lifetime of the Plan numerous transportation projects and land use development projects would be implemented. The construction of these projects could expose sensitive receptors to substantial pollutant concentrations. The greatest potential for exposure to substantial pollutant concentrations and TAC emissions during construction of both transportation projects and anticipated development, would be DPM emissions associated with heavy-duty equipment operations and truck traffic during construction activities. According to the SCAQMD methodology, health effects from carcinogenic air toxics are described in terms of individual cancer risk. "Individual Cancer Risk" is the likelihood that a person continuously exposed to concentrations of TACs over a 70-year lifetime will contract cancer based on the use of standard risk assessment methodology. SCAQMD, VCAPCD, MDAQMD, and AVAPCD has stated that the incremental cancer risk should not exceed an incremental increase of 10 excess cancer cases per million, and the chronic and acute non-carcinogenic risks should not exceed a calculated Hazard Index (HI) value of 1.0.

The California Office of Environmental Health Hazard Assessment (OEHHA) published a guidance manual in 2015 to assist the preparation of health risk assessments (HRA) for carcinogenic and non-carcinogenic exposures to air toxics in accordance with the Air Toxics Hot Spots Information and Assessment Act.[146] The 2015 OEHHA HRA guidelines provide methodologies for assessing various types of environmental exposures to toxic contaminants, including inhalation exposures. The 2015 OEHHA HRA guidance relied upon a comprehensive review of the most up-to-date scientific literature to formulate the recommended exposure estimation methodologies. The OEHHA guidance acknowledges that children are especially susceptible to the effects of toxic air contaminant exposure, and incorporated age sensitivity factors (ASFs) and age-specific daily breathing rates (DBRs) to account for

[146] OEHHA, *Guidance Manual for Preparation of Health Risk Assessments*, February 2015.

the differences in sensitivity to carcinogens during early life exposure. OEHHA recommends a default ASF of 10 for the age range between the third trimester of pregnancy through two years, and an ASF of three for ages two through 15 years.

As a conservative measure to characterize maximum potential exposures of sensitive receptors to carcinogenic risks, residential exposures are assumed to begin in the third trimester and exposures of children at schools is anticipated to begin at the lowest educational grade level. The OEHHA guidance provides recommended DBR values that are specific to the age of the receptor and the type of activity in which the receptor would be engaged during exposure, which are evaluated on a case-by-case basis. Air districts in the SCAG region (including SCAQMD) have not adopted guidelines to implement the 2015 OEHHA HRA guidelines for construction and indicated it is currently considering how to implement the guidelines. Only one air district -- the San Joaquin Valley Air Pollution Control District – appears to have adopted guidelines to implement the 2015 OEHHA HRA guidelines. BAAQMD is undergoing a process to implement guidelines as well.

The specific size and location of future construction activity within the SCAG region is not known, and therefore many variables related to characterizing potential exposures to air toxics during construction activities could not be determined, such as proximity to the emissions sources and duration of exposure. Connect SoCal's Project List (See **Appendix 2.0**) includes transportation projects through 2045, however a construction health risk analysis would be speculative given the lack of a construction location and construction activities. However, it is reasonable to assume that some level of construction activity would occur adjacent to sensitive receptors (e.g., residences and schools). The significant construction emissions identified above, could result in adverse health effects to sensitive receptors. As such, it is likely that intense construction activities (e.g., from development projects that involve a high volume of haul trucks) would exceed the health risk significance thresholds due to equipment and truck exhaust emissions. This is considered a significant impact related to substantial pollutant concentrations during construction activities.

On-Road Mobile-Source Emissions

Mobile source (heavy-duty truck) diesel emissions, specifically DPM, are the primary source of health concern in most urban areas in the SCAG region. Mobile DPM emissions in the SCAG region are anticipated to decrease as compared to existing conditions. Additionally, from 2019 to 2031, passenger and light daily truck PM2.5 is expected to remain constant, while heavy-duty PM2.5 emissions

continuously decrease.[147] As a result, existing sensitive receptors would be exposed to lower concentrations of TACs in the future. Sensitive receptors include residences, schools, medical facilities, senior centers, nursing homes, and similar uses. CARB recommends that local governments avoid locating new sensitive land uses within 500 feet of freeways as discussed in the Regulatory Framework above (see **Section 3.3.1**). Consistent with CARB recommendations, it is anticipated that local governments would limit growth within 500 feet of freeways and/or address potential health concerns through appropriate design requirements. For example, in the City of Los Angeles, all new mechanically ventilated buildings located within 1,000 feet of freeways are required to install air filtration media that provides a Minimum Efficiency Reporting Value (MERV) of 13.[148] In addition, properties within 1,000 feet of freeways are subject to an advisory notice regarding adverse health impacts resulting from chronic exposure to vehicle exhaust and particulate matter. The notice indicates that all applicants filing for a discretionary action within 1,000 feet of a freeway must adhere to design guidelines regarding freeway proximity, including a) avoiding locating sensitive uses such as schools, day-care facilities and senior centers; b) locate occupied open space away from freeway sources; c) prioritize non-habitable spaces (e.g. parking) nearest the freeway; and d) screen the site with substantial vegetation and or wall/barrier.[149] The City of Los Angeles also has numerous general plan policies related to air emissions and health. The City has also announced the City of Los Angeles Green New Deal, which includes goals that would reduce on-road mobile-source emissions (see **Section 3.6, Energy**).

Nonetheless, new sensitive receptors are likely to be developed within 500 feet of freeways and lanes may be added to freeways that result in widenings that bring freeway lanes in closer proximity to existing sensitive receptors. To assess the public health risks associated with emissions from major roadways, an HRA was prepared for Connect SoCal and is included in **Appendix 3.3**. An HRA evaluating the cancer risk from the transportation emissions in the SCAG region provides estimated cancer risk to the most impacted sensitive groups from a large sector of pollutants (transportation). An evaluation of the total emissions to sensitive receptors is not feasible because detailed data regarding all other sources of emissions is not available for 2045; see the discussion of the 2016 AQMP health effects appendix in **Impact AQ-2**.

According to the SCAQMD's most recent 2016 AQMP, which summarized the MATES IV study, the SCAQMD region has a population weighted cancer risk of 897 per million (2012-20136) for both

147 SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. Available online at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed October 29, 2019.

148 See Los Angeles Municipal Code § 99.04.504.6.

149 City of Los Angeles Department of City Planning. 2018. *Zoning Information File ZI No. 2427*. Available online at: http://zimas.lacity.org/documents/zoneinfo/zi2427.pdf, accessed October 3, 2019.

stationary and mobile sources. [150] It should be noted that the MATES IV study evaluated the risk from June 2012 through June 2013 and the results of the MATES IV study resulted in a 70% decrease in diesel emissions and a 50% decrease in cancer risk compared to the MATES III study that evaluated the risk from 2004 to 2006.[151] According to the MATES-IV study, the highest concentration of DPM was simulated to occur at the Ports of Los Angeles and Long Beach. [152] Since the MATES-IV study monitoring (2012-2013), California has mandated measures to reduce diesel exhaust at the ports. For example, in 2014 California requires that 50% of fleet calls must use shore power instead of running diesel-fueled auxiliary on-bard engines while at berth. Shore power is estimated to cut air pollution from ships at berth by 95 percent. The percentage of fleet calls using shore power increases to 70% in 2017 and 80% in 2020.[153] Therefore, it can be assumed that the MATES V study, which is currently underway, will also find a significant decrease in the weighted cancer risk since it is based on 2018 monitoring data.[154]According to CARB, DPM emissions account for approximately 70% of the known cancer risk related to air toxics in California. Major sources of diesel emissions include ships, trains, and heavy-duty trucks, especially for residents living near ports, railyards, and heavily traveled roadways.[155]

The Connect SoCal HRA evaluates potential carcinogenic health risks from emissions of DPM from motor vehicles on major freeways and transportation corridors. CARB has previously evaluated the risks posed to residential receptors near the Ports of Los Angeles and Long Beach and railyards across the SCAG region, including the four railyards in the City of Commerce, the Union Pacific Railyard in the City of Industry, Union Pacific Los Angeles Transportation Center (LATC) Railyard, and Union Pacific Mira Loma Railyard. According to CARB, port activities (including ship hoteling, cargo handling, and on-port trucking) would result in a cancer risk of over 10 in a million to approximately 1.98 million people, with

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150 SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. Available online at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed October 31, 2019.

151 Ibid.

152 SCAQMD. 2015. *MATES-IV Final Report*. Available online at: https://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7, accessed November 6, 2019.

153 Port of Long Beach. *Shore Power*. Available online at: http://www.polb.com/environment/air/shorepower.asp, accessed November 15, 2019.

154 SCAQMD. 2017. *MATES – Overview of goals, previous studies, and timeline*. Available online at: http://www.aqmd.gov/docs/default-source/default-document-library/presentation-on-item-2---overview-of-goals-previous-studies.pdf?sfvrsn=0, accessed November 6, 2019.

155 CARB. *Overview: Diesel Exhaust & Health*. Available online at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health, accessed November 5, 2019.

the nearest receptors exceeding 500 in one million cancer risks.[156] The Commerce railyards (Union Pacific Commerce Railyard, BNSF Hobart Railyard, BNSF Mechanical Sheila Railyard, and BNSF Commerce Eastern Railyard) will expose approximately 1.29 million people to a cancer risk greater than 10 in a million over a 76,000-acrea area.[157] Additionally the City of Industry, LATC, and Mira Loma Railyards are estimated to expose approximately 91,000 residents over 8,300-acres in Industry, 147,000 residents over 9,400-acres in LA, and 7,900 people over 3,000-acres in Mira Loma, respectively, to risks equal or greater to 10 in a million.[158,159,160] The Connect SoCal HRA evaluates a remaining major source of DPM emissions, highly traveled roadways.

DPM emissions have been associated with acute and chronic health effects, such as the worsening of heart and lung diseases. Elevated levels of ambient particulate matter have also been identified as one of many aggravating factors for childhood asthma. At levels above the federal and state ambient air quality standards, PM10 and PM2.5 emissions are a health concern. PM2.5 is believed to have greater negative health effects because the smaller particles can penetrate to the deepest parts of the lungs. Diesel exhaust from heavy duty trucks emits a mixture of gaseous and solid air pollutants, the solid pollutants make up DPM. Approximately 90% of DPM emissions are less than 1 μm, thus the majority of DPM emissions are a subset of PM2.5 and are small enough to be inhaled into the lungs.[161]

The HRA quantitatively analyzed the potential to expose people to increased cancer and other health risks, based on using the potential for increased cancer risk from diesel particulate matter from heavy-duty diesel trucks traveling on major freeways. Cancer risk is used as a proxy for general respiratory health. Only motor vehicle emissions on freeways were quantitatively evaluated because emissions from

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156 CARB. 2006. *Diesel Particulate Matter Exposure Assessment Study for the Port of Los Angeles and Long Beach*. Available online at: https://ww3.arb.ca.gov/ports/marinevess/documents/portstudy0406.pdf?_ga=2.166328956.333186014.1572896497-1229197864.1566229390, accessed November 5, 2019.

157 CARB 2007. *Health Risk Assessment for the Four Commerce Railyards*. Available online at: https://ww3.arb.ca.gov/railyard/hra/4com_hra.pdf?_ga=2.93549535.333186014.1572896497-1229197864.1566229390, accessed November 5, 2019.

158 CARB. 2008. *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard*. Available online at: https://ww3.arb.ca.gov/railyard/hra/up_coi_hra.pdf?_ga=2.56341481.333186014.1572896497-1229197864.1566229390, accessed November 5, 2019.

159 CARB. 2007. *Health Risk Assessment for the Union Pacific Railroad Los Angeles Transportation Center Railyard*. Available online at: https://ww3.arb.ca.gov/railyard/hra/up_latc_hra.pdf?_ga=2.64093421.333186014.1572896497-1229197864.1566229390, accessed November 5, 2019.

160 CARB. 2007. *Health Risk Assessment for the Union Pacific Railroad Mira Loma Auto Facility Railyard*. Available online at: https://ww3.arb.ca.gov/railyard/hra/up_miraloma_hra.pdf?_ga=2.97678301.333186014.1572896497-1229197864.1566229390, accessed November 5, 2019.

161 CARB. *Overview: Diesel Exhaust & Health*. Available online at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health, accessed October 3, 2019.

other transportation corridors are much less than emissions on major freeways. Additionally, stationary sources were not evaluated as there was insufficient data available to model the health risk posed from these sources.

The HRA shows substantial reductions in DPM and associated health risks (see discussion below). In the future under Plan (and No Plan) conditions, as a result of stringent emission controls, DPM and health risk would be reduced substantially as compared to existing conditions.

Implementation of the Plan would result in new transportation projects being developed near existing sensitive receptors or locating new receptors near transportation projects. Sensitive receptors would continue to be exposed to DPM as a result of the Plan. However, as shown in **Table 3.3-16**, cancer risk would decrease considerably in the future, and local jurisdictions are requiring more robust air filtration and other ways of reducing exposure to existing sources of pollutants in particular in proximity to freeways (see above discussion regarding the City of Los Angeles).

The declines in cancer risk across all freeway segments is the result of continued decreases in per-vehicle mile fleet emissions projected to occur due to continued emission control technology improvements in new vehicles.

The methodology for selection of the HRA segments is discussed above (based on vehicle volumes). Emissions of DPM from each segment were calculated using the SCAG Transportation Demand Model VMT data for 2019 and projections for 2045. The potential cancer risk for residences were evaluated for a 30-year exposure, 9-year exposure and 70-year exposure periods, assuming continuous exposure over those time periods (i.e. 24 hours a day, 7 days a week). SCAG VMT data was provided for heavy duty vehicles and light/medium duty vehicles. The most current version of CARB mobile source emissions model (EMFAC2014) was used to obtain emissions factors of PM10 in diesel-fueled vehicles, which were assumed equal to DPM emission factors.[162]

The potential health risk of emissions from a representative 1-mile long portion of each freeway segment were evaluated with CARB-approved AERMOD dispersion model (Version 18081) and meteorological data obtained from South Coast, Mojave Desert, Imperial, and Ventura Air District monitoring sites. The calculated DPM concentration was then used to calculate the potential carcinogenic risk using the most current OEHHA 2015 guidelines.

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[162] EMFAC 2014 model was the most recent, EPA-approved version at the time SCAG released the Conformity Assumptions for this analysis (i.e., EMFAC2017 had not yet been approved). Additionally, EMFAC2017 had not yet been approved at the time of releasing the NOP. On August 15, 2019, EPA approved EMFAC2017 for use; however, EPA provided a two-year grace period in which SACOG is not required to use EMFAC2017. The grace period runs through August 16, 2021.

To analyze potential cancer risk with respect to DPM, the threshold of 10 in one million identified above is considered. A 30-year exposure cancer risk was used in the analysis below per OEHHA guidance. As stated above, a 9-year and 70-year health risk analysis was also conducted. OEHHA recommends that a cancer risk for a range of residency times be calculated to coincide with the U.S. EPA's estimates of the average (9 years), high-end estimates (30-years) of residence time, and a lifetime residency (70 years). According to OEHHA, the 30-year exposure duration should be used to determine the risk characterization and recommends a 9-year and 70-year cancer risk be included as a supplemental analysis.[163] The 9-year and 70-year cancer risk estimates are provided in **Appendix 3.3, Health Risk Assessment Technical Report**.

As shown on **Table 3.3-16, Summary Maximum Exposed Individual Residential 30-Year Exposure Cancer Risk** (also see **Appendix 3.3**), the maximum 30-year exposure to residential cancer risk for each transportation segment is significantly reduced when compared to existing conditions. While the daily VMT would rise in every county under the Plan (even though per capita VMT is expected to decrease), see **Table 3.8-11** in **Section 3.8, Greenhouse Gases**, the maximum potential cancer risk would be on average 87 percent less than existing conditions. This is due to the dramatic reductions in emissions that are expected to result from federal and state regulations that require reduced tail pipe emissions from on-road heavy-duty diesel trucks (HDDT). It is important to note that despite the reduction in cancer risk compared to existing conditions, the Plan would still result in exposing sensitive receptors to substantial pollutant concentrations, however such emissions would be substantially less than under existing conditions. As shown on **Table 3.3-16** emissions under the Plan, on all segments, would decrease substantially. Due to the significant reduction in DPM emissions and associated health risk, overall risk is reduced and therefore, impacts are considered less than significant.

163 Office of Health Hazard Assessment. 2015. Air Toxics Hot Spots Program. Available online at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed October 1, 2019.

Table 3.3-16
Summary Maximum Exposed Individual Residential 30-Year Exposure Cancer Risk

Segment No.	Transportation Segment	County/Region	Existing Conditions	2045 No Project	2045 Connect SoCal
1	IMP I-8	Imperial / El Centro	24.5	14.2	14.5
2	IMP SR-78	Imperial / Westmoreland	64.6	37.1	18.9
3	LA I-110	Los Angeles / Carson	69.4	24.8	23.5
4	LA I-710	Los Angeles / Compton	63.8	31.2	30.9
5	LA SR-60 DB	Los Angeles / Diamond Bar	106.6	31.1	29.7
6	LA SR-60 SEM	Los Angeles / South El Monte	64.4	18.4	16.9
7	ORA I-5	Orange / Orange	24.8	5.36	5.49
8	ORA I-405	Orange / Seal Beach	43.3	12.2	11.8
9	RIV I-10	Riverside / Banning	10.5	4.97	4.83
10	RIV I-15	Riverside / Temecula	16.7	9.65	9.52
11	RIV SR-91	Riverside / Corona	22.6	8.4	8.41
12	SB I-15 ONT	San Bernardino / Ontario	40.4	10.4	10.5
13	SB I-15 VIC	San Bernardino / Victorville	109.9	40.6	41.3
14	SB SR-60	San Bernardino / Ontario	71.9	19.1	18.8
15	VEN US-101 SB	Ventura / San Buenaventura	21.2	4.93	4.85
16	VEN US-101 TO	Ventura / Thousand Oaks	102.5	19.6	21.9

Note: Cancer Risk Threshold is an increase of 10 per 1 million from the Plan.
Source: Health Risk Assessment (Appendix 3.3).

As demonstrated in **Table 3.3-16**, six of the transportation segments under the No Project scenario would have lower cancer risk than under the Plan. This is likely due to changes in the land use growth pattern and the ratio of light/medium vehicle versus heavy-duty truck travel expected under the Plan versus a No Plan. For example, Segment 12 is in Ontario on the I-15, under the Plan the segment would experience a decrease in VMT from light and medium duty cars of over 100,000 as compared to the No Project, however heavy-duty truck traffic is expected to increase by approximately 7,400 daily trips under the Plan as compared to the No Project scenario. Since the majority of DPM emissions and the associated health risk results from heavy-duty vehicles, the health risk would be greater in this segment under the Plan. The health risk under the Plan is anticipated to be less in most segments as compared to the No Project scenario. The total health risk in analyzed segments under the Plan (268.7 in one million) would

be less than the No Project (290.71 in one million). Additionally, the total health (268.7 in one million) risk under the Plan would be less than under existing conditions (857.1 in one million).

In addition to mobile-source emissions, multiple social, economic, and lifestyle factors could contribute to the detriment of the region's public health. Built upon the public health emphasis of previous Plans, Connect SoCal emphasizes public health.

As indicated in the Connect SoCal Public Health Technical Report, poor air quality can also impact non-cancer related health problems including asthma. Additionally, climate change can lead to increased wildfires and smoke, which in turn degrades the air quality in the region. Increases in PM2.5 from wildfires leads to increased hospital visits and mortality.[164] This risk persists even after a wildfire is extinguished because particulate matter from fire ash can be picked up by winds. SCAG has evaluated social detriments including the community context, availability of health care, neighborhood and surrounding built environment, education, and economic health to see how these factors shape public health. With nearly half of U.S. adults living with a chronic disease, SCAG recognizes improving public health is vital to the community. The Surgeon General promotes increasing physical activity as one strategy to improve public health.[165]

SCAG's responsibility as it relates to air quality is to focus on mobile source emissions. Air districts, such as the SCAQMD are responsible for overseeing air quality in the region for stationary sources. As stated above, the SCAQMD prepares an AQMP in order to ensure the area reaches attainment for ozone and particulate matter. According to the SCAQMD, 25% of the SCAB area's ozone-forming air pollutant comes from stationary sources and 75% comes from mobile-source emissions.[166] Therefore, while air districts have more authority in reducing stationary source pollution by creating rules and thresholds within their jurisdictions as well as have more authority in project-level analysis, air quality management districts must work closely with MPO's, such as SCAG, in order to ensure reductions in mobile-source air emissions. For example, SCAQMD's most recent 2016 AQMP includes a discussion of the health risk in the SCAB region as a result of both stationary and mobile source emissions based on the MATES IV model, which included on-road mobile source information obtained from SCAG.[167] As indicated above, the weighted cancer risk from all sources from 2012-2013 is approximately 897 in one million, which is

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164 Southern California Association of Governments. 2019. *Public Health Draft Technical Report.*

165 U.S. Department of Health & Hazard Services. 2015. *Executive Summary from Step It Up!: Surgeon General's Call to Action*. Available online at: https://www.hhs.gov/surgeongeneral/reports-and-publications/physical-activity-nutrition/walking-executive-summary/index.html, accessed September 3, 2019.

166 SCAQMD. *About*. Available online at: http://www.aqmd.gov/nav/about, accessed November 5, 2019.

167 SCAQMD. 2015. *Mates IV*. Available online at: http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7, accessed November 5, 2019.

likely lower in 2019.[168] The MATES IV study goes onto say that the areas of highest risk include those near the ports, Central Los Angeles, and along transportation corridors.[169]

While implementation of the Plan would increase total VMT from 2019 to 2045 (see **Table 3.8-11, Population and VMT (2019 and 2045)**), there is a growing support for increasing active transportation throughout the communities in the region. These changes can only be met if there is also a change in the built environment that enable people to walk safely in their communities. Proposed land use strategies and transportation investments, such as provision of additional investments in active transportation networks including first mile/last mile improvements, Safe Routes to School projects, and regional bikeways infrastructure are expected to increase the number of short trips, reduce per capita VMT and improve physical activity outcomes. The statewide Affordable Housing and Sustainable Communities (AHSC) program, as noted in the Plan, would improve air quality and reduce greenhouse gas emissions by funding housing and transportation improvements that support infill and compact development thereby reducing VMT.[170] Land use strategies within Connect SoCal also focuses development in HQTAs.

Connect SoCal includes regional strategies that would contribute to improving public health by reducing VMT (as well as encouraging increased healthy activities). As discussed in **Section 2.0, Project Description,** these strategies include, increased transportation investments in active transportation opportunities and facilities, transit and passenger rail use, and land use strategies that create more opportunities for walking and biking or other physics activities. The Plan projects total VMT would increase from 2019, but VMT per capita would decrease.

Summary

Connect SoCal would provide strategies to improve public health and develop walkable and transit friendly communities. The cancer risk adjacent to freeways would be significantly reduced when compared to existing conditions. The Plan would not exacerbate the health risk compared to existing conditions and therefore the impact of on-road emissions is less than significant.

As discussed above, construction activity would occur adjacent to sensitive receptors. The significant construction emissions identified in AQ-2, could result in an adverse health effects to sensitive receptors.

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168 SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. Available online at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed October 31, 2019.

169 SCAQMD. 2015. *MATES-IV Final Report*. Available online at: https://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7, accessed November 6, 2019.

170 Southern California Association of Governments. 2019. *Connect SoCal*.

As such, it is likely that extended intense construction activities (e.g., from development projects that involve a high volume of haul trucks) would exceed the health risk significance thresholds due to equipment and truck exhaust emissions. This is considered a significant impact related to substantial pollutant concentrations during construction activities. Mitigation is required.

Mitigation Measures

SCAG Mitigation Measures

See **SMM AQ-1, SMM AQ-2, SMM**, and **SMM AQ-3.**

Project Level Mitigation Measures

See PMM-AQ-1.

Level of Significance after Mitigation

As discussed above, regulations and policies would reduce each of the impacts but given the regional scale of the analysis in this PEIR, it is not possible to determine if all impacts would be fully mitigated by existing regulations and policies. Therefore, this PEIR identifies project-level mitigation measures consistent with applicable regulations and policies designed to reduce impacts. Lead Agencies may choose to include project-level mitigation measures in environmental documents as they determine to be appropriate and feasible. However, because of the anticipated construction emissions, the regional nature of the analysis and SCAG's lack of authority to impose project-level mitigation measures, this PEIR finds impacts related to air emission impacts on sensitive receptors during construction could be significant and unavoidable even with implementation of mitigation.

Impact AQ-4 Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Less than Significant Impact.

Connect SoCal would result in a less than significant impact to air quality in relation to exposing a substantial number of people to objectionable odors. Odor sources within the SCAG region, such as wastewater treatment facilities, landfills, and agricultural operations, are controlled by county and city odor ordinances and air district rules that prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors. These ordinances and rules are enforced by the air pollution control districts and local law enforcements. For example, SCAQMD, MDAQMD, and AVAQMD Rule 113; VPAPCD Rule 74.2; and ICAPCD Rules 101 and 424, *Architectural Coatings*, limit the amount of

volatile organic compounds from architectural coatings and solvents to further reduce the potential for odiferous emissions. SCAQMD also provides rules to establish odor management practices and requirements from solid waste transfer stations, material recovery facilities, and rendering facilities in Rule 410, *Odors from Transfer Stations and Material Recovery Facilities*, [171] and Rule 415, *Odors from Rendering Facilities*.[172] Additionally, SCAQMD and MDAQMD's Rule 402; [173, 174] VCAPCD's Rule 51; [175] and IPAPCD's Rule 407[176] *Nuisance* establishes that no person shall discharge any source of air contaminants that may cause harm or nuisance to the public. In order to hold any facility accountable for nuisance rules, the air quality management districts allow the public to report any air quality problems within the district including odor complaints.[177] As such, the Plan would be required to adhere to these rules and implementation of the Plan would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions. Therefore, the impact would be less than significant, and the consideration of mitigation measures is not warranted.

Construction

Construction of transportation projects and anticipated development under the Plan have the potential to cause an increase in construction activities in the region. Activities associated with the operation of construction equipment, diesel, the application of asphalt, the application of architectural coatings and other interior and exterior finished, and roofing may produce discernible odors typical of most construction sites. As stated above, SCAQMD, MDAQMD, and AVAQMD Rule 113; VPAPCD Rule 74.2; and ICAPCD Rules 101 and 424, *Architectural Coatings*, limit the amount of volatile organic compounds from architectural coatings and solvents to further reduce the potential for odiferous emissions. Although these odors could be a source of nuisance to adjacent uses, odors from construction at any individual site

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171 South Coast Air Quality Management District. 2006. *Rule 410. Odors from Transfer Stations and Material Recovery Facilities*. Available online at: https://ww3.arb.ca.gov/drdb/sc/curhtml/r410.pdf, accessed October 30, 2019.

172 South Coast Air Quality Management District. 2017. *Rule 415. Odors from Rendering Facilities*. Available online at: https://ww3.arb.ca.gov/drdb/sc/curhtml/r415.pdf, accessed October 30, 2019.

173 South Coast Air Quality Management District. 1976. *Rule 402. Nuisance*. Available online at: http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf?sfvrsn=4, accessed October 30, 2019.

174 MDAQMD. 1977. *Rule 402 Nuisance*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=290, accessed November 15, 2019.

175 VCAPCD. 2004. *Rule 51- Nuisance*. Available online at: http://www.vcapcd.org/Rulebook/Reg4/RULE%2051.pdf, accessed November 15, 2019.

176 ICAPCD. 1999. *Rule 407 Nuisances*. Available online at: https://ww3.arb.ca.gov/drdb/imp/curhtml/r407.pdf, accessed November 15, 2019.

177 South Coast Air Quality Management District. 2019. *Odor Complaints and Nuisance Violations*. Available online at: http://www.aqmd.gov/home/news-events/community-investigations/sunshine-canyon-landfill/odor-complaints, accessed October 30, 2019.

is temporary and intermittent in nature. Construction-related emissions also decrease with distance from individual project sites and quickly dissipate.

In accordance with federal and state regulations, diesel emissions from heavy duty trucks are projected to decrease with the Plan (see the HRA in **Appendix 3.3**), and construction activities associated with the Plan would adhere to CARB's guidelines regarding proximity to sensitive receptors. As such, construction resulting from the Plan would result in less than significant odor impacts.

Land Use Development Projects

The development projects anticipated to occur under the Plan would have the potential to result in nuisance odors. There are certain industries and activities that tend to result in odor complaints. According to the SCAQMD *CEQA Air Quality Handbook*, land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies and fiberglass molding. Any and all of these uses/activities could occur somewhere in the SCAG region under the Plan.

However, development projects would be required to comply with applicable odor regulations, such as SCAQMD, MDAQMD, and AVAQMD Rule 113; VPAPCD Rule 74.2; and ICAPCD Rules 101 and 424, *Architectural Coatings* and SCAQMD and MDAQMD Rule 402; VPAPCD Rule 51; and ICAPCD Rule 407 *Nuisance*. The air quality management districts use similar *Nuisance* rules which state:

> *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 to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.*[178, 179, 180, 181]

Therefore, most development projects would be required to comply with rules prohibiting nuisance to the public, including odors. The level of exposure and number of receptors affected from potential odor can only be determined through project-level analysis once facility designs of individual projects are

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178 South Coast Air Quality Management District. 1976. *Rule 402. Nuisance*. Available online at: http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf?sfvrsn=4, accessed December 2, 2019.

179 MDAQMD. 1977. *Rule 402 Nuisance*. Available online at: http://mdaqmd.ca.gov/home/showdocument?id=290, accessed December 2, 2019.

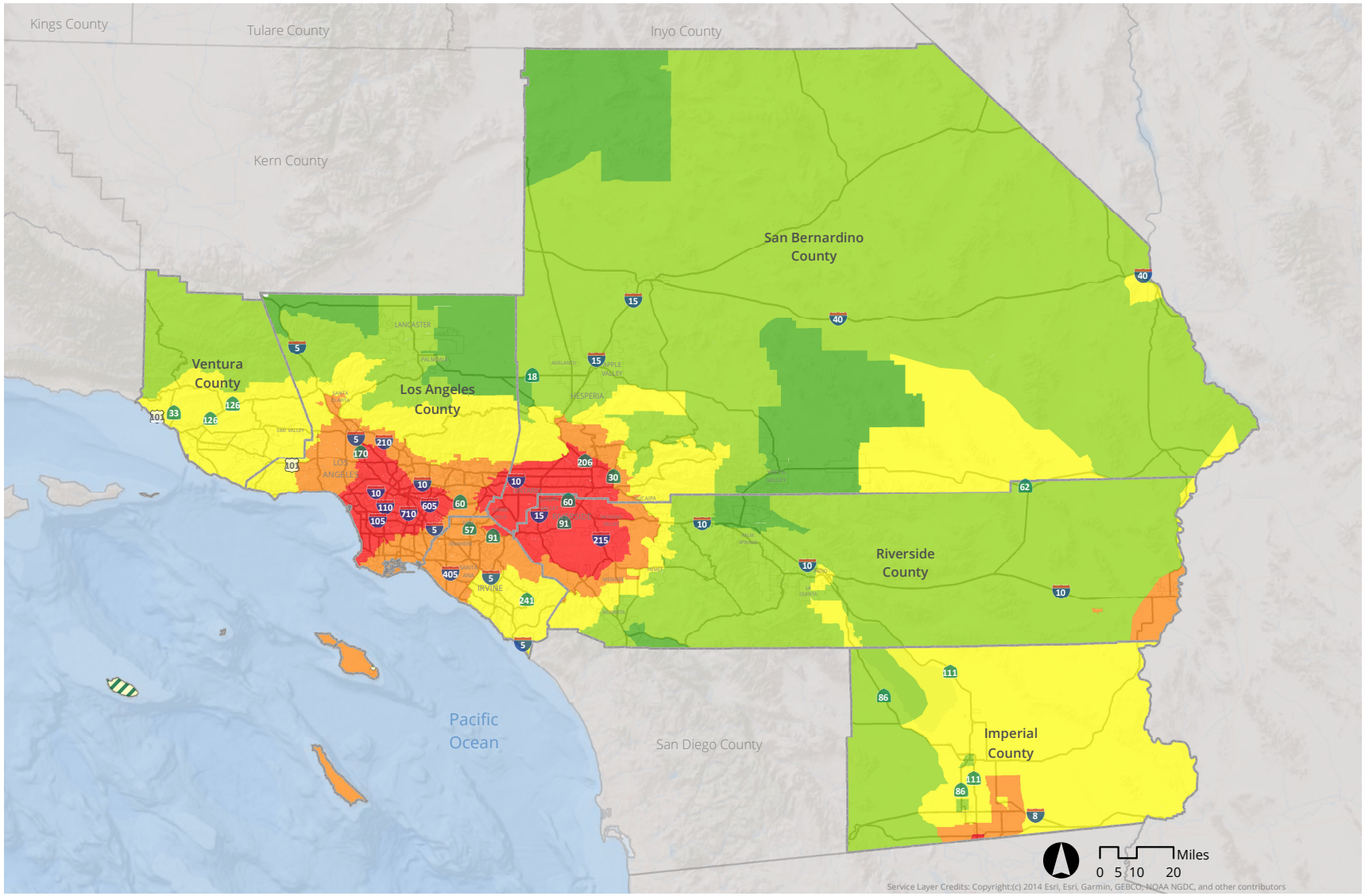
180 VCAPCD. 2004. *Rule 51- Nuisance*. Available online at: http://www.vcapcd.org/Rulebook/Reg4/RULE%2051.pdf, accessed December 2, 2019.

181 ICAPCD. 1999. *Rule 407 Nuisances*. Available online at: https://ww3.arb.ca.gov/drdb/imp/curhtml/r407.pdf, accessed December 2, 2019.

available. Therefore, odor impacts related to development would be analyzed at the individual project level. However, since development projects are required to comply with applicable odor regulations, land use development would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions, the impact would be less than significant, and the consideration of mitigation measures is not warranted.

Transportation Improvements

Connect SoCal includes the implementation of transportation projects (see **Appendix 2.0, Project List**) with the aim of reducing overall emissions in both mobile and stationary sources by increasing density and reducing VMT. Some transportation projects that involve roadway expansions or realignments could result in the transfer of vehicle emissions and/or could result in odor emissions sources being located closer to receptors. For example, Connect SoCal includes a transportation project to widen Harbor Boulevard in Orange County by one lane in each direction from Warner Avenue to 17th Street. Extending the street will bring vehicles and the associated exhaust emissions and odors closer to existing receptors along the roadway. In addition, some projects (e.g., rail stations) could result in localized traffic congestion that could incrementally add to odor concentrations. However, the SCAQMD does not indicate that transportation projects are associated with odor complaints. Similar to development projects, transportation projects would be required to comply with applicable odor regulations, such as the SCAQMD and MDAQMD's Rule 402; VCAPCD's Rule 51; and ICAPCD's Rule 407 *Nuisance*. Transportation projects would not be expected to result in substantial odor emissions or affect a substantial number of people when compared to existing conditions. Therefore, the impact would be less than significant, and the consideration of mitigation measures is not warranted.



Annual Mean Concentration of PM2.5 (Average of Quarterly Means, µg/m3), Over Three Years (2012 to 2014)

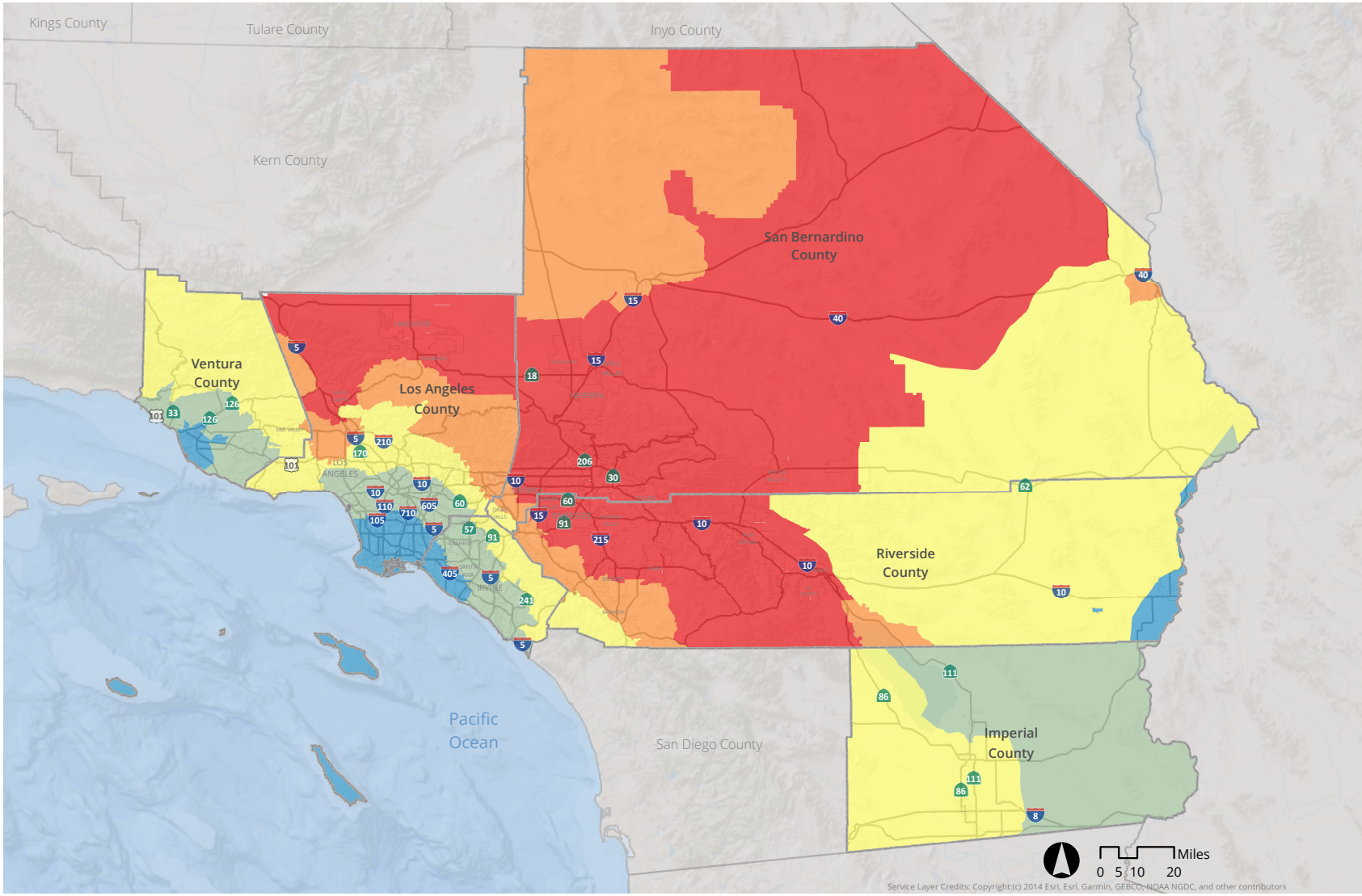
No Data | 4.5 - 6.0 | 6.1 - 8.0 | 8.1 - 10.0 | 10.1 - 12.0 | 12.1 - 14.6

SOURCE: CAlEPA, OEHHA, CalEnviroScreen 3.0, 2017

FIGURE **3.3-1**

IMPACT SCIENCES

Average Annual Concentration of PM2.5



Mean of Summer Months (May-October) of the Daily Maximum 8-Hour Ozone Concentration (ppm), Averaged over Three Years (2012 to 2014)

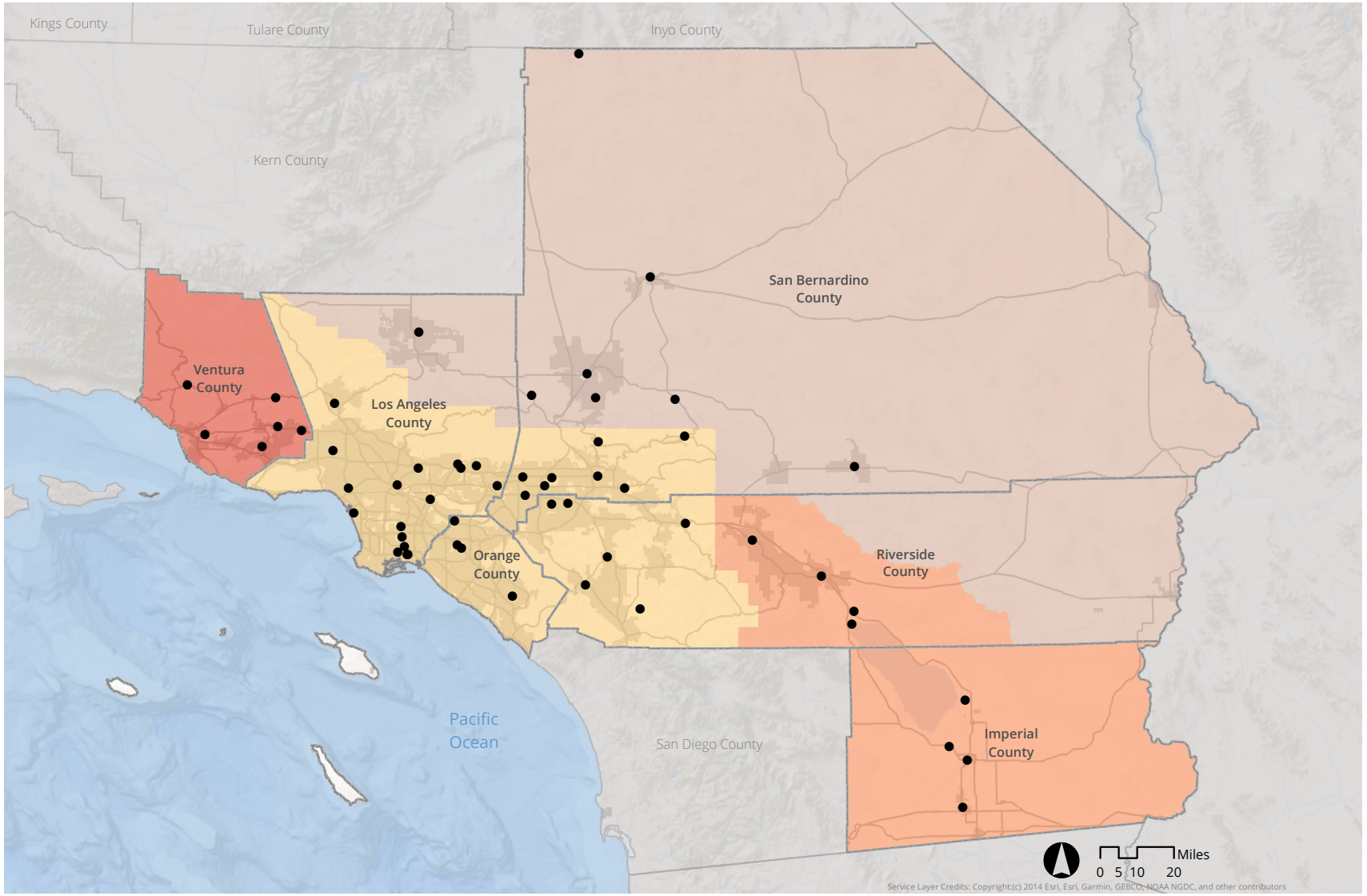
0.040 - 0.045 | 0.046 - 0.050 | 0.051 - 0.055 | 0.056 - 0.060 | 0.061 - 0.068

SOURCE: CalEPA, OEHHA, CalEnviroScreen 3.0, 2017

FIGURE **3.3-2**

IMPACT SCIENCES

Average Daily Ozone Exposure in Excess of National 8-Hour Standard



SOURCE: CalEPA, OEHHA, CalEnviroScreen 3.0, 2017

FIGURE **3.3-3**

IMPACT SCIENCES

Air Quality Basins and Monitoring Stations

1329.001•10/19

Legend

2016 PEIR Additonal Segment

Original Segment

County Boundary

SOURCE: Kleinfelder, 2016

FIGURE **3.3-4**

IMPACT SCIENCES

Overview Freeway Segments Evaluated in HRA

3.3.5 SOURCES

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