

4.3 AIR QUALITY

This section evaluates the potential impacts of the proposed Plan related to air quality. See Appendix D for more details on the air quality technical analysis.

4.3.1 EXISTING CONDITIONS

TOPOGRAPHY AND CLIMATE

The proposed Plan is within the San Diego Air Basin (SDAB), which includes all of the County of San Diego. The SDAB covers roughly 4,200 square miles, lies in the southwest corner of California, and encompasses all of the county. The region's population and emissions are concentrated mainly in the western portion of the county (SDAPCD 2019a).

Topography

The topography of the San Diego region is highly varied, comprising coastal plains and lagoons, flatlands and mesas, broad valleys, canyons, foothills, mountains, and deserts. Generally, building structures can be found on and in the flatlands, mesas, and valleys, while the canyons and foothills tend to be sparsely developed. This segmentation has led to the region being a conglomeration of separate cities with mostly low-density housing and an automobile-centric character.

The topography is unique and varied. To the west are the region's beaches and the Pacific Ocean, to the south is Tijuana, Mexico, and the Baja California Peninsula, to the near east are the mountains, to the far east is the desert (the Salton Sea Air Basin), and to the north is the South Coast Air Basin (the greater Los Angeles-Riverside-San Bernardino area).

The topography also drives the pollutant levels. The SDAB is not classified as a contributor, but it is classified as a transport recipient. The transport pollutants are ozone (O₃), nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are transported from the South Coast Air Basin to the north and, when the wind shifts direction, Tijuana, Mexico, to the south (SDAPCD 2019a).

Climate

The climate of San Diego is classified as Mediterranean but is incredibly diverse because of the topography. The climate is dominated by the Pacific High-pressure system that results in mild, dry summers and mild, wet winters. San Diego experiences an average of 201 days above 70°F and 9–13 inches of rainfall annually (mostly, November–March). El Niño and La Niña patterns have large effects on the annual regional rainfall.

An El Niño is a warming of the surface waters of the eastern Pacific Ocean. It is a climate pattern that occurs across the tropical Pacific Ocean that is associated with drastic weather occurrences, including enhanced rainfall in Southern California. La Niña is a term for cooler than normal sea surface temperatures across the Eastern Pacific Ocean. San Diego receives less than normal rainfall during La Niña years.

The Pacific High drives the prevailing winds in the SDAB. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases the O₃ levels. In the winter, San Diego often experiences a shallow inversion layer, which tends to increase carbon monoxide

and PM_{2.5} (particulate matter smaller than or equal than 2.5 microns in diameter) concentration levels due to the increased use of residential wood burning.

In the fall months, the SDAB is often affected by Santa Ana winds. These winds are the result of a high-pressure system over the Nevada-Utah region that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. These winds are powerful and incessant. They blow the air basin's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O₃ concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions (SDAPCD 2019a).

POLLUTANTS OF CONCERN

The analysis for air quality focuses on the following two types of air pollutants that are of greatest concern for the Plan Area:

- **Criteria Pollutants.** Pollutants for which the United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have set ambient air quality standards or that are chemical precursors to compounds for which ambient standards have been set. The criteria pollutants associated with Plan implementation are O₃ and the precursors thereof (VOC and NO_x), particulate matter (PM) (PM₁₀ is PM smaller than or equal to 10 microns in diameter and PM_{2.5} is PM smaller than or equal than 2.5 microns in diameter), carbon monoxide (CO), and sulfur dioxide (SO₂).
- **Toxic Air Contaminants.** The EPA has identified nine air toxic compounds associated with mobile sources as the considerable contributors to background air quality concerns. The toxic air contaminants associated with Plan implementation are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.

Criteria Pollutants

The federal and state governments have established the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for six criteria pollutants: O₃, lead (Pb), CO, nitrogen dioxide (NO₂), SO₂, and PM₁₀ and PM_{2.5}. The NAAQS and CAAQS for these six criteria pollutants were established with the goal of protecting the public's health from air pollution. O₃ is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as CO, NO₂, SO₂, and Pb are considered local pollutants that tend to accumulate in the air locally. PM is both a local and a regional pollutant. The primary criteria pollutants of concern generated by the proposed Plan are ozone precursors (VOC and NO_x), CO, and PM.

All criteria pollutants can have human health and environmental effects at certain concentrations. The ambient air quality standards for these pollutants (Table 4.3-1) are set to protect public health and the environment within an adequate margin of safety (Clean Air Act Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards.

Principal characteristics and possible health and environmental effects from exposure to the primary criteria pollutants potentially generated by the proposed Plan are discussed below.

- **Ozone**, a component of urban smog, is photochemical oxidant that is formed when VOC and NO_x (both byproducts of the internal combustion engine) react with sunlight. VOC are compounds made up primarily

of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of VOC are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_x are nitric oxide (NO) and NO₂. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO₂ is a reddish-brown irritating gas formed by the combination of NO and oxygen. In addition to serving as an integral participant in ozone formation, NO_x also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoors. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggregate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (EPA 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggests that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (EPA 2019b). The CAAQS and NAAQS for ozone are shown in Table 4.3-1.

In addition to human health effects, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials.

- **Nitrogen Oxides** is formed by the combination of NO and oxygen through internal combustion. Long-term exposure to NO₂ can aggravate respiratory diseases, such as asthma, leading to increased hospital admissions (EPA 2016b). Controlled studies demonstrate effects (airway reactivity) among asthmatics at a short-term (less than 3 hours) exposure to 0.3 parts per million (ppm) NO₂. Effects among healthy individuals occurred at high levels of exposure (1.5 to 2 ppm) (McConnell et al. 2002). For reference, the 1-hour CAAQS for NO₂ is 0.18 ppm (see Table 4.3-1). In addition to human health effects, NO₂ can also reduce visibility and react with water, oxygen, and other chemicals to contribute to acid rain, which can harm sensitive ecosystems (EPA 2016b).
- **Carbon Monoxide** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the Plan Area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at concentrations above the CAAQS or NAAQS (see Table 4.3-1) can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (CARB 2020a).
- **Particulate Matter** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now regulated—inhalable coarse particles, or PM₁₀, and inhalable fine particles, or PM_{2.5}. Particulate discharge into the atmosphere results primarily from industrial,

agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Additionally, secondary formation of PM, primarily in the form of fine particulate, occurs through the chemical transformation of precursors such as NO_x, SO₂, ammonia, and VOCs.

Particulate pollution can be transported over long distances and may adversely affect humans, especially people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease. Other symptoms of exposure may include nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Exposure to concentrations of PM above the current ambient air quality standards may result in these health effects (EPA 2020a). Similar to O₃, the elderly and those with preexisting heart and lung diseases are at greater risk to the harmful effects of PM exposure. Children are also at increased risk because they breathe faster than adults, and therefore inhale more air per pound of body weight and tend to spend more time outdoors. The CAAQS and NAAQS for PM are set to protect these sensitive populations and define the number of particles that can be present in outdoor air without threatening the health of infants, children, or the elderly (CARB 2020b). The CAAQS and NAAQS for PM are shown in Table 4.3-1.

Depending on its composition, both PM₁₀ and PM_{2.5} can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (EPA 2020a).

- **Sulfur dioxide** is a product of fuel combustion. The predominant source of SO₂ emissions within the San Diego region is mobile source fuel combustion, primarily aircraft, ocean-going vessels, and onroad vehicles. In recent years emissions of SO₂ have been significantly reduced by the increasingly stringent controls placed on the sulfur content of fuels used in stationary sources and mobile sources. SO₂ is a precursor to fine PM formation in the form of sulfates, such as ammonium sulfate. Short-term exposure to SO₂ can aggravate the respiratory system, making breathing difficult. Controlled laboratory studies indicate that brief exposure (5 to 10 minutes) of exercising asthmatics to an average SO₂ level of 0.4 ppm can result in increases in air resistance. Healthy adults do not show any symptoms to SO₂ at levels as high as 1 ppm, even after up to 3 hours of exposure. Based on the concentration needed to protect sensitive individuals (e.g., asthmatics), CARB and EPA have adopted the CAAQS and NAAQS for SO₂ (see Table 4.3-1) (SCAQMD 2017). In addition to public health impacts, SO₂ can also affect the environment by damaging foliage and decreasing plant growth (EPA 2019b).
- **Lead** is a soft metal that was previously added to gasoline and emitted to the environment through motor vehicle exhaust. Since lead was removed from gasoline, emissions have declined, and the primary source of emissions is now metal processing facilities and leaded aviation gasoline. Lead can also be resuspended into the air when contaminated soil or paints are disturbed. Lead emissions can be inhaled and ingested, leading to accumulation of lead particles in bone. Lead exposure can lead to cognitive function decrements, behavioral problems, kidney and heart disease, decreased immunity and red blood cell counts, and reproductive and developmental effects (CARB 2020e).

CAAQS have been established for other criteria pollutants, including Sulfates, Hydrogen Sulfide, and Vinyl Chloride (see Table 4.3-1). However, these criteria pollutants are not affected by the proposed Plan and are not quantified. Vinyl Chloride is associated with industrial processes, such as polyvinyl chloride (PVC) plastic and vinyl product production. Hydrogen Sulfide is associated with natural gas extraction and processing, and natural emissions from geothermal fields. Moreover, while sulfates are primarily emitted from fossil fuel combustion, sulfates are part of PM_{2.5}; thus, they are included in PM_{2.5} estimates herein. Additionally, while

lead is both a CAAQS and a NAAQS, Lead emissions are not present in current fossil fuels, and are primarily associated with manufacturing, some aviation fuels, and battery recycling and manufacturing plants.

Toxic Air Contaminants

TACs are pollutants that have no ambient standard but pose the potential to increase the risk of developing cancer or acute or chronic health risks. The most relevant TAC associated with the proposed Plan is DPM. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Therefore, no NAAQS or CAAQS exist for TACs. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders.

The State Air Toxics Program (Assembly Bill [AB] 2588) identified over 200 TACs. EPA has assessed this expansive list of toxics and identified a master list of TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

EPA has assessed this expansive list in their rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register* [FR], Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from their 2014 National Air Toxics Assessment (NATA) (EPA 2018). These nine compounds, considered “priority” MSATs, are acrolein, acetaldehyde, benzene, 1,3-butadiene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM) (FHWA 2016).

The California-specific transportation air quality analysis model, CT-EMFAC, is designed to model MSATs. However, CT-EMFAC does not have the most recent speciation data for POM and naphthalene. To use a consistent source and rely on current data for speciation factors for all MSATs and the different vehicle and fuel types, the speciation factors from EPA’s MOVES2014b mobile source emission model; current at the time of analysis, were used for all on-road mobile sources, instead of CT-EMFAC (EPA 2015a, 2016).

Health effects from MSATs/TACs, including cancer and chronic noncancer risks from on-road traffic, have been associated primarily with diesel PM, benzene, and 1, 3-butadiene. In addition to these three compounds, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient TAC risk for which data are available within California.

Diesel Particulate Matter Exposure and Human Health Impacts

Most of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being DPM. DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of

hundreds of substances. DPM is emitted from both mobile and stationary sources. Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban TACs, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel particulates are of the greatest health concern and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements.

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. Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depend upon several factors, including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure.

DPM emissions are believed to be responsible for about 70 percent of California's estimated known cancer risk attributable to TACs. DPM comprises about 8% of outdoor PM_{2.5} concentrations, which is a known health hazard. DPM contributes to numerous health impacts that have been attributed to PM exposure, including increased hospital admissions, particularly for heart disease, but also for respiratory illnesses, and even premature death. CARB estimates that diesel PM contributes to approximately 1,400 (95 percent confidence interval: 1,100-1,800) premature deaths from cardiovascular disease annually in California. Additionally, exposure to diesel exhaust may contribute to the onset of new allergies; a clinical study of human subjects has shown that diesel exhaust particles, in combination with potential allergens, may actually be able to produce new allergies that did not exist previously (CARB 2021b).

Ultrafine Particulate Matter

Ultrafine particulate matter (UFP) refers to a subfraction of currently regulated PM_{2.5} and PM₁₀ size particles. Although the operational definition of UFP varies in the scientific literature, it is generally accepted that particles with size less than 100 nanometers (0.1 micrometer) are labeled as UFPs. Although UFPs contribute only a small amount to total PM mass, they have a large surface area and often very high concentrations. Because of its small size, a given mass of UFP contains thousands to tens of thousands more particles, with a correspondingly larger surface area, than an equivalent mass of PM_{2.5} or PM₁₀. This means that a given mass of UFP can impact a larger surface area of lung tissue than equal mass of PM_{2.5} or PM₁₀, thus increasing exposure (EPA 2017a). The predominant source of UFP is combustion by on-road vehicles, off-road vehicles, and stationary sources (CARB 2006). Concentrations of UFP have been found to be substantially higher at locations proximate to and downwind of high-volume roadways, particularly roadways travelled by diesel-powered vehicles (Health Effects Institute 2013). Studies have also shown that commuters using non-automobile travel (e.g., bicycles) have a higher risk of exposure and adverse health impacts if commuting is performed along roadways (Panis et al. 2010). Moreover, evidence suggests that UFP can penetrate the microclimate within vehicles, causing increasingly more exposure to UFP among those with long commutes (Bigazzi and Figliozzi 2012).

Other Air Toxics

Other TACs are emitted from combusting non-diesel fuels, primarily gasoline. In total, the Federal Highway Administration (FHWA) has identified nine priority TACs from mobile sources, which are called mobile source air toxics (FHWA 2016):

- 1,3-butadiene
- Acetaldehyde
- Acrolein
- Benzene
- DPM
- Ethylbenzene
- Formaldehyde
- Naphthalene
- Polycyclic organic matter (POM)

CARB notes that DPM, which is composed of black carbon and numerous organic compounds (i.e. polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene) is responsible for 70 percent of the total known cancer risk related to air toxics in California (CARB 2021c).

Odors

Odor sources commonly associated with negative human response include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, food packaging plants, and cannabis growers. Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

Sensitive Receptors

Sensitive receptors are defined as locations where pollutant-sensitive members of the population may reside or where the presence of air pollutant emissions could adversely affect use of the land. CARB has identified the following people as the most likely to be affected by air pollution: children younger than 14, the elderly older than 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors (CARB 2005). Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder-care facilities, elementary schools, and parks. Most health studies indicate that health effects are strongest within 1,000 feet of emission sources (CARB 2005).

AMBIENT AIR QUALITY CONDITIONS

The federal Clean Air Act (CAA) requires EPA to designate areas within the country as either attainment or nonattainment for each criteria pollutant based on whether the NAAQS have been achieved. Similarly, the California CAA (CCAA) requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. If a pollutant concentration is lower than the state or federal standard, the area is classified as being in attainment for that pollutant. If a pollutant violates the standard, the area is considered a nonattainment area. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data show that a state standard for the pollutant was violated at least once during the previous 3 calendar years. Exceedances that

are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment. CAAQS and NAAQS as well as the attainment status for each in the county is summarized in Table 4.3-1.

**Table 4.3-1
State and Federal Attainment Air Quality Standards and Attainment Status for the San Diego Region**

Pollutant	Averaging Time	State Standard ¹	Federal Standard ²	State Designation ³	Federal Designation ⁴
Ozone (O ₃)	1 hour	0.09 ppm ³	--	--	Attainment
	8 hour	0.070 ppm	0.070 ppm (2015) 0.075 ppm (2008)	Nonattainment	Moderate Nonattainment (2015) Serious/Severe Nonattainment (2008) ⁵
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Attainment	Attainment
	8 hour	9.0 ppm	9 ppm	Attainment	Attainment
Nitrogen Dioxide (NO ₂)	1 hour	0.18 ppm	100 ppb	Attainment	Attainment
	Annual Arithmetic Mean	0.030 ppm	53 ppb	Attainment	Attainment
Sulfur Dioxide (SO ₂)	1 hour	0.25 ppm	75 ppb	Attainment	Attainment
	24 hour	0.04 ppm	0.14 ppm	Attainment	Attainment
Respirable Particulate Matter (PM ₁₀)	24 hour	50 µg/m ³	150 µg/m ³	Nonattainment	Unclassifiable/Attainment
	Annual Arithmetic Mean	20 µg/m ³	--	Nonattainment	--
Fine Particulate Matter (PM _{2.5})	24 hour	--	35 µg/m ³	Nonattainment	--
	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³	Nonattainment	Attainment
Sulfates	24 hour	25 µg/m ³	--	Attainment	No Federal Standard
Lead (Pb)	30 day average	1.5 µg/m ³	--	Attainment	--
	Calendar quarter	--	1.5 µg/m ³	--	Attainment
	Rolling 3-Month Average	--	0.15 µg/m ³	--	Attainment
Hydrogen Sulfide	1 hour	0.03 ppm	--	Unclassified ⁴	No Federal Standard
Vinyl Chloride	24 hour	0.01 ppm	--	Unclassified ⁴	No Federal Standard

Sources: EPA 2021b, SDAPCD 2019a

¹ The CAAQS for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, PM₁₀, and PM_{2.5} are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

² The NAAQS, other than O₃ and those based on annual averages, are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years,

is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

³ State and federal designations are based on San Diego Air Pollution Control District's attainment status webpage and the EPA's Greenbook, which was accessed in July 2021.

⁴ At the time of designation, if the available data do not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

⁵ Separate ozone standards were promulgated in 2015 (0.070 ppm) and 2008 (0.075 ppm). San Diego County has not met either standard, and is classified as nonattainment for both standards. Thus, both standards remain in effect.

ppm = parts per million by volume; ppb = parts per billion; µg/m³ = micrograms per cubic meter.

Air quality is monitored at various monitoring sites throughout the region. Monitoring is performed by the San Diego Air Pollution Control District (SDAPCD). The monitoring network has been designed to provide criteria pollutant monitoring coverage to the majority of the inhabited areas of the region. The purpose of air monitoring is to identify areas where pollutant levels exceed federal and state ambient air quality standards, then develop strategies and regulations to achieve the emission reductions necessary to meet all NAAQS and CAAQS. Data from the ambient monitoring network are then used to indicate the success of the regulations and control strategies in terms of the rate of progress towards attaining the standards or to demonstrate that standards have been attained and maintained.

Table 4.3-2 below shows the ambient air quality monitoring stations operated by the SDAPCD and the pollutants measured at each.

Annual air quality data from the monitoring stations are summarized in SDAPCD's Annual Reports and Five-Year Air Quality Summary. The most recent annual report at the time of Draft EIR preparation was the 2020 Annual Report, which summarizes monitoring concentrations, exceedances, and the number of days during the 2015 to 2019 time period (SDAPCD 2020). Monitoring data are also reported to CARB and maintained within CARB's statewide Aerometric Data Analysis and Management (ADAM) air quality database (CARB 2020d). The Annual Report provides data by monitoring station, whereas the ADAM database provides a summary of the data for the entire SDAB. A summary of SDAB data from the ADAM database is provided in Table 4.3-3 for all pollutants except CO and SO₂. SO₂ and CO are not reported air basin-wide within the ADAM database; therefore, the maximum measured concentrations from specific monitoring stations (e.g., El Cajon-Lexington Elementary School for SO₂) are reported in Table 4.3-3.

**Table 4.3-2
Ambient Air Monitoring Stations in the San Diego Region**

Monitoring Station	Pollutant Measured						
	O ₃	PM ₁₀	PM _{2.5}	CO	NO ₂	SO ₂	Lead
Alpine	✓		✓		✓		
Camp Pendleton	✓		✓		✓		
Chula Vista	✓	✓	✓		✓		
Donovan-Otay Mesa	✓	✓	✓		✓		
El Cajon-Lexington Elementary School	✓	✓	✓	✓	✓	✓	
Kearny Mesa-Kearny Villa Road	✓	✓	✓		✓		
Palomar-McClellan Airport							✓
San Diego-Rancho Carmel Drive				✓	✓		
San Diego-Sherman Elementary	✓		✓		✓		

Source: SDAPCD 2019a

**Table 4.3-3
Summary of Annual Ambient Air Quality Data (2014–2019) – San Diego Air Basin**

Pollutant Standards	2014	2015	2016	2017	2018	2019
Carbon Monoxide (CO)¹						
Maximum concentration (1-hour, ppm)	2.7	2.4	2	2	1.9	4.1
Number of days state standard exceeded (1-hour)	0	0	0	0	0	0
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Maximum concentration (8-hour, ppm)	1.9	1.4	1.2	1.5	1.4	2.5
Number of days state standard exceeded (8-hour)	0	0	0	0	0	0
Number of days national standard exceeded (8-hour)	0	0	0	0	0	0
Nitrogen Dioxide (NO₂)						
Maximum concentration (1-hour, ppm)	87	62	73	74	55	86
Number of days state standard exceeded (1-hour)	0	0	0	0	0	0
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Annual Average (ppm)	13	14	17	16	15	14
Ozone (O₃)						
Maximum concentration (1-hour, ppm)	0.1	0.098	0.104	0.109	0.102	0.110
Number of days state standard exceeded (1-hour)	3	3	7	13	3	2
Maximum concentration (8-hour, ppm)	0.087	0.084	0.091	0.095	0.083	0.085
Number of days state standard exceeded (8-hour)	33	34	34	57	25	21
Number of days national standard exceeded (8-hour)	33	34	34	54	23	19
Particulate Matter (PM₁₀)						
Maximum concentration (24-hour, µg/m ³)	59	136	79	68	55	199
Number of days state standard exceeded (24-hour)	3	10	9	4	3	8

Pollutant Standards	2014	2015	2016	2017	2018	2019
Number of days national standard exceeded (24-hour)	0	0	0	0	0	1
Annual average ($\mu\text{g}/\text{m}^3$)	30.2	34.8	31.4	26.9	26.3	31.4
Particulate Matter (PM_{2.5})						
Maximum concentration (24-hour, $\mu\text{g}/\text{m}^3$)	36.7	33.5	34.4	42.7	41.9	23.8
Number of days national standard exceeded (24-hour)	1	0	0	1	1	0
Annual average ($\mu\text{g}/\text{m}^3$)	10.2	9.3	8.7	9.6	10.0	8.6
Sulfur Dioxide (SO₂)²						
Maximum concentration (1-hour, ppm)	0.0012	0.0012	0.0018	0.0011	0.0035	0.0008
Number of days national standard exceeded (1-hour)	0	0	0	0	0	0
Maximum concentration (24-hour, ppm)	0.0005	0.0004	0.0005	0.0004	0.0004	0.0003
Number of days national standard exceeded (24-hour)	0	0	0	0	0	0
Annual average (ppm)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00007
Lead (Pb)						
Maximum calendar quarter (calendar quarter, $\mu\text{g}/\text{m}^3$)	0.010	0.015	0.010	0.020	0.020	0.036
Maximum 3-month rolling average (3-month, $\mu\text{g}/\text{m}^3$)	0.011	0.015	0.010	0.020	0.020	0.02
Number of days national standard exceeded	0	0	0	0	0	0

Sources: CARB 2020d, EPA 2020b, SDAPCD 2019a, SDAPCD 2019b.

¹ 2015–2019 CO values are from the Rancho Carmel Drive monitoring station; 2014 values are from the Beardsley Street monitoring station.

² 2014–2016 SO₂ values are from the Floyd Smith Drive monitoring station; 2017–2019 values are from the 533 First Street monitoring station.

Attainment Status

As noted in Table 4.3-1, the San Diego region is currently designated as a ~~serious-severe~~ nonattainment area for the 2008 8-hour O₃ NAAQS and a moderate nonattainment area for the 2015 8-hour O₃ NAAQS. Accordingly, the SDAPCD (discussed in more detail below) is required to prepare and submit to the EPA, through CARB, a plan identifying control measures and associated emission reductions as necessary to demonstrate attainment for each O₃ standard as part of the State Implementation Plan (SIP). The 2016 Eight-Hour O₃ Attainment Plan (2016 SIP) addresses the requirements for attaining the 2008 8-hour O₃ NAAQS. The 2020 Plan for Attaining the National Ozone Standards (2020 SIP) addresses the requirements for attaining the 2008 and 2015 8-hour O₃ NAAQS. The 2016 SIP complies with the moderate nonattainment area classification for the planning requirements and includes demonstrations for attainment of the 2008 O₃ NAAQS by July 20, 2018 (2017 attainment year). Despite substantial air quality progress, the region did not attain the 2008 O₃ NAAQS (75 ppb) by the attainment deadline; as a result, EPA reclassified San Diego County as a ~~serious-severe~~ nonattainment area for that standard with a new attainment date of July 20, 2027 (2026 attainment year).

Furthermore, the 2020 SIP complies with the severe nonattainment Area classification planning requirements and includes demonstrations for attainment of the 2008 and 2015 O₃ NAAQS by 2026 and 2032, respectively. The 2020 SIP includes updated inventories of O₃ precursor emissions (VOC and NO_x) for the 2017 base year (the year from which future-year inventories are projected) and the 2026 and 2032 attainment years (SDAPCD 2020).

Section 2.1 of the 2016 SIP identifies emission budgets for transportation conformity, and Section 3.1.2 of the 2020 SIP identifies Emission Budgets for transportation conformity. The conformity budgets for O₃ precursors NO_x and VOC were developed in consultation with SANDAG, SDAPCD, CARB, and the EPA based on vehicle miles travel (VMT) data provided by SANDAG. The modeling for the conformity budgets in the 2020 SIP indicates that by 2026, on-road motor vehicle NO_x and VOC emissions in the San Diego region are projected to decrease 54 percent relative to 2017 levels (SDAPCD 2020).

As for other NAAQS, the San Diego region became an attainment area (along with every other area of the state except South Coast) for CO on June 1, 2018, following a 20-year maintenance period. Accordingly, because conformity only applies to nonattainment and maintenance areas, transportation conformity requirements for CO ceased on June 1, 2018 (EPA 2018b). The San Diego region is in attainment for all other NAAQS, including NO₂, O₃, PM₁₀ and PM_{2.5}, SO₂, and Pb.

Local Air Quality

CARB has developed the California Emissions Projection Analysis Model (CEPAM), which provides historical data as well as projections of future year emissions at different scales of interest in the state. Table 4.3-4 presents the emissions inventory for the SDAB for the year 2016 based by CEPAM emission category.

**Table 4.3-4
Criteria Pollutant Emissions Inventory for 2016 – San Diego Air Basin**

Emission Category	Emissions (tons per day)					
	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Fuel Combustion	0.96	13.63	3.40	0.25	1.08	1.07
Waste Disposal	2.42	0.12	0.30	0.05	1.71	0.42
Cleaning and Surface Coatings	16.00	--	--	--	--	--
Petroleum Production and Marketing	6.73	0.01	0.01	--	--	--
Industrial Processes	3.66	0.35	0.23	0.02	4.73	0.97
Solvent Evaporation	27.44	--	--	--	0.01	0.01
Miscellaneous Processes	6.22	15.48	2.58	0.14	59.96	11.35
On-Road Motor Vehicles	24.03	187.85	48.27	0.42	5.26	2.45
Other Mobile Sources	25.00	168.39	27.74	0.30	3.36	3.06
Natural Sources	74.42	28.26	0.81	0.34	3.13	2.65
Total	186.88	414.09	83.33	1.53	79.23	21.97

Source: CARB 2018.

SOURCES OF AIR POLLUTION

Emissions are normally grouped into four main categories: stationary, area-wide, mobile, and natural sources. Generally, stationary- and area-wide sources are those attached to the ground, while mobile sources, as the

name implies, are those involved in the movement of people and goods. Natural emission sources refer to emissions that are non-anthropogenic (not human-caused) sources. Each of these categories is usually further divided into major source categories and then summary categories. The sections below provide a brief description of these four main categories.

Stationary Emission Sources

Stationary source emissions, also referred to as point-source emissions, are emissions from major industrial, manufacturing, and processing plants. This category also includes emissions from electric utilities; waste burning; solvent use; petroleum processing, storage, and transfer; and industrial processes.

Mobile Emission Sources

There are two major categories under mobile emissions:

- **On-Road Mobile Sources:** This major source category accounts for the emissions from all types of vehicles licensed to travel on public roads and highways. This includes passenger cars, light- and medium-duty trucks, heavy-duty gas and diesel trucks, heavy-duty urban diesel buses, and motorcycles.
- **Off-Road Mobile Sources:** This major category accounts for vehicular emissions from construction equipment, farm tractors, off-road recreational vehicles, trains, ships, aircraft, mobile equipment, utility equipment, and lawn mowers.

Area-Wide Emission Sources

Area-wide sources are those that individually emit small quantities, but collectively result in substantial emissions when aggregated over a larger area. Emissions result from landscaping; natural gas consumption; small industrial engines; solvent use in dry cleaning; auto repair, auto body, and paints; wood burning; industrial coatings; consumer products; printing; bakeries and restaurants; asphalt paving; and fugitive dust.

Natural Emission Sources

Natural sources are non-anthropogenic emission sources, which include biological and geological sources, wildfires, windblown dust, and biogenic emissions from plants and trees.

ANTICIPATED EFFECTS OF CLIMATE CHANGE

The San Diego region is likely to experience a variety of climate change impacts. These include wetter winters and more intense precipitation that can lead to increased flooding, more frequent and intense drought, more intense heat waves and annual average temperatures increases of up to 4.8°F by 2050, and a longer and less predictable fire season (CEP and SDF 2015, Kalansky et al. 2018, OPC 2018). More details on future climate projections are available in Appendix F.

Climate change may worsen air quality in the San Diego region by influencing ozone, and wildfire. Quantitative estimates of the extent of this impact are not available for the region. Nationwide, assuming no change in regulatory controls or population characteristics, estimates of additional premature deaths per year by 2050 from combined ozone and particulate matter due to climate change range from 1,000–4,300 (Melillo et al. 2014).

Ozone forms through a combination of heat, precursor chemicals, and methane emissions (Reidmiller et al. 2018). Therefore, higher temperatures can lead to more ozone formation and thus to poorer air quality. Studies on the overall air quality impact to the San Diego region are not available. In general, given anticipated temperatures rises in the region, higher temperatures will increase ozone (Pfister et al. 2014).

Wildfires can emit particulate matter, carbon monoxide, nitrogen oxide, and other volatile organic compounds, further worsening air quality. The negative health impacts of wildfire smoke can spread across the San Diego region, exacerbating respiratory and asthma-related conditions (Reidmiller et al. 2018). A significant increase in the areas of wildfire is also projected for the San Diego region. Furthermore, precipitation during dry seasons, which can help fight wildfires and may play a part in clearing away air pollution (Kim et al. 2007), is projected to decrease due to climate change.

Climate change could increase the incidence of flooding and wildfire that may block routes and disrupt traffic; this could increase vehicle idling and thus increase the amount of particulate matter and SO_x coming from vehicles (WSP 2018).

Droughts, which are anticipated to be longer and more severe in the region, may also cause health and air quality issues by increasing levels of dust. In the southwestern United States, this can be dangerous due to the spores of the fungi *Coccidioides*, which cause valley fever and reside in indoor and outdoor dust (Crimmins et al. 2016). However, the consequences of climate change on drought and resulting outdoor air quality in the San Diego region have not yet been quantified.

Climate change may also worsen the intensity of odors coming from landfills. After heavy rains, the Miramar Landfill in the City of San Diego has received complaints of odors from residents living nearby (Patton 2019). Studies on landfill odors have also shown that odor pollution is worse in high temperatures, high humidity, and low air pressure (Ying et al. 2012). Because temperatures and intense precipitation are expected to increase in the San Diego region, this may exacerbate air quality issues due to landfill odors in the future.

4.3.2 REGULATORY SETTING

The Plan Area is subject to air quality regulations developed and implemented at the federal, state, and regional levels. At the federal level, EPA is responsible for implementation of the CAA. Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between CARB and regional air quality districts. Areas of control for the regional districts are set by CARB, which divides the state into air basins. Plans, policies, and regulations relevant to the proposed Plan are discussed below.

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Federal Clean Air Act

The federal CAA, as amended, is the primary federal law that governs air quality nationwide. The CAA was first enacted in 1963 and has been amended numerous times in subsequent years (1967, 1970, 1977, and 1990). The CAA establishes the NAAQS and specifies future dates for achieving compliance. The CAA also mandates that each state submit and implement a SIP for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the development of the proposed Plan include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. Table 4.3-1 shows the NAAQS currently in effect for each criteria pollutant. The NAAQS were amended in July 1997 to include an 8-hour standard for O₃ and adopt a standard for PM_{2.5}. The 8-hour O₃ NAAQS was further amended in October 2015.

The CAA requires that each state containing non-attainment areas develop SIPs to attain the NAAQS by a specified attainment date. California's SIP integrates non-attainment plans prepared by local air districts. Once the air quality standard is attained, air districts prepare maintenance plans to demonstrate continued maintenance of the NAAQS.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy Standards (CAFÉ) were first enacted in 1975 to improve the average fuel economy of cars and light duty trucks.

On August 2, 2018, the National Highway Traffic Safety Administrative (NHTSA) and EPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is consider Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables EPA/NHTSA to provide nationwide uniform fuel economy and greenhouse gas (GHG) vehicle standards, specifically by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California's CAA preemption waiver to set state-specific standards.

EPA and NHTSA published their decisions to withdraw California's waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 FR 51310). California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (California et al. v. United States Department of Transportation et al., 1:19-cv-02826, U.S. District Court for the District of Columbia). On October 28, 2019, the Union of Concerned Scientists, Environmental Defense Fund (EDF), and other groups filed a protective petition for review after the federal government sought to transfer the suit to the D.C. Circuit (Union of Concerned Scientists v. National Highway Traffic Safety Administration).

EPA and NHTSA published final rules to amend and establish national CO₂ and fuel economy standards on April 30, 2020 (Part Two of the SAFE Vehicles Rule) (85 FR 24174). The revised rule changes the national fuel economy standards for light duty vehicles from 50.4 miles per gallon (mpg) to 40.5 mpg in future years. California, 22 other states, and the District of Columbia filed a petition for review of the final rule on May 27, 2020. This new rule rolls back California fuel efficiency standards for on-road passenger vehicles. California and 22 other states are currently challenging this new rule in the court system. Also, on January 20, 2021, the President signed Executive Order 13990, directing the government to revise fuel economy standards with the goal of further reducing emissions. In February 2021 the Department of Justice also asked courts to put the

state litigation on hold while the administration “reconsidered the policy decisions of a prior administration.” More recently, on April 22, 2021, NHTSA proposed to formally roll back portions of the SAFE Rule, thereby restoring California’s right to set more stringent fuel efficiency standards. NHTSA is also planning to issue a new rule to increase the national fuel economy standard for light duty vehicles beyond those in Part Two of the SAFE Vehicles Rule (NHTSA 2021). Moreover, on August 5, the President signed an Executive Order that targets to make half of all new vehicles sold in 2030 zero-emissions vehicles, including battery electric, plug-in hybrid electric, or fuel cell electric vehicles (White House 2021).

Transportation Conformity

Transportation conformity is required by the CAA Section 176(c) (42 United States Code [USC] 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with (and conform to) the air quality goals established by a SIP. The conformity requirement prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to SIP for attaining the NAAQS. Conformity means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (EPA 2018a).

Transportation conformity applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the CAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the CAA.

Note that this EIR does not address Regional Plan CAA conformity. Conformity documentation was performed separately by SANDAG and is contained within Appendix C of the proposed Plan.

Appendix C of the proposed Plan provides detailed information about the transportation conformity process for the proposed Plan.

Air Toxics

The 1990 Amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants (NESHAPs), which are nationally uniform standards oriented toward controlling particular hazardous air pollutants (HAPs). Section 112(b) of the CAA identifies 189 “Air Toxics” (HAPs, since modified to 187 pollutants), directs EPA to identify sources of the HAPs, and establishes a 10-year time period for EPA to issue technology-based emissions standards for each source category. Emission standards have been developed for all of the stationary source categories under 40 Code of Federal Regulations (CFR) Part 63. Title III of the CAA provides for a second phase under which EPA is to assess residual risk after the implementation of the first phase of standards and impose new standards, when appropriate, to protect public health.

As mentioned in Section 4.31, in 2011, the EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the NATA. These significant contributors include 1,3-butadiene, acetaldehyde, acrolein, benzene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules (FHWA 2016).

Emission Standards

EPA has adopted regulations to limit emission from all sources of emissions. EPA regulates the emissions from mobile sources by setting standards for the specific pollutants being emitted. Emissions standards set limits on the amount of pollution a vehicle or engine can emit. Mobile source emission standards have been established for light-duty vehicles, trucks, and motorcycles; heavy duty trucks; and non-road engines, including aircraft, locomotives, marine vessels, and recreational engines and vehicles. The EPA has also established gasoline and diesel fuel standards (EPA 2017b).

A description of emission standards for sources analyzed in this EIR are included herein.

Emission Standards for Light-Duty Vehicles

Not including the SAFE Rule, which requires national CO₂ and fuel economy standards, the EPA has also established a series of increasingly strict emission standards for new light-duty vehicle engines. These standards were phased-in over three tiers:

- Tier 1 standards were published as a final rule on June 5, 1991, and phased-in progressively between 1994 and 1997.
- Tier 2 standards were adopted on December 21, 1999, with a phase-in implementation schedule from 2004 to 2009.
- Tier 3 standards were finalized on March 3, 2014, to be phased-in between 2017 and 2025.

Tier 1 standards applied to all new light-duty vehicles (LDV) of less than 8,500-pound gross vehicle weight rating (GVWR). The Tier 2 rule extended the applicability of the light-duty emission standards to medium-duty passenger vehicles (MDPV) with GVWR between 8,500 and 10,000 pounds. Tier 3 regulations additionally include emission standards for chassis-certified heavy-duty vehicles up to 14,000 pounds (Class 2b and Class 3). The successive tiers of emission regulations do not begin with a sharp cut-off date. Rather, each new tier of emission standards is phased-in over a number of years. During the phase-in period, manufacturers are required to certify an increasing percentage of their new vehicle fleet to the new standards, with the remaining vehicles still certified to the preceding tier of emission regulations (DieselNet 2020).

Emission Standards for Heavy-Duty Vehicles

The EPA has established a series of increasingly strict emission standards for new heavy-duty bus and truck engines. Emissions from heavy-duty trucks are managed by regulations and emission limits implemented at the federal, state, and local levels. In December 2000, EPA signed the Heavy-Duty Highway Rule, which reduces emissions from on-road, heavy-duty diesel trucks by establishing a series of increasingly strict emission standards for new engines. Manufacturers were required to produce new diesel vehicles that meet particulate matter and NO_x emission standards beginning with model year 2007, with the phase-in period being between 2007 and 2010. The phase-in was based on a percentage-of-sales basis: 50 percent from 2007 to 2009 and 100

percent in 2010. The requirements apply to engines installed in all vehicles with GVWR above 14,000 pounds, and to some engines installed in vehicles with GVWR between 8,500 and 14,000 pounds (EPA 2019c).

Additionally, the EPA and NHTSA established fuel efficiency and GHG standards for medium- and heavy-duty trucks under a joint rule. This rule—called the Phase 1 standards—requires fuel efficiency standards for engines in model years 2014 through 2018. In 2016, EPA and NHTSA adopted the Phase 2 standards, which requires fuel efficiency standards for engines in model years 2018 through 2027 (EPA 2016b). More information can be found within Section 4.8, *Greenhouse Gas Emissions*.

Emission Standards for Non-Road Diesel Engines

EPA established a series of increasingly strict emission standards for new non-road diesel engines. Tier 1 standards were phased in on newly manufactured equipment from 1996 through 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in on newly manufactured equipment from 2001 through 2006. Tier 3 standards were phased in on newly manufactured equipment from 2006 through 2008. Tier 4 standards, which require advanced emission control technology to attain them, were phased in between 2008 and 2015. These emissions standards apply to all non-road (off-road) equipment used to construct elements of the Regional Plan (EPA 2004).

Emission Standards for Locomotives

The EPA established a series of increasingly strict emission standards for new or remanufactured locomotive engines (63 FR 18997-19084). Tier 0 standards, effective as of 2000, applied to engines manufactured or remanufactured from 1973 to 2001. Tier 1 standards applied to engines manufactured/remanufactured from 2002 to 2004. Tier 2 standards applied to engines manufactured/remanufactured after 2004.

In 2008, EPA strengthened the Tier 0 through 2 standards to apply to existing locomotives and introduced more stringent Tier 3 and 4 emission requirements (73 FR 88 25098-25352). Tier 3 standards, met by engine design methods, were phased in between 2011 and 2014. Tier 4 standards, which are expected to require exhaust gas after-treatment technologies, became effective starting in 2015. These standards apply to locomotives that are propelled by engines with total rated horsepower (hp) of 750 kilowatts (kW) (1,006 hp) or more (EPA 2016c). These emissions standards apply to all locomotive engines greater than 750 kW (1,006 hp) in the San Diego region. Engines smaller than 750 kW, including the 440-hp diesel-multiple unit (DMU) engines that power some Coaster and Sprinter activity, are regulated under the non-road standards discussed below. All freight (BNSF) and intra-regional passenger (Amtrak and Metrolink) trains are regulated under these standards.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

Mulford-Carrel Act

CARB was established when the California Legislature passed the Mulford-Carrell Act in 1967, which combined two bureaus within the Department of Health: the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board. CARB's mission is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants, while recognizing and considering the effects on the state's economy. CARB also oversees the activities of 35 local and regional air pollution control districts. These districts regulate industrial pollution sources. They also issue permits, develop local plans to attain healthy air quality, and ensure that the industries in their area adhere to air quality mandates (CARB 2020c).

California Clean Air Act

In 1988, the state legislature adopted the CCAA, which established a statewide air pollution control program. CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfate, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 4.3-1.

CARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Toxic Air Contaminant Identification and Control Act of 1983 and Air Toxics "Hot Spots" Information and Assessment Act of 1987

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people who were exposed to a significant health risk, and facility plans to reduce these risks. The "Hot Spots" Act requires OEHHA to develop an approach for health risk assessments that can be used to determine the "likelihood of risks." The resultant guidance manual is titled *Air Toxics Hot-Spots Program Guidance Manual for the Preparation of Health Risk Assessments* (OEHHA 2015).

In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan was to reduce respirable DPM emissions and the associated health risk by 75 percent in 2010 and 85 percent in 2020. The plan identifies 14 measures that CARB has or may implement.

Senate Bill 535 and Assembly Bill 1532 of 2012

Senate Bill 535 requires the California Environmental Protection Agency (Cal/EPA) to identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria. It also requires that the investment plan developed and submitted to the Legislature pursuant to AB 1532 allocate no less than 25 percent of available proceeds from the carbon auctions held under AB 32 to projects that will benefit these disadvantaged communities. At least 10 percent of the available funds from these auctions must be directly invested in such communities. Because CalEnviroScreen has been developed to identify areas

disproportionately affected by pollution and those areas whose populations are socioeconomically disadvantaged, it is well suited for the purposes described by Senate Bill 535 (OEHHA 2018).

Emission Standards

CARB established a series of increasingly strict emissions standards for new off-road diesel equipment (Small Off-Road Engines [13 California Code of Regulations (CCR) 2403-2407] and Tier 4 Off-Road Compression-Ignition Engine Regulations and Exhaust Emission Certification Test Fuel for Off-Road Spark-Ignition Engines, Equipment, and Vehicles [13 CCR 2421-2427]), on-road diesel trucks (California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles [13 CCR 1956]), and harbor craft (Low-Sulfur Fuel Requirement, Emission Limits, and Other Requirements for Commercial Harbor Craft [13 CCR 2299.6] and Airborne Toxic Control Measure for Commercial Harbor Craft [13 CCR 93118.5]).

CARB has also adopted emissions standards to reduce NO_x, DPM and other criteria pollutant emissions from in-use (i.e., existing) off-road diesel-fueled vehicles (Regulation for In-Use Off-Road Diesel-Fueled Fleets [13 CCR 2449]) and in-use on-road diesel-fueled vehicles (Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen, and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles [13 CCR 2025]).

Additionally, CARB established the Low Carbon Fuel Standard (LCFS), the Phase 1 Tractor-Trailer GHG regulation, and the Advanced Clean Cars Program (AB 1493 of 2002). While these standards, regulations, and programs predominately target GHG emissions, they also help reduce criteria air pollutant emissions. These standards, regulations, and programs are discussed in more detail in Chapter 4.8.

Executive Order N-79-20

Under EO N-79-20, 100 percent of in-state sales of new passenger cars and trucks are to be zero-emission by 2035; 100 percent of in-state sales of medium- and heavy-duty trucks and busses are to be zero-emission by 2045 for all operations, where feasible, and by 2035 for drayage trucks; and 100 percent of off-road vehicles and equipment sales are to be zero-emission by 2035 where feasible. EO N-79-20 directs CARB to partner with the Governor's Office of Business and Economic Development and other agencies to develop a Zero-Emissions Vehicle Market Development Strategy by January 31, 2021.

California Sustainable Freight Action Plan

The *Sustainable Freight Action Plan* (Sustainable Freight Action Plan or Action Plan) provides an integrated action plan that establishes clear targets to improve freight efficiency, transition to zero-emission technologies, and increase the competitiveness of California's freight system. The Action Plan was developed by several state agencies and is a recommendation document that integrates investments, policies, and programs across several state agencies to help realize a singular vision for California's freight transport system. This Action Plan provides a recommendation on a high-level vision and broad direction to the Governor to consider for state agencies to utilize when developing specific investments, policies, and programs related to the freight transport system that serves California's transportation, environmental, and economic interest. Furthermore, the CARB *2017 Scoping Plan* (2017 Scoping Plan) incorporates potential actions from the Action Plan that provide GHG emissions reduction benefits (CARB 2016b).

Climate Change Scoping Plan (2008 and 2017)

The first *CARB Scoping Plan* (Scoping Plan) was adopted in 2008 and updated in 2014 to meet 2020 targets, and laid out the state’s strategy for achieving the 2020 reduction target to meet the state’s 2020 reduction targets. It includes numerous recommended measures to reduce GHG emissions from a variety of activities and sources, including on-road transportation, electricity generation, and building energy use. In 2017, the Scoping Plan was updated to reflect the state’s 2030 reduction target. The 2017 Scoping Plan integrates several existing CARB regulations and state strategies, including the Cap-and-Trade Program, Low Carbon Fuel Standard, SB 350 goals for renewable electricity procurement and doubling of Statewide energy efficiency savings in electricity and natural gas end uses, Mobile Source Strategy, Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant (SLCP) Strategy. The 2017 Scoping Plan accelerates the state’s focus on moving freight with zero and near-zero technologies, investing in renewables, creating walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and managing natural lands to become carbon sinks. While the Scoping Plan itself is a plan to reduce GHG emissions, many of the measures and strategies implemented to reduce GHGs from across the economy also result in significant reductions in criteria air pollutants (CARB 2017a).

Executive Order N-19-19

Executive Order N-19-19 requires the Department of Finance to create a Climate Investment Framework and requires the State Transportation Agency to align transportation spending with achieving objectives of the Climate Change Scoping Plan, as well as to reduce VMT through strategic discretionary investments.

Air Quality and Land Use Handbook (2005) and Technical Advisory (2017)

CARB prepared a guidance document that includes recommendations for siting of sensitive receptors in proximity of emission sources. The *Air Quality and Land Use Handbook: A Community Health Perspective* (Land Use Handbook) provides guidance to the public and decision-makers to provide information on the siting “sensitive land uses” near specific sources of air pollution (CARB 2005); namely:

- High traffic freeways and roads
- Distribution centers
- Rail yards
- Ports
- Refineries
- Chrome plating facilities
- Dry cleaners
- Large gas dispensing facilities

The recommendations are provided in Table 4.3-5. The Land Use Handbook includes various limitations, and notes that the recommendations are advisory and that land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

**Table 4.3-5
Recommendations on Siting New Sensitive Land Uses Such as Residences, Schools, Daycare Centers,
Playgrounds, or Medical Facilities**

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within 1 mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	<ul style="list-style-type: none"> • Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks.
Refineries	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	<ul style="list-style-type: none"> • Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

Source: CARB 2005.

The State Planning Priorities emphasize infill development, as this pattern of development can help attain goals to promote equity, strengthen the economy, protect the environment, and promote public health and safety. However, many infill and compact development communities are located near freeways and other busy traffic corridors. This can present public health concerns regarding roadways near existing and future developments as this increases the possibility that at-risk populations/communities—such as children, pregnant women, the elderly, and those with serious health problems affected by air pollution—will be exposed to traffic emissions.

In response to this, CARB supplemented the Land Use Handbook in April 2017 to provide local planners and stakeholders with information regarding reducing exposure to traffic emissions near high-volume roadways in order to protect public health and promote equity and environmental justice. The *Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (Technical Advisory) includes various strategies to reduce pollution exposure through practices and technologies to reduce traffic emissions, increase dispersion of traffic pollution (or the dilution of pollution in the air), or remove pollution from the air (CARB 2017b).

The Technical Advisory includes seven effective strategies, divided into the following three general categories (CARB 2017b).

Strategies that Reduce Traffic Emissions

1. Speed reduction mechanisms including roundabouts
2. Traffic signal management
3. Speed limit reductions on high-speed roadways (>55 miles per hour [mph])

Strategies that Reduce the Concentration of Traffic Pollution

1. Urban design that promotes air flow and reduces the concentration of pollution along street corridors
2. Solid barriers such as sound walls
3. Vegetation that reduces the concentration of pollution

Strategies that Remove Pollution from Indoor Air

1. Indoor high efficiency filtration that removes pollution from the air

Public Exposure to Particulate Matter

Senate Bill (SB) 656 (Health and Safety Code Section 39614) of 2003 required CARB, in consultation with local 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 CARB and the air districts to reduce PM₁₀ and PM_{2.5} (collectively referred to as PM). Measures adopted as part of SB 656 complement and support those required for federal PM_{2.5} attainment plans, as well as for state O₃ plans. This will ensure continuing focus on PM reduction and progress toward attaining California's more health protective standards. The list of air district control measures was adopted by CARB on November 18, 2004. CARB also developed a list of state PM control measures for mobile and stationary sources, including measures for adoption as part of CARB's Diesel Risk Reduction Plan.

Siting of Schools

State law (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 siting of schools is also regulated in the California Code of Regulations. According to 5 CCR Section 14010(e): "The site shall not be adjacent to a road or freeway that any site-related traffic and sound level studies have determined will have safety problems or sound levels which adversely affect the educational program."

Air Toxics Control Measures (Health and Safety Code Division 26)

Under Health and Safety Code, Division 26 (Air Resources), CARB 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. As such, CARB has promulgated several mobile and stationary source airborne toxic control measures that identify specific measures designed to reduce emissions and therefore the exposure of individuals to TACs emitted from a variety of sources.

Specifically, CARB has adopted regulations governing diesel emissions from compression-ignition engines (17 CCR 93115 et seq.), portable engines (17 CCR 93116 et seq.), and locomotives and marine vessels (17 CCR 93117, 93118 et seq., and 93119; and 13 CCR 2299 et seq.), and emissions from offroad engines, including construction equipment, cargo handling equipment, and recreational vehicles (13 CCR 2400 et seq.).

Assembly Bill 617 of 2017

AB 617, signed into law in 2017, established the Community Air Protection Program (CAPP), which requires new community-focused and community-driven action to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants. Communities identified for monitoring include Portside Environmental Justice Neighborhoods of Barrio Logan as well as portions of National City, Sherman Heights, and Logan Heights. The SDAPCD is implementing the CAPP in San Diego County, which will eventually lead to additional pollution monitoring and additional requirements through the following: accelerated installation of pollution controls on industrial sources like oil refineries, cement plants, and glass manufacturers; expanded air quality monitoring within communities; increased penalties for violations of emissions control limits; and greater transparency and improved public access to air quality and emissions data through enhanced online web tools (SDAPCD 2018).

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

San Diego Air Pollution Control District

Local air pollution control districts have the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations in the San Diego region. SDAPCD's primary roles include controlling air pollution from stationary sources, developing and monitoring the region's portion of the SIP, and developing rules for attaining NAAQS and CAAQS.

Regional Air Quality Strategy and State Implementation Plan

CARB and SDAPCD are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. As mentioned above, the most relevant air quality plan is the 2020 SIP, which addresses federal ozone non-attainment and represents the San Diego region's portion of the SIP. In addition, the *San Diego Regional Air Quality Strategy* (RAQS) is SDAPCD's most recent plan for attaining and maintaining state standards. The RAQS was initially adopted in 1991 and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, 2009, and most recently in 2016 (SDAPCD 2016). The RAQS does not currently address the state air quality standards for PM₁₀ or PM_{2.5}. Both the RAQS and SIP demonstrate the effectiveness of CARB measures (mainly for mobile sources) and SDAPCD's plans and control measures (mainly for stationary and area-wide sources) for attaining the O₃

NAAQS. The SIP is also updated on a triennial basis. For the 8-hour O₃ standard, the 2016 SIP outlines SDAPCD's portion of the SIP, and also outlines plans and control measures designed to attain and maintain the 8-hour O₃ NAAQS (2008 standard). The 2020 SIP outlines plans and control measures designed to attain and maintain the 8-hour O₃ NAAQS (2008 and 2015 standard). As of July 2021, the 2020 SIP is awaiting EPA approval and remains in draft form.

Chapter 5 of the RAQS includes three categories of emission control programs to reduce NO_x and VOCs emissions from mobile sources: Incentive Programs, Indirect Source Programs, and TCMs. TCMs are described in more detail in the AQ-1 impact analysis.

Incentive programs augment traditional control programs to further encourage technology development and provide cost-effective emission reductions in advance of regulatory requirements. The following Incentive Programs provide funding to reduce emissions of ozone precursors:

- Carl Moyer Memorial Air Quality Attainment Program
- Voucher Incentive Program (VIP)
- Proposition 1B Goods Movement Emission Reduction Program (GMERP)
- Vehicle Registration Fund Program (VRF)
- Lower Emission School Bus Replacement and Retrofit Program (LESB)
- American Recovery and Reinvestment Act Funding for the National Clean Diesel Funding Assistance Program (ARRA)
- Air Quality Power Generation Mitigation Fund
- Airport Taxicab Replacement Program (ended in 2015)
- Lawn Mower Exchange Program/Lawn and Garden Equipment Replacement Program (LGER)

SDAPCD's Indirect Source Program consists of ongoing outreach and assistance to local governments, land developers, citizen groups, and non-profit organizations to reduce vehicle trips and associated emissions through voluntary land use and street design improvements (i.e., "smart growth"). SDAPCD efforts include ongoing technical assistance to SANDAG on programs to encourage smart growth, and incorporate emission reductions goals and strategies into the 2011 and 2015 RTPs; technical assistance to both the City and County of San Diego in crafting their Climate Action Plans (CAPs); workshops/presentations and technical assistance for city planning staff, developers, and neighborhood groups to improve support alternative forms of transportation (walking, bicycling, transit); and developed smart growth and alternative transportation modes fact sheets.

Mobile Source Programs

SDAPCD operates two categories of emission control programs related to mobile sources—Financial Incentive Programs and an Indirect Source Program—in addition to coordinating with SANDAG to implement Transportation Control Measures.

Financial Incentive Programs augment traditional control programs to further encourage technology development and provide cost-effective emission reductions in advance of regulatory requirements. The incentive programs that have been implemented in the San Diego region during the last 6 years include Carl Moyer Memorial Air Quality Attainment Program, Voucher Incentive Program (VIP), Proposition 1B Goods

Movement Emission Reduction Program (GMERP), Vehicle Registration Fund Program (VRF), Lower Emission School Bus Replacement and Retrofit Program (LESB), American Recovery and Reinvestment Act Funding for the National Clean Diesel, Funding Assistance Program (ARRA), Air Quality Power Generation Mitigation Fund, Airport Taxicab Replacement Program; and Lawn Mower Exchange Program/Lawn and Garden Equipment Replacement Program (LGER).

The **Indirect Source Program** consists of ongoing outreach and assistance to local governments, land developers, citizen groups, and non-profit organizations to reduce vehicle trips and associated emissions through voluntary land use and street design improvements (i.e., "smart growth").

Recent SDAPCD efforts include the following, which are taken directly from Chapter 5 of the 2016 RAQS:

- Ongoing technical assistance to SANDAG on programs to encourage smart growth, including the following:
 - Adoption of the 2011 RTP and Sustainable Community Strategy to reduce greenhouse gases, which included smart growth incentives and funding for walking, bicycling, transit, and neighborhood traffic safety programs.
 - Creation of a regional Complete Streets Policy, as called for in the 2011 RTP.
 - Adoption of goals for the 2015 RTP update, including alternatives to single occupancy vehicles, air quality, greenhouse gas emission reductions, and public health.
- Technical assistance to both the City of San Diego and the County of San Diego in crafting their respective Climate Action Plans, to reflect greater reliance on transit and non-motorized transportation modes.
- Workshops/presentations and technical assistance for city planning staffs, traffic engineers, developers, merchant organizations, neighborhood groups, and others working to improve conditions for walking, bicycling, and transit.
- Developed fact sheets providing technical information on smart growth and alternative transportation modes, and posted them to the District's website.

Transportation Control Measures continue to be implemented for the six measures contained in previous RAQS revisions, consistent with program commitments made in the 2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), approved in 2015 and the 2014 Regional Transportation Improvement Program (RTIP), approved in 2014. The six RAQS Transportation Control Measures are: (1) Transit Improvements, (2) Vanpools, (3) High Occupancy Vehicle (HOV) Lanes, (4) Park-and-Ride Facilities, (5) Bicycle Facilities, and (6) Traffic Signal Improvements. Together, these measures have reduced motor vehicle travel and emissions.

Community Emissions Reduction Plan (2020/2021)

In December 2019, CARB selected the Portside Community¹ for a Community Emissions Reduction Program (CERP). The purpose of the CERP is to focus and accelerate new actions that go beyond existing state and regional programs to provide direct reductions in air pollution emissions and exposure within Portside communities. The CERP was presented in two phases. Phase I includes actions that have been fully developed

¹ The Portside Community includes the neighborhoods of Barrio Logan, Logan Heights, and Sherman Heights in the City of San Diego, and West National City within National City.

and supported by all jurisdictions or organizations that have an implementation role. The Phase I Draft CERP was released in September 2020 and was adopted in November 2020 (SDAPCD 2020b). Phase II includes the competition of a comprehensive CERP that fulfills the state's requirement, including a community profile and a suite of proposed goals and actions to improve air quality and reduce exposure to air pollution in the Portside Community. The Phase II Final CERP was adopted by SDAPCD in July 2021 (SDAPCD 2021a, SDAPCD 2021b).

The CERP is a plan for action to reduce air pollutant emissions and community exposure to those emissions in the Portside Community. The CERP includes 11 goals and 39 actions to achieve these emission reductions. Goals include reducing TAC emissions in the community, supporting electric freight truck infrastructure and upgrades, quantifying health risk from port and non-port activities, establishing health risk reduction goals, and implementing actions to achieve those goals. Actions include incentivizing building retrofits and emission reduction efforts, re-evaluating SDAPCD rules to increase regulation and increase rule enforcement, implementing various heavy duty freight truck strategies, implementing land use strategies (including a buffer between residential and industrial uses, the port, and freeways), and supporting various reduction efforts at the port (including equipment and electrification), along with outreach and community engagement.

Rules and Regulations

SDAPCD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Land use and transportation projects under the proposed Plan may be subject to the following SDAPCD rules, and others.

- **Regulation 2, Rule 20.2—New Source Review Non-Major Stationary Sources:** establishes Air Quality Impact Analysis (AQIA) Trigger Levels, which set emission limits for non-major new or modified stationary sources.
- **Regulation 2, Rule 20.3—New Source Review Major Stationary Sources and Prevention of Significant Deterioration Stationary Sources:** establishes AQIA Trigger Levels, which set emission limits for major new or modified stationary sources or Prevention of Significant Deterioration stationary sources. Major sources are defined in Regulation 8 as sources that emit 100 tons per year of PM₁₀, SO_x, CO, and lead; and 50 tons per year of NO_x and volatile organic compounds (VOC) in federal O₃ nonattainment areas.
- **Rule 50—Visible Emissions:** establishes limits for the opacity of emissions within the SDAPCD. The proposed project is subject to Rule 50(d)(1) and (6) and should not exceed the visible emission limitation.
- **Rule 51—Nuisance:** prohibits emissions that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or cause injury or damage to business or property.
- **Rule 52—Particulate Matter:** establishes limits for the discharge of any particulate matter from nonstationary sources.
- **Rule 54—Dust and Fumes:** establishes limits for the amount of dust or fume discharged into the atmosphere in any 1 hour.
- **Rule 55—Fugitive Dust Control:** sets restrictions on visible fugitive dust from construction and demolition projects.
- **Rule 67—Architectural Coatings:** establishes limits to the VOC content for coatings applied within the SDAPCD.

- **Rule 67.7—Cutback and Emulsified Asphalts:** establishes general provisions and limits to the VOC content for asphalt materials applied within the SDAPCD.
- **Regulation 8, Rules 1200–1210:** establishes rules and procedures governing new, relocated, or modified emission units that may increase emissions of one or more TAC. While the proposed Plan is not y subject to the requirements of these rules, the risk assessment guidelines and procedures published as part of this regulation are used in the health risk assessment herein. Specifically, SDAPCD Rule 1210 implements the public notification and risk reduction requirements of AB 2588. The rule requires stationary sources with a risk above 10 in a million cancer risk and/or a hazard index above 1.0 for non-cancer effects to notify the public of potential risks due to exposure from emissions. The rule also requires facilities with a risk above 100 in a million to implement risk reduction measures. SDAPCD is currently in the process of revising Rule 1210 to require facilities with a risk above 10 in a million to implement risk reduction (instead of 100 in a million currently) measures. The updated rule is expected to be adopted in Fall 2021 (SDAPCD 2021c).

4.3.3 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines (“Appendix G”) provides criteria for determining the significance of a project’s environmental impacts in the form of Initial Study checklist questions. Unless otherwise noted, the significance criteria specifically developed for this EIR are based on the Appendix G checklist questions. In some cases, SANDAG has combined checklist questions, edited their wording, or changed their location in the document in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR, the unique nature of the proposed Plan’s air quality impacts, and the unique characteristics of the proposed Plan.

Checklist questions for air quality are provided in Section III of Appendix G. To better focus the potential impacts associated with the proposed Plan, the Appendix G questions have been combined and modified. Specifically, air quality criterion (c) has been expanded to three items herein to better focus the potential impacts of similar criterion (“substantial pollutant concentrations”) that require different modeling and result in varying degrees of health outcomes. Specifically, substantial pollutant concentrations of PM10 and PM2.5 are included in Impact AQ-4, substantial pollutant concentrations of TACs are included in Impact AQ-5, and substantial pollutant concentrations of CO hotspots are included in Impact AQ-6. The other air quality checklist items (a, b, and d) have been revised to focus the impact determination on actual impacts associated with the proposed Plan.

Therefore, implementation of the proposed Plan would have a significant air quality impact if it would:

- | | |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AQ-1 | Conflict with or obstruct implementation of the Regional Air Quality Strategy and/or State Implementation Plan |
| AQ-2 | Result in a cumulatively considerable net increase in nonattainment or attainment criteria pollutants, including VOC, NO _x , PM10, PM2.5, and SO _x |
| AQ-3 | Result in construction-related emissions above regional mass emission thresholds |
| AQ-4 | Expose sensitive receptors to substantial PM10 and PM2.5 concentrations |
| AQ-5 | Expose sensitive receptors to substantial TAC concentrations |
| AQ-6 | Expose sensitive receptors to carbon monoxide hot spots |
| AQ-7 | Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people |

4.3.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE REGIONAL AIR QUALITY STRATEGY AND/OR STATE IMPLEMENTATION PLAN

ANALYSIS METHODOLOGY

The applicable air quality attainment plans include the 2020 SIP, the 2016 SIP, and the 2016 RAQS. While the SDAB is designated as a nonattainment area for the state PM₁₀ and PM_{2.5} standards, the CCAA does not require preparation of attainment plans for these pollutants, and no such plans have been prepared.

Regional Growth and Land Use Change

The analysis evaluates whether forecasted regional growth and land use change under the proposed Plan would conflict with or obstruct implementation of programs and rules and regulations adopted as part of the RAQS and SIP. The growth forecast used in the RAQS and O₃ SIPs is compared to forecasted growth under the proposed Plan. In addition, the analysis describes whether forecasted regional growth and land use change would conflict with or obstruct implementation of any of the applicable control measures contained within the 2020 SIP, 2016 SIP, or the 2016 RAQS.

Attachments D and E of the 2020 SIP includes a list of control measures adopted by CARB between 1985 and 2019 to reduce emissions of O₃ precursors.

Transportation Network Improvements and Programs

The SANDAG transportation conformity analysis provided in Appendix D to this EIR is used to determine whether implementation of planned transportation network improvements and programs would conflict with or obstruct implementation of both the 2016 SIP and 2020 SIP. Modeled motor vehicle emissions resulting from implementation of the proposed Plan are compared to the emissions budgets established in the SIP. In this case, the conformity analysis was conducted for both the 2016 SIP, which was adopted by EPA in October 2016, and the 2020 SIP, which was under EPA review at the time of Draft EIR preparation.

The emissions for regional conformity were calculated using CARB's EMFAC2017 model and take into account SAFE Vehicles Rule adjustment factors provided by CARB.² The analysis also compares the planned transportation network improvements and programs with the TCMs identified in the RAQS and both the 2016 and 2020 Ozone SIPs.

² The emissions from the regional conformity and Impact AQ-1 EIR analysis conservatively applied the SAFE Vehicles Rule adjustment factors, which increase AQ and GHG emissions in line with the increased fuel consumption. Thus, if the SAFE Rule were to be rescinded, Impact AQ-1 analyzes the worst case emission scenario.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

The RAQS is based on the Series 12 Regional Growth Forecast and the 2011 RTP, which forecast growth in the region (relative to 2008) of 400,000 people by the year 2020, 900,000 people by the year 2035, and 1.3 million people by the year 2050. Total population was projected to be 4.4 million in 2050.

The 2020 SIP is based on a number of sources, including EMFAC2017. Growth in EMFAC2017 modeling is based on Department of Finance (DOF) forecasting and SANDAG assumptions in Series 13. The Series 13 Regional Growth Forecast and the 2015 Regional Plan forecast growth in the region (relative to 2012) of approximately 300,000 people by the year 2020, 700,000 people by the year 2035, and 925,000 people by the year 2050. Total population was projected to be 4.1 million in 2050 (SANDAG 2015).

The proposed Plan is based on the Series 14 Regional Growth Forecast, which aligns with DOF forecasting from January 2020. Growth projections included within the proposed Plan, relative to 2016, show a growth of approximately 160,000 people by the year 2025, 310,000 people by the year 2035, and 435,000 people by the year 2050. Total population is now projected to be 3.7 million in 2050, which represents an 8 percent reduction from the estimate assumed in the RAQS and a 15 percent reduction from the estimate assumed in the SIP.

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed in the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2025. Thus, because the proposed Plan's growth forecast is below that assumed in the RAQS, the proposed Plan's growth forecast does not conflict with the growth forecast in the RAQS.

Chapter 4 of the RAQS includes a re-evaluation of control measures for stationary sources that have been adopted to reduce emissions of VOCs and NO_x within the region. The RAQS control measures that apply to stationary sources include the following:

- Control of Solvent Cleaning (SDAPCD Rule 66.1)
- Control of Architectural Coatings (SDAPCD Rule 67.0.1)
- Control of Wood Coatings (SDAPCD Rule 67.11)
- Polyester Resin Operations (SDAPCD Rule 67.12.1)
- Automotive Refinishing (SDAPCD Rule 67.20.1)
- Stationary Combustion Turbines (SDAPCD Rule 69.3.1)
- Small Boilers, Process Heaters, and Steam Generators Between 600,000 and 2 Million BTU/hr³ (SDAPCD Rule 69.2.1)

³ BTU = British thermal units; hr = hour

- Medium Boilers, Process Heaters, and Steam Generators Between 2 Million and 5 Million BTU/hr (SDAPCD Rule 69.2.2)
- Control of Stationary Combustion Turbines (SDAPCD Rule 69.3.1)
- Control of Residential Water Heaters Smaller than 75,000 BTU/hr (SDAPCD Rule 69.5.1)
- Stationary Reciprocating Internal Combustion Engines Best Available Retrofit Technology (SDAPCD Rule 69.4.1)

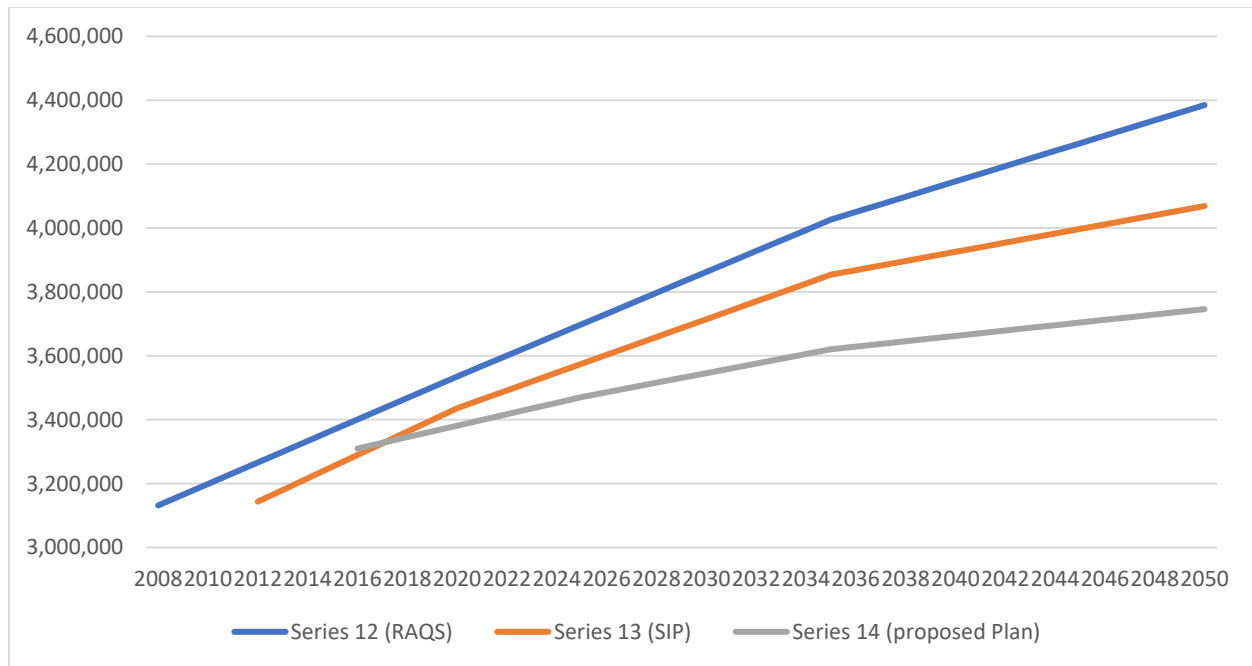
Moreover, Attachment B of the 2020 SIP includes a list of rules that are being added or supplemented as part of the submittal to EPA:

- Transfer of Gasoline into Stationary Underground Storage Tanks (SDAPCD Rule 61.3.1)
- Major Source Landfill Flare Control Measure (SDAPCD Rule to be determined)
- Transfer of Volatile Organic Compounds into Mobile Transport Tanks ((SDAPCD Rule 61.2)
- Cold Solvent Cleaning and Stripping Operations (SDAPCD Rule 67.6.1)

SDAPCD rules are implemented primarily through SDAPCD permitting processes that are specific to each facility or operation. These measures were adopted as part of the RAQS and SIP to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. Land use changes in 2025 under the proposed Plan would be subject to and implement the above regulations, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct implementation of the applicable air quality plans in 2025. This impact is less than significant.

Figure 4.3-1. Comparison of Regional Population Projections



Source: SANDAG 2015, SDAPCD 2016, SANDAG 2021a.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_x in 2025 are less than the conformity budget emissions for both ROG and NO_x in both the 2016 SIP and 2020 SIP. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than anticipated by relevant federal and state air quality attainment plans.

Table 4.3-6
Air Quality Conformity Emissions (tons per day)

SIP Year	Year	ROG		NO _x	
		SIP Budget	Proposed Plan	SIP Budget	Proposed Plan
2016 SIP	2023	23	13.5	42	17.2
	2025	23	12.5	42	16.0
	2030	23	10.0	42	13.1
	2035	23	8.7	42	12.4
	2040	23	7.4	42	11.7
	2050	23	6.8	42	12.0
2020 SIP	2023	13.6	13.5	19.3	17.2
	2025	12.6	12.1	18.0	15.5
	2026	12.1	11.4	17.3	14.7
	2029	11.0	10.2	15.9	13.4
	2032	10.0	9.3	15.1	12.6
	2035	10.0	8.6	15.1	12.3
	2040	10.0	7.4	15.1	11.7
	2050	10.0	6.8	15.1	12.0

Source: SANDAG 2021b

Note: Conformity years for the 2016 SIP (2023, 2030, 2040, 2050) and 2020 SIP (2023, 2026, 2029, 2032, 2040, 2050) do not align perfectly with the analysis years for the proposed Plan. SIP budgets and emission estimates for the missing years (2025 and 2035) were estimated based on linearly interpolating between the previous and next conformity year. Interpolated numbers are shown in *italics*. Interpolated numbers for the missing years for the proposed Plan are different in the 2016 and 2020 SIP comparisons because the conformity years differ, and the emissions under proposed Plan conditions do not necessarily increase linearly. For example, linearly interpolating between the 2023 and 2030 numbers in the 2016 SIP emissions results in a different value than interpolating between the 2023 and 2026 numbers in the 2020 SIP, even though the 2023 and 2040 estimates are the same under both SIPs.

Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2035 and 2050), and slightly increased VMT for Plan year 2025, which would reduce emissions for baseline (2016) and Plan years (2035 and 2050), and slightly increase emissions for Plan year 2025. No update to the air quality modeling is required because the air quality model results are conservative for 2035 and 2050, and would show only very minor increases for 2025; these changes would not change any conclusions in this EIR.

There are four federally approved TCMs in the RAQS that must be implemented in the San Diego region, which the SIP refers to as *transportation tactics*. These TCMs include ridesharing, transit improvements, traffic flow improvements, and bicycle facilities and programs. The TCMs have been fully implemented. Ridesharing, transit, bicycling, and traffic flow improvements continue to be funded, although the level of implementation established in the SIP has been surpassed (Appendix D).

There are six TCMs in the RAQS, which are commitments made in the 2050 Regional Transportation Plan (2011 EIR): (1) Transit Improvements, (2) Vanpools, (3) High Occupancy Vehicle (HOV) Lanes, (4) Park-and-Ride Facilities, (5) Bicycle Facilities, and (6) Traffic Signal Improvements. A discussion demonstrating the proposed Plan's consistency with these six TCMs is provided below (SANDAG 2011).

Transit Improvement and Expansion Program. The RAQS identifies replacing diesel-fueled buses with Compressed Natural Gas buses, increasing bus travel, and increasing rail transit services. The entire

Metropolitan Transit System (MTS) fleet of 40- and 60-foot buses uses Renewable Compressed Natural Gas, and MTS recently adopted a plan to transition the entire fleet to zero-emissions vehicles by 2040. MTS currently has eight electric buses in service and plans to fast track the purchase of 17 additional zero emission buses by 2022 (MTS 2021).

The goal of the Transit Leap Big Move is a complete network of fast, convenient, and reliable transit services that connect people from where they live to where they want to go. Transit leap improvements include Commuter Rail, Next Gen Rapid Service, Mobility Hub investments, and Light Rail Transit (LRT). Commuter Rail includes new and upgraded rail service with high-speed trains that are fast and convenient with grade-separated infrastructure. Next Gen Rapid Service is reliable Rapid bus service operating in priority lanes and making use of better signal technology. Mobility Hub investments include land acquisition and amenities for the San Ysidro Mobility Hub and Central Mobility Hub. LRT includes improvements to existing light rail services and new tram services. Ferry service operating in San Diego Bay is also included.

Through 2025, major transit improvements include commuter rail (Commuter Rail 398) improvements between Oceanside and Downtown San Diego, including a new Gaslamp station; the Rapid 10 line from La Mesa to Ocean Beach via Mid-City, Hillcrest, and Old Town; the Rapid 292 line for Pacific Beach and Kearny Mesa; and the Rapid 450 between Oceanside and Escondido via Palomar Airport Road. New zero-emission buses and initiatives to promote more environmentally sustainable freight vehicles will also be a priority. The proposed Plan would provide an additional 39,000 miles of transit service and increase transit mode share approximately one percent while reducing vehicular mode share and vehicle trip lengths approximately 3 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in Fiscal Year (FY) 2019.

High Occupancy Vehicle (HOV) Lanes. Managed Lanes (MLs), such as those along the Interstate (I-) 15 corridor, offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. MLs are expanded to all urban and interregional highway corridors in the region. Existing infrastructure is maximized by repurposing shoulders or existing travel lanes to create MLs where shoulders, high-occupancy vehicle travel lanes, or general-purpose travel lanes exist today. By 2025, the only additional ML proposed is along I-5 between Manchester Avenue and Vandegrift Boulevard.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage. There are no specific park-and-ride lots proposed.

Bicycle Facilities. Projects in the proposed Plan would improve or expand bicycle and pedestrian interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Additionally, projects that support the proposed Plan's Active Transportation improvements reflect the adopted Regional Bike Network and include both on- and off-street improvements to create a safe and comfortable space for people to walk, bike, and ride micromobility options. By 2025, major bike projects include the Central Avenue Bikeway, North Park/Mid-City Bikeways, Bayshore Bikeway, Pershing Bikeway, Uptown Bikeways, and Mobility Hub connections. SANDAG also has funding allotted for e-bike incentives and to implement a Commuter Services and Bike Program.

Traffic Signal Improvements. The proposed Plan would encourage funding of traffic signal improvements to reduce congestion in the region. There are some projects to implement signal improvements, such as in National City along Plaza Boulevard. Traffic signal improvements do not reduce VMT but they do reduce intersection delay.

2025 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_x. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2025.

2035

Regional Growth and Land Use Change

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed for the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2035.

The RAQS and SIP were adopted to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. Forecasted regional growth and land use change in 2035 under the proposed Plan would be subject to and implement the regulations described in the 2025 analysis above, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct of implementation of the applicable air quality plans. This impact is less than significant.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_x in 2035 are less than the conformity budget emissions for both ROG and NO_x. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than forecast by relevant federal and state air quality attainment plans.

The same RAQS TCMs discussed above under 2025 are applicable to the 2035 time horizon. A discussion demonstrating the proposed Plan's consistency with the six TCMs by 2035 is provided below.

Transit Improvement and Expansion Program. By 2035, major transit improvements include expanded commuter rail services (Commuter Rail 582) improvements between Sorrento Mesa and National City, ferry services between Downtown San Diego and North Island (Coronado), Double/Third tracking and other improvements along the Trolley's Blue Line, improvements along the Trolley's Orange Line, the San Ysidro Mobility Hub, along with the Central Mobility Hub, and associated improvements, including the Airport

Connection Automated People Mover. Moreover, there are numerous Rapid Bus projects, serving all major communities and corridors. The proposed Plan would provide an additional 150,000 miles of transit service and increase transit mode share approximately 3 percent while reducing vehicular mode share 7 percent and vehicle trip lengths approximately 3 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in FY2019.

High Occupancy Vehicle (HOV) Lanes. MLs, such as those along the I-15 corridor, offer priority access to people using transit, carpooling, or vanpooling along with emergency vehicles and low-emission vehicles with appropriate decals. MLs are expanded to all urban and interregional highway corridors in our region. Existing infrastructure is maximized by repurposing shoulders or existing travel lanes to create MLs where shoulders, high-occupancy vehicle travel lanes, or general-purpose travel lanes exist today. By 2035, there are numerous ML projects proposed along I-5, I-15, I-805, State Route (SR) 163, SR 905, and SR 125.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage. There are no specific park-and-ride lots proposed by 2035.

Bicycle Facilities. By 2035, major bike projects include improvements to the Bayshore Bikeway, Uptown Bikeway, North Park/Mid-City Bikeway, the Central Mobility Bikeway, the Imperial Bikeway to J Street Cycle Track Connector, the I-15 Bikeway, the Mira Mesa Neighborhood Bikeway, and the San Diego River Bikeway and Connections. SANDAG also has funding allotted for e-bike incentives and to implement a Commuter Services and Bike Program.

Traffic Signal Improvements. By 2035, there are some projects to implement signal improvements, including Harbor Drive 2.0, which will, among other things, provide signal priority for freight trucks traveling to and from Tenth Avenue Marine Terminal, as well signal improvements at the Palm Avenue/I-805 Interchange.

2035 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_x. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2035.

2050

Regional Growth and Land Use Change

Figure 4.3-1 summarizes the growth projections assumed in Series 12 (assumed in the RAQS), Series 13 (assumed in the SIP), and Series 14 (assumed here for the proposed Plan). As shown, the projections for the proposed Plan are lower than assumed in the prior growth forecasts in 2050.

The RAQS and SIP were adopted to reduce emissions that contribute to ozone formation. SDAPCD and CARB have adopted various strategies within the RAQS and SIP as enforceable requirements, and regional growth and land use changes associated with the proposed Plan are subject to the applicable regulations.

As noted, forecasted growth for each forecast year is less than that assumed in the RAQS and SIP. Forecasted regional growth and land use change in 2050 under the proposed Plan would be subject to and implement the regulations described in the 2025 analysis above, and therefore would not conflict with or obstruct implementation of the RAQS or the SIP. Therefore, regional growth and land use change would not conflict with or obstruct of implementation of the applicable air quality plans. This impact is less than significant.

Transportation Network Improvements and Programs

Modeled emissions from the transportation conformity analysis are summarized in Table 4.3-6. As shown, ozone precursors ROG and NO_x in 2050 are less than the conformity budget emissions for both ROG and NO_x. Thus, the transportation network improvements and programs of the proposed Plan would not generate emissions greater than anticipated by relevant federal and state air quality attainment plans.

The same RAQS TCMs discussed above under 2025 are applicable to the 2050 time horizon. A discussion demonstrating the proposed Plan's consistency with the six TCMs by 2050 is provided below.

Transit Improvement and Expansion Program. By 2050, major transit improvements include expanded commuter rail services (Commuter Rail 582) improvements between the Central Mobility Hub, National City, and the U.S. Border; a Tram connecting downtown with Logan Heights, Golden Hill, and other communities; and a Sprinter. All told, by 2050, the proposed Plan would increase commuter rail and light rail (Trolley) service up to 22 hours per day, while connecting major residential areas with employment centers, commercial areas, and other popular destinations; operate numerous Rapid Bus lines up to 20 hours per day; and improve local bus and provide microtransit services to complete the Transit Leap. By 2050, the proposed Plan could result in 13 percent of commuters using transit (up from 3 percent today) and a substantial decline in commuters driving alone to work (from 80 percent today to 62 percent in 2050). The proposed Plan would provide an additional 263,000 miles of transit service and increase transit mode share approximately 3.7 percent while reducing vehicular mode share 10 percent and vehicle trip lengths approximately 2 percent over 2016 levels.

Vanpools. SANDAG would continue to operate its Regional Vanpool Program, providing increased access to carpooling. The SANDAG Vanpool program is offered by iCommute and displaced approximately 93 million vehicle miles traveled in FY2019.

High Occupancy Vehicle (HOV) Lanes. By 2050, there are numerous ML projects proposed along every freeway in the region, including those listed for 2035, along with SR 54 and SR 11.

Park-and-Ride Facilities. The proposed Plan supports the use of carpooling and transit park-and-ride facilities to provide access to alternative modes of transportation and is consistent with this TCM. SANDAG iCommute maintains a park-and-ride webpage.

Bicycle Facilities. Projects in the proposed Plan would improve or expand bicycle and pedestrian interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Additionally, projects that support the proposed Plan's Active Transportation improvements reflect the adopted Regional Bike Network and include both on- and off-street improvements to create a safe and comfortable space for people to walk, bike, and ride micromobility options.

By 2050, major bike projects include the SR 56 Bikeway, Mira Mesa Corridor, Harbor Drive Multimodal Corridor Improvements, SR 125 Corridor – Sweetwater Bikeway, La Mesa Regional Bike Network Connector, San Diego River Bikeway, I-15 Bikeway, SR 52 Bikeway, and Mid-County Bikeway.

Traffic Signal Improvements. The proposed Plan would encourage funding of traffic signal improvements to reduce congestion in the region.

2050 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to conflict with or obstruction of implementation of the applicable air quality plans because regional growth and land use change would be consistent with the SIP growth forecasts, and applicable rules, regulations, and programs adopted as part of the plans by the SDAPCD and CARB. Implementation of the transportation network improvements and programs would also be consistent with the applicable air quality plans because the emissions are less than the conformity budget emissions budget for ROG and NO_x. Also, the transportation network improvements and programs are consistent with the TCMs contained within the SIP and the RAQS. Therefore, this impact (AQ-1) is less than significant in 2050.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region that could conflict with or obstruct implementation of the regional air quality plans as described in Section 4.3.1, the proposed Plan would not exacerbate climate change effects on the air quality plans if it remains in compliance with existing and evolving regulatory requirements, assuming these requirements incorporate consideration of future climate change.

AQ-2 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN NONATTAINMENT OR ATTAINMENT CRITERIA POLLUTANTS, INCLUDING VOC, NO_x, CO, PM10, AND PM2.5, AND SO_x

ANALYSIS METHODOLOGY

This analysis focuses on the criteria pollutants for which the region is classified as nonattainment: O₃ (NAAQS and CAAQS) and PM_{2.5} and PM₁₀ (CAAQS). Emissions are also projected for criteria pollutants for which the region is attainment: CO and SO_x.

Future operational emissions of ozone precursors (VOC and NO_x), PM₁₀, PM_{2.5}, CO, and SO_x associated with implementation of the proposed Plan are identified. Future emissions under the proposed Plan are then compared to 2016 levels. Pollutant emissions that show no change or decrease under the proposed Plan would not contribute to a cumulative increase in emissions and therefore are not addressed further in the analysis. Where operational pollutant emissions increase under the proposed Plan, the analysis consider whether the increase is cumulatively considerable. Any incremental increase associated with the proposed Plan is considered cumulatively considerable. Cumulative emissions from all sources in the region are reported from the CARB emissions inventory for 2016, 2025, and 2035. 2050 emissions are extrapolated from 2035 from the CARB emissions inventory, as explained in Appendix D. Please note that construction emissions are addressed separately under Impact AQ-3.

On-road emissions were estimated based on emission factors from CARB's EMFAC2017 model based on the average fleet mix operating in San Diego County for each analysis year, fugitive road dust PM₁₀ and PM_{2.5} emission factors using CARB methodology, and activity data from SANDAG's activity-based model for each

analysis year,⁴ Freight rail emissions were estimated based on CARB's freight emissions model in EMFAC for each analysis year. Passenger rail emissions were estimated based on rail activity for existing (e.g., Amtrak, Sprinter, and Coaster) and proposed new rail lines as well as fleet locomotive fleet turnover for each analysis year, as provided by SANDAG staff (SANDAG pers comm), along with EPA emission factors for locomotives.

Note that the on-road emission estimates differ from the emissions estimates for the transportation conformity (Table 4.3-6) due to methodological differences. The primary difference here is that on-road emissions estimates are estimated by roadway link using the actual speeds provided in SANDAG activity-based model. The VMT and emission factor model are the same, so differences in emissions are due primarily to speed differences.

Note that the focus of this analysis is on those emission sources that would be directly changed by the proposed Plan. The proposed Plan does not cause additional regional growth; instead, the proposed Plan calls for concentrating future growth within designated Mobility Hubs or Smart Growth Opportunity Areas. This focus on densification would not change the amount of future development in the region. Other sources of emissions associated with land use development — such as stationary sources (electric utilities, cogeneration, fuel combustion for food and agricultural processing, fuel combustion for service and commercial uses, sewage treatment, landfills, and dry cleaning) and area sources (consumer products use, architectural coatings, pesticides and fertilizers, residential fuel combustion, and cooking) — are therefore not included in the emissions estimates.

Health Impacts

As discussed in Section 4.3.1, all criteria pollutants that would be generated by the proposed project are associated with some form of health risk (e.g., asthma, lower respiratory problems). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO₂, SO_x, and Pb are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition.

Regional Project-Generated Criteria Pollutants (Ozone Precursors, Regional SO_x, and Regional PM)

Adverse health effects induced by regional criteria pollutant emissions generated by the proposed Plan (ozone precursors, SO_x and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_x) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and NO_x generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate and SO_x pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone, SO_x, or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an

⁴ The status of the SAFE Vehicles Rule is highly uncertain given the recent Executive Order aimed at its repeal and replacement with more aggressive electric vehicle standards. Even if the rule were maintained, the impact on emissions is negligible.

adverse health effect—as discussed above, there are large individual differences in the intensity of symptomatic responses to air pollutant. However, other variables, including the overall health of individuals and other underlying medical conditions, which cannot be known, strongly influence individual health consequences.

Nonetheless, emissions increases by the proposed Plan, were they to occur, could increase photochemical reactions and the formation of tropospheric ozone, SO_x, and secondary PM, which, at certain concentrations, could lead to increased incidence of specific health consequences, such as various respiratory and cardiovascular ailments, which for the reasons stated above cannot meaningfully be quantified. As discussed previously, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Thus, NAAQS and CAAQS are health-based standards.

Localized Project-Generated Criteria Pollutants and Air Toxics (CO, NO₂, SO_x, and Pb)

Localized pollutants generated by a project are deposited and potentially affect populations near the emissions source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct health impacts on adjacent sensitive receptors. Localized pollutants include localized PM and TACs.

The localized PM analysis is provided in Impact AQ-4. In AQ-4, if the proposed Plan would contribute to an existing violation or create a new violation, it would also contribute to these adverse health effects. Health impacts of TACs are analyzed separately in Impact AQ-5.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Forecasted regional growth and land use change and transportation network improvements and programs by 2025 would generate air pollutant emissions directly and indirectly during operation of development and the transportation network.

As shown in Table 4.3-7, emissions would decrease from 2016 to 2025 under implementation of the proposed Plan for all emissions as follows:

- ROG reduced by 4.1 tons per day, or 63 percent
- NO_x reduced by 23.3 tons per day, or 66 percent
- CO reduced by 78.8 tons per day, or 54 percent
- PM₁₀ reduced by 0.5 ton per day, or 3 percent
- PM_{2.5} reduced by 0.5 ton per day, or 13 percent
- SO_x reduced by 0.1 ton per day, or 15 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2025. Reductions in emissions across the board are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity

increases, the rail lines, such as Coaster and Amtrak, are replacing existing older locomotives with modern, Tier 4 engines by 2025. Thus, while activity and fuel consumption increase, emissions are reduced, because Tier 4 engines emit fewer emissions per gallon of fuel consumed than the current locomotive fleet.

For on-road sources, the average vehicle fleet in 2025 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT would increase less than 0.611 percent), emissions of all pollutants decrease, because newer vehicles emit less emissions on a per mile basis. It is worth noting that the decrease in PM10 and PM2.5 is less than other pollutants because PM10 and PM2.5 emissions from onroad sources are dominated (comprising 95 percent of PM10 and 83 percent of PM2.5) by paved road dust as well as brake and tire wear in 2025, and emission rates for paved road dust as well as brake and tire wear do not follow the same downward trend as vehicle exhaust. Therefore, PM10 and PM2.5 emissions trend down by 2025, but only slightly.

As shown, emissions from the proposed Plan are reduced for each criteria pollutant, including nonattainment pollutants. There would be no adverse health effects associated with these emissions decreases. Because the proposed Plan would result in reduction in ozone.

**Table 4.3-7
Proposed Plan Emission Estimates Prior to Mitigation**

Emission Category	Emissions (tons per day)					
	ROG	NO _x	CO	PM10	PM2.5	SO _x
2016						
On-Road Sources	6.4	33.0	145.1	13.5	3.6	0.4
Freight Rail	<0.0	0.8	0.2	<0.0	<0.0	<0.0
Passenger Rail	0.1	1.4	<0.0	0.1	<0.0	<0.0
Total 2016	6.5	35.3	145.3	13.6	3.7	0.4
2025						
On-Road Sources	2.4	11.2	67.1	13.1	3.2	0.3
Freight Rail	<0.0	0.5	0.2	<0.0	<0.0	<0.0
Passenger Rail	<0.0	0.3	<0.0	<0.0	<0.0	0.1
Total 2025	2.4	12.0	67.4	13.1	3.2	0.3
Net Change From 2016	-4.1	-23.3	-78.0	-0.5	-0.5	-0.04
2035						
On-Road Sources	1.8	8.0	53.4	13.3	3.2	0.2
Freight Rail	<0.0	0.3	0.3	<0.0	<0.0	<0.0
Passenger Rail	<0.0	0.6	<0.0	<0.0	<0.0	0.1
Total 2035	1.8	8.8	53.7	13.4	3.2	0.4
Net Change From 2016	-4.7	-26.5	-91.7	-0.2	-0.5	<-0.0
2050						
On-Road Sources	1.6	7.5	51.1	13.8	3.3	0.2
Freight Rail	<0.0	0.3	0.3	<0.0	<0.0	<0.0
Passenger Rail	0.1	1.4	<0.0	<0.0	<0.0	0.3
Total 2050	1.7	9.2	51.4	13.8	3.4	0.5
Net Change From 2016	-4.8	-26.1	-93.9	+0.2	-0.3	+0.1

Source: Refer to Appendix D for modeling assumptions, inputs, and results.

Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

2025 Conclusion

Implementation of the proposed Plan would not result in a cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, as emissions would be lower than baseline (2016) conditions. Therefore, this impact is less than significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.3-7, emissions would decrease from 2016 to 2035 under implementation of the proposed Plan for all emissions as follows:

- ROG reduced by 4.7 tons per day, or 73 percent
- NO_x reduced by 26.5 tons per day, or 75 percent
- CO reduced by 91.7 tons per day, or 63 percent
- PM₁₀ reduced by 0.2 ton per day, or 2 percent
- PM_{2.5} reduced by 0.5 ton per day, or 12 percent
- SO_x reduced by 0.04 ton per day, or 9 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2035. Reductions in emissions across the board are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity increases, all passenger rail lines (both current and new) are assumed to be operating completely with modern, Tier 4 engines by 2035. Thus, while activity and fuel consumption increase, emissions are reduced, because Tier 4 engines emit fewer emissions per gallon of fuel consumed than the current locomotive fleet.

For on-road sources, the average vehicle fleet in 2035 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT would increase (2.23 percent), emissions of all pollutants decrease, because newer vehicles emit less emissions on a per mile basis. It is worth noting that the decrease in PM₁₀ and PM_{2.5} is less than other pollutants because PM₁₀ and PM_{2.5} emissions from onroad sources are dominated (comprising 98 percent of PM₁₀ and 94 percent of PM_{2.5}) by paved road dust as well as brake and tire wear in 2035, and emission rates for paved road dust as well as brake and tire wear do not follow the same downward trend as vehicle exhaust. Therefore, PM₁₀ and PM_{2.5} emissions trend down by 2035, but only slightly.

As shown, emissions from the proposed Plan are reduced for each criteria pollutant, including nonattainment pollutants. There would be no adverse health effects associated with these emissions decreases.

2035 Conclusion

Implementation of the proposed Plan would not result in a cumulatively considerable net increase in any nonattainment or attainment criteria pollutant, as emissions would be lower than baseline (2016) conditions. Therefore, this impact is less than significant in 2035.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.3-7, emissions would decrease from 2016 to 2050 under implementation of the proposed Plan as follows:

- ROG reduced by 4.8 tons per day, or 74 percent
- NO_x reduced by 26.1 tons per day, or 74 percent
- CO reduced by 93.9 tons per day, or 65 percent
- PM_{2.5} reduced by 0.3 ton per day, or 9 percent

As shown in Table 4.3-7, emissions would increase from 2016 to 2050 under implementation of the proposed Plan as follows:

- PM₁₀ increased by 0.2 ton per day, or 1 percent
- SO_x increased by 0.1 ton per day, or 32 percent

Note that in terms of activity, VMT, freight rail, and passenger rail activity is projected to increase between 2016 and 2050. Reductions in emissions for ROG, NO_x, CO, and PM_{2.5} are due primarily to federal and state regulations that reduce emissions from vehicles and locomotives over time. Moreover, while passenger rail activity increases, all passenger rail lines (both current and new) are assumed to be operating completely with modern, Tier 4 engines by 2050. Thus, while activity and fuel consumption increase, emissions from passenger rail are reduced because Tier 4 engines emit fewer emissions per gallon of fuel consumed than the current locomotive fleet. Note that in 2050, emissions of CO and SO_x from passenger rail are expected to increase because there are no Tier 4 reductions assumed for CO and SO_x; thus, CO and SO_x emissions from rail increase along with the increase in activity and fuel consumption.

For on-road sources, the average vehicle fleet in 2050 is assumed to be substantially cleaner than the existing fleet. Therefore, while total VMT is would increase (~~6.7~~5.4 percent), emissions of all pollutants decrease except PM₁₀ and SO_x, because newer vehicles emit less emissions on a per mile basis. The PM₁₀ emissions increase is due to fact that PM₁₀ emissions from road dust as well as brake and tire wear are not assumed to decrease on a per-mile basis over time, and these emissions are tied to increased VMT. This incremental increase in PM₁₀ emissions is a significant impact.

The SO_x emissions increase is due to fact that SO_x emissions from passenger rail are assumed to increase along with the increase in fuel consumption. The proposed Plan includes various mobility improvements that aim to increase commuter transit ridership from 3 percent under current conditions to 13 percent by 2050. The proposed Plan includes four new commuter rail lines by 2050, and facilitates increased activity along existing (e.g., Amtrak, Coaster, and Sprinter) commuter rail lines. Total transit trips (including both electric light rail [trolley] and commuter rail [diesel]) would increase from 631 daily trips under existing conditions, to over 2,900 daily trips by 2050. This results in an increase from passenger rail diesel fuel combustion on the average day from 7,500 gallons per day under existing conditions to almost 62,000 gallons per day in 2050, due solely

to the increase in activity and assuming all new passenger rail activity and rail lines will be powered by Tier 4 diesel engines.

While the EIR modeling conservatively assumes all new commuter rail will be diesel, future commuter rail, particularly those lines that begin service after 2035, are actually likely to be powered by zero emission or near-zero emission technologies, such as electric, hybrid, and other technologies and fuels, as those technologies improve, costs decrease, and existing diesel locomotives reach the end of their useful life. As agencies and the State look beyond Tier 4 emissions standards, zero emissions rail is set to dictate the next cycle of rail vehicle design. Zero-emissions is supported by the Governor through Executive Order N-79-20 and is likely to become standard practice in the coming years.

As shown, emissions from the proposed Plan are reduced for VOC, NO_x, CO, and PM_{2.5} but increase for PM₁₀ and SO_x, representing a significant impact. The increase in these emissions can contribute to short- and long-term human health effects described in Section 4.3-1.

SO_x is a precursor to fine PM formation in the form of sulfates, such as ammonium sulfate, and short-term exposure can aggravate the respiratory system, making breathing difficult. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease.

Broadly, PM contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. However, PM_{2.5} is more of a concern than PM₁₀. CARB states that PM_{2.5} is more likely to travel into and deposit on the surface of the deeper parts of the lung, while the EPA states that PM_{2.5} poses the greatest risk to health (CARB 2021, EPA 2021). As shown in Table 4.3-7 and as discussed above, while PM₁₀ emissions increase slightly (1 percent), PM_{2.5} emissions decrease (9 percent).

2050 Conclusion

Implementation of the proposed Plan would result in a cumulatively considerable net increase in PM₁₀ and SO_x emissions in 2050. Therefore, this impact (AQ-1) is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan is expected to exacerbate climate change effects on increases in some criteria pollutants. Climate change may result in increased wildfire frequency and intensity, which can increase emissions of particulate matter, carbon monoxide, nitrogen oxide, and other volatile organic compounds. Precipitation during dry seasons may also decrease under climate change, reducing regional ability to fight wildfires and reduce this source of particulate matter (Reidmiller et al. 2018). As mentioned in Section 4.3.1, climate change could increase vehicle idling due to traffic disruption from flooding and wildfire that may block routes, thus increasing the amount of particulate matter and SO_x coming from vehicles. Since the proposed Plan may also result in increased PM₁₀ and SO_x emissions, the air quality impacts from the proposed Plan may exacerbate climate change impacts.

The proposed Plan would not cause a considerable net increase in other nonattainment criteria pollutants, such as ROG, NO_x, CO, and PM_{2.5}. Therefore, although there will be climate change impacts in the San Diego region that could increase emissions of these pollutants as described in Section 4.3.1, the proposed Plan would not exacerbate climate change-caused increases of these emissions.

MITIGATION MEASURES

AQ-2 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN NONATTAINMENT AND ATTAINMENT CRITERIA POLLUTANTS, INCLUDING VOC, NO_x, PM₁₀, PM_{2.5}, AND SO_x

2050

Implement mitigation measures **GHG-5a (Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans)**, **GHG-5b (Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure)**, **GHG-5d (Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide)**, and **GHG-5f (Implement Measures to Reduce GHG Emissions from Development Projects)**, as discussed under Impact GHG-5 in Section 4.8. In addition, implement mitigation measure **TRA-2 (Achieve Further VMT Reductions for Transportation and Development Projects)**, as discussed under Impact TRA-2 in Section 4.16, *Transportation*.

AQ-2a. Secure Incentive Funding. SANDAG, in partnership with SDAPCD and the Port of San Diego, and member cities, will seek to secure incentive funding to reduce mobile SO_x and PM emissions from mobile exhaust, and entrained PM sources such as tire wear, brake wear, and re-entrained road dust. Such incentive funding or programs are:

- Voucher Incentive Program (VIP)
- Vehicle Registration Fund Program (VRF)
- Lower Emission School Bus Replacement and Retrofit Program (LESB)
- American Recovery and Reinvestment Act funding for the National Clean Diesel Funding Assistance Program (ARRA)

2050

AQ-2b. Zero Emission Trains. SANDAG shall only purchase zero emission trains on any new rail lines or train equipment after 2035. Zero emission trains can include fully electric, battery-electric, hydrogen fuel cell, or any technology that results in no tailpipe emissions. New rail lines construction after 2035 shall be powered completely by zero emission trains.

SIGNIFICANCE AFTER MITIGATION

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM₁₀ and PM_{2.5} emissions from tire wear, brake wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce PM₁₀ and SO_x emissions and associated concentrations.

Mitigation AQ-2a would reduce PM₁₀ and SO_x emissions from onroad sources by securing funding to implement ways to reduce all emissions, including PM₁₀ and SO_x emissions from mobile sources.

Mitigation AQ-2b would reduce exhaust PM10 and SO_x emissions from commuter trains by replacing diesel fuel combustion with zero-emission energy sources. The SO_x impact in 2050 is due primarily to fuel combustion from commuter trains, since SO_x emission scale linearly with fuel consumption, regardless of the engine tier. This mitigation measure would be implemented in all new rail lines after 2035, and would reduce diesel fuel consumption by 46 percent in 2050 relative to unmitigated conditions. This would result in a similar 46 percent in SO_x from passenger rail and a 25 percent in SO_x overall, as shown in Table 4.3-8. After mitigation, SO_x emissions would be reduced to below 2016 conditions.

**Table 4.3-8
Proposed Plan Emission Estimates After Mitigation for 2050**

Emission Category	Emissions (tons per day)					
	ROG	NO _x	CO	PM10	PM2.5	SO _x
2050 Mitigated						
On-Road Sources ¹	1.63	7.49	51.08	13.77	3.32	0.23
Freight Rail ¹	0.01	0.28	0.30	0.00	0.00	0.00
Passenger Rail ²	0.03	0.77	0.01	0.02	0.01	0.15
Total 2050	1.67	8.54	51.39	13.79	3.34	0.39
Net Change From 2016 ³	-4.87	-26.74	-93.93	+0.19	-0.36	-0.005

¹ Onroad and Freight Rail emissions are unchanged from the unmitigated emission estimates shown in Table 4.3-7.

² Passenger Rail emissions assume a 46 percent decrease in fuel consumption in 2035.

³ 2016 emissions are shown in Table 4.3-7.

Note: From the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Mitigation has been identified for PM10 (AQ-2a) and SO_x (AQ-2b). Mitigation measure AQ-2b would reduce SO_x emissions so that they would be less than cumulatively considerable, and therefore less than significant. However, for mitigation measure AQ-2a and other PM-reducing mitigation measures, it cannot be guaranteed that PM10 emissions would be reduced to where they would be less than cumulatively considerable. Therefore, impacts related to cumulatively considerable net increases in air pollutant emissions would remain significant and unavoidable.

AQ-3 RESULT IN CONSTRUCTION-RELATED EMISSIONS ABOVE MASS EMISSION THRESHOLDS

ANALYSIS METHODOLOGY

Projects that could be constructed as part of the proposed Plan would generate construction-related criteria pollutant and TAC emissions from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, dust from land clearing, and application of asphalt and architectural coatings. However, the specific size, location, and construction techniques and scheduling that would be utilized for each individual development project occurring from implementation of the proposed Plan are not currently known. With a horizon year of 2050, development of the various land use changes and transportation network improvements would occur over an extended period and would depend on factors such as local economic conditions, market demand, and other financing considerations.

Although SDAPCD has not developed specific thresholds of significance to evaluate construction and operational impacts within CEQA documents, SDAPCD's Regulation II, Rules 20.2 and 20.3 (new source review for non-major and major stationary sources, respectively), outline AQIA Trigger Levels for criteria pollutants for new or modified sources. Based on SDAPCD's AQIA Trigger Levels, as well as EPA rulemaking and CEQA thresholds adopted by the South Coast Air Quality Management District (SCAQMD), the County of San Diego has established screening-level thresholds (SLTs) to assist lead agencies in determining the significance of project-level air quality impacts within the county. These hourly, daily, and annual thresholds are shown in Table 5 of the *County's Guidelines for Determining Significance – Air Quality* (County of San Diego 2007). The County's guidelines typically inform environmental review for development projects in the County, and are used here to help determine impact significance.

Pursuant to the County Guidelines, construction impacts predominantly result from two sources: fugitive dust from surface disturbance activities; and exhaust emissions resulting from the use of construction equipment (including, but not limited to: graders, dozers, back hoes, haul trucks, stationary electricity generators, and construction worker vehicles). One of the pollutants of concern during construction is particulate matter, since PM10 is emitted as windblown (fugitive) dust during surface disturbance, and as exhaust of diesel-fired construction equipment (particularly as PM2.5). Other emissions of concern include architectural coating products off-gassing (VOCs), and other sources of mobile source (on-road and off-road) combustion (NO_x, SO_x, CO, PM10, PM2.5, and VOCs) associated with the project.

At this program level of analysis, it is not possible to quantify the amount of construction emissions from implementation of the proposed Plan or their health impacts. To the extent that construction emissions would violate ambient air quality standards, they could lead to the health consequences discussed in Section 4.3.1. However, the overall impact on local and regional air quality from any one project or all projects combined would be primarily dependent on the quantity, age, and fuel type of the equipment and the duration of their operation at the construction site or in the region. It should be noted that construction emissions, although not quantified, would add to the concentration impacts in AQ-4 and AQ-5.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Various transportation and development projects would be constructed by 2025. Construction of land use changes and transportation network improvements would result in emissions of air pollutants, including ROG, NO_x, CO, SO_x, PM10, and PM2.5. Emissions associated with a typical construction project are generally short-term and limited to the project construction phase. Construction emission sources include construction equipment, employee commuting, vendor and material deliveries, haul trucks, demolition, grading and other ground disturbing activities, application of paint and other coatings, and paving.

The proposed Plan includes numerous transportation projects by 2025 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 97,661 new households, 161,338 new residents, and 115,328 new jobs by 2025. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, and discussed below, total regional emissions of VOC and NO_x from construction sources would generally decline through at least 2032.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions exceeding thresholds. Construction could result in substantial construction-related emissions on a daily or annual basis, exceeding County thresholds.

2025 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed; therefore, this impact (AQ-2) would be significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

The proposed Plan includes numerous transportation projects by 2035 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 219,311 new households, 310,838 new residents, and 275,056 new jobs by 2035. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, total regional emissions of VOC and NO_x from construction sources would generally decline through at least 2032.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions below thresholds. Construction could result in substantial construction-related emissions exceeding County thresholds on a daily or annual basis.

2035 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed, and this impact would be significant.

2050***Regional Growth and Land Use Change and Transportation Network Improvements and Programs***

The proposed Plan includes numerous transportation projects by 2050 as part of the SCS, 5 Big Moves, transportation network improvements, and supporting policies and programs. The proposed Plan would also accommodate land use growth to accommodate 280,744 new households, 436,563 new residents, and 439,899 new jobs by 2050. While construction of each individual project is temporary and limited in nature, emissions from individual construction projects have the potential to exceed daily thresholds.

EPA and CARB have adopted rules and regulations establishing criteria pollutant and hazardous emissions limits for diesel-powered on-road vehicles and off-road equipment. EPA and CARB regulations will continue to reduce emissions from internal combustion trucks and equipment over the life of the proposed Plan. Further, SDAPCD has rules in place to limit emissions from construction activities, such as Rule 55 (requires measures to minimize fugitive dust during construction and demolition activities) and Rule 51 (restricts the discharge of air contaminants or other material which cause harm, injury, or nuisance). Additionally, construction activities are accounted for in SDAPCD's RAQS and SIP inventories. As demonstrated in the 2020 SIP, total regional emissions of VOC and NO_x from construction sources would generally decline through 2050.

Despite regulatory actions from EPA, CARB, and SDAPCD, these regulations cannot assure that all projects consistent with the proposed Plan would not result in emissions below thresholds. Construction could result in substantial construction-related emissions exceeding County thresholds on a daily or annual basis.

2050 Conclusion

The proposed Plan could result in a substantial increase in construction-related emissions exceeding County thresholds as the various land use changes and transportation network improvements are constructed, and this impact would be significant.

Exacerbation of Climate Change Effects

Climate change would not increase construction emissions, so the proposed Plan's increases in construction emissions would not exacerbate a climate change effect.

MITIGATION MEASURES**AQ-3 RESULT IN CONSTRUCTION-RELATED EMISSIONS ABOVE MASS EMISSION THRESHOLDS****2025, 2035, and 2050**

Implement mitigation measures **GHG-5e (Implement Measures to Reduce GHG Emissions from Transportation Projects)** and **GHG-5f (Implement Measures to Reduce GHG Emissions from Development Projects)**, as discussed under Impact GHG-5 in Section 4.8.

AQ-3a Implement Construction Best Management Practices for Fugitive Dust. During planning, design, and project-level CEQA review of transportation network improvements and programs or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, evaluate the potential for localized particulate (PM₁₀ and PM_{2.5}) impacts

that result in exceedances of the CAAQS or NAAQS using applicable procedures and guidelines for such analyses (for example, SDAPCD and EPA air dispersion modeling guidance). If impacts are significant, during project-level construction, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement best management practices (BMPs) to reduce impacts, including but not limited to, the following:

- Use fugitive dust control measures to reduce generation from exposed surfaces during construction, as specified in SDAPCD Rule 55 (SDAPCD 2009). SDAPCD Rule 55 includes various requirements, including preventing visible dust beyond the property line for more than 3 minutes in any 60-minute period, applying dust suppressants, removing all track-out/carry-out dust at the conclusion of each work day. Compliance with these regulatory requirements is a performance standard for mitigation of construction activity particulate emissions. . Reductions in fugitive dust emissions range from 40 to 80 percent for minimizing track-out to 90 percent for use of tarps or cargo covering when transporting material (SCAQMD 2007, WRAP 2006).
- Use additional fugitive dust control measures such as watering or application of dust suppressants to reduce the generation of fugitive dust at active construction sites. Reductions in fugitive dust emissions range from 10 to 74 percent for watering of unpaved surfaces to 84 percent for use of dust suppressants (WRAP 2006).
- Implement controls on haul trucks to reduce emissions from haul trucks transporting soil, sand, or other loose material off site. Reductions in fugitive dust emissions are estimated at 91 percent for use of tarps or cargo covering when transporting material (SCAQMD 2007).
- Remove visible mud or dirt track-out onto adjacent public roads. Reductions in fugitive dust emissions range from 40 to 80 percent for minimizing track-out (WRAP 2006).
- Limit vehicle speeds on unpaved surfaces during construction to 15 mph. Reductions in fugitive dust emissions from unpaved surfaces are estimated at 57 percent (WRAP 2006).
- Suspend excavation, grading, and/or demolition activities when average wind speeds exceed 20 mph. Reductions in fugitive dust emissions are estimated at 98 percent (WRAP 2006).
- Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas. Reductions in fugitive dust emissions from wind erosion are estimated at 90 percent (WRAP 2006).
- Wash all trucks and equipment, including their tires, prior to leaving the construction site. No quantitative estimate of the effectiveness of this measure is available.
- Implement other site-specific fugitive dust control measures as warranted for individual construction projects for the transportation network and/or land use projects.

AQ-3b Reduce Diesel Emissions During Construction From Off-Road Equipment. For impacts on air quality from construction exhaust s, during planning, design, and project-level CEQA review of transportation network improvements and programs or development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement BMPs to reduce criteria pollutant and TAC impacts from off-road equipment, including, but not limited to, the following:

- Ensure off-road equipment greater than 25 horsepower (hp) that will be operating for more than 20 hours during construction meets the following requirements:

- Ensure engines are zero emissions or equipped with an CARB Level 3 Verified Diesel Emissions Control Strategy, if available for the equipment being used, unless the equipment meets EPA Tier 4 emission standards.
- If project-specific analysis demonstrates that the above measure would not adequately reduce impacts (as determined by the project-level lead agency), provide engines that meet or exceed either EPA Tier 4 off-road standards.
- Monitor idling time of diesel-powered construction equipment and limit to no more than 2 minutes.
- Maintain and properly tune construction equipment in accordance with the manufacturers' specifications.
- Prohibit portable diesel generators and use grid power when it is available. Use propane or natural gas generators when grid power electricity is not feasible.
- Use late model engines.
- Use low emission diesel products.
- Use alternative fuels in construction equipment.
- Use engine retrofit technology to control emissions from off-road equipment.

AQ-3c Reduce Diesel Emissions During Construction From On-Road Vehicles. For impacts on air quality from construction exhaust as a result of transportation network improvements and programs or development projects, during project-level CEQA review and construction, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, implement BMPs to reduce criteria pollutant and TAC impacts from on-road vehicles, including but not limited to:

- Monitor idling time of diesel-powered trucks, and limit to no more than 2 minutes.
- Provide clear signage for construction workers at all access points.
- Maintain and properly tune vehicles in accordance with the manufacturers' specifications.
- Ensure that construction activity deliveries are scheduled during off-peak hours (e.g., 10 a.m. to 3 p.m.) and are coordinated to consolidate truck trips. When the movement of construction materials and/or equipment impacts traffic flow, provide temporary traffic control (e.g., flag person) to improve traffic flow.
- Use late model engines (2010 or new model years).
- Use low emission diesel products in on-road vehicles.
- Use zero emission or near-zero emission technologies or alternative fuels in on-road vehicles.
- Use engine retrofit technology on on-road vehicles.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure AQ-3a would reduce the impacts associated with fugitive dust (fugitive PM10 and PM2.5 emissions) during construction, as well as the impacts associated with exhaust emissions from construction equipment. Mitigation measure AQ-3b would reduce the impacts associated with exhaust emissions from construction equipment. Mitigation measure AQ-3c would reduce diesel emissions during construction from on-road vehicles.

Additionally, mitigation measures GHG-5e and GHG-5f would reduce construction emissions through use of energy and fuel-efficient vehicle and equipment. (see Section 4.8). Although mitigation would reduce impacts, there is no guarantee that all projects' impacts would be reduced to below a level of significance; thus, impacts would be significant and unavoidable.

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PM10 AND PM2.5 CONCENTRATIONS

ANALYSIS METHODOLOGY

If the proposed Plan would violate the PM10 or PM2.5 air quality standards or substantially contribute to an existing violation, then it would be considered to expose sensitive receptors to substantial PM10 and PM2.5 concentrations, which in turn would contribute to adverse health effects. Under the CAAQS, the SDAB is designated as a state nonattainment area for PM10 and PM2.5 (as well as ozone). The San Diego region is in attainment of the NAAQS for PM10 and PM2.5 (as well as other criteria pollutants). This analysis is based on operational emissions associated with forecasted regional growth and land use change and planned transportation network improvements and programs. The assumptions for operational emissions calculations for regional growth and land use change and transportation network improvements and programs are provided in Appendix D of this EIR.

The analysis to evaluate whether the proposed Plan would violate any PM10 or PM2.5 air quality standard or contribute substantially to an existing projected air quality violation involves two main steps.

1. Existing baseline mass emissions and future mass emissions in 2025, 2035, and 2050 under the proposed Plan were estimated for onroad, freight rail, and commuter rail sources. Methods and assumptions for projecting mass emissions are presented in Appendix D of this EIR. Results are presented in Impact AQ-2.
2. Based on these emission estimates, a detailed localized analysis was performed for each analysis year to determine whether the operational emissions of the proposed Plan would violate an air quality standard or contribute substantially to an existing violation.

Note that from the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Methods and results for the PM10 and PM2.5 modeling are presented in detail in Appendix D of this EIR. Because San Diego County is designated as a state nonattainment area for both PM10 and PM2.5, localized modeling is performed for both PM10 and PM2.5.

Given the spatial limitations in the chosen dispersion model (AERMOD), the populated areas of the county were divided into six modeling subdomains. Each modeling subdomain was assigned a representative meteorological station and air quality monitoring station. Background monitoring data at each subdomain was evaluated to determine the appropriate design values for modeling. While San Diego as a whole is currently in nonattainment for both the PM2.5 CAAQS and the PM10 CAAQS, not all monitoring station in the region, or subdomains, exceed these CAAQS.

For monitoring stations that exceed the respective NAAQS or CAAQS, the PM threshold was assumed to be equal to the difference between the applicable NAAQS or CAAQS level for PM concentrations (refer to Table 4.3-1) and the monitored Design Value (DV) for that region. For monitoring stations that do not exceed the respective NAAQS or CAAQS, incremental federal Significant Impact Levels (SIL), are which are used to ensure that a project's emissions do not contribute to an air quality violation. Currently, there are no violations of the PM10 and PM2.5 NAAQS at these monitoring stations, so all comparisons to NAAQS are based on the difference between the design value and the NAAQS. For monitoring stations that do not exceed the appropriate CAAQS, comparisons to appropriate CAAQS are based on the difference between the DV and the CAAQS. Monitoring stations that do exceed some or all CAAQS (Downtown and Chula Vista), comparisons to appropriate CAAQS are based on the appropriate SIL, which are 3 $\mu\text{g}/\text{m}^3$ for annual PM10 CAAQS, and 5 $\mu\text{g}/\text{m}^3$ for 24-hour PM10 CAAQS.

Sensitive receptors are specific locations where air pollutant concentrations are simulated in the dispersion model. For PM10 and PM2.5 modeling, sensitive receptors represent locations beyond the roadway or railway boundaries where the general public may be exposed to air pollutants. In AERMOD, ambient receptors are placed on a regular grid, spaced 50 meters apart. Thus, the area represented by a single receptor is 50 meters by 50 meters, which is 2,500 square meters (0.62 acre). The land area (in acres) in the tables below was estimated based on multiplying the number of receptors that exceed a threshold by 0.62 acre. The acreage estimates are provided to contextualize results, and are not considered precise estimates of exposure.

Health Impacts

As discussed in Section 4.3.1, short-term and long-term exposure to PM10 and PM2.5 may result in adverse health effects including:

- Aggravated asthma
- Increases in respiratory symptoms like coughing and difficult or painful breathing
- Chronic bronchitis
- Decreased lung function
- Heart attack
- Premature death

The ambient air quality standards are health-based standards. Therefore, in this impact analysis, when the proposed Plan would result in a new violation of a particulate standard or substantially contribute to an existing violation, it would also contribute to these adverse health effects. Health impacts of diesel particulates, a TAC and subset of PM10 and PM2.5 emissions, are analyzed separately in Impact AQ-5.

This analysis identifies and maps receptors in 2016 and future years within the areas exposed to specified concentrations of PM10 and PM2.5 emitted from Plan sources. These receptors would be at greatest risk of experiencing the health effects listed above.

Given the limitations of modeling tools and assumptions, receptor exposure numbers are an indication of relative exposure, and not a precise prediction. Also, because of the conservative modeling assumptions (see Appendix D to the EIR), the analysis presents maximum ambient air quality impacts. For these reasons, the actual exposure to particulate matter would likely be lower than presented in this analysis. Proven scientific models that are designed to quantitatively correlate mass emissions of particulates from a plan or project to project-specific localized health impacts (e.g., number of cases of decreased lung function) are not available.

Similarly, given the limitations of the localized particulate methodology, it is not possible to directly and accurately correlate increased standards violations to project-specific health impacts. The localized health effects of new PM standard violations or substantial contributions to existing violations are best quantified by the Impact AQ-5 health risk assessment for TACs, which include air toxics and diesel particulates.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM_{2.5} and PM₁₀ from 2016 to 2025 from major roadways freeways and highways under implementation of the proposed Plan are shown in Table 4.3-9 and Table 4.3-10, respectively. For PM_{2.5}, modeling shows a small decrease in concentrations in some areas, no change in some areas, and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. This impact is less than significant.

For PM₁₀, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS. These exceedances in Escondido and Chula Vista are due primarily to road dust from freeway travel.⁵ The maximum increases in both Escondido and Chula Vista are at receptor locations immediately adjacent to I-15 and I-5, respectively. These PM₁₀ increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM₁₀ is significant. The locations of PM₁₀ exceedances for 2025 are shown in Figure 4.3-2.

**Table 4.3-9
Summary of Incremental PM_{2.5} Concentrations, 2025**

Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM _{2.5} Annual CAAQS	0.6	0	No
PM _{2.5} 24-hr CAAQS	1.0	0	No
PM _{2.5} Annual NAAQS	1.0	0	No

Source: Appendix D.

**Table 4.3-10
Summary of Incremental PM₁₀ Concentrations, 2025**

Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM ₁₀ 24-hr NAAQS	4	0	No
PM ₁₀ Annual CAAQS	2	33	Yes ¹

⁵ While brake and tire wear emissions would make up a portion of the modeled PM₁₀ concentrations in Escondido and Chula Vista, the largest source of PM₁₀ emissions that contribute to the modeled PM₁₀ concentrations is from road dust.

PM10 24-hour CAAQS	6	1	Yes ²
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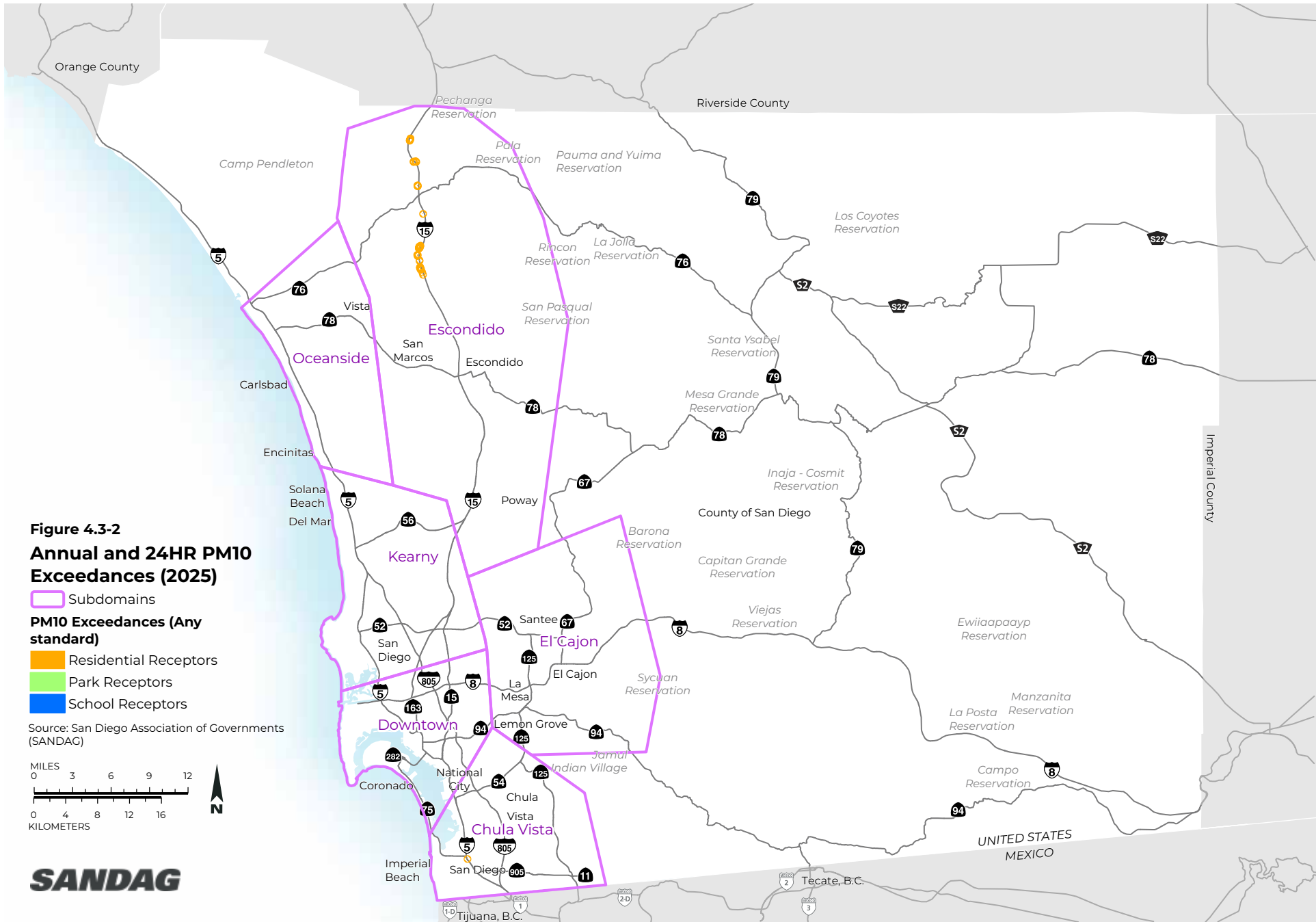
Source: Appendix D.

¹ These exceedances are in the Escondido domain

² These exceedances are in the Chula Vista domain

2025 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2025 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2025 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2025.



2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM_{2.5} and PM₁₀ from 2016 to 2035 from major roadways, freeways, and highways with implementation of the proposed Plan are shown in Tables 4.3-11 and 4.3-12, respectively. For PM_{2.5}, modeling shows no change in some areas and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. This impact for PM_{2.5} is less than significant.

For PM₁₀, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the El Cajon and Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS.

These exceedances in El Cajon, Escondido, and Chula Vista are due primary to road dust from freeway travel.⁶ The maximum increase in El Cajon is at a single receptor location immediately adjacent SR-125; the maximum increases in Escondido are at receptor locations immediately adjacent I-15 and SR-78; and the maximum increases in Chula Vista are at receptor locations immediately adjacent I-5 both south and north of SR-905, and along SR-905. These PM₁₀ increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM₁₀ is significant. The locations of PM₁₀ exceedances for 2035 are shown in Figure 4.3-3.

Table 4.3-11
Summary of Incremental PM_{2.5} Concentrations, 2035

Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM _{2.5} Annual CAAQS	0.6	0	No
PM _{2.5} 24-hr CAAQS	1.0	0	No
PM _{2.5} Annual NAAQS	1.0	0	No

Source: Appendix D.

Table 4.3-12
Summary of Incremental PM₁₀ Concentrations, 2035

Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM ₁₀ 24-hr NAAQS	10	0	No
PM ₁₀ Annual CAAQS	3	113	Yes ¹
PM ₁₀ 24-hour CAAQS	14	6	Yes ²

Source: Appendix D.

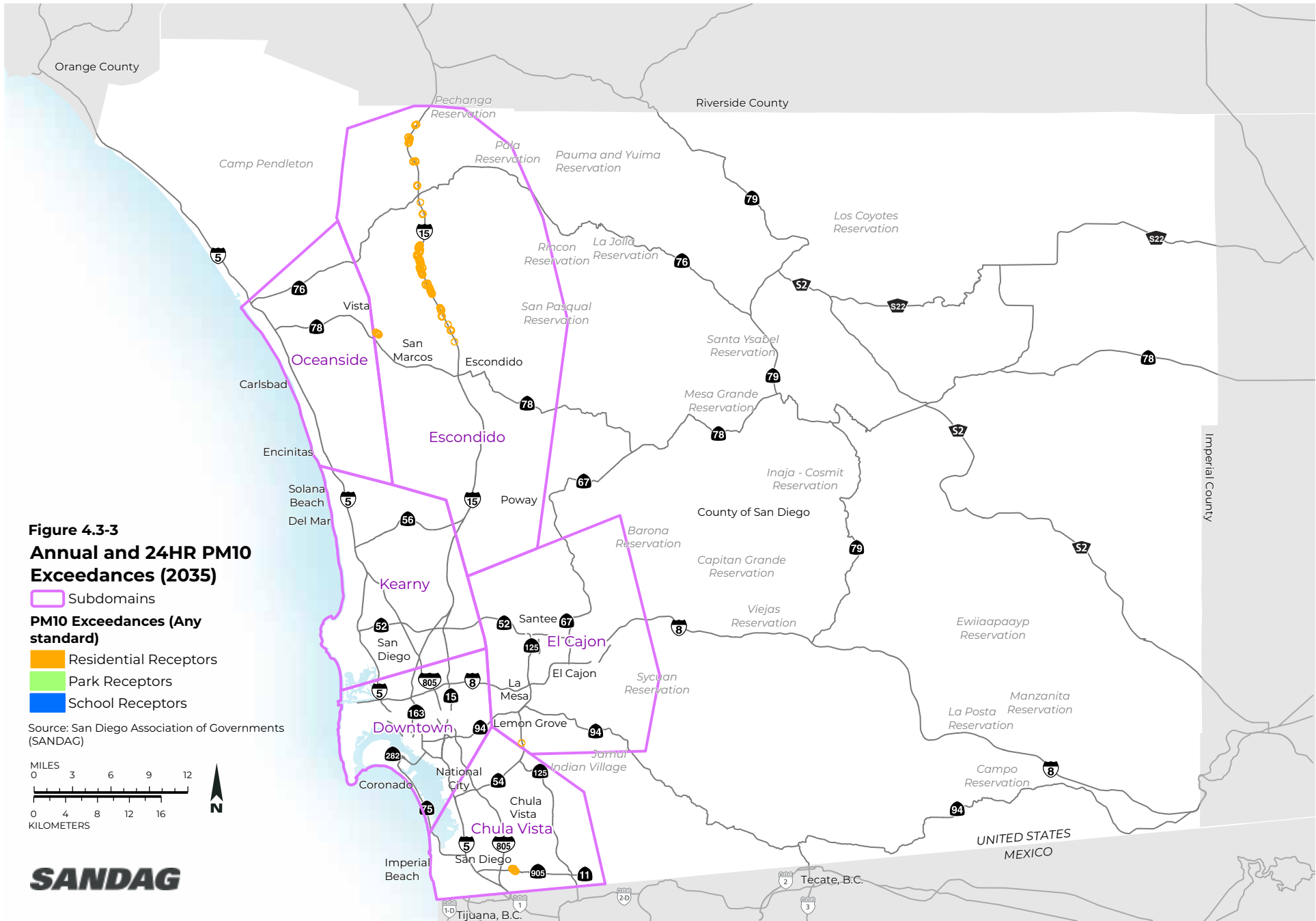
¹ These exceedances are mostly in the Escondido domain (112.4 acres), with some exceedances in the El Cajon domain (0.6 acres)

² These exceedances are in the Chula Vista domain

⁶ Ibid.

2035 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2035 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2035 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the El Cajon and Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2035.



2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Maximum changes in concentrations of 24-hour and annual levels of PM_{2.5} and PM₁₀ from 2016 to 2050 from major roadways, freeways, and highways under implementation of the proposed Plan are shown in Tables 4.3-13 and 4.3-14, respectively. For PM_{2.5}, modeling shows no change in some areas and a small increase in some areas. However, all increases would be less than the criteria identified above for a new violation or substantial contribution to an existing violation. The impact for PM_{2.5} is less than significant.

For PM₁₀, modeling shows no change in some areas and a small increase in some areas. However, concentrations would increase above thresholds within the Kearny, El Cajon, and Escondido domains for the annual CAAQS, as well as in Chula Vista for the 24-hour CAAQS.

These exceedances in El Cajon, Escondido, and Chula Vista are due primarily to road dust from freeway travel.⁷ The maximum increase in El Cajon is at receptor locations immediately adjacent to SR-125 and along I-8 in La Mesa, El Cajon, and near the interchange with SR-125; the maximum increases in Escondido are at various receptor locations immediately adjacent to I-15 and SR-78; and the maximum increases in Chula Vista are at receptor locations immediately adjacent to I-5 both south and north of SR-905, and along SR-905.

These PM₁₀ increases could contribute to a new violation or substantial contribution to an existing violation. The impact for PM₁₀ is significant. The locations of PM₁₀ exceedances for 2050 are shown in Figure 4.3-4.

Table 4.3-13
Summary of Incremental PM_{2.5} Concentrations, 2050

Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM _{2.5} Annual CAAQS	0.7	0	No
PM _{2.5} 24-hr CAAQS	2	0	No
PM _{2.5} Annual NAAQS	1	0	No

Source: Appendix D.

Table 4.3-14
Summary of Incremental PM₁₀ Concentrations, 2050

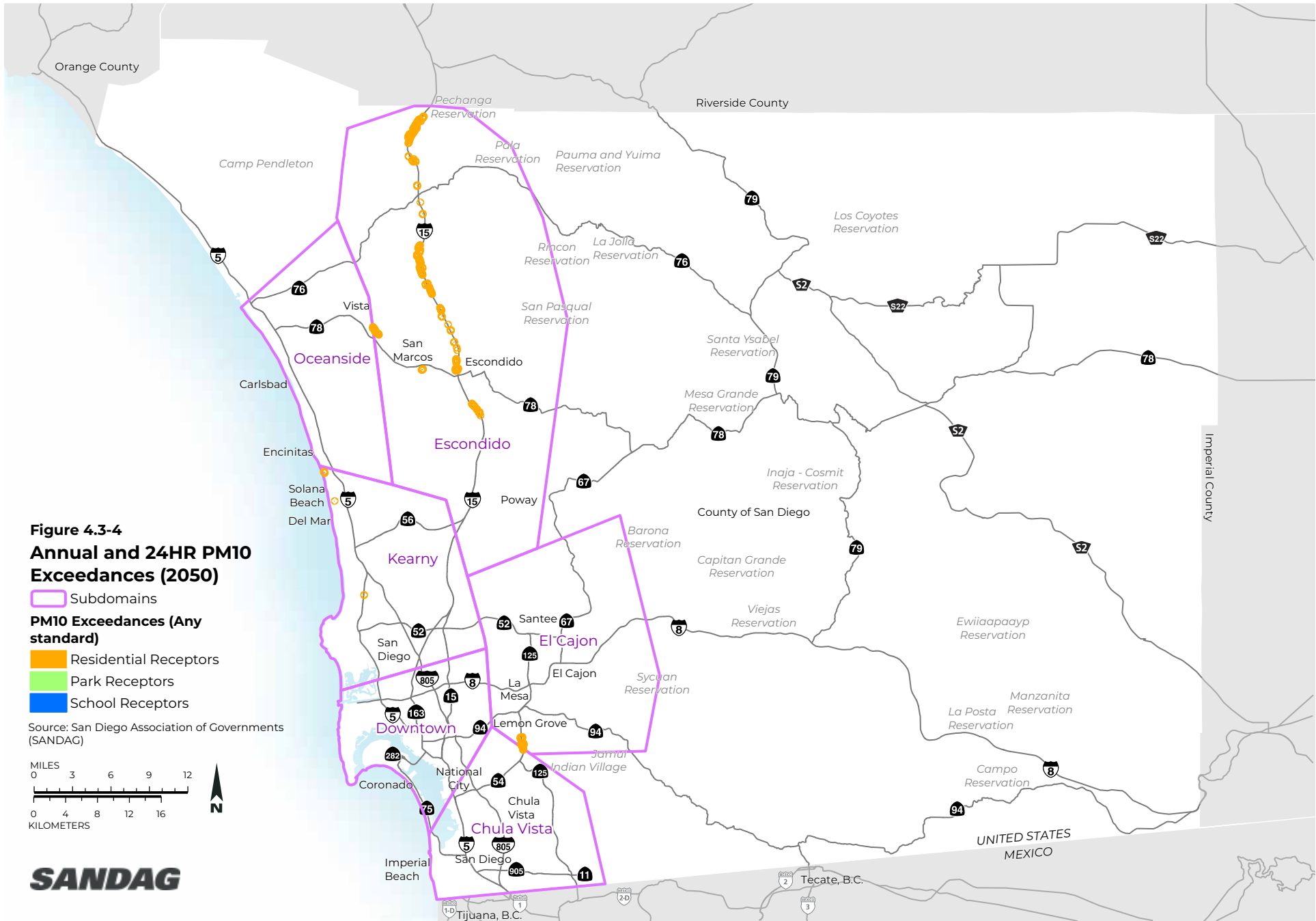
Standard	Maximum Incremental Concentration (µg/m ³)	Area of Threshold Exceedance (acres)	Significant Impact?
PM ₁₀ 24-hr NAAQS	10	0	No
PM ₁₀ Annual CAAQS	4	273	Yes ¹
PM ₁₀ 24-hour CAAQS	15	2	Yes ²

Source: Appendix D.

¹ These exceedances are mostly in the Escondido domain (241.5 acres), in the El Cajon domain (24.7 acres), with some exceedances in the Kearny domain (6.2 acres)

² These exceedances are in the Chula Vista domain.

⁷ Ibid.



2050 Conclusion

Implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2050 under the proposed Plan would not substantially contribute to violations or create new violations of 24-hour PM10 NAAQS, annual PM2.5 NAAQS or CAAQS, or 24-hour PM2.5 CAAQS. However, implementation of forecasted regional growth and land use change and planned transportation network improvements and programs by 2050 under the proposed Plan could substantially contribute to violations or create new violations of annual PM10 CAAQS in the Kearny, El Cajon, and Escondido domains, and the 24-hour PM10 CAAQS in the Chula Vista domain. Therefore, this impact is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan is expected to exacerbate climate change effects on exposing sensitive receptors to substantial PM10 and PM2.5 concentrations. Climate change may result in increased wildfire frequency and intensity, which can increase emissions of particulate matter. Precipitation during dry seasons may also decrease under climate change, reducing regional ability to fight wildfires and reduce this source of particulate matter (Reidmiller et al. 2018). Furthermore, as mentioned in Section 4.3.1, climate change could increase the incidence of flooding and wildfire that may block routes and disrupt traffic; this could increase vehicle idling and thus increase the amount of PM10 and PM2.5 coming from vehicles (WSP 2018).

As the proposed Plan would result in increased exposure of sensitive receptors to PM10 and PM2.5 (Impact AQ-4), the air quality impacts expected from climate change may add to the proposed Plan's PM impacts.

MITIGATION MEASURES

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PM10 AND PM2.5 CONCENTRATIONS

2025, 2035, and 2050

Implement mitigation measure **AQ-2a**, as discussed under Impact AQ-2. Mitigation measure **AQ-2a** would reduce road dust from freeway travel, which is the primary cause of the PM10 exceedances discussed herein.

The following mitigation measures presented in Section 4.8 will further reduce PM10 and PM2.5 emissions:

- **GHG-5a. Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**
- **GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**
- **GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**
- **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects**

The following mitigation measure presented in Section 4.16 will further reduce PM10 and PM2.5 emissions by reducing VMT:

- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects**

In addition, the following measure is proposed:

AQ-4 Reduce Exposure to Localized Particulate Emissions. During planning, design, and project-level CEQA review of transportation network improvements and programs, and during planning, design, and project-level CEQA review of development projects, SANDAG shall, and other transportation project sponsors, the County of San Diego, cities, and other local jurisdictions can and should, evaluate the potential particulate matter concentration impacts of the project using applicable procedures and guidelines for such analyses. If exceedances of PM10 or PM2.5 standards are predicted, SANDAG shall, and other transportation project sponsors can and should, apply measures to reduce PM emissions, including but not limited to the following:

- Design sites to locate sensitive receptors more than 500 feet of a freeway, 500 feet of urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
- Design sites to locate sensitive receptors more than 1,000 feet of a major diesel rail service or railyards.

Where adequate buffer cannot be implemented, implement the following:

- Install air filtration (as part of mechanical ventilation systems or stand-alone air cleaners) to indoor reduce pollution exposure for residents and other sensitive populations in buildings that are close to transportation network improvement projects. Use air filtration devices rated MERV-13 or higher. As part of implementing this measure, require an ongoing maintenance plan for the building's Heating, Ventilation and Air Conditioning (HVAC) air filtration system. Air filtration devices rated MERV-13 are estimated to reduce indoor levels of particulates by 75 to 90 percent (CARB 2017b).
- Plant trees and/or vegetation suited to trapping roadway air pollution and/or sound walls between sensitive receptors and the pollution source. This measure would trap pollution emitted from pollution sources such as freeways, reducing the amount of pollution to which residents and other sensitive populations would be exposed. The vegetation buffer should be thick, with full coverage from the ground to the top of the canopy (CARB 2017c, EPA 2016). Vegetation can be combined with sound walls to further reduce pollution exposure, particularly for locations immediately behind the barrier.
- Design streets that have more open space and varied building heights.
- Move bus stops and other gathering location farther from intersections.

SIGNIFICANCE AFTER MITIGATION

2025, 2035, and 2050

Mitigation measure **AQ-2a will help secure incentive funding to reduce PM emissions from mobile sources.** Mitigation measure **AQ-4 will** reduce the exposure of sensitive receptors to localized PM emissions with the implementation of design measures.

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM10 and PM2.5 emissions from tire wear, brake wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce PM10 and PM2.5 emissions and associated concentrations.

Although mitigation would reduce impacts, there is no guarantee that all projects would be reduced to below a level of significance. Impacts would remain significant for the Escondido and Chula Vista areas for 2025, 2035, and 2050 and the El Cajon area for 2035 and 2050. Thus, impacts would be significant and unavoidable.

AQ-5 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS

ANALYSIS METHODOLOGY

This analysis addresses the exposure of sensitive receptors to substantial concentrations of TACs. A health risk assessment was performed to analyze exposure of sensitive receptors to substantial concentrations of TACs; increases in cancer risk associated with such exposure. For this analysis, sensitive receptors are defined as residential, school, and recreational land uses.

The cancer risk of a given area is a measure of any one person's likelihood of contracting cancer due to exposure from a particular carcinogen; it is not a measure of how many people will contract cancer. For example, for an area with an increase in cancer risk of 10 in 1 million, any one person's likelihood of contracting cancer would increase by 10 chances in 1 million (i.e., increased likelihood of contracting cancer would increase by 0.001 percent). Moreover, in estimating any one person's cancer risk in residential uses, the analysis assumes that person would stay in the same place for 30 years, 7 days a week, 24 hours a day, 350 days a year. The analysis follows the OEHHA guidelines (OEHHA 2015), and utilizes the 95th percentile breathing rates and other conservative assumptions to calculate exposure to TACs. Accordingly, it is designed to provide a conservative estimate of cancer risk, and likely overestimates actual impacts that would occur.

This analysis evaluates both increases in cancer risk from the baseline risk, and total (or cumulative) cancer risk from the transportation network, including diesel locomotives, stationary sources, and on-road mobile sources. The increased cancer risk analysis compares the estimated risks for 2025, 2035, and 2050 with the existing baseline risks (2016), and evaluates whether there is an increase above 10 in 1 million (i.e., the likelihood of contracting cancer would increase by 0.001 percent) from changes in the transportation network. Total (or cumulative) cancer risk is not based on a comparison with baseline levels, but rather identifies the areas in which the total (or cumulative) cancer risk from the transportation network plus stationary sources would exceed 100 in 1 million (i.e., likelihood of contracting cancer of 0.01 percent) in 2025, 2035, and 2050.

Note that from the Draft EIR to the Final EIR, SANDAG revised its ABM2+ model to reflect minor modifications to the transportation network improvements as well as minor modeling corrections. Those modeling changes result in lower VMT for baseline (2016) and Plan years (2025, 2035, and 2050), which would reduce emissions for baseline (2016) and Plan years (2025, 2035, and 2050). No update to the air quality modeling is required because the air quality model results are conservative and these changes would not change any conclusions in this EIR.

Exposure to TACs may result in noncancer health effects as well as increases in cancer risk, as described in Section 4.3.1, *Existing Conditions*. The noncancer health effects analysis involves calculating the total health hazard index (THI) (OEHHA 2015). A health hazard index is a comparison of the concentration of a TAC to the level at which adverse noncancer health effects would be experienced (the recommended exposure limit [REL] for TAC emissions). The calculation involves dividing the predicted TAC concentration by its REL. This analysis focused on evaluating the THI at the maximally exposed individual receptor (MEIR). If the maximum THI is greater than 1.0, the concentration to which an individual is exposed would be above the level at which noncancer health effects could occur, and a significant impact would result. If it is below 1.0, then noncancer health effects would not be expected to occur. The analysis examines generation of TACs from planned transportation network improvements and programs under the proposed Plan, and placement of existing and new sensitive receptors under forecasted regional growth and land use change under the proposed Plan in locations where they would be exposed to substantial concentrations of TACs. Note that transportation network improvements and programs under the proposed Plan include both increased motor vehicle travel on

the roadway network and new commuter rail lines throughout the region, as shown in Figures 2-25 and 2-34 in Chapter 2, *Project Description*. As described in detail above, the following criteria are used to evaluate whether implementation of the proposed Plan would expose sensitive receptors to substantial concentrations of TACs:

1. Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?
2. Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in 1 million?
3. Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

The analysis also discloses TAC exposure of new land use added by the Regional Plan's regional growth and land use changes. Sensitive receptors associated with new land uses include future residential and park uses near existing pollution sources, such as roads, rail, and stationary sources.

The Supreme Court in *California Building Industry Assoc. v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369 (*CBIA v. BAAQMD*) considered the issue of whether such TAC exposure of new receptors added by a project represents an environmental impact under CEQA. In that case, the California Building Industry Association challenged the Bay Area Air Quality Management District's (BAAQMD) adoption of new CEQA thresholds for determining whether a project's exposure to existing levels of TACs would result in a significant impact. The Supreme Court's review of the case focused on whether CEQA requires an analysis of how existing environmental conditions will impact future residents or users (receptors) of a proposed project. After reviewing the CEQA statute and Section 15126.2(a) of the State CEQA Guidelines, the Court concluded that CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents.

The Court did not exclude all consideration of existing hazards from CEQA analysis. An agency must evaluate existing conditions in order to assess whether a project could exacerbate hazards that are already present. In light of the Court's decision, exposure of future project land uses to existing air quality conditions, including TAC risks, that would not be exacerbated by a project are not subject to CEQA analysis. Nevertheless, recognizing the unique nature of the Proposed Regional Plan, which includes both regional growth and land use change and transportation network improvements, the Impact AQ-5 analysis voluntarily does consider such exposure of future land uses to existing TAC risks as an impact. The methodology and detailed results for the health risk assessment are described in detail in Appendix D. Due to the nature of this analysis, the combined impacts of regional growth and land use change and transportation network improvements and programs are presented together.

Health Impacts

Exposure to diesel particulates and TACs may result in adverse health effects, both increased cancer risk as well as noncancer health effects, as described in Section 4.3.1.

This HRA identifies and maps sensitive receptors in 2016 and future years within the areas exposed to specified concentrations of TAC emissions to determine where cancer and non-cancer risk thresholds are exceeded. For the HRA, sensitive receptors are locations represented by residential, school, and recreational land uses. HRA results are presented separately for cancer and non-cancer effects. For cancer risks, the results include a summary of the risk at the maximally exposed sensitive receptor, and the area (in acres) that exceed the applicable threshold, which is 10 in 1 million for plan-level increase in risk and 100 in 1 million for cumulative

effects. For non-cancer risks, the results include a summary of the risk at the maximally exposed sensitive receptor, and the area (in acres) that exceed the applicable threshold, which is 1.0 for both chronic and acute hazard effects.

Given the limitations of modeling tools and assumptions, sensitive receptor exposure numbers are an indication of relative exposure, and not a precise prediction. Actual exposure would be lower because of the conservative EMFAC 2017 modeling assumptions used in the cancer risk analysis (see above). The cancer risk of a given area is a measure of any one person's likelihood of contracting cancer due to exposure from a particular carcinogen; it is not a measure of how many people will contract cancer.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-15 summarizes health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in cancer risk in 2025 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the Downtown domain, but Chula Vista and Oceanside see an increase due to expanded rail services. Risk exceeds the 10 in 1 million threshold in a number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due to siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown, El Cajon, and Chula Vista domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant.

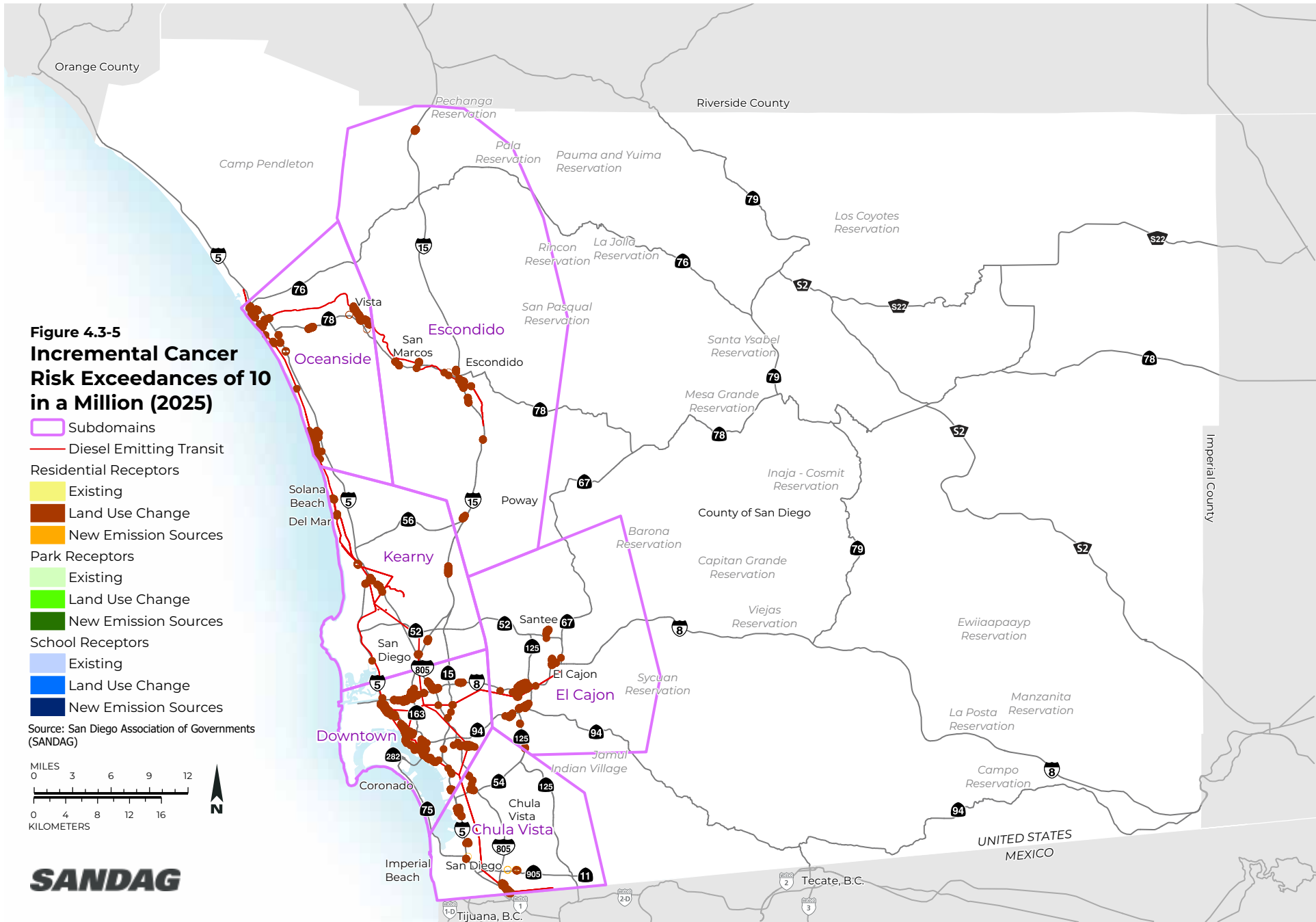
Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2025 are shown in Figure 4.3-5.

**Table 4.3-15
Summary of Cancer Health Risk, 2025**

Receptor Type	2016		2025	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-5	0
Recreational	13	24	0	0
School	11	2	0	0
New Sources				
Residential	--	--	54	7
Recreational	--	--	3	0
School	--	--	0	0
New Land Uses				
Residential	--	--	149	948
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.

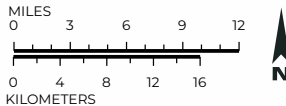
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.



**Figure 4.3-5
Incremental Cancer Risk Exceedances of 10 in a Million (2025)**

- Subdomains
- Diesel Emitting Transit
- Residential Receptors**
- Existing
- Land Use Change
- New Emission Sources
- Park Receptors**
- Existing
- Land Use Change
- New Emission Sources
- School Receptors**
- Existing
- Land Use Change
- New Emission Sources

Source: San Diego Association of Governments (SANDAG)



SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cumulative cancer risks above 100 in one 1 million?

Table 4.3-16 summarizes cumulative health risk at residential sensitive receptors in 2025 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of sensitive receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

**Table 4.3-16
Summary of Cumulative Health Risk, 2025**

Receptor Type	2016		2025		2025 vs. 2016	
	Maximum Cumulative Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Cumulative Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Change in Maximum Cumulative Cancer Risk (per million)	Change in Area of Threshold Exceedance (acres)
Residential	1,015	7,570	946	7,439	-69	-131

Source: Appendix D.

Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute TAC emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-17. Overall, TAC emissions reduce 62 to 91 percent relative to 2016. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-17
Summary of Toxic Air Contaminants Tons per Year, 2025

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.023	0.110	0.0120	0.26	0.120	0.220	0.0230	0.00008	0.530
2025	0.002	0.032	0.0029	0.10	0.041	0.079	0.0065	0.00004	0.093
Change vs. 2016	-91%	-71%	-76%	-62%	-66%	-64%	-72%	-41%	-82%

Source: Appendix D.

Note: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-18 summarizes non-cancer health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2025 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the chronic threshold at residential and recreational receptors. The maximally exposed areas are within the Downtown and Chula Vista domains. Non-cancer chronic risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Escondido domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in each domain. Non-cancer acute and chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant.

Table 4.3-18
Summary of Noncancer Hazards, 2025

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	-0.1	-0.6	0	0
Recreational	2.3	37	-0.1	-0.8	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	--	--	0.2	5.4	0	7
Recreational	--	--	0.3	6.8	0	5
School	--	--	0	0	0	0
New Land Uses						
Residential	--	--	2.1	14.9	5	950
Recreational	--	--	0	0	0	0
School	--	--	0	0	0	0

Source: Appendix D.

Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2025 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2025.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-19 summarizes health effects in 2035 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed receptors is below 2016 conditions. There are no existing residential, park, or school receptors that show an increase in cancer risk in 2035. Therefore, the impact on existing sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the El Cajon and Downtown domains. Risk exceeds the 10 in 1 million threshold in a

number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due to siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown and El Cajon domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant.

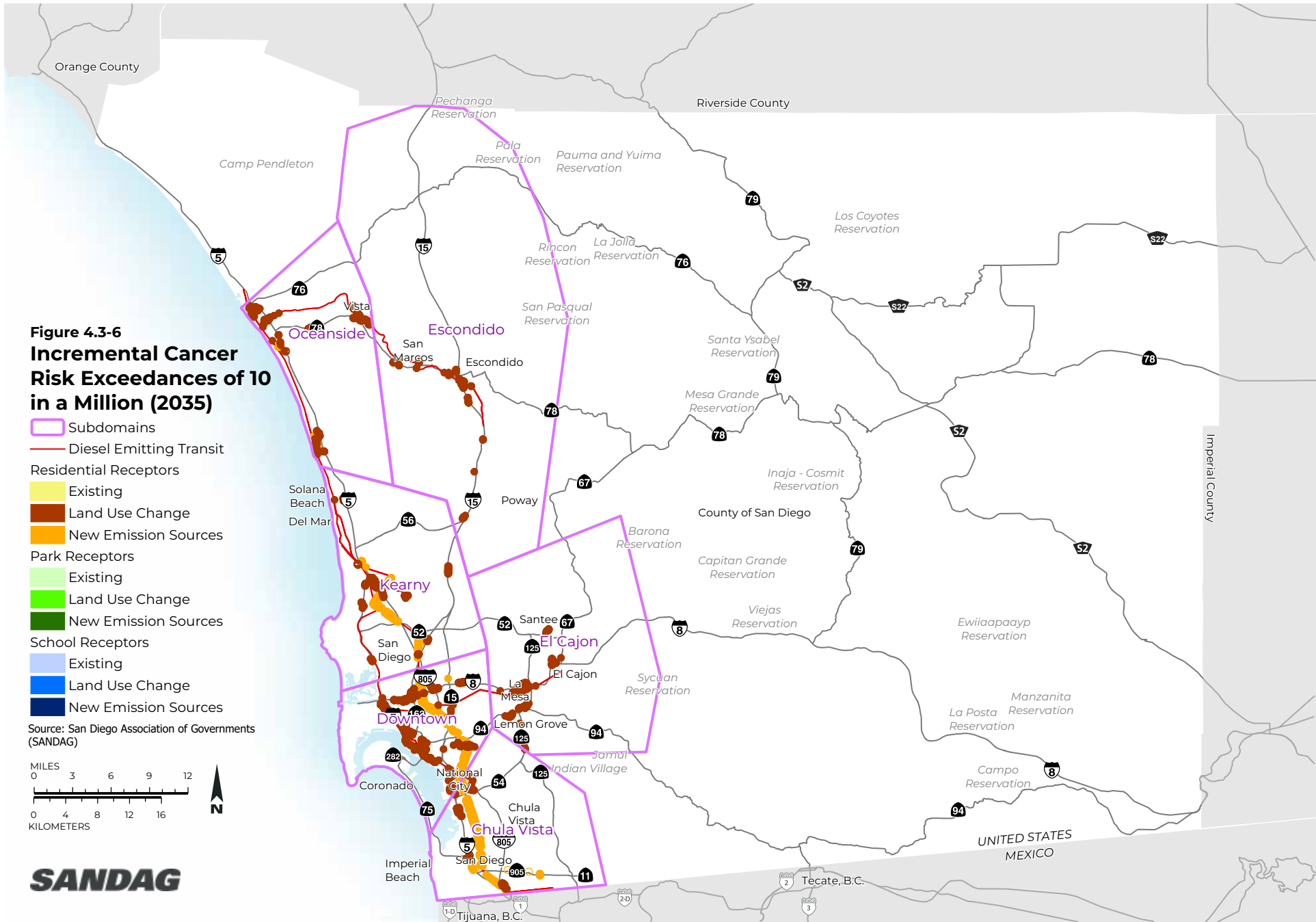
Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2035 are shown in Figure 4.3-6.

Table 4.3-19
Summary of Cancer Health Risk, 2035

Receptor Type	2016		2035	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-6	0
Recreational	13	25	0	0
School	11	2	0	0
New Sources				
Residential	--	--	132	1,261
Recreational	--	--	2	0
School	--	--	0	0
New Land Uses				
Residential	--	--	137	1,155
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.

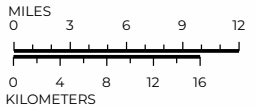
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.



**Figure 4.3-6
Incremental Cancer Risk Exceedances of 10 in a Million (2035)**

- Subdomains
- Diesel Emitting Transit
- Residential Receptors
 - Existing
 - Land Use Change
 - New Emission Sources
- Park Receptors
 - Existing
 - Land Use Change
 - New Emission Sources
- School Receptors
 - Existing
 - Land Use Change
 - New Emission Sources

Source: San Diego Association of Governments (SANDAG)



SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in one 1 million?

Table 4.3-20 summarizes cumulative health risk at residential receptors in 2035 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

**Table 4.3-20
Summary of Cumulative Health Risk, 2035**

Receptor Type	2016		2035		2035 vs. 2016	
	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Change in Maximum Cumulative Cancer Risk	Change In Area of Threshold Exceedance (acres)
Residential	1,015	7,570	928	7,214	-87	-356

Source: Appendix D.

Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute TAC emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-21. As shown, project conditions in 2035 show a decrease in all TAC emissions Overall, TAC emissions reduce between 71 and 100 percent relative to 2016 conditions. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-21
Summary of Toxic Air Contaminants Emissions per Year, 2035

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.0230	0.1100	0.0120	0.2600	0.1200	0.2200	0.0230	0.0001	0.5300
2035	0.0001	0.0250	0.0020	0.0750	0.0280	0.0550	0.0046	0.00002	0.0780
Change vs. 2016	-100%	-77%	-83%	-71%	-77%	-75%	-80%	-68%	-85%

Source: Appendix D.

Notes: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-22 summarizes non-cancer health effects in 2025 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2035 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental change in chronic hazard index at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The maximally exposed areas are within the El Cajon, Downtown, and Chula Vista domains, with other increases in Kearny above the threshold. Non-cancer chronic risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Escondido domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in Chula Vista, Downtown, Escondido, and Kearny. Non-cancer acute and chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant.

Table 4.3-22
Summary of Noncancer Hazards, 2035

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	0	-0.8	0	0
Recreational	2.3	37	-0.1	-0.9	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	-	-	0.8	14.2	0	1,266
Recreational	-	-	0.2	4.7	0	123
School	-	-	0	0	0	0
New Land Uses						
Residential	-	-	1.4	13.2	2	1,161
Recreational	-	-	0	0	0	0
School	-	-	0	0	0	0

Source: Appendix D.

Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2035 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2035.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Criterion 1: Does the proposed Plan result in increases in cancer risk to sensitive receptors over baseline (2016) conditions that exceed 10 in 1 million?

Table 4.3-23 summarizes health effects in 2050 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental risk at the maximally exposed receptors is below 2016 conditions. There are no existing residential, park, or school receptors near existing emission sources that show an increase in cancer risk in 2050. Therefore, the impact on existing sensitive receptors near existing emission sources is less than significant.

For sensitive receptors near new emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due almost exclusively to the new commuter rail lines. The maximally exposed areas are within the El Cajon and Downtown domains, with residential receptor exceedances in each

modeling domain. Risk exceeds the 10 in 1 million threshold in a number of locations due to new rail activity. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses, the incremental risk at the maximally exposed sensitive receptors exceeds the threshold at residential receptors. The threshold is exceeded at various residential receptors within each modeling domain due to siting of new residential uses near existing rail and roadway sources. The maximally exposed areas are within the Downtown, El Cajon, and Escondido domains. Risk exceeds the 10 in 1 million threshold in a number of locations due to the siting of new land uses. Therefore, the impact on new sensitive receptors in new land uses is significant.

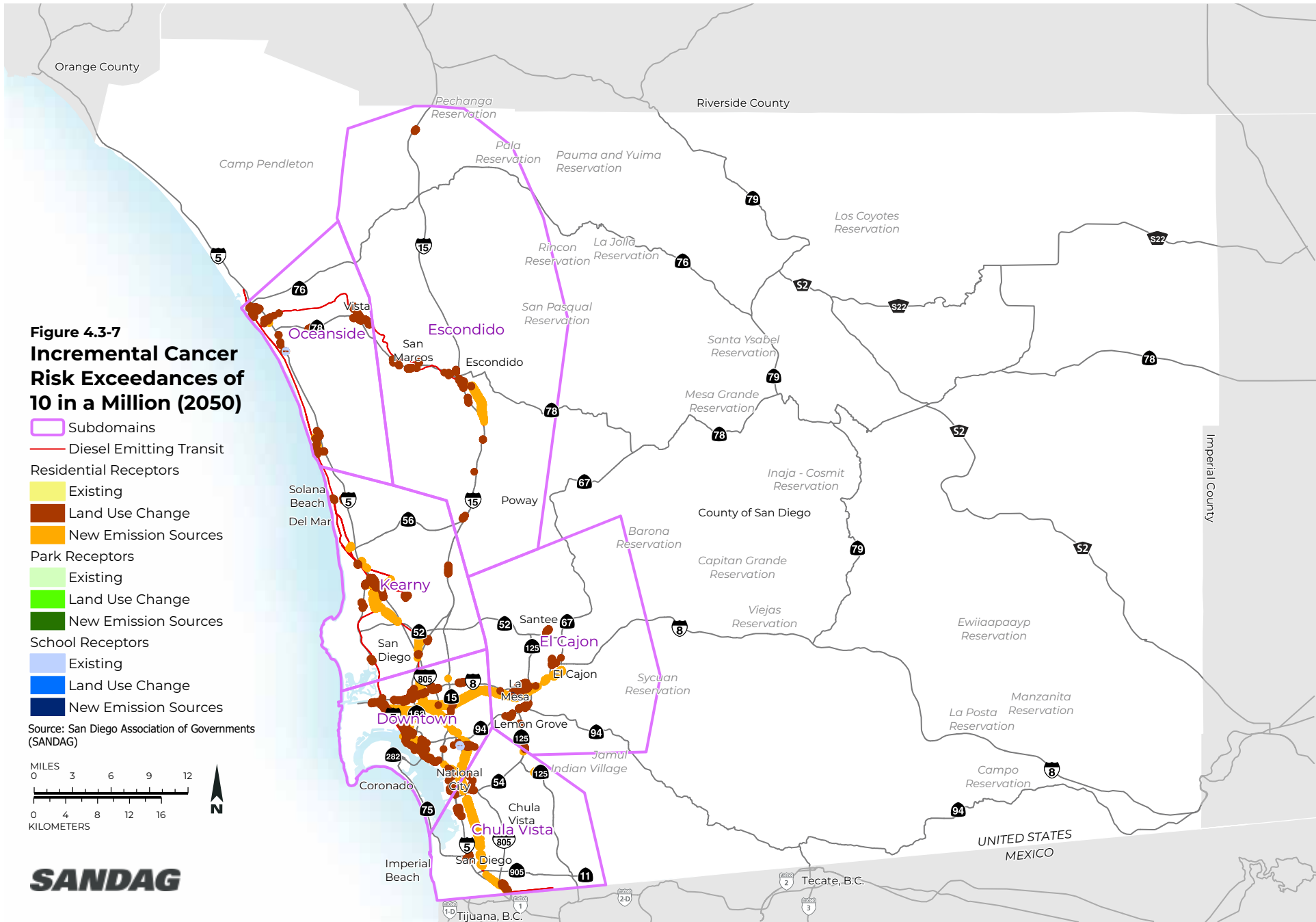
Sensitive receptors exposed to new emission sources and new sensitive receptors that show an incremental increase in cancer risk above thresholds in 2050 are shown in Figure 4.3-7.

Table 4.3-23
Summary of Cancer Health Risk 2050

Receptor Type	2016		2050	
	Maximum Cancer Risk (per million)	Area of Threshold Exceedance (acres)	Maximum Incremental Cancer Risk (per million)	Incremental Area of Threshold Exceedance (acres)
Existing Sources				
Residential	447	7,563	-5	0
Recreational	13	25	0	0
School	11	2	0	0
New Sources				
Residential	--	--	131	2,481
Recreational	--	--	3	0
School	--	--	1	0
New Land Uses				
Residential	--	--	133	1,223
Recreational	--	--	0	0
School	--	--	0	0

Source: Appendix D.

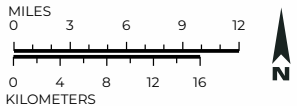
Notes: Cancer risk threshold is 10 in 1 million. Modeled cancer risks were rounded to the nearest whole number.



**Figure 4.3-7
Incremental Cancer Risk Exceedances of 10 in a Million (2050)**

- Subdomains
- Diesel Emitting Transit
- Residential Receptors
 - Existing
 - Land Use Change
 - New Emission Sources
- Park Receptors
 - Existing
 - Land Use Change
 - New Emission Sources
- School Receptors
 - Existing
 - Land Use Change
 - New Emission Sources

Source: San Diego Association of Governments (SANDAG)



SANDAG

Criterion 2: Does the proposed Plan expose sensitive receptors to total cancer risks above 100 in one 1 million?

Table 4.3-24 summarizes cumulative health risk at residential receptors in 2050 relative to 2016 conditions. As shown, the maximum cumulative cancer risk and the number of receptors in the modeling exposed to 100 per million health risk would decrease. This reduction in exposure is due in part to regulatory policies that reduce emissions from diesel trains and vehicles and gasoline vehicles due to state and federal programs designed to reduce emissions of TACs and improve fuel efficiency. Thus, reductions in the number of exposed individuals would occur despite the proposed Plan's forecasted increase in the population and housing units within the region.

**Table 4.3-24
Summary of Cumulative Health Risk, 2050**

Receptor Type	2016		2050		2050 vs. 2016	
	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Maximum Cumulative Cancer Risk	Area of Threshold Exceedance (acres)	Change in Maximum Cumulative Cancer Risk	Change in Area of Threshold Exceedance (acres)
Residential	1,015	7,570	922	7,232	-93	-338

Source: Appendix D.

Note: Modeled cancer risks were rounded to the nearest whole number.

The SCS portion of the proposed Plan includes proposed land use changes, with a focus on development within Mobility Hubs or Smart Growth Opportunity Areas. These Mobility Hubs are proposed for communities with a high concentration of people, destinations, and travel choices where densification is envisioned in the SCS. Many of these proposed land uses are within areas that are near existing pollution sources. Although the proposed Plan would contribute emissions at both the regional and local scale, these increases would not increase existing hazards, when taking into account the reduction of emissions over time due to regulatory policies.

A summary of TAC emissions is shown in Table 4.3-25. As shown, project conditions in 2050 show a decrease in all TAC emissions. Overall, TAC emissions reduce between 74 and 100 percent relative to 2016 conditions. Given this reduction in TACs, the proposed Plan would not increase existing hazards, taking into account the effect of regulatory policies over time. Based on the above analysis, this impact is therefore less than significant.

Table 4.3-25
Summary of Toxic Air Contaminants Tons per Year, 2050

Year	Butadiene1,3	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	Naphthalene	PAH	DPM
2016	0.0230	0.1100	0.0120	0.2600	0.1200	0.2200	0.0230	0.0001	0.5300
2050	0.0001	0.0240	0.0018	0.0680	0.0250	0.0520	0.0042	0.00002	0.0710
Change vs. 2016	-100%	-78%	-85%	-74%	-79%	-76%	-82%	-76%	-87%

Source: Appendix D.

Notes: Some values have been rounded to the nearest ten thousandths or hundred thousandths.

Criterion 3: Does the proposed Plan result in increases in health risks to sensitive receptors for noncancer hazards as measured by a THI above 1.0?

Table 4.3-26 summarizes non-cancer health effects in 2050 for the three receptor types.

For land uses near existing roadway and rail sources, the incremental non-cancer risk at the maximally exposed sensitive receptors is below 2016 conditions. For all residential, park, or school sensitive receptors near existing roadway and rail sources, there are no sensitive receptors that show an increase in chronic hazard or acute hazard in 2050 relative to 2016 conditions. Therefore, the impact on sensitive receptors near existing emission sources is less than significant.

For sensitive receptors that would be exposed to new emission sources, the incremental risk at the maximally exposed sensitive receptors far exceeds both the chronic and acute threshold at residential and recreational receptors. The maximally exposed areas are within the El Cajon, Downtown, and Chula Vista domains, with increases in all domains above the threshold. Non-cancer chronic and acute risk at various residential and recreational receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on sensitive receptors near new emission sources is significant.

For new sensitive receptors in new land uses that would be exposed to existing emission sources, the incremental risk at the maximally exposed sensitive receptors exceeds both the acute and the chronic threshold at residential uses. The maximally exposed area for acute hazard is within the Chula Vista domain. The maximally exposed area for chronic hazard is within the El Cajon domain, with exceedances in each domain. Non-cancer chronic risk at various residential receptor location exceeds the 1.0 hazard index threshold. Therefore, the impact on new sensitive receptors in new land uses is significant.

**Table 4.3-26
Summary of Noncancer Hazards, 2050**

Receptor Type	2016 Maximum Hazard Index		Maximum Incremental Change vs. 2016		Incremental Area of Threshold Exceedance (acres)	
	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard	Acute Hazard	Chronic Hazard
Existing Sources						
Residential	6.9	52.9	0.5	-0.6	0	0
Recreational	2.3	37	0.2	-0.9	0	0
School	1.5	24.9	0	0	0	0
New Sources						
Residential	--	--	0.9	13.8	0	2,477
Recreational	--	--	0.6	4.3	0	299
School	--	--	0.2	2.2	0	1
New Land Uses						
Residential	--	--	1.5	11.2	2	1,218
Recreational	--	--	0	0	0	0
School	--	--	0	0	0	0

Source: Appendix D.

Notes: Noncancer hazard risk threshold is 1.0 for both Acute and Chronic Hazards. Modeled noncancer hazard risks were rounded to the nearest one decimal place.

2050 Conclusion

Implementation of the proposed Plan would not expose existing sensitive receptors, but would expose new receptors, to substantial concentrations of TAC emissions. Therefore, this impact is significant in 2050.

Exacerbation of Climate Change Effects

The proposed Plan could potentially exacerbate climate change effects on exposing sensitive receptors to substantial TAC concentrations. Climate change could increase exposure to some carcinogens, such as through particulate matter from wildfire and flooding inundation of chemical or waste sites that may release carcinogens (Nogueira, Yabroff, and Bernstein 2020).

MITIGATION MEASURES

AQ-5 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS

2025, 2035, and 2050

Implement mitigation measure **AQ-2a**, as discussed under Impact AQ-2. Mitigation measure **AQ-2a** would reduce road dust from freeway travel, which is the primary cause of the PM10 exceedances discussed herein.

Implement mitigation measure **AQ-4**, as discussed under Impact AQ-4. Mitigation measure **AQ-4** would reduce pollution exposure at land uses near emission sources. These design measures would also reduce TACs by reducing exposure to all roadway and rail pollution.

The following mitigation measures, as discussed in Section 4.8, will further reduce TAC emissions:

- **GHG-5a. Allocate Competitive Grant Funding to Projects that Reduce GHG Emissions and for Updates to CAPs or GHG Reduction Plans**
- **GHG-5b. Establish New Funding Programs for Zero-Emissions Vehicles and Infrastructure**
- **GHG-5d. Develop and Implement Regional Digital Equity Strategy and Action Plan to Advance Smart Cities and Close the Digital Divide**
- **GHG-5f. Implement Measures to Reduce GHG Emissions from Development Projects**

The following mitigation measures presented in Section 4.16 will further reduce TAC emissions by reducing VMT:

- **TRA-2 Achieve Further VMT Reductions for Transportation and Development Projects.**

In addition, the following measures are proposed:

AQ-5a Reduce Exposure to Localized Toxic Air Contaminant Emissions. During planning, design, and project-level CEQA review of transportation network improvements and programs, SANDAG shall, and other transportation project sponsors can and should, evaluate the potential toxic air contaminant (TAC) impacts of the project using applicable procedures and guidelines for such analyses (for example, California Air Pollution Control Officers' Association, OEHHA, and/or EPA air toxics health risk assessment guidance).

In addition, during planning, design, and project-level CEQA review of development projects, the County of San Diego, cities, and other local jurisdictions can and should apply the above measures, and additional measures to reduce TAC emissions or exposure to TAC emissions, including but not limited to:

- Reduce the potential for TACs to be introduced into buildings by all of the following:
 - Maintaining a positive air pressure within buildings that include sensitive receptors.
 - Achieving a performance standard of at least one air exchange per hour of fresh outside filtered air.
 - Achieving a performance standard of at least 4 air exchanges per hour of recirculation.
 - Achieving a performance standard of at least 0.25 air exchanges per hour of unfiltered air if the building is not positively pressurized.
- Within developments, separate sensitive receptors from truck activity areas, such as loading docks and delivery areas. This measure would reduce exposure of residents and other sensitive receptors by locating sources of TACs associated with loading docks and delivery areas away from sensitive receptors.
- Replace or retrofit existing diesel generators that are not equipped to meet CARB's Tier 4 emission standards.
- Reduce emissions from diesel trucks using the project site through the following measures:
 - Install electrical hook-ups for electric or hybrid trucks at loading docks.
 - Require trucks to use Transportation Refrigeration Units (TRUs) that meet Tier 4 emission standards.
 - Require truck-intensive projects to use advanced exhaust technology (e.g., hybrid) or alternative fuels.
 - Prohibit trucks from idling for more than 2 minutes as feasible.

This measure would reduce emissions of TACs from trucks and TRUs by reducing operations and requiring them to use electrical hookups.

- Do not locate sensitive receptors in the same buildings as a perchloroethylene dry cleaning facility. This measure would reduce potential exposure of sensitive receptors to perchloroethylene from dry cleaning facilities.
- Maintain a 50-foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year). This measure would reduce potential exposure of sensitive receptors to emissions from gas stations.
- Ensure that private (individual and common) exterior open space, including playgrounds, patios, and decks, is shielded from stationary sources of air pollution by buildings or otherwise buffered to further reduce air pollution exposure for project occupants. This measure would reduce the potential for exposure of residents and other sensitive populations to stationary sources of TAC emissions.

AQ-5b. Reduce Exposure to Localized Toxic Air Contaminant Emissions during Railway Design. In order to help reduce localized toxic air contaminant (TAC) concentrations at sensitive receptors near the future proposed railway(s), SANDAG shall require the design of railway tunnels or other approaches to move emissions underground, where feasible, during individual project-level design. Furthermore, individual project-level design of railway tunnels or other underground features shall require that portals, adits, windows, and other venting features are located as far away as feasibly possible from nearby sensitive receptor(s).

SIGNIFICANCE AFTER MITIGATION

2025, 2035, 2050

Mitigation Measure AQ-2, as described under Impact AQ-2, which will help secure incentive funding to reduce PM emissions from mobile sources. Mitigation Measure AQ-5a will reduce TAC emissions and TAC emission exposure on existing and new receptors through design and siting requirements. Mitigation Measure AQ-5b will reduce diesel emission exposure on existing and new receptors through undergrounding and design.

Mitigation measures GHG-5a, GHG-5b, GHG-5d, and GHG-5f would reduce PM10 and PM2.5 emissions from tire wear, brake wear, and vehicle exhaust, as discussed in Section 4.8. In addition, mitigation measure TRA-2 would reduce criteria pollutants through project-level VMT reduction measures, as discussed in Section 4.16. Measures to reduce VMT or vehicle exhaust (e.g., EVs) in these mitigation measures would reduce TAC emissions and associated concentrations.

Although mitigation would reduce impacts, there is no guarantee that impacts would be reduced to below a level of significance for every project. Thus, this impact would be significant and unavoidable.

AQ-6 EXPOSE SENSITIVE RECEPTORS TO CARBON MONOXIDE HOT-SPOTS

ANALYSIS METHODOLOGY

This analysis addresses the exposure of sensitive receptors to substantial concentrations of CO. A CO hot spot is a localized concentration of CO, typically found at congested intersections, that is above the state or national 1-hour or 8-hour ambient air standards for the pollutant. Projects that do not generate CO concentrations in excess of the health-based NAAQS or CAAQS would not contribute a significant level of CO such that localized air quality and human health would be substantially affected.

This analysis qualitatively evaluates proposed Plan CO concentration impacts, including CO hot spots, by comparing them to CO concentrations disclosed in the 2015 Regional Plan EIR.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is projected to decrease by approximately 4,000,000 VMT daily compared to 2025 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR analyzed CO concentrations at four congested intersections and found impacts to be well below significance thresholds, even for the existing year 2012. CO emissions would be even lower under the proposed Plan due to reduced traffic volumes and cleaner engine technology, as compared to what was modeled in the 2015 Regional Plan EIR. Thus, CO concentrations would be lower and continue to be well below significance thresholds. The proposed Plan's CO concentration impacts would also be lower than the 2015 Regional Plan's impacts because background CO concentrations are lower today than what was assumed in the 2015 Regional Plan EIR. In the 2015 Regional Plan EIR analysis, modeled concentrations were added to background concentrations to evaluate Plan conditions against 1-hour or 8-hour ambient air standards. The 2015 Regional Plan EIR used a 1-hour background of 4.4 ppm and an 8-hour background of 3.8 ppm. Over the most recent 5-year period, data from the EPA (see Table 4.3-3) has the maximum 1-hour background at 4.1 ppm and the 8-hour background at 2.5 ppm. These background concentrations are lower than assumed in the 2015 Regional Plan EIR.

2025 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2025. This impact is less than significant.

2035

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is would decrease by approximately 8,500,000 VMT daily compared to the 2035 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR and proposed Plan both modeled CO emissions for the year 2035. According to the 2015 Regional Plan EIR, on-road vehicle sources would be responsible for 71.26 tons per day of CO emissions (2015 Regional Plan EIR Table 4.3-12). As shown in Table 4.3-7, the proposed Plan would emit 53.40 tons per day of CO from on-road vehicle sources. Compared to the 2015 Regional Plan EIR, the proposed Plan would

emit approximately 17.86 tons per day less of CO emissions, or 26 percent less than the 2015 Regional Plan EIR. According to the 2015 Regional Plan EIR, the implementation of the 2015 Regional Plan would not induce a CO hotspot at four congested intersections for the year 2035. Thus, as the 2015 Regional Plan EIR did not have a CO hot spot impact and modeled higher CO emissions from on-road sources (26 percent more) compared to the proposed Plan, the proposed Plan would also not have a CO hot spot impact.

2035 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2035. This impact is less than significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

Vehicle travel under the proposed Plan is assumed to decrease by approximately 10,700,000 VMT daily compared to 2050 projections under the 2015 Regional Plan (see Section 4.16). Proposed transportation infrastructure and programs within the proposed Plan would help to reduce VMT by providing alternative forms of transportation, including biking, walking, and transit, which would reduce passenger car travel and thereby reduce any exposure to emissions at congested roadways. VMT and overall vehicle use would be lower than assumed in the 2015 Regional Plan.

The 2015 Regional Plan EIR modeled that on-road vehicle sources CO emissions would be approximately 65.08 tons per day (2015 Regional Plan EIR Table 4.3-16). Furthermore, the 2015 Regional Plan EIR analyzed CO concentrations at four congested intersections and found impacts to be well below significance thresholds for the year 2050. According to Table 4.3-7, on-road sources within the proposed Plan would emit approximately 51.08 tons per day of CO. This would be 14 tons per day less than what was analyzed within the 2015 Regional Plan EIR. Thus, as the 2015 Regional Plan EIR did not find a CO hotspot at four congested intersections while assuming higher on-road source CO emissions, the proposed Plan would also not create any CO hotspots.

2050 Conclusion

Implementation of the proposed Plan would not expose sensitive receptors to substantial concentrations of CO in 2050. This impact is less than significant.

Exacerbation of Climate Change Effects

The proposed Plan would not exacerbate climate change effects on exposing sensitive receptors to substantial concentrations of CO. This impact is less than significant for the proposed Plan and climate change is not expected to worsen CO hotspots, so there is unlikely to be an exacerbation of climate change effects.

AQ-7 RESULT IN OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS) ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE

ANALYSIS METHODOLOGY

The proposed Plan would result in significant impacts if it would result in the emission of odors that causes nuisance to a considerable number of persons or to the public. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable

number of offsite receptors. Odor sources within the SANDAG region, such as agricultural operations, wastewater treatment facilities, and landfills, are controlled by city and county odor policies enforced by SDAPCD, including SDAPCD Rule 51, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts on nearby receptors.

IMPACT ANALYSIS

2025

Regional Growth and Land Use Change

From 2016 to 2025, population within the region is projected to increase by 161,338 people, housing by 97,661 units, and employment by 115,328 jobs. Construction of land use development projects could release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2025 in the proposed Plan does not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2025 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2025 include commuter rail, several rapid bus lines, zero-emission bus upgrades, I-15 Managed Lanes, and several bikeway and bike facility improvements. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2025 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2025 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public, when compared to existing conditions; therefore, this impact (AQ-7) in the year 2025 is less than significant.

2035

Regional Growth and Land Use Change

From 2016 to 2035, population within the region is expected to increase by 310,838 people, housing by 219,311 units, and employment by 275,056 jobs. Construction of land use development projects could release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2035 in the proposed Plan does

not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2035 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2035 include additional commuter rail, ferry services, improvements to light rail, the San Ysidro Mobility Hub, the Central Mobility Hub, and the airport people mover. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2035 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2035 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public when compared to existing conditions; therefore, this impact (AQ-7) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

From 2016 to 2050, population within the region is projected to increase by 436,563 people, housing by 280,744 units, and employment by 439,899 jobs. Construction of land use development projects release odors from offroad equipment. Sources of odors from operational activities would include agricultural activities, wastewater treatment plants, food processing plants, chemical plants, composting facilities, landfills, dairies, and fiberglass molding. The regional growth and land use change for 2050 in the proposed Plan does not result in major increases in industrial areas that are likely to include these types of land uses. Activities that would have the potential to result in nuisance odors would be required to comply with applicable odor regulations, including SDAPCD Rule 51, that prevent impacts from being significant.

Therefore, regional growth and land use change projects in 2050 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

Transportation Network Improvements and Programs

Transportation network improvements proposed in 2050 include additional commuter rail, a tram, additional Rapid bus improvements, and bikeway improvements. Transportation network improvements would be required to comply with applicable odor regulations, including Rule 51, that prevent impacts from being significant. Therefore, transportation network improvements and programs in 2050 would not result in substantial odor emissions or affect a substantial number of people when compared to existing conditions.

2050 Conclusion

Implementation of the proposed Plan would result in a less-than-significant impact related to odor impacts because both development projects and transportation network improvements would be required to comply with applicable odor regulations that prevent impacts from being significant. Odors from these projects would not cause nuisance to a considerable number of persons or to the public, when compared to existing conditions; therefore, this impact (AQ-7) in the year 2050 is less than significant.

Exacerbation of Climate Change Effects

Although there will be climate change impacts in the San Diego region that could result in emissions leading to increased odors as described in Section 4.3.1, the proposed Plan would not exacerbate climate change effects on increased odors assuming land use and transportation projects implementing the proposed Plan comply with odor regulations.