

## 4.2 Air Quality

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This section evaluates the air quality impacts resulting from implementation of the proposed 2022 RTP/SCS. Both temporary impacts relating to construction activities and long-term impacts associated with population and employment growth and associated growth in vehicle traffic and energy consumption are discussed. In addition, the potential health risks associated with the proposed 2022 RTP/SCS land use scenario are discussed. Greenhouse gas emissions are analyzed in Section 4.9, *Greenhouse Gas Emissions and Climate Change*.

### 4.2.1 Setting

#### **a. Climate and Meteorology**

Air quality is affected by the rate and location of pollutant emissions and by climatic conditions that influence the movement and dispersion of pollutants. Atmospheric conditions, such as wind speed, wind direction and air temperature gradients, along with local and regional topography, mediate the relationship between air pollutant emissions and air quality.

The SJCOG region is located within the San Joaquin Valley Air Basin (SJVAB), which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and western Kern County counties. The SJVAB is approximately 250 miles long and 35 miles in width (on average) and is bordered by the Coast Range Mountains on the west, the Sierra Nevada mountains on the east, and the Tehachapi Mountains to the south. On the valley floor, the SJVAB is open only to the north, which heavily influences prevailing winds. Northwesterly winds are common during summer months, and air masses are often channeled towards the southeastern end of the San Joaquin Valley. Winds are often weaker in the winter, which contribute to stagnation events in which transport of pollutants is very limited (San Joaquin Valley Air Pollution Control District [SJVAPCD] 2015).

The SJVAB is generally considered to have a Mediterranean climate, characterized by sparse rainfall and hot, dry summers. With an average of over 260 sunny days per year, the SJVAB provides favorable conditions for ozone formation. While precipitation and fog during the winter block sunlight and reduce ozone concentrations, wintertime fog provides favorable conditions for the formation of particulate matter (SJVAPCD 2015a).

Local climate conditions for the SJCOG region are shown in Table 4.2-1. As summarized therein, the warmest month of the year is July, and the coldest month of the year is January. The annual average maximum temperature is 75 degrees Fahrenheit (°F), while the annual average minimum temperature is 46°F.

**Table 4.2-1 San Joaquin County Climate Conditions**

Temperature Parameter or Metric	Condition
Average annual rainfall	15.4 inches
Average annual maximum temperature	75°F
Average annual minimum temperature	46°F
Warmest month	July
Coolest month	January
Average annual mean temperature	60°F
Average wind speed	7.7 miles per hour
Predominant wind direction	west/northwest

°F = degrees Fahrenheit

Note: Averages are based on the period of record from March 1906 to June 2016.

Source: Western Regional Climate Center 2016; Iowa Environmental Mesonet 2021.

**b. Sources of Air Pollution**

Air pollutant emissions in the SJVAB are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories:

- Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat.
- Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products.

Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and can also be divided into two major subcategories:

- On-road sources may be legally operated on roadways and highways.
- Off-road sources include aircraft, ships, trains, and self-propelled construction equipment.

Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

**c. Air Pollutants of Primary Concern**

The federal and State Clean Air Acts mandate the control and reduction of certain air pollutants. Under these laws, the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for “criteria pollutants” and other pollutants. Some pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere, including carbon monoxide, volatile organic compounds (VOC)/reactive organic gases (ROG),<sup>1</sup> nitrogen oxides (NO<sub>x</sub>), particulate matter with diameters of up to ten microns (PM<sub>10</sub>) and up to 2.5 microns (PM<sub>2.5</sub>), sulfur dioxide, and lead. Other pollutants are

<sup>1</sup> CARB defines VOC and ROG similarly as, “any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate,” with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this EIR.

created indirectly through chemical reactions in the atmosphere, such as ozone, which is created by atmospheric chemical and photochemical reactions primarily between ROG and NO<sub>x</sub>. Secondary pollutants include oxidants, ozone, and sulfate and nitrate particulates (smog). The characteristics, sources and effects of criteria pollutants are discussed in the following subsections. The following subsections describe the characteristics, sources, and health and atmospheric effects of air pollutants of primary concern.

## Ozone

Ozone is produced by a photochemical reaction triggered by sunlight between NO<sub>x</sub> and ROG. ROG are composed of non-methane hydrocarbons (with some specific exclusions), and NO<sub>x</sub> is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide. NO<sub>x</sub> are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO<sub>x</sub> levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans, including changes in breathing patterns, reduction of breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes (U.S. EPA 2021a). Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

## Carbon Monoxide

Carbon monoxide is a localized pollutant that is found in high concentrations only near its source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is the incomplete combustion of petroleum fuels by automobile traffic. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of carbon monoxide include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. The health effects of carbon monoxide are related to its affinity for hemoglobin in the blood. Carbon monoxide causes a number of health problems, including aggravation of some heart diseases (e.g., angina), reduced tolerance for exercise, impaired mental function, and impaired fetal development. At high levels of exposure, carbon monoxide reduces the amount of oxygen in the blood, leading to mortality (U.S. EPA 2021a). Carbon monoxide tends to dissipate rapidly into the atmosphere; consequently, violations of the NAAQS and/or CAAQS for carbon monoxide are generally associated with localized carbon monoxide “hotspots” that can occur at major roadway intersections during heavy peak-hour traffic conditions.

## Nitrogen Dioxide

Nitrogen dioxide is a by-product of fuel combustion; the primary sources are motor vehicles and industrial boilers and furnaces. The principal form of NO<sub>x</sub> produced by combustion is nitric oxide, but nitric oxide reacts rapidly to form nitrogen dioxide, creating the mixture of nitric oxide and nitrogen dioxide commonly called NO<sub>x</sub>. Nitrogen dioxide is an acute irritant that can aggravate respiratory illnesses and symptoms, particularly in sensitive groups (U.S. EPA 2021a). A relationship between nitrogen dioxide and chronic pulmonary fibrosis may exist, and an increase in bronchitis in

young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility (U.S. EPA 2021a). It can also contribute to the formation of PM<sub>10</sub> and acid rain.

## **Sulfur Dioxide**

Sulfur dioxide is included in a group of highly reactive gases known as “oxides of sulfur.” The largest sources of sulfur dioxide emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of sulfur dioxide emissions include industrial processes such as extracting metal from ore and the burning of fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Sulfur dioxide is linked to a number of adverse effects on the respiratory system, including aggravation of respiratory diseases, such as asthma and emphysema, and reduced lung function (U.S. EPA 2021a).

## **Particulate Matter**

Suspended atmospheric PM<sub>10</sub> and PM<sub>2.5</sub> is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both PM<sub>10</sub> and PM<sub>2.5</sub> are directly emitted into the atmosphere as by-products of fuel combustion and wind erosion of soil and unpaved roads. Particulate matter is also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with PM<sub>10</sub> and PM<sub>2.5</sub> can be very different. PM<sub>10</sub> is generally associated with dust mobilized by wind and vehicles while PM<sub>2.5</sub> is generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. PM<sub>2.5</sub> is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems (CARB 2021a). More than half of PM<sub>2.5</sub> that is inhaled into the lungs remains there. These materials can damage health by interfering with the body’s mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance (South Coast Air Quality Management District 2005). Suspended particulates can also reduce lung function, aggravate respiratory and cardiovascular diseases, increase mortality rates, and reduce lung function growth in children (U.S. EPA 2021a).

## **Lead**

Lead is a metal found naturally in the environment, as well as in manufacturing products. The major sources of lead emissions historically have been mobile and industrial sources. However, because of the U.S. EPA’s regulatory efforts to remove lead from gasoline, atmospheric lead concentrations have declined substantially over the past several decades. The most dramatic reductions in lead emissions occurred prior to 1990 due to the removal of lead from gasoline sold for most highway vehicles. Lead emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least in part as a result of national emissions standards for hazardous air pollutants. As a result of phasing out leaded gasoline, metal processing currently is the primary source of lead emissions. The highest level of lead in the air is generally found near lead smelters. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers. The health impacts of lead include behavioral and hearing disabilities in children and nervous system impairment (U.S. EPA 2021a).

## Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health.

TACs may result in long-term health effects such as cancer, birth defects, neurological damage, asthma, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation, runny nose, throat pain, and headaches. TACs are considered either carcinogenic or non-carcinogenic based on the nature of the health effects associated with exposure. For carcinogenic TACs, potential health impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Non-carcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur.

### *Diesel Particulate Matter*

One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). Diesel exhaust is composed of two phases, either gas or particle, and both phases contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. Diesel exhaust has a distinct odor, which is primarily a result of hydrocarbons and aldehydes contained in diesel fuel. The particle phase also has many different types of particles that can be classified by size or composition. The size of diesel particulates that are of greatest health concern are those that are in the categories of fine and ultra-fine particles. The composition of these fine and ultra-fine particles may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements.

More than 90 percent of DPM is less than one micron in diameter (about 1/70<sup>th</sup> the diameter of a human hair) and thus is a subset of PM<sub>2.5</sub>. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2021a). The particles have hundreds of chemicals adsorbed onto their surfaces, including many known or suspected mutagens and carcinogens. The California Office of Environmental Health Hazard Assessment (OEHHA) completed a comprehensive health assessment of diesel exhaust in 1998, which formed the basis for CARB to formally identify the particles in diesel exhaust as a TAC. In California, DPM has a significant impact since it is estimated that 70 percent of total known cancer risk related to air toxics is attributable to DPM. According to CARB, DPM is estimated to increase statewide cancer risk by 520 cancers per million residents exposed over a lifetime (CARB 2021a).

DPM can also be responsible for elevated localized exposures (“hotspots”). Risk characterization scenarios conducted by CARB have determined the potential cancer risk resulting from proximity to DPM sources, such as school buses and high-volume freeways. California freeway studies show about a 70% drop off in particulate pollution levels at 500 feet from freeways and high-traffic roads

(CARB 2005). Residences and communities in proximity to TAC sources are disproportionately impacted. To protect people from TACs and reduce exposure, CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. Additional non-cancer health risk attributable to proximity to freeways was seen within 1,000 feet and was strongest within 300 feet. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet (CARB 2005).

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs and some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure in experimental animal inhalation studies has shown a range of dose-dependent lung inflammation and cellular changes in the lung and there are also diesel exhaust immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

Besides DPM, several other pollutants are emitted by vehicle exhaust are a public health concern. U.S. EPA has identified five pollutants of highest priority in addition to DPM: acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene. The latter five pollutants are found in organic gases emitted by vehicles.

### **Hydrocarbons and Other Organic Gases (Total Hydrocarbons, CH<sub>4</sub>NMHC [non-methane], AHC, NHC)**

Any of the vast family of compounds consisting of hydrogen and carbon in various combinations are known as hydrocarbons. Fossil fuels are included in this group. Many hydrocarbon compounds are major air pollutants, and those which can be classified as olefins or aromatics are highly photochemically reactive. Atmospheric hydrocarbon concentrations are generally higher in winter because the reactive hydrocarbons react more slowly in the winter and meteorological conditions are more favorable to their accumulating in the atmosphere to higher concentration before producing photochemical oxidants. Due to the role they play as ozone precursors, reactive hydrocarbons are one of the two criteria pollutants subject to federal ozone requirements.

Motor vehicles are a major source of anthropogenic hydrocarbons (AHC) in the basin. Other sources include evaporation of organic solvents and petroleum refining and marketing operations. Trees are the principal emitters of biogenic or natural hydrocarbons (NHC).

Certain hydrocarbons can damage plants by inhibiting growth and causing flowers and leaves to fall. Levels of hydrocarbons currently measured in urban areas are not known to cause adverse effects in humans. However, certain members of this contaminant group are important components in the reactions which produce photochemical oxidants (U.S. EPA 2021a).

#### **d. Current Air Quality**

California is divided geographically into 15 air basins for managing the air resources of the state on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. Depending on whether the federal and state standards are met or exceeded, the local air basin is classified as in “attainment” or “non-attainment.” Once a nonattainment area has achieved the air quality standards for a particular pollutant, it may be redesignated to an attainment area for that pollutant. SJVAPCD is required to

monitor air pollutant levels to assure the standards are met and, if they are not, to develop strategies to meet these standards.

Monitoring of ambient air pollutant concentrations is conducted by CARB, SJVAPCD, and the United States National Park Service. Some monitors are operated specifically for use in determining attainment status, while others are operated for other purposes, such as generating daily air quality forecasts. In total, SJVAPCD utilizes data from monitors operating at 29 sites in the SJVAB, three of which are in the SJCOG region. Figure 4.2-1 shows the locations of all monitoring stations in the SJVAB, including those in San Joaquin County that were in operation in 2021. The San Joaquin County portion of the SJVAB is classified as a nonattainment area for the federal 8-hour ozone and PM<sub>2.5</sub> standards and State ozone, PM<sub>10</sub> and PM<sub>2.5</sub> standards. The SJVAB is classified as in attainment (or unclassifiable/attainment) for all other State and federal standards (SJVAPCD). Table 4.2-2 presents a ten-year summary of the days that the SJVAB exceeded NAAQS and CAAQS for ozone, PM<sub>2.5</sub>, and PM<sub>10</sub>. Table 4.2-3 presents the number of days San Joaquin County exceeded NAAQS and CAAQS for ozone, NO<sub>2</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub>.

**Table 4.2-2 Ten-Year SJVAB Air Quality Summary (2010-2019) for Days Over the Ozone, PM<sub>2.5</sub>, and PM<sub>10</sub> NAAQS and CAAQS**

Year	Ozone 1-Hour CAAQS	Ozone 8-Hour NAAQS	Ozone 8-Hour CAAQS	PM <sub>2.5</sub> 24 Hour NAAQS	PM <sub>10</sub> 24 Hour NAAQS	PM <sub>10</sub> 24 Hour CAAQS
2011	70	130	131	65	0	116
2012	72	131	134	39	0	89
2013	41	111	112	69	4	122
2014	48	122	128	53	8	139
2015	47	97	99	53	0	121
2016	51	112	113	34	0	158
2017	48	122	126	47	8	146
2018	42	111	112	61	10	164
2019	24	96	100	28	16	130
2020	50	119	121	80	39	157

CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less

Note: No aggregated summary data available for SJVAB through CARB Top-4 Summary tool post-2020

Source: CARB 2022

**Table 4.2-3 Ambient Air Quality in San Joaquin County<sup>1</sup>**

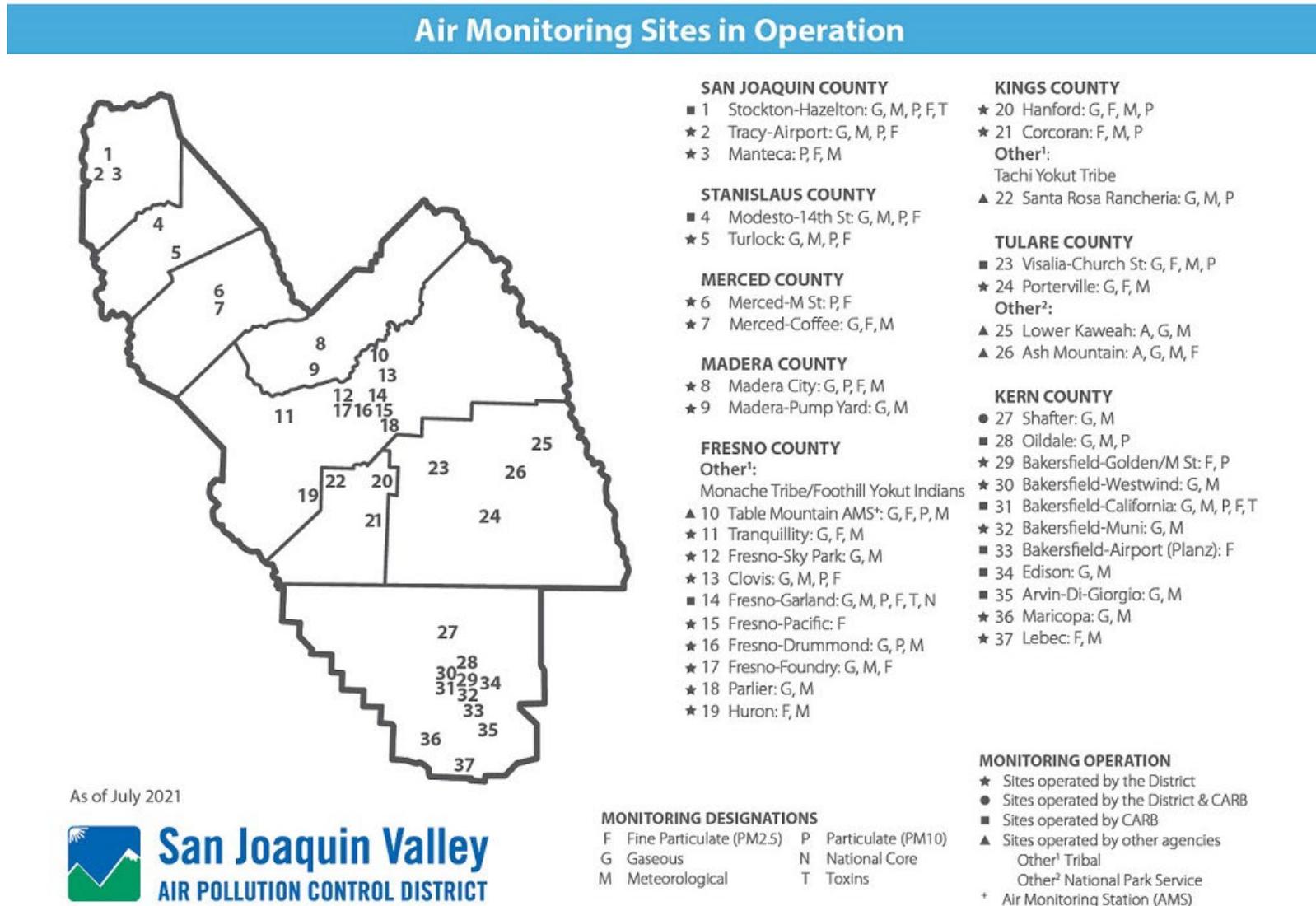
Pollutant	2018	2019	2020
Ozone (ppm), Eight-Hour Average	0.081	0.079	0.078
Number of days of state exceedances (>0.070 ppm)	8	4	4
Number of days of federal exceedances (>0.070 ppm)	8	4	4
Ozone (ppm), Worst Hour	0.099	0.098	0.100
Number of days of state exceedances (>0.09 ppm)	1	2	1
Nitrogen Dioxide (ppm), Worst Hour	0.0653	0.0723	0.0600
Number of days of state exceedances (>0.18 ppm)	0	0	0
Particulate Matter <10 microns ( $\mu\text{g}/\text{m}^3$ ), Worst 24 Hours <sup>1</sup>	187.0	85.9	147.0
Number of days of state exceedances (>50 $\mu\text{g}/\text{m}^3$ )	32	45	12
Number of days of federal exceedances (>150 $\mu\text{g}/\text{m}^3$ )	13	0	0
Particulate Matter <2.5 microns ( $\mu\text{g}/\text{m}^3$ ), Worst 24 Hours	188.0	50.1	140.0
Number of days of federal exceedances (>35 $\mu\text{g}/\text{m}^3$ )	25	6	28

ppm = parts per million

<sup>1</sup> Countywide data not available for this pollutant. Data obtained from the Stockton – Hazelton Street Station.

Source: CARB 2022

Figure 4.2-1 SJVAB Air Quality Monitoring Stations (2021)



As of July 2021



Source: SJVAPCD 2021a

## 4.2.2 Regulatory Setting

### a. Federal Laws, Regulations, and Policies

#### Clean Air Act

The federal Clean Air Act (CAA) governs air quality in the United States and is administered by the U.S. EPA at the federal level. Air quality in California is also governed by regulations under the California Clean Air Act, which is administered by CARB at the state level. At the regional and local levels, local air districts such as SJVAPCD typically administer the federal and California Clean Air Acts.

The U.S. EPA is responsible for enforcing the federal CAA, which defines non-attainment areas as geographic regions designated as not meeting one or more of the national ambient air quality standards (NAAQS) that are required under the 1977 CAA and subsequent amendments. The federal CAA requires that a State Implementation Plan (SIP) be prepared for each non-attainment area and a maintenance plan be prepared for each former non-attainment area that subsequently demonstrated compliance with the standards. A SIP is a compilation of a state’s air quality control plans and rules, approved by the U.S. EPA. Section 176(c) of the CAA provides that federal agencies cannot engage, support, or provide financial assistance for licensing, permitting, or approving any project unless the project conforms to the applicable SIP. The state and the U.S. EPA’s goals are to eliminate or reduce the severity and number of violations of the NAAQS and to achieve expeditious attainment of these standards.

Table 4.2-4 summarizes the NAAQS and California Ambient Air Quality Standards (CAAQS). The CAAQS are more restrictive than the NAAQS for several pollutants, including the one-hour standard for carbon monoxide, the 24-hour standard for sulfur dioxide, and the 24-hour standard for PM<sub>10</sub>.

**Table 4.2-4 Current Federal and State Ambient Air Quality Standards**

Pollutant	Averaging Time	Federal Primary Standards	California Standards
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.10 ppm	0.18 ppm
Sulfur Dioxide	Annual	–	–
	24-Hour	–	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM <sub>10</sub>	Annual	–	20 µg/m <sup>3</sup>
	24-Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
PM <sub>25</sub>	Annual	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
	24-Hour	35 µg/m <sup>3</sup>	–
Lead	30-Day Average	–	1.5 µg/m <sup>3</sup>
	3-Month Average	0.15 µg/m <sup>3</sup>	–

Pollutant	Averaging Time	Federal Primary Standards	California Standards
Visibility Reducing Particles	8-Hour	–	Extinction of 0.23 per kilometer*
Sulfates	24-Hour	–	25 µg/m <sup>3</sup>
Hydrogen Sulfide	1-Hour	–	0.03 ppm (42 µg/m <sup>3</sup> )
Vinyl Chloride	24-Hour	–	0.01 ppm 0.02 (26 µg/m <sup>3</sup> )

ppm = parts per million; µg/m<sup>3</sup> = micrograms per cubic meter

\* In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: CARB 2016

## 1990 Amendments to the Federal Clean Air Act

The 1990 amendments to the federal Clean Air Act included a provision to address air toxics. Under Title III of the federal Clean Air Act, the U.S. EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants, which are national uniform standards oriented toward controlling particular hazardous air pollutants. Section 112(b) of the federal Clean Air Act identifies 189 “Air Toxics” (hazardous air pollutants), directs U.S. EPA to identify sources of the 189 pollutants, and establishes a 10-year time period for the U.S. EPA to issue technology-based emissions standards for each source category. Title III of the federal Clean Air Act provides for a second phase under which the U.S. 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.

## Safer Affordable Fuel-Efficient Vehicles Rule

In August 2018, the U.S. EPA and NHTSA issued a proposed ruling to roll back some of the fuel economy and GHG standards for medium- and heavy-duty trucks. The new ruling proposed by the U.S. EPA and NHTSA, the Safer Affordable Fuel-Efficient (SAFE) Vehicle Rules, would replace the CAFE standards set for model year 2022-2025 passenger car and light trucks, while the 2021 model year vehicles will maintain the CAFE standards. The ruling is split into two parts.

Part One, “One National Program” (84 FR 51310), revokes a waiver granted by U.S. EPA to the State of California under Section 209 of the CAA to enforce more stringent emission standards for motor vehicles than those required by U.S. EPA for the explicit purpose of GHG reduction, and indirectly, criteria air pollutants and ozone precursor emission reduction. This revocation became effective on November 26, 2019, potentially restricting the ability of CARB to enforce more stringent GHG emission standards for new vehicles and set zero emission vehicle mandates in California.

Part Two addresses CAFE standards for passenger cars and light trucks for model years 2021 to 2026. This rulemaking proposes new CAFE standards for model years 2022 through 2026 and would amend existing CAFE standards for model year 2021. The proposal would retain the model year 2020 standards (specifically, the footprint target curves for passenger cars and light trucks) through model year 2026. The proposal addressing CAFE standards was jointly developed by NHTSA and U.S. EPA, with U.S. EPA simultaneously proposing tailpipe CO<sub>2</sub> standards for the same vehicles covered by the same model years.

In September 2019, U.S. EPA and the National Highway Traffic Safety Administration issued the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program, which revoked

California's authority to set its own GHG emissions standards and zero-emission vehicle mandates in California (84 Federal Register 51310). In April 2020, the federal agencies issued the SAFE Vehicles Rule Part Two for Model Years 2021–2026 Passenger Cars and Light Trucks, which relaxed federal GHG emissions and fuel economy standards (85 Federal Register 24174). On February 8, 2021, the incoming federal administration issued a stay in regard to the legal challenges by California and other states to the revocation of California's waiver (JDSupra 2021). On December 21, 2021, the National Highway Traffic Safety Administration (NHTSA) published its Corporate Average Fuel Economy (CAFE) Preemption rule, which finalizes its repeal of 2019's SAFE Rule Part One. On March 31, 2022, the NHTSA finalized new CAFE Standards for model years 2024 through 2026 that would increase federal CAFE standards compared to the SAFE Rule Part Two (NHTSA 2022).

## **b. State Laws, Regulations, and Policies**

### **AB 32**

Assembly Bill (AB) 32, also known as the Global Warming Solutions Act of 2006 (Nunez), expanded CARB's role to development and oversight of California's main GHG reduction programs. These include cap and trade, the Low Carbon Fuel Standard, and the zero-emission vehicle programs. With the passage of additional laws (such as Senate Bill [SB] 32 in 2016 and AB 398 in 2017), CARB continues to map out how these programs and others can help California reach its next statutory target: reducing GHG emissions an additional 40 percent below 1990 levels by 2030. Reductions in GHG emissions are tied to improvements in air quality.

### **California Clean Air Act**

The California Clean Air Act (CCAA) was enacted in 1988 (California Health & Safety Code Section 39000 et seq.) and amended in 1992. The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles (see Table 4.2-4). Air basins or areas that exceed the CAAQS are designated non-attainment until compliance is disclosed in an attainment plan. In California, CARB is responsible for meeting the State requirements of the federal CAA, administering the California CAA, and establishing the California ambient air quality standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

### **Senate Bill 656 (Chapter 738, Statutes of 2003)**

In 2003, the California Legislature enacted Senate Bill (SB) 656 (Chapter 738, Statutes of 2003), codified as Health and Safety Code Section 39614, to reduce public exposure to PM<sub>10</sub> and PM<sub>2.5</sub>. SB 656 required that, by January 1, 2005, CARB, in consultation with local air pollution control and air quality management districts (air districts), must develop and adopt 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 PM<sub>10</sub> and PM<sub>2.5</sub> (collectively referred to as PM). The legislation established a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for PM<sub>2.5</sub> and provided new direction on PM reductions in those areas not subject to federal requirements for PM. Measures adopted as part of SB 656 complement and support those required for federal PM<sub>2.5</sub> attainment plans, as well as for State ozone plans. This ensures continuing

focus on PM reduction and progress toward attaining California’s more health protective standards. This list of air district control measures was adopted by CARB on November 18, 2004.

### **Toxic Air Contaminant Identification and Control Act of 1983**

The Toxic Air Contaminant Identification and Control Act (Assembly Bill 1807) created California's program to reduce exposure to air toxics. The program involves a two-step process: risk identification and risk management. In the risk identification step, and upon CARB's request, the Office of Environmental Health Hazard Assessment evaluates the health effects of substances other than pesticides and their pesticidal uses. Substances with the potential to be emitted or that are currently being emitted into the ambient air may be identified as a TAC. In the risk management step, once a substance is identified as a TAC, and with the participation of local air districts, industry, and interested public, CARB prepares a report that outlines the need and degree to regulate the TAC through a control measure.

### **Assembly Bill 2588: Air Toxics “Hot Spots” Information and Assessment Act of 1987**

The Air Toxics “Hot Spots” Information and Assessment Act (Assembly Bill 2588) was enacted in 1987 to require stationary sources to report the types and quantities of substances identified as having a localized health risk. This act aims to ascertain health risks, notify nearby residents of significant risks, and reduce significant risks to acceptable levels. The California Office of Environmental Health Hazard Assessment (OEHHA) is the lead agency for the assessment of health risks posed by environmental contaminants. OEHHA, which is an office within the California Environmental Protection Agency, aims to protect human health and the environment through scientific evaluation of risks posed by hazardous substances. In addition, OEHHA develops health-protective exposure levels for contaminants in air, water, and soil as guidance for regulatory agencies and the public. These include public health goals for contaminants in drinking water and both cancer potency factors and non-cancer reference exposure levels for the Air Toxics Hot Spots Program.

### **Executive Order N-79-20**

In 2021, Governor Newsom signed Executive Order N-79-20 which calls for the elimination of new internal combustion passenger vehicles by 2035. The Executive Order establishes a target for the transportation sector that helps put the state on a path to carbon neutrality by 2045. Furthermore, the Executive Order provides momentum for providers of charging and refueling infrastructure, electric utilities, and others to plan for and support the increasing consumer demand for these vehicles (CARB 2021b).

### **CARB Air Quality and Land Use Handbook and 2017 Technical Advisory**

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* recommends that local agencies avoid siting new, sensitive land uses within specific distances of potential sources of TACs, such as freeways and high-traffic roads, distribution centers, railroads, and ports (CARB 2005). Specifically, CARB recommends that local agencies avoid siting new, sensitive land uses within 500 feet of a freeway. The primary concern is the effect of diesel exhaust particulate on sensitive uses.

CARB's *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* technical advisory (2017) identifies effective strategies that planners and other land use decision-makers can

implement locally and in the near-term to reduce exposure to near-roadway pollution from increased infill development while also protecting public health. These strategies complement the state's many efforts to reduce air pollution from all sources, including cars and trucks.

### **Diesel Risk Reduction Program**

In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as TACs, based on data linking diesel PM emissions to increased risks of lung cancer and respiratory disease. Following the identification process, CARB was required to determine if there was a need for further control, which led to creation of the Diesel Advisory Committee to assist in the development of a risk management guidance document and risk reduction plan. In September 2000, CARB adopted the Diesel Risk Reduction Plan, which recommends control measures to reduce the risks associated with diesel PM and achieve a goal of 75 percent diesel PM reduction by 2010 and 85 percent by 2020. Specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles are continuing to be evaluated and developed. The goal of these regulations is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

### **Airborne Toxic Control Measures**

Under the California 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. CARB has promulgated several mobile and stationary source airborne toxic control measures (ATCMs) pursuant to this authority. For instance, effective as of July 2003, CARB approved an ATCM that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns (13 California Code of Regulations [CCR] Chapter 10, Section 2480). This ATCM is intended to reduce diesel PM and other TACs and air pollutants from heavy-duty motor vehicle exhaust. It applies to school buses, transit buses, school activity buses, youth buses, general public paratransit vehicles, and other commercial motor vehicles. This ATCM focuses on reducing public exposure to diesel PM and other TACs, particularly for children riding in and playing near school buses and other commercial motor vehicles who are disproportionately exposed to pollutants from these sources. In addition, effective February 2005, CARB approved an ATCM to limit the idling of diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds, regardless of the state or country in which the vehicle is registered (13 CCR Chapter 10, Section 2485).

### **Drayage Truck Regulation**

CARB established the Drayage Truck Regulation as part of its ongoing efforts to reduce PM and NO<sub>x</sub> emissions from diesel-fueled engines and improve air quality associated with goods movement. The purpose of this regulation is to reduce emissions and public exposure to diesel PM, NO<sub>x</sub>, and other air contaminants by setting emission standards for in-use, heavy-duty diesel-fueled vehicles.

Starting January 1, 2023, drayage trucks will be subject to the provisions of 13 CCR Section 2025, the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy Duty Diesel-Fueled Vehicles, which requires that all not otherwise exempt in-use on-road diesel vehicles, including drayage trucks, have a 2010 model year emissions equivalent engine by January 1, 2023 (13 CCR Section 2027).

## Proposition 1B: Goods Movement Emission Reduction Program

The \$1 billion Proposition 1B Goods Movement Emission Reduction Program is a partnership between CARB and local agencies, air districts, and seaports to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. Local agencies apply to CARB for funding. Then those agencies offer financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies. Projects funded under this program must achieve early or extra emission reductions not otherwise required by law or regulation.

### c. Regional Laws, Regulations, and Policies

#### San Joaquin Valley Air Pollution Control District

##### *Air Quality Management Plans*

The Federal Clean Air Act Amendments of 1990 set a schedule for the attainment of the NAAQS. States are required to prepare a State Implementation Plan (SIP) to develop strategies to bring about attainment of the standards. In addition, the California Clean Air Act of 1988 requires areas that exceed the California ambient air quality standards to plan for the eventual attainment of the CAAQS. SJVAPCD monitors and regulates local air quality in the SJVAB and implements Air Quality Management Plans (AQMPs). Since 1992, SJVAPCD has adopted numerous attainment plans to reduce ozone and particulate emissions.

The 2016 Ozone Plan is the most recent ozone attainment plan adopted by SJVAPCD. Implementation of each of the plans has contributed to the adoption of over 600 rules and amendments aimed at reducing air pollution concentrations. These measures have substantially reduced ozone precursor pollutants, which include NO<sub>x</sub> and ROG. SJVAPCD is mandated under federal Clean Air Act requirements to develop a new attainment plan for the revised ozone standard by 2022, which is currently in progress. Ozone precursor emissions in the SJVAB are at historically low levels, with an approximately 80 percent reduction in NO<sub>x</sub> stationary sources emissions since 1990 (SJVAPCD 2016).

The 2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards is the most recent attainment plan for particulate matter adopted by SJVAPCD (SJVAPCD 2018b). On August 19, 2021, the District's Governing Board approved the *Attainment Plan Revision for the 1997 Annual PM<sub>2.5</sub> Standard* to establish a new attainment target for the 1997 annual PM<sub>2.5</sub> standard. The Valley would have met this standard by the projected attainment target of 2020, but for the significant wildfire impacts and data collection issues at the air monitoring site in Bakersfield (operated by CARB). Based on implementation of the control strategy in the 2018 PM<sub>2.5</sub> Plan, it is estimated that the SJVAB will attain the 1997 annual PM<sub>2.5</sub> standard by 2023 (SJVAPCD 2021b).

##### *Rules and Regulations*

SJVAPCD has adopted numerous rules and regulations directed at improving regional air quality. The following District rules would be applicable to individual projects:

- **Rule 4102 Nuisance:** A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.

- **Rule 8021 Earthmoving Activities:** Requires construction, demolition, excavation, extraction, and other earthmoving activities to include implementation of measures designed to limit fugitive dust emissions.
- **Rule 8041 Carryout and Trackout:** Requires owners and operators to sufficiently prevent or cleanup carryout and trackout as described in SJVAPCD Regulation VIII. The use of blower devices, or dry rotary brushes or brooms, for removal of carryout and trackout on public roads is expressly prohibited. The removal of carryout and trackout from paved public roads does not exempt an owner/operator from obtaining state or local agency permits which may be required for the cleanup of mud and dirt on paved public roads.
- **Rule 8061 Paved and Unpaved Roads:** Requires implementation of control measures and design criteria to limit fugitive dust emissions from any new or existing public or private paved or unpaved road, road construction project, or road modification project.
- **Rule 9510 Indirect Source Review (ISR):** Requires new developments expected to create a substantial amount of air pollution to incorporate on-site mitigation or emission reducing designs and practices into the project.

#### d. Local Laws, Regulations, and Policies

City and county general plans within the SJCOG region contain policies to protect air quality. Listed below are the policies from the County of San Joaquin and cities in the SJCOG region applicable to air quality. Cities in the region have generally similar policies, and examples are provided in more detail below.

#### County of San Joaquin

The County of Joaquin has established a series of provisions in the San Joaquin County 2035 General Plan that relate to the physical development of the County. Several goals and policies contained in the General Plan relate to air quality (County of San Joaquin 2012). Applicable goals related to air quality are as follows:

- **LU-1.1 Compact Growth and Development:** The County shall discourage urban sprawl and promote compact development patterns, mixed-use development, and higher-development intensities that conserve agricultural land resources, protect habitat, support transit, reduce vehicle trips, improve air quality, make efficient use of existing infrastructure, encourage healthful, active living, conserve energy and water, and diversify San Joaquin County's housing stock.
- **TM-4.1 Pedestrian and Bicycle Network Continuity:** The County shall strive to eliminate gaps in the rural bicycle network by constructing or designating new bike facilities, where appropriate, and in accordance with the San Joaquin Bicycle Master Plan.
- **TM-5.3 Variety of Transit Types:** The County shall consider a variety of transit types including regional rail, bus rapid transit, regional and local buses, express buses, and neighborhood shuttles, to meet the needs of residents, workers, and visitors.
- **TM-5.4 Alternative to the Automobile:** The County shall promote public and private transit systems in addition to the automobile.
- **C-1.6 Promote Infill:** The County shall promote infill development within existing urban and rural communities and City fringe areas before expanding community boundaries.

- **PHS-5.2 SJVAPCD Coordination:** The County shall coordinate with the SJVAPCD during the review of new development projects which have the potential for causing adverse air quality impacts.
- **PHS-5.4 Innovative Mitigation Measures:** The County shall encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties.
- **PHS-5.6 Toxic Air Contaminants:** The County shall require effective buffers between residential areas and other sensitive receptors and non-residential land uses, such as highways, trucking centers, gasoline dispensing facilities, and dry cleaners, that generate toxic air contaminants.
- **PHS-5.7 ATAC Exposure Reduction Measures for New Development:** The County shall require new development projects to implement all applicable best management practices that will reduce exposure of sensitive receptors (e.g., hospitals, schools, daycare facilities, elderly housing and convalescent facilities) to toxic air contaminants.
- **PHS-5.8 Minimize Motor Vehicle Emissions:** The County shall strive to minimize motor vehicle emissions through land use and transportation strategies, as well as by promotion of alternative fuels.
- **PHS-5.9 Particulate Emissions from Construction:** The County shall support SJVAPCD efforts to reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions from construction, grading, excavation, and demolition to the maximum extent feasible and consistent with State and Federal regulations.
- **PHS-5.10 Particulate Emissions from County Roads:** The County shall require PM<sub>10</sub> and PM<sub>2.5</sub> emission reductions on County-maintained roads to the maximum extent feasible and consistent with State and Federal regulations.

## City of Stockton

The Stockton 2040 General Plan (2014) also contains the following actions:

- **Action LU-1.1A:** Require renovated and new mixed-use projects to be planned and designed to contribute to the corridor's identity through appropriate public spaces, gateways, streetscapes, pedestrian walkways, setbacks, edge treatments, and other design features.
- **Action LU-2.5A:** Improve transit, bicycle, and pedestrian connectivity between the Downtown and local colleges and universities.
- **Action TR-1.1A:** Direct truck traffic to designated truck routes that facilitate efficient goods movement and minimize risk to areas with concentrations of sensitive receptors, such as schools, for example by disallowing any new truck routes to pass directly on streets where schools are located, and vulnerable road users, like pedestrians and bicyclists.
- **Action TR-2.2D:** Support efforts to electrify buses.
- **Action SAF-4.1A:** Require the construction and operation of new development to implement best practices that reduce air pollutant emissions, including:
  - Use of low-emission and well-maintained construction equipment, with idling time limits.
  - Development and implementation of a dust control plan during construction.
  - Installation of electrical service connections at loading docks, where appropriate.
  - Installation of Energy Star-certified appliances.
  - Entering into Voluntary Emissions Reduction Agreements with the SJVAPCD.

- **Action SAF-4.1C:** Require the use of electric-powered construction and landscaping equipment as conditions of project approval when appropriate.
- **Action SAF-4.1D:** Limit heavy-duty off-road equipment idling time to meet CARB’s idling regulations for on-road trucks.
- **Action SAF-4.2A:** Provide information and conduct marketing and outreach to major existing and new employers about the transportation demand management (TDM) program facilitated by SJCOG.
- **Action SAF-4.3B:** Coordinate review of development project applications with the SJVAPCD to ensure that air quality impacts are consistently identified and mitigated during CEQA review.

## City of Tracy

The City of Tracy includes policies relating to air quality in the Air Quality Element of its General Plan (2011). Some of the policies include:

- **Policy AQ-1.1-P1:** The City shall promote land use patterns that reduce the number and length of motor vehicle trips.
- **Policy AQ-1.1-P2:** To the extent feasible, the City shall maintain a balance and match between jobs and housing.
- **Policy AQ-1.1-P3:** Higher density residential and mixed-use development shall be encouraged adjacent to commercial centers and transit corridors
- **Policy AQ-1.1-P4:** Employment areas should include a mix of support services to minimize the number of trips.
- **Policy AQ-1.1-P5:** Village Centers and other retail and office areas should be located within walking and biking distance of existing and proposed residential developments.
- **Policy AQ-1.2-P2:** The City shall assess air quality impacts using the latest version of the CEQA Guidelines and guidelines prepared by the SJVAPCD.
- **Policy AQ-1.2-P3:** Developers shall implement best management practices to reduce air pollutant emissions associated with the construction and operation of development projects.

Other cities within the SJCOG region include Escalon, Lathrop, Lodi, Manteca, and Ripon. The General Plans of these cities include goals and policies pertaining to air quality that are similar to those outlined above.

### 4.2.3 Impact Analysis

#### a. Methodology and Significance Thresholds

This analysis uses the guidance and methodologies recommended in the SJVAPCD’s 2015 *Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI)* (SJVAPCD 2015a) to determine whether the proposed 2022 RTP/SCS impacts exceed the thresholds identified in CEQA Guidelines Appendix G.

#### Significance Thresholds

Based on Appendix G of the CEQA Guidelines, the 2022 RTP/SCS would have a significant impact on air quality if it would:

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

- 2 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard
- 3 Expose sensitive receptors to substantial pollutant concentrations
- 4 Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)

The GAMAQI does not provide guidance applicable to a program of projects. However, the SJVAPCD’s GAMAQI includes significance criteria for evaluating construction and operational emissions associated with individual projects. SJVAPCD recommends the use of quantitative thresholds to determine if a project would significantly contribute to a nonattainment designation based on the emissions generated. These thresholds are shown in Table 4.2-5. SJVAPCD Rule 9510, Indirect Source Review, and Regulation VIII, Fugitive PM<sub>10</sub> Prohibitions, would apply to individual projects under the 2022 RTP/SCS as appropriate.

**Table 4.2-5 SJVAPCD Air Quality Significance Thresholds**

Pollutant	NO <sub>x</sub>	ROG	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	CO
Construction and Operation Thresholds (Tons Per Year)	10	10	15	15	27	100

NO<sub>x</sub> = nitrogen oxides; ROG = reactive organic gases; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate Matter with a diameter of 2.5 microns or less

Source: SJVAPCD 2015a

In addition to the annual thresholds outlined above, SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the SJVAPCD’s GAMAQI (2015). The *Ambient Air Quality Screening Tools* guidance provides a screening threshold of 100 pounds per day for NO<sub>x</sub>, ROG, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>x</sub>, and CO. SJVAPCD recommends that an ambient air quality analysis be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project operational activities exceed the 100 pounds-per-day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

### Short-Term Emissions Methodology

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Construction-related emissions are speculative at the RTP/SCS level because such emissions are dependent on the characteristics of individual development projects. However, because construction of projects under the proposed 2022 RTP/SCS would generate temporary criteria pollutant emissions, primarily due to the operation of construction equipment and truck trips, a qualitative analysis is provided.

### Long-Term Emissions Methodology

The methodology for determining the significance of air quality impacts compares baseline conditions in 2016 to future 2046 conditions, as required in CEQA Guidelines Section 15126.2(a). For the purposes of this analysis, a 2016 baseline is used to match the SJCOG transportation modeling baseline. This allows an accurate, *apples to apples* comparison to the same baseline year. This baseline is consistent with the baseline used in SJCOG’s Sustainable Communities Strategy, and as

such is more reflective of the comparative analysis made within the SCS than if data from a different year was used. Pursuant to Section 15125(a)(1) of the *State CEQA Guidelines*, although the analysis baseline will normally reflect physical environmental conditions as they exist at the time the notice of preparation is published, “where necessary to provide the most accurate picture practically possible of the project’s impacts, a lead agency may define existing conditions by referencing historic conditions.” SJCOG has elected to do so here, for the reasons just described.

State and federal clean air laws require that emissions of pollutants for which NAAQS or CAAQS are violated be reduced from current levels. Therefore, for Impact AQ-3, the project’s long-term mobile source impacts to air quality would be considered significant if the proposed 2022 RTP/SCS would result in mobile source emissions that exceed existing levels. In this case, the pollutants of concern are ozone precursors (NO<sub>x</sub> and ROG), PM<sub>10</sub>, and PM<sub>2.5</sub> because these are the primary pollutants associated with vehicle transportation.

Projected air emissions from mobile sources were calculated using the EMFAC2021 model with data for vehicle miles traveled (VMT) from the RTP/SCS transportation analysis completed by SJCOG. Data from EMFAC outputs and SJCOG’s transportation analysis were used to calculate projected vehicle emissions. Induced demand VMT is included in the total VMT used for modeling. Induced demand is demand that has been realized by improvements made to transportation infrastructure. For example, a road-widening project may generate increased traffic because the roadway is perceived by drivers to be a more viable travel route. Projected vehicle emissions for the year 2046 under the proposed 2022 RTP/SCS were compared to baseline 2016 conditions.

## **Health Impacts**

Short-term and long-term exposure to criteria pollutants and TACs may result in adverse health effects, based on the information presented in Section 4.2.1(c), *Air Pollutants of Primary Concern*. As discussed in that section, these effects may include: aggravated asthma, increases in respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, increased cancer risk, heart attack, and premature death.

The NAAQS and CAAQS are health-based standards. Therefore, in this impact analysis, if the proposed 2022 RTP/SCS would result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard, it would also contribute to these adverse health effects.

The SJVAPCD has determined thresholds of significance for TAC emissions from the operation of both permitted and non-permitted sources. The significance threshold for long-term public health risk is set at 20 excess cancer cases in a million for cancer risk. For non-cancer risk (i.e., chronic or acute risk), the significance threshold is set at a hazard index of greater than 1.0. The health impacts of TACs are discussed separately under Impact AQ-4.

### **b. Project Impacts and Mitigation Measures**

This section discusses impacts and mitigation measures associated with transportation projects and the land use scenario contained within the 2022 RTP/SCS. Specific projects may generate air quality impacts during construction and operation. Section 4.2.3(c) summarizes the impacts associated with transportation projects in the 2022 RTP/SCS. Due to the programmatic nature of the 2022 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed

transportation improvement projects and future projects under the land use scenario envisioned by the 2022 RTP/SCS could result in the impacts as described in the following sections.

**Threshold 1:** Conflict with or obstruct implementation of the applicable air quality plan.

**Impact AQ-1 THE PROPOSED 2022 RTP/SCS WOULD NOT CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

The policies and land use patterns facilitated by the proposed 2022 RTP/SCS are projected to reduce emissions of ozone precursors and particulate matter below 2016 baseline levels, as discussed under Impact AQ-3 (see Table 4.2-8), which is consistent with the goals and policies of SJVAPCD's 2016 Ozone Plan and 2018 PM<sub>2.5</sub> Plan. Although VMT would increase as compared to baseline levels, emissions would decrease due to increasingly fuel-efficient vehicles, improving emissions control technology, and an increased share of electric vehicle adoption. In addition, implementation of proposed transportation improvements and land use projects envisioned by the proposed 2022 RTP/SCS, among other strategies, would improve alternative transportation options and circulation. To accommodate future growth in the region while reducing emissions, the strategy of the proposed 2022 RTP/SCS is to develop an efficient circulation network with multi-modal transportation in addition to promoting congestion management; coordinating land use, housing, and transportation systems; and providing incentives that reduce vehicle use. Implementation of these strategies would result in reduced overall vehicle miles traveled, which would reduce regional criteria air pollutant emissions and TAC emissions from mobile sources. The goals of the 2016 Ozone Plan and the 2018 PM<sub>2.5</sub> Plan are to reduce precursor pollutants, which include NO<sub>x</sub> and ROG, and particulate matter pollutants within the SJVAB. The above RTP/SCS strategies and other actions in the proposed 2022 RTP/SCS would align with the emissions reduction goals of both SJVAPCD attainment plans. Therefore, implementation of the proposed 2022 RTP/SCS would not conflict with or obstruct implementation of the applicable air quality plans, and this impact would be less than significant.

### Mitigation Measures

No mitigation measures are required.

**Threshold 2:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (construction)

**Impact AQ-2 CONSTRUCTION ACTIVITIES ASSOCIATED WITH TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE IN CRITERIA POLLUTANTS FOR WHICH THE PROJECT REGION IS NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.**

There are three primary sources of short-term emissions that would be generated by construction of future transportation projects under the proposed 2022 RTP/SCS. These sources include:

- Operation of construction vehicles (i.e., scrapers, loaders, dump trucks);
- The creation of fugitive dust during clearing and grading; and
- The use of asphalt or other oil-based substances during the final construction phases, which also generate nuisance odors.

The significance of daily emissions, particularly ROG and NO<sub>x</sub> emissions, generated by construction equipment utilized to build RTP/SCS transportation improvements would depend on the quantity of equipment used and the hours of operation. The significance of fugitive dust (PM<sub>2.5</sub> and PM<sub>10</sub>) emissions would depend upon the following factors:

- The areal extent of disturbed soils;
- The length of disturbance time;
- Whether existing structures are demolished;
- Whether excavation is involved (including the potential removal of underground storage tanks); and
- Whether transport of excavated materials offsite is necessary.

Intersection improvements, such as signalization or signal coordination, are small-scale projects and are not expected to generate significant short-term emissions. However, other RTP/SCS projects as well as future development facilitated by the SCS land use scenario may involve grading and paving, or the construction of permanent facilities. For example, substantial grading and paving would be required for roadway widening and other large improvements on State Routes and regional roadways. The precise quantity of emissions would need to be determined at the time of proposed construction of a given transportation improvement or development project. When project-specific CEQA documents are prepared, these emissions would be compared to SJVAPCD's construction thresholds, as listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(a). Although any individual transportation improvement or development project may not generate significant short-term emissions, it is probable that several projects would be under construction simultaneously, generating cumulative construction emissions that could impact air quality. SJVAPCD construction emissions thresholds listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(a) would be used to determine whether construction impacts of individual projects are significant. In addition, construction equipment would be subject to the stringent rules and regulations adopted by the U.S. EPA and CARB to reduce criteria pollutant and hazardous emissions limits from on-road vehicles and off-road equipment. For example, CARB has the In-Use Off-Road Diesel-Fueled Fleets Regulation to reduce particulate matter and NO<sub>x</sub> from off-road heavy-duty diesel vehicles from various industries including air travel, manufacturing, and landscaping. In addition, the U.S. EPA and CARB both have ignition diesel engine standards for non-road portable equipment, such as diesel generators and air compressors, which require the non-road equipment engines to be rated a cleaner tier by specific years, which will result in reduced emissions (CARB 2021c, U.S. EPA 2016).

Even though these regulations exist, it cannot be assumed that projects under the proposed 2022 RTP/SCS would be constructed using the latest and lowest emitting construction equipment for a majority of their construction fleet. Therefore, short-term impacts would be significant because construction emissions could exceed SJVAPCD significance thresholds and result in cumulatively considerable net increases in PM<sub>2.5</sub> and PM<sub>10</sub> and/or ozone precursor emissions. Implementation of mitigation measures for individual projects would reduce PM and ozone precursor emissions. However, this impact would remain significant and unavoidable. The following mitigation measures would reduce this impact.

### **Mitigation Measures**

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measures developed

for the proposed 2022 RTP/SCS program where applicable for transportation projects that would result in fugitive dust and ozone precursor emissions. Cities and the County can and should implement these measures, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust these mitigation measures as necessary to respond to site-specific conditions.

#### *AQ-2(a) Application of SJVAPCD Feasible Mitigation Measures*

For all projects, the implementing agency shall incorporate the most recent SJVAPCD feasible construction mitigation measures and/or technologies for reducing inhalable particles based on analysis of individual sites and project circumstances. Additional and/or modified measures may be adopted by SJVAPCD prior to implementation of individual projects under the proposed 2022 RTP/SCS; therefore, the most current list of feasible mitigation measures at the time of project implementation shall be used. The current SJVAPCD feasible mitigation measures include the following (SJVAPCD 2015b):

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, tarp cover, or other suitable cover or vegetative ground cover.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.

#### *AQ-2(b) Diesel Equipment Emissions Standards*

The implementing agency shall ensure, to the maximum extent feasible, that diesel construction equipment meeting CARB Tier 4 emission standards for off-road heavy-duty diesel engines is used. If use of Tier 4 equipment is not feasible, diesel construction equipment meeting Tier 3 (or if infeasible, Tier 2) emission standards shall be used. These measures shall be noted on all construction plans, and the implementing agency shall perform periodic site inspections.

#### *AQ-2(c) Electric Construction Equipment*

The implementing agency shall ensure that to the extent feasible, construction equipment utilizes electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.

### IMPLEMENTING AGENCIES AND TIMING

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. These mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during construction where appropriate.

### Significance After Mitigation

Implementation of Measures AQ-2(a) through AQ-2(c) would reduce short-term construction emissions from individual projects and thus reduce the severity of impacts by requiring best practices for dust and exhaust emissions via readily available, lower-emitting diesel equipment, and/or equipment powered by alternative cleaner fuels (e.g., propane) or electricity, as well as on-road trucks using particulate exhaust filters. To the extent that an implementing agency requires an individual project to implement all feasible mitigation measures described above, individual project impacts may be reduced to a less than significant level. Implementation of Mitigation Measure GHG-1 would also reduce construction emissions from the proposed 2022 RTP/SCS. However, these mitigation measures may not be feasible or effective for all projects. Therefore, this impact would remain significant and unavoidable. No additional mitigation measures to reduce this impact to less than significant levels are feasible at the programmatic level.

**Threshold 2:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (operation)

**Impact AQ-3      OPERATION OF THE PROPOSED TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF A CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.**

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### Transportation Emissions

Projected on-road vehicle emissions on the SJCOG transportation network for the year 2046 under proposed 2022 RTP/SCS conditions were compared to baseline (2016) conditions.

Table 4.2-6 shows the results of the long-term emissions analysis based on Total Daily VMT for the SJCOG region.

**Table 4.2-6 Regional Air Pollutant Emissions – SJCOG Region**

Scenario	VMT	ROG (tons/day)	NO <sub>x</sub> (tons/day)	PM <sub>2.5</sub> (tons/day) <sup>1</sup>	PM <sub>10</sub> (tons/day) <sup>1</sup>
2016 Baseline	17,015,116	5.847	17.264	0.458	0.824
2046 with Proposed 2022 RTP/SCS	23,495,442	2.069	4.772	0.279	0.761
<b>Net Change from 2016 Baseline</b>	<b>8,369,997</b>	<b>(3.778)</b>	<b>(12.493)</b>	<b>(0.178)</b>	<b>(0.062)</b>

( ) denotes a negative number

<sup>1</sup>PM<sub>2.5</sub> and PM<sub>10</sub> includes tire wear and brake wear emissions

Notes: The on-road mobile source criteria pollutant emissions estimates for the proposed 2022 RTP/SCS were calculated using CARB’s EMFAC2021 emission inventory model. VMT data was provided by SJCOG. Emission totals may not add up due to rounding.

Source: See Appendix A for EMFAC2021 modeling results

As shown in Table 4.2-6, emissions of ROG, NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> under the proposed 2022 RTP/SCS would decrease as compared to SJCOG’s 2016 baseline despite a projected increase in VMT. This decrease in emissions is consistent with the statewide downward trend for these pollutants as a result of CARB rules designed to reduce emissions from cars and trucks. The transportation improvements and future land use scenario envisioned by the RTP/SCS encourage improved circulation and higher density development along transportation corridors, which would further reduce on-road mobile emissions. The proposed 2022 RTP/SCS is intended to increase residential and commercial land use capacity within existing transit corridors, shifting a greater share of future growth to these corridors and ultimately increasing density, improving circulation and multi-modal connections, designed to lower per capita VMT, which would have a beneficial effect on air quality.

As previously noted, San Joaquin County is currently in nonattainment for federal and state PM<sub>2.5</sub> and ozone standards and state PM<sub>10</sub> standards. As shown in

Table 4.2-6, emissions levels for ozone precursors are forecast to decline despite projected future growth. NO<sub>x</sub> emissions are primarily generated by trucks and are expected to decrease over time due in part to the impact of CARB rules designed to reduce NO<sub>x</sub> emissions from diesel trucks and buses. ROG emissions are primarily due to gasoline vehicles and are lower due to improvements in vehicle emission rates. Decreasing PM<sub>10</sub> and PM<sub>2.5</sub> emissions are also generally consistent with statewide trends.

In addition to specific transportation improvements and land use scenarios, the proposed 2022 RTP/SCS also includes several policies that would contribute to a reduction of air pollutants. Below is a summary of the proposed 2022 RTP/SCS goals and policies that promote improvements to air quality:

- **Strategy No. 3:** Enhance the connection between land use and transportation choices through projects supporting energy and water efficiency.
- **Strategy No. 4:** Improve air quality by reducing transportation-related emissions.
- **Strategy No. 6:** Encourage infill development and development near transit, including transit-oriented development to maximize existing transit investments.
- **Strategy No. 7:** Provide transportation improvements to facilitate nonmotorized travel, including incorporation of complete streets elements as appropriate.
- **Strategy No. 12:** Prioritize projects that make more efficient use of the existing road network.

- **Strategy No. 16:** Promote electric power, alternative fuels, and autonomous technologies for public transit
- **Strategy No. 30:** Enhance public health through active transportation projects.

The air pollutant emissions shown in Table 4.2-6 are modeled emissions based on estimated VMT. The results do not account for some proposed VMT reduction strategies, such as a transportation demand management plan, telecommuting, and transit service enhancements, because these strategies are off-model reductions that cannot be included in EMFAC. The mobile air pollutant emissions from the proposed 2022 RTP/SCS are expected to further decrease with the inclusion of these VMT reduction strategies, such that the analysis herein represents a reasonable worst-case scenario for air pollutant emissions. Therefore, long-term operational air quality impacts associated with mobile source emissions would be less than significant.

### **Other Land Use Emissions**

In addition to the transportation-related GHG emissions shown in Table 4.2-6, land use projects envisioned by the land use scenario in the proposed 2022 RTP/SCS would also result in criteria air pollutant emissions due to sources such as architectural coatings, consumer products, fireplaces, landscaping equipment, and natural gas usage. Over the planning period, per capita emissions associated with consumer products, architectural coatings, fireplaces, landscaping equipment, and natural gas consumption are anticipated to decline, primarily as a result of increasingly stringent CARB and SJVAPCD rules and regulations. In addition, the proposed 2022 RTP/SCS would reduce per capita transportation related air pollutant emissions associated with future land use development, which would contribute to an overall reduction in per capita air pollutant emissions associated with future (2046) land use development as compared to 2016 baseline conditions. Nevertheless, the proposed land use scenario would most likely increase countywide ROG, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions based on growth forecasts, which would increase the likelihood that San Joaquin County will continue to exceed the federal and state PM<sub>2.5</sub> and ozone standards and state PM<sub>10</sub> standards for which San Joaquin County is currently in non-attainment. Also, individual land use projects could exceed the SJVAPCD operational significance thresholds as listed in Section 4.2.3(a), *Methodology and Significance Thresholds* under Threshold 2(b). Therefore, because operational emissions generated by the proposed 2022 RTP/SCS land use scenario would contribute to existing non-attainment conditions in the SJVAB, impacts would be significant. The following mitigation measure would reduce this impact.

### **Mitigation Measures**

For land use projects under their jurisdiction, cities and the County can and should implement the following mitigation measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

#### *AQ-3 Long-term Regional Operational Emissions*

Implementing agencies can and should implement long-term operational emissions reduction measures. Such reduction measures include the following:

- Require that all interior and exterior architectural coatings for all developments utilize coatings following SJVAPCD Rule 4601, *Architectural Coatings*.

- Increase building envelope energy efficiency standards in excess of applicable building standards and encourage new development to achieve zero net energy use.
- Install energy-efficient appliances, interior lighting, and building mechanical systems. Encourage installation of solar panels for new residential and commercial development.
- 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.
- 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.
- Plant trees and/or vegetation suited to trapping roadway air pollution and/or sound walls between sensitive receptors and the pollution source. The vegetation buffer should be thick, with full coverage from the ground to the top of the canopy.
- Install higher efficacy public street and exterior lighting.
- Use daylight as an integral part of lighting systems in buildings.
- Use passive solar designs to take advantage of solar heating and natural cooling.
- Install light-colored “cool” roofs, cool pavements.
- Install solar and tankless hot water heaters.
- Exclude wood-burning fireplaces and stoves.
- Incorporate design measures and infrastructure that promotes safe and efficient use of alternative modes of transportation (e.g., neighborhood electric vehicles, bicycles) pedestrian access, and public transportation use. Such measures may include incorporation of electric vehicle charging stations, bicycle lanes, bicycle-friendly intersections, and bicycle parking and storage facilities.
- Incorporate design measures that promote ride sharing programs (e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides).

### **IMPLEMENTING AGENCIES AND TIMING**

Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during operation where appropriate.

### **Significance After Mitigation**

If implementing agencies adopt and require the mitigation described above, emission impacts would be reduced because said measures encourage the use of cleaner vehicles and reduce vehicle trips. Implementation of Mitigation Measures T-1(a), T-1(b), GHG-2, and GHG-4 would also reduce operational emissions from the proposed 2022 RTP/SCS. However, since the implementation is not project- or site-specific, reductions cannot be estimated and cannot be guaranteed on a project-by-project basis. Therefore, this impact would remain significant and unavoidable. No additional

feasible mitigation measures are available that would reduce daily emissions such that emissions would not contribute to existing nonattainment conditions in the SJVAB.

**Threshold 3:** Expose sensitive receptors to substantial pollutant concentrations

**Impact AQ-4 THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL PARTICULATE MATTER POLLUTANT CONCENTRATIONS. HOWEVER, BECAUSE THE PROPOSED 2022 RTP/SCS WOULD REDUCE EXPOSURE IN COMPARISON TO BASELINE CONDITIONS, IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Re-entrained dust refers to roadway dust that is “kicked up” by moving vehicles on paved and unpaved roadways. This type of dust would be generated by roadway activity under the proposed 2022 RTP/SCS. In addition, dust from construction activity would add to regional dust levels. The synergistic effects of road dust (typically measured as PM<sub>10</sub>) with ozone and the hazardous constituents of re-entrained road dust itself (carcinogens, irritants, pathogens) may affect human health by contributing to respiratory illnesses such as asthma and allergies. Although motor vehicle emission control advances have allowed vehicle tailpipe emissions of some pollutants to decrease over the last 20 years, the number of vehicles in use and the amount of vehicle activity has continued to increase. This would suggest that re-entrained road dust has increased as well, as the amount of re-entrained dust is related to the number of vehicles on a road.

Table 4.2-7 compares total particulate emissions for the baseline conditions in 2016 and 2046 with implementation of the proposed 2022 RTP/SCS.

**Table 4.2-7 On-Road Mobile Source Particulate Matter Comparison**

Scenario	PM <sub>10</sub> Emissions (tons/day)	PM <sub>2.5</sub> Emissions (tons/day)
2016 Baseline	0.824	0.458
2046 with Proposed 2022 RTP/SCS	0.822	0.302
<b>Net Change from 2016 Baseline</b>	<b>(0.002)</b>	<b>(0.156)</b>
<b>Percent Change from 2016 Baseline</b>	<b>(0.2%)</b>	<b>(34.1%)</b>

Source: Appendix A

As shown in Table 4.2-7, total particulate emissions would be lower with implementation of the proposed 2022 RTP/SCS as compared to 2016 baseline conditions. Despite an increase in VMT within the SJCOG region, particulate emissions would be lower under proposed 2022 RTP/SCS conditions as compared to existing conditions largely due to emission control advances. Therefore, the proposed 2022 RTP/SCS would not expose sensitive receptors to substantial pollutant concentrations associated with re-entrained road dust, and impacts would be less than significant.

**Mitigation Measures**

No mitigation measures are required.

**Threshold 3:** Expose sensitive receptors to substantial pollutant concentrations

**Impact AQ-5 THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL TAC CONCENTRATIONS. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.**

As described in Section 4.2.1, *Setting*, TACs are air pollutants that pose a potential hazard to human health by causing or contributing to an increase in mortality or serious illness. Common sources of TAC include high traffic freeways and roads, gas dispensing facilities, industrial facilities, and diesel engines. DPM is classified as the primary airborne carcinogen in California. CARB reports that diesel particulate matter represents about 70 percent of the potential cancer risk from vehicle travel on a typical urban freeway. To protect people from TACs and reduce exposure, CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day (CARB 2005).

According to the SJVAPCD GAMAQI, sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s). The location of sensitive receptors is needed to assess toxic impacts on public health.

Several high traffic freeways and roads are located throughout the SJCOG region, including Interstates 5, 205, and 580 and State Routes 4, 12, 26, 33, 99, 88, 120, and 132. Within the SJCOG region, sensitive receptors residing close to freeways or busy roadways may experience adverse health effects beyond those typically found in urban areas. Because exposure of TACs is primarily based on local parameters (e.g., average daily traffic on local roadway segments and wind direction in relation to source and receptor), health risks adjacent to high volume roadways and transportation facilities would remain higher than regional averages.

As discussed above, the SJVAPCD significance threshold for long-term public health risk is set at 20 excess cancer cases in a million for cancer risk. For non-cancer risk (i.e., chronic or acute risk), the significance level is set at a hazard index of greater than 1.0. If a formal health risk assessment shows that a significant impact results, mitigation measures to reduce the predicted levels of toxic air pollutants from the facility to a less-than-significant level may be imposed by the lead agency.

To assess the impact of the proposed 2022 RTP/SCS on diesel emissions on regional roadways, an analysis of on-road mobile source diesel PM<sub>2.5</sub> and PM<sub>10</sub> emissions (primary particulate matter) and diesel NO<sub>x</sub>, (as a proxy for secondary PM<sub>10</sub>) is shown in Table 4.2-8. This table compares baseline (2016) conditions with 2046 conditions with implementation of the proposed 2022 RTP/SCS. Projected emissions for 2046 with implementation of the proposed 2022 RTP/SCS would result in reductions of diesel NO<sub>x</sub>, diesel PM<sub>2.5</sub>, and diesel PM<sub>10</sub> emissions. Because on-road diesel emissions with implementation of the 2022 RTP/SCS would decrease compared to baseline (2016) conditions, impacts related to diesel particulate matter exposure and associated health risks and nuisance odors at the regional level would be less than significant.

**Table 4.2-8 On-Road Mobile Source Diesel Toxics Comparison**

Scenario	Diesel PM <sub>2.5</sub> (tons/day)	Diesel PM <sub>10</sub> (tons/day)	Diesel NO <sub>x</sub> (tons/day)
2016 Baseline	0.26	0.27	11.98
2046 with Proposed 2022 RTP/SCS	0.05	0.06	4.08
<b>Net Change from 2016 Baseline</b>	<b>(0.21)</b>	<b>(0.21)</b>	<b>(7.90)</b>
<b>Percent Change from 2016 Baseline</b>	<b>(57%)</b>	<b>(57%)</b>	<b>(46%)</b>

Source: Appendix A

Diesel SO<sub>x</sub> emissions would increase with implementation of the proposed RTP/SCS. However, overall SO<sub>x</sub> from all on-road mobile sources would decrease (see Appendix A). Because diesel SO<sub>x</sub> is a subset of overall SO<sub>x</sub>, and overall emissions of this pollutant would decrease, it can be determined that diesel SO<sub>x</sub> would not contribute to sensitive receptor exposure to substantial concentrations of pollutants. Therefore, impacts related to diesel SO<sub>x</sub> are not of concern for this analysis.

Additionally, exposure is primarily based on local parameters such as average daily traffic (ADT) on local roadway segments, or wind direction in relation to source and receptor. As such, the health risks adjacent to heavily trafficked roadways and transportation facilities (e.g., Interstates 5, 205, and 580 and State Routes 4, 12, 26, 33, 99, 88, 120, and 132) would remain higher than regional averages. See Section 4.14, *Transportation*, for a summary of ADT on heavily trafficked roadways in the SJCOG region.

In the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005), CARB recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with more than 100,000 vehicles per day, or rural roads with more than 50,000 vehicles per day. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet (CARB 2005). As discussed above, proximity to freeways increases cancer risk and exposure to particulate matter. Similarly, proximity to heavily travelled transit corridors and intersections would expose residents to higher levels of diesel particulate matter and carbon monoxide.

As discussed in Chapter 2, *Project Description*, as a result of proposed 2022 RTP/SCS policies and the proposed land use scenario, the anticipated growth pattern would facilitate improved circulation and expanded roadway networks, which could result in more people being exposed to elevated health risks as compared to areas of the region more distant from such activities. The location and pattern of the proposed 2022 RTP/SCS growth would influence travel behavior. An efficient and well-maintained circulation network facilitates a reduction in individual vehicle trips and associated congestion (refer to Section 4.14, *Transportation*). Reduced congestion and vehicle trips are directly linked to reduced regional criteria air pollutant emissions and toxic air emissions from mobile sources.

It is important to note that a variety of other factors contribute to the decline in contaminant emissions compared to existing conditions, including vehicle technology, cleaner fuels, and fleet turnover. However, in order to achieve the greatest VMT reductions from an efficient circulation network, development also must necessarily be in relatively close proximity to public transit and major roadway corridors. Although the precise location and density of such development is not known at this time, the proposed 2022 RTP/SCS could result in new sensitive receptors sited close to

existing and new TAC sources, potentially resulting in the exposure of sensitive receptors to substantial TAC concentrations. Therefore, impacts related to TAC emissions would be potentially significant. The siting of new sensitive receptors would be subject to an individual jurisdiction's land use approval processes and would be analyzed on an individual project basis and subject to mitigation measures identified below. The below mitigation measure would reduce this impact.

## Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the proposed 2022 RTP/SCS program where applicable for transportation projects that would result in fugitive dust and ozone precursor emissions. Cities and the County can and should implement this measure, where relevant to land use projects implementing the proposed 2022 RTP/SCS. Project-specific environmental documents may adjust this mitigation measure as necessary to respond to site-specific conditions.

### AQ-4 Health Risk Reduction Measures

Transportation project sponsor agencies shall implement the following measures for projects that could facilitate an increase in vehicle trips:

- During project-specific design and CEQA review, the potential localized particulate (PM<sub>10</sub> and PM<sub>2.5</sub>) impacts and their health risks shall be evaluated for individual projects. Localized particulate matter concentrations shall be estimated using procedures and guidelines consistent with U.S. EPA 2015's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM<sub>2.5</sub> and PM<sub>10</sub> Nonattainment and Maintenance Areas*. If required based on the project-level hotspot analysis, project-specific mitigation shall be added to the project design concept or scope to ensure that local particulate (PM<sub>10</sub> and PM<sub>2.5</sub>) emissions would not reach a concentration at any location that would cause estimated cancer risk to exceed the SJVAPCD threshold of 20 in one million. Per the U.S. EPA guidance (2015), potential mitigation measures to be considered may include but shall not be limited to: providing a retrofit program for older higher emitting vehicles, anti-idling requirements or policies, controlling fugitive dust, routing traffic away from populated zones and replacing older buses with cleaner buses. These measures can and should be implemented to reduce localized particulate impacts as needed.
- For projects that do not meet screening criteria, retain a qualified air quality consultant to prepare a health risk assessment (HRA) in accordance with CARB and OEHHA requirements to determine the exposure of nearby residents to TAC concentrations.
- If impacts result in increased risks to sensitive receptors above significance thresholds, plant trees and/or vegetation suited to trapping TACs and/or sound walls between sensitive receptors and the pollution source.

In addition, consistent with the general guidance contained in CARB's *Air Quality and Land Use Handbook* (2005) and *Technical Advisory on Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (2017), cities and counties shall incorporate appropriate and feasible measures into project building design for land use projects, including residential, school and other sensitive uses located within 500 feet (or other appropriate distance as determined by the lead agency) of freeways, heavily travelled arterials, railways and other sources of diesel particulate matter, including roadways experiencing significant vehicle delays. The appropriate measures shall include one or more of the following methods, as applicable and as determined by a qualified professional.

The implementing agency shall incorporate health risk reduction measures based on an analysis of individual sites and project circumstances. These measures may include:

- Avoid siting new sensitive land uses within 500 feet of a freeway or railway.
- Require development projects for new sensitive land uses to be designed to minimize exposure to roadway-related pollutants to the maximum extent feasible through inclusion of design components including air filtration and physical barriers.
- Do not locate sensitive receptors near the entry and exit points of a distribution center.
- Locate structures and outdoor living areas for sensitive uses as far as possible from the source of emissions. As feasible, locate doors, outdoor living areas and air intake vents primarily on the side of the building away from nearby high-volume roadways or other pollution source. As feasible, incorporate dense, tiered vegetation that regains foliage year-round and has a long life span between the pollution source and the project.
- Maintain a 50-foot buffer from a typical gas dispensing facility (under 3.6 million gallons of gas per year).
- Install, operate, and maintain in good working order a central heating and ventilation (HV) system or other air take system in the building, or in each individual residential unit, which meets the efficiency standard of the MERV 13. The HV system should include the following features:
  - Installation of a high efficiency filter and/or carbon filter-to-filter particulates and other chemical matter from entering the building.
  - Use of either HEPA filters or ASHRAE 85 percent supply filters.
  - Completion of ongoing maintenance.
- Retain a qualified HV consultant or Home Energy Rating Systems rater during the design phase of the project to locate the HV system based on exposure modeling from the mobile and/or stationary pollutant sources.
- Maintain positive pressure within the building.
- Achieve a performance standard of at least one air exchange per hour of fresh outside filtered air.
- Achieve a performance standard of at least four air exchanges per hour of recirculation. Achieve a performance standard of 0.25 air exchanges per hour of unfiltered infiltration if the building is not positively pressurized.
- Require project owners to provide a disclosure statement to occupants and buyers summarizing technical studies that reflect health concerns about exposure to highway/freeway exhaust emissions.

#### **IMPLEMENTING AGENCIES AND TIMING**

Implementing agencies for transportation projects are SJCOG and transportation project sponsor agencies. Implementing agencies for land use projects are cities and the County. This mitigation measure shall, or can and should, be applied during permitting and environmental review and implemented during operation where appropriate.

#### **Significance After Mitigation**

Although implementation of the above mitigation would reduce health risks associated with TAC emissions, individual receptors may still be exposed to substantial TAC concentrations that would

have significant health risk effects. Therefore, this impact remains significant and unavoidable. No additional mitigation measures to reduce this impact to less-than-significant levels are feasible.

<b>Threshold 4:</b> Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people
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**Impact AQ-6 CONSTRUCTION OF THE TRANSPORTATION IMPROVEMENTS AND LAND USE PROJECTS ENVISIONED BY THE PROPOSED 2022 RTP/SCS WOULD NOT RESULT IN OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS) ADVERSELY AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

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While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable distress among the public (SJVAPCD 2015a). The degree to which an odor is offensive is based on an individual's sensitivity and tolerance for said odor. Some people may find an odor acceptable (e.g., odors from a coffee roaster), while others may find it off-putting. Since odors are subjective, the sensory and physical response experienced by an individual varies based on their perception of the quality and intensity of the odor. Quality refers to the nature of the smell (e.g., flowery or sour) and intensity refers to the strength of the odor. Furthermore, the distance between the odor source and receptor, the wind direction, and sensitivity of the receptor can influence how the impact is perceived. Common sources of odors include landfills, agricultural uses, wastewater treatment plants, refineries, and vehicle exhaust.

## Construction

Construction activities implementing the proposed 2022 RTP/SCS would generate oil and diesel fuel odors during construction from equipment use. The odors would be limited to the construction period and would be intermittent and temporary. Furthermore, these odors would dissipate rapidly with distance from in-use construction equipment. Accordingly, construction activities would not generate other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

## Operation

Development associated with the proposed 2022 RTP/SCS is related to transportation improvements such as roadway widening, interchange improvements, and installation of bicycle lanes. These types of projects are not typical operational sources of odors. However, all proposed 2022 RTP/SCS projects would be subject to SJVAPCD Rule 4102, *Nuisance*, which prohibits the discharge of air contaminants or other material that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons. Furthermore, the projects would be required to adhere to local policies, zoning designations, and municipal codes that would limit odors. As discussed in Section 4.2.2, *Regulatory Setting*, the County of San Joaquin and cities within the SJCOG region have air quality-related policies in their General Plans that promote multi-modal transportation, electric-vehicles, and transit-oriented development. These types of policies aim to reduce travel with fossil-fueled vehicles and indirectly reduce odors from vehicle exhaust. However, if offensive odors are present and become a nuisance, complaints can be filed by email or phone call with SJVAPCD, who will then investigate the source. Because odorous emissions associated with the operation of the projects under the proposed 2022 RTP/SCS would be regulated by local governing bodies (i.e., SJVAPCD, County of San Joaquin, and local cities), implementation of the proposed 2022 RTP/SCS would not result in other emissions (such as odors) adversely affecting a substantial number of people. Impacts would be less than significant.

## Mitigation Measures

No mitigation measures are required.

### c. Specific RTP Projects That May Result in Impacts

The RTP/SCS projects listed in Section 2, *Project Description*, would have the potential to result in air quality impacts. All projects that include a construction component could result in the impacts described under Impact AQ-2. Projects that include roadway, rail, and transit features and/or expansions could result in the impacts described under Impacts AQ-3 and AQ-4. Additional specific analysis outlined in the above mitigation measures would need to be conducted as individual projects are designed and implemented to determine the magnitude of impacts. Because any number of the proposed 2022 RTP/SCS projects that require construction equipment or include transportation improvement would presumably increase air pollutant emissions, no specific projects are listed in this section related to the adverse impacts on air pollutant emissions in the SJCOG region.

#### 4.2.4 Cumulative Impacts

For the purposes of evaluating cumulative impacts to air quality, the geographic scope of the cumulative impacts analysis is the SJVAB, which includes the SJCOG planning region as well as Kern, Kings, Fresno, Madera, Merced, Stanislaus, and Tulare counties. As detailed in Section 4.2.1(d), *Current Air Quality*, San Joaquin County is in nonattainment for federal ozone and PM<sub>2.5</sub> standards and state ozone, PM<sub>10</sub>, and PM<sub>2.5</sub> standards. Because San Joaquin County is in nonattainment for these air quality standards, a cumulative air quality impact currently exists. Any growth within San Joaquin County would contribute to existing exceedances of ambient air quality standards. SJVAPCD has prepared air quality plans for both ozone and particulate matter to address this cumulative impact, improve conditions, and meet federal and state air quality standards. As stated in the SJVAPCD GAMAQI (2015), any proposed development project that would individually have a significant air quality impact related to criteria air pollutant emissions would also be considered have a cumulatively considerable contribution to existing significant cumulative impacts related to criteria air pollutant emissions. For TACs, the SJVAPCD GAMAQI (2015) states that because impacts from TACs are localized and the thresholds of significance for TACs have been established at such a conservative level, risks over the individual thresholds of significance are also considered cumulatively significant.

Construction activities associated with transportation projects under the proposed 2022 RTP/SCS, as well as the land use projects envisioned by the proposed 2022 RTP/SCS, would create fugitive dust and ozone precursor emissions and have the potential to result in temporary adverse impacts on air quality. As discussed under Impact AQ-2, although any individual improvement or development project may not generate significant short-term emissions, it is probable that several projects would be under construction simultaneously, generating cumulative construction emissions that could impact air quality. Short-term impacts would be significant because construction emissions could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment. Implementation of Mitigation Measures AQ-2(a) through AQ-2(c) for individual projects would reduce PM and ozone precursor emissions. However, the contribution of construction emissions facilitated by the proposed 2022 RTP/SCS to the existing significant cumulative impact would remain cumulatively considerable and unavoidable because it cannot be guaranteed that all future project-level impacts can be mitigated to a less-than-significant level.

As discussed under Impact AQ-3, regional ozone precursor and PM emissions from on-road mobile sources would decrease by 2046 with the proposed 2022 RTP/SCS compared to baseline 2016 conditions. As a result, the long-term operational mobile source emissions under the proposed 2022 RTP/SCS would not result in a cumulatively considerable contribution to existing significant cumulative air quality impacts. However, land use operational emissions would be cumulatively considerable before and after mitigation because land use projects under the proposed 2022 RTP/SCS may contribute to an increase in ozone precursor and PM emissions. As discussed under Impact AQ-5, impacts from TAC emissions would be cumulatively considerable despite a decrease in TAC emissions from baseline 2016 conditions because the proposed 2022 RTP/SCS may result in the siting of sensitive receptors in close proximity to existing or new sources of TACs. Mitigation Measure AQ-4 would reduce impacts from TACs; however, it cannot be guaranteed that impacts resulting from the proposed 2022 RTP/SCS can be mitigated to a less-than-significant level. Therefore, the impact would remain cumulatively considerable.

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