AIR QUALITY
EXISTING CONDITIONS REPORT
SAN JOSE, CA

June 12, 2009

Prepared for:

Will Burns
David J. Powers & Associates, Inc.
1885 The Alameda, Suite 204
San Jose, California 95126

Prepared by:

James A. Reyff

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

505 Petaluma Boulevard South
Petaluma, CA 94952
Telephone: (707) 766-7700 Fax: (707) 766-7790
www.Illingworthrodkin.com

Job No.: 08-209

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

I PURPOSE

This Existing Conditions Report presents a discussion of laws, regulations, policies, and programs related to air quality in the City of San José. This report identifies the existing air quality conditions and environmental constraints in the City of San José for consideration as part of the Envision San José 2040 General Plan Update.

San José generally experiences good to moderate air quality. While San José is a large urban area with abundant emission sources, it does lie downwind of other major urban portions of the San Francisco Bay Area. As a result, emissions from human activities (primarily traffic) within San José and upwind locations (the Peninsula and central Bay Area) contribute to air quality problems experienced in San José and elsewhere in the Bay Area.

The Bay Area Air Quality Management District (BAAQMD), along with other regional planning agencies, relies on local jurisdictions to assist with plans to improve air quality. Many land use and transportation strategies to reduce air quality rely on cities and counties as implementing agencies. Under the California Government Code, air quality is mentioned only as an optional issue in the "Conservation" element. BAAQMD encourages local jurisdictions to include General Plan policies or elements that, when implemented, would improve air quality. Although air quality elements are not mandated, general plans are required to be consistent with any air quality policies and programs that exist within that jurisdiction. Local plans should also be consistent with regional air quality plans, i.e., the Bay Area Clean Air Plan. This background report provides a discussion of current air quality conditions and future planning efforts. Climate and meteorological conditions that affect air quality in the project area are described.

II PHYSICAL ENVIRONMENT

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations designed to ensure that the public health and welfare are protected, while including a reasonable margin of safety to protect the more sensitive individuals in the population.

San José is located in the southern portion of the San Francisco Bay Area Air Basin. The basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County. The local air quality regulatory agency responsible for this basin is the Bay Area Air Quality Management District (BAAQMD).

Climate and Meteorological Conditions

The climate of San José is characterized by warm dry summers and cool moist winters. The proximity of the San Francisco Bay and Pacific Ocean has a moderating influence on the climate. San José is located at the northern portion of the Santa Clara Valley climate sub region of the Bay Area. The Santa Clara Valley is bounded by mountains to the east and west, and San Francisco Bay to the north.

The major large-scale weather feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is strongest during summer and located off the west coast of the United States. Large-scale atmospheric subsidence associated with the Pacific High produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 1,000 to 3,000 feet above sea level, depending on the intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus-type clouds usually form offshore and move into the Bay Area during the evening hours. Stratus also forms over the San Francisco Bay during the evening hours. Typically, stratus covers the Peninsula and moves into the Santa Clara Valley during late night and early morning hours. As the land warms the following morning, the clouds often dissipate. The stratus then redevelops and moves inland late in the day along with an increase in winds. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Precipitation is generally lowest along the Bay and the Santa Clara Valley with much higher amounts occurring along south and west facing mountain slopes that to the west. Santa Clara, which lies on the lee side of the Santa Cruz Mountains, receives about 15 inches of precipitation. Mountains to the west receive about 40 inches. Most of rainfall occurs from November through April. High-pressure systems are also common in winter with low-level inversions that trap produce cool stagnant conditions. Radiation fog and haze trapped near the surface are common during extended winter periods where high-pressure systems influence the weather

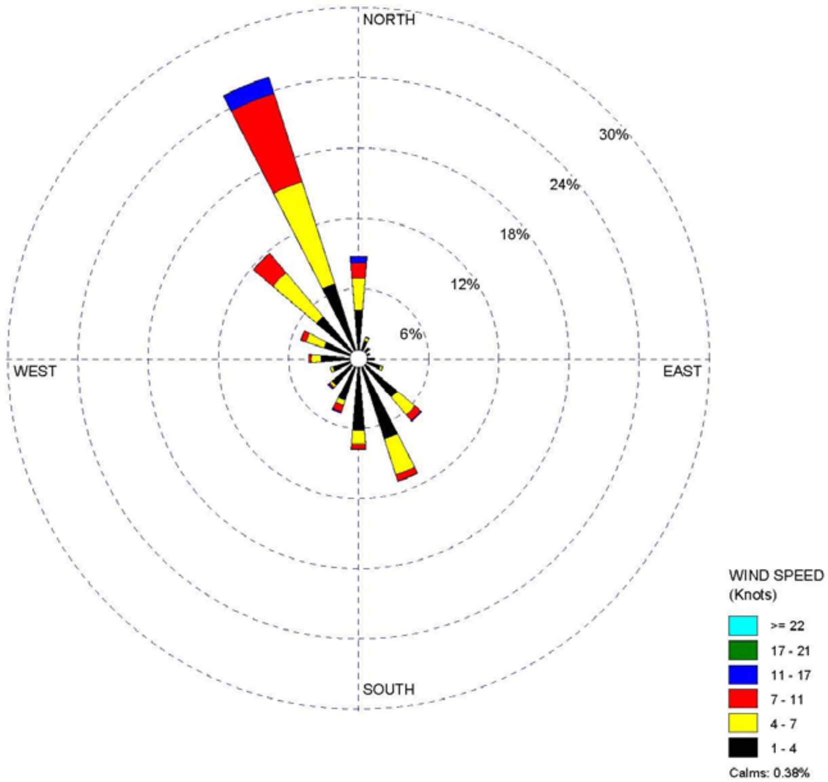
The direction of wind flow in Santa Clara Valley is influenced primarily by terrain, resulting in prevailing wind flows along the valley’s northwest-southeast axis. The proximity of the eastern Pacific High and relatively lower pressure inland produces a prevailing westerly sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other topographical gaps to the west, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. Marine air penetrates the eastern Peninsula mainly from the northwest and through gaps in the lower mountains. The prevailing wind in most of San José is primarily from a northwest direction, especially during spring and summer (see Figure 1). The northwest sea breeze is common on most days from spring through early fall. At night and winter, southeasterly flow is common, but with lighter wind speeds. Southeasterly winds are more common in the southern portion of San José as seen by comparing the wind roses for Mineta-San José International Airport and Alviso to the Almaden IBM facility. In winter, winds become variable with more of a southeasterly orientation. Nocturnal winds and land breezes during the colder months of the year prevail with variable drainage out of the mountainous areas, but a general southerly flow in San José. Wind speeds are highest during the spring and early summer and lightest in fall. Winter storms bring relatively short episodes of strong southerly winds.

Temperatures in San José tend to be less extreme compared to further inland locations due to the moderating effect of the Pacific Ocean and the San Francisco Bay. In summer, high temperatures are generally in the low 80's and in the 50's to about 60 during winter. Low temperatures range from the 50's in summer to the 30's in winter.

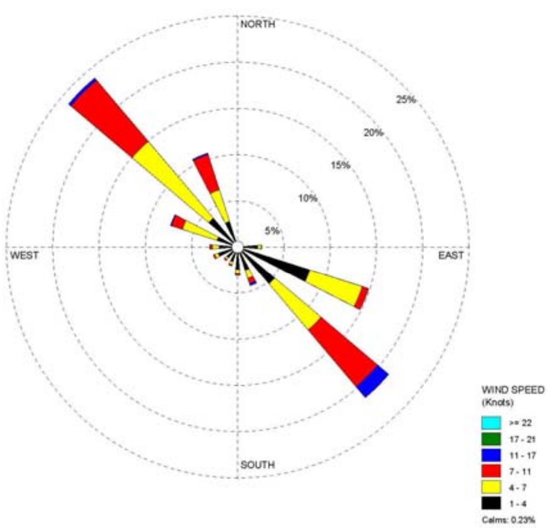
Air pollution potential in the Santa Clara Valley is high. The southern end of the valley is susceptible to some of the highest ozone levels in the region. This is due to a number of effects. Air pollution emitted from the Valley combines with pollution emitted throughout much of the immediate Bay Area that is transported south through the valley. Summer days are typically characterized by relatively warm temperatures, clear skies and a relatively stable air mass. In addition, a weaker southerly sea breeze at the southern end of the valley meets the northwest sea breeze and can form a convergence zone. This area typically has low wind speeds. As a result, ozone levels in Gilroy and Morgan Hill are typically higher than those measured in San José and other upwind Peninsula stations. Ozone standards traditionally are exceeded in downwind portions of the Bay Area when this condition occurs during the warmer months of the year. Highest ozone concentrations tend to occur when high pressures strengthen over the area in late spring summer. This results in warmer temperatures, light winds and less vertical mixing.

The highest $PM_{2.5}$ levels in the region are measured in San José. Episodes of high particulate levels occur in late fall and winter when the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. High $PM_{2.5}$ levels are the result of direct combustion emissions and secondary aerosol formation in the atmosphere under certain meteorological conditions. Most of these aerosols originate from gaseous air pollutants, such as nitrogen oxides (NOx).

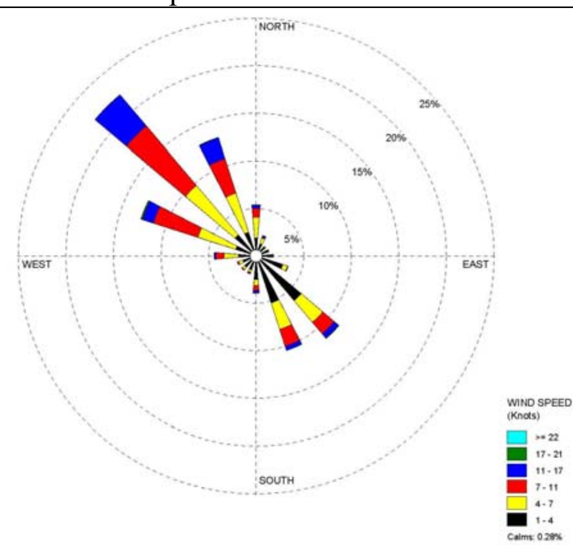
FIGURE 1 WIND ROSE FOR SAN JOSÉ



Mineta-San José International Airport



IBM Facility



Alviso - 1996 through 2000

III REGULATORY FRAMEWORK

Air Quality Standards

The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National ambient air quality standards (NAAQS) were established by the Federal Clean Air Act of 1970 (amended in 1977 and 1990) for six "criteria" pollutants. These criteria pollutants now include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). In 1997, EPA added fine particulate matter or $PM_{2.5}$ as a criteria pollutant. These are considered the most prevalent air pollutants that are known to be hazardous to human health.

California established ambient air quality standards as early as 1969 through the Mulford-Carrol Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the Federal Clean Air Act. In many cases, California standards are more stringent than the national ambient air quality standards. Federal and State air quality standards are shown in Table 1. Both the national and California ambient air quality standards have been adopted by BAAQMD. A brief description of the six criteria air pollutants is as follows:

Ozone. Ground-level ozone is the principal component of smog. It is not directly emitted into the atmosphere but is formed by the photochemical reaction of reactive organic gases (ROG) and nitrogen oxides (known as ozone precursors) in the presence of sunlight. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Approximately half of the reactive organic gas and nitrogen oxide emissions in the Bay Area are from motor vehicles. Adverse health effects of ground-level ozone include respiratory impairment and eye irritation. High ozone concentrations are also a potential problem to sensitive crops such as wine grapes.

Carbon Monoxide. Carbon monoxide is a non-reactive pollutant that is highly toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest source of carbon monoxide emissions is motor vehicles. Wood stoves and fireplaces also contribute to high levels of carbon monoxide. Unlike ozone, carbon monoxide is directly emitted to the atmosphere. The highest carbon monoxide concentrations occur during the nighttime and early mornings in late fall and winter. Carbon monoxide levels are strongly influenced by meteorological factors, such as wind speed and atmospheric stability. Strong, ground-based inversions form on cool late fall and winter evenings with very light winds and persist until the sun rises. This creates very stable atmospheric conditions that can lead to a buildup of air pollutants. In addition, use of wood burning fireplaces is highest during these periods. Wood smoke also contains carbon monoxide. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, fatigue, headache, confusion, and dizziness. Exposure to carbon monoxide can be fatal in cases of very high concentrations in enclosed places.

Nitrogen Dioxide. Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the primary sources of nitrogen dioxide. Sources of NO_2 include high temperature combustion processes such as motor vehicle engines and power plants. It can also be the product of atmospheric processes where nitrogen oxides (NOx) react with ozone to create NO_2. NOx, mostly a combustion by-product, includes all nitric oxides such as NO_2 and NO. Most NOx emitted during combustion is in the form of NO, but NO_2 makes up about 10% of those initial NOx emissions. Indoor concentrations are a concern, because people spend most of their time indoors. Elevated indoor NO_2 concentrations are caused by sources such as gas appliances, and un-vented gas heating systems. Nitrogen dioxide contributes to ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness. NO2 is a concern particularly for asthmatics and for infants and children. CARB updated the California ambient air quality standards for NO_2 in 2007 to reflect the latest available information on health effects associated with this pollutant.

Particulate Matter. Respirable particulate matter, PM_{10}, and fine particulate matter, $PM_{2.5}$, consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM_{10} and $PM_{2.5}$ are a health concern, particularly at levels above the Federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because minute particles are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of $PM_{2.5}$ because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This type of dust is considered more of a soiling nuisance rather than a health hazard. However, all dust includes some fraction of PM_{10} that can create localized health impacts (i.e., exceed an ambient air quality standard).

TABLE 1 CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards [a] Primary [b,c]	National Standards [a] Secondary [b,d]
Ozone	8-hour	0.070 ppm (154 μg/m^3)	0.075 ppm (176μg/m^3)	—
	1-hour	0.09 ppm (180 μg/m^3)	--(e)	Same as primary
Carbon monoxide	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide	Annual	—	0.053 ppm (100 μg/m^3)	Same as primary
	1-hour	0.25 ppm (470 μg/m^3)	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 μg/m^3)	—
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	1-hour	0.25 ppm (655 μg/m^3)	—	—
PM_{10}	Annual	20 μg/m^3	50 μg/m^3	Same as primary
	24-hour	50 μg/m^3	150 μg/m^3	Same as primary
$PM_{2.5}$	Annual	12 μg/m^3	15 μg/m^3	
	24-hour	—	35 μg/m^3	
Lead	Calendar quarter	—	1.5 μg/m^3	Same as primary
	30-day average	1.5 μg/m^3	—	—

Notes: (a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.

(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(e) The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

In 1983, the California Air Resources Board (CARB) replaced the standard for "suspended particulate matter" with a standard for suspended PM_{10} or "respirable particulate matter." This standard was set at 50 $\mu g/m^3$ for a 24-hour average and 30 $\mu g/m^3$ for an annual average. CARB revised the annual PM_{10} standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM_{10} standard is 20 $\mu g/m^3$ for an annual average. $PM_{2.5}$ standards were first promulgated by the EPA in 1997 and were recently revised to lower the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ for 24-hour exposures. EPA revoked the annual PM_{10} standard due to lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects. CARB has adopted an annual average $PM_{2.5}$ standard, which is set at 12 $\mu g/m^3$, which is more stringent than the federal standard of 15 $\mu g/m^3$.

Sulfur Dioxide. Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur containing fuels such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in the Bay Area are well below the ambient standards, and therefore, are not a concern in San José to regulators. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstruction lung disease and increased risk of acute and chronic respiratory illness.

Lead. Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles, although the use of lead in fuel has been virtually eliminated. Because of lead being eliminated from fuels, levels in the Bay Area have dropped dramatically. Lead concentrations in the Bay Area are well below the ambient standards.

Toxic Air Contaminants (TACs)

Besides the "criteria" air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants (HAPs) under the Federal Clean Air Act and Toxic Air Contaminants (TACs) under the California Clean Air Act. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods. They are regulated at the local, state, and federal level.

HAPs are the air contaminants identified by U.S. EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of these contaminants originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of the 188 identified HAPs. Of the 21 HAPs identified by EPA as MSATs, a list of six priority HAPs were identified that include: diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. While vehicle miles traveled in the United States is expected to increase by 64% over the period 2000 to 2020, the

Federal Highway Administration reports that emissions of MSATs are anticipated to decrease substantially as a result of efforts to control mobile source emissions. This reduction would be 57 percent to 67 percent depending on the contaminant (FHWA 2006).

California developed a program under the Tanner Toxics Act (AB 1807) to identify, characterize and control toxic air contaminants (TACs). Subsequently, AB 2728 incorporated all 188 HAPs into the AB 1807 process. TACs include all HAPs plus other containments identified by CARB. These are a broad class of compounds known to cause morbidity or mortality (e.g., cancer risk). TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level.

Particulate matter from diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by ARB, and are listed as carcinogens either under State Proposition 65 or under the Federal HAPs programs.

CARB reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing toxic air contaminants emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) was found to comprise much of that risk. In August 1998, CARB formally identified DPM as a TAC. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. The vast majority of diesel exhaust particles (over 90 percent) consist of $PM_{2.5}$, which are the particles that can be inhaled deep into the lung. Like other particles of this size, a portion will eventually become trapped within the lung possibly leading to adverse health effects. While the gaseous portion of diesel exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce DPM emissions 85 percent by 2020. The U.S. EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

Smoke from residential wood combustion can be a source of TACs. Wood smoke is typically emitted during wintertime when dispersion conditions are poor. Localized high

TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind; the pollution can persist for many hours, especially in sheltered valleys during winter. Wood smoke also contains a significant amount of PM_{10} and $PM_{2.5}$. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

Federal Air Quality Regulations

If an area does not meet NAAQS over a set period (three years), EPA designates it as a "nonattainment" area for that particular pollutant. EPA requires states that have areas that do not comply with the national standards to prepare and submit air quality plans showing how the standards would be met. If the states cannot show how the standards would be met, then they must show progress toward meeting the standards. These plans are referred to as the State Implementation Plan (SIP). Under severe cases, EPA may impose a federal plan to make progress in meeting the federal standards.

Carbon Monoxide

Prior to 1998, the Bay Area was a "moderate nonattainment" area for carbon monoxide due to localized exceedances of the national carbon monoxide standards in downtown San José and Vallejo. The carbon monoxide standards have not been exceeded since 1991. Since the region had not experienced exceedances of the carbon monoxide standards, the San Francisco Bay Area Redesignation Request and Maintenance Plan for the Carbon Monoxide national ambient air quality standard was approved by the U. S. EPA in 1998. That action reclassified the area as a carbon monoxide "attainment" area.

Ozone

Prior to 1995, the San Francisco Bay Area air basin was classified by EPA as a "moderate nonattainment" area for ozone, since some air pollutant monitors in the area routinely measure concentrations exceeding the national one-hour ozone standard. In 1993, after three years of monitoring compliance with the one-hour ozone standard, the Bay Area Air Quality Management District (BAAQMD) submitted the 1993 Ozone Maintenance Plan to EPA to request the redesignation of the region to an ozone maintenance area. The plan included measures to maintain the attainment of the ozone NAAQS. In 1995, EPA formally recognized that the area attained the ozone standard and approved the 1993 Ozone Maintenance Plan. The Bay Area was classified by EPA as a "maintenance" area, since the region had not violated the ozone standard for 5 years (1990-1994). However, violations of the national one-hour ozone standards occurred during the summers of 1995 and 1996. As a result, in 1997 EPA revoked the region's clean air status and designated the area as an "unclassified nonattainment" area for ozone. In April 2004, EPA designated the Bay Area as a "marginal nonattainment" area under the 8-hour ozone NAAQS. The U.S. EPA then revoked the NAAQS for one-hour ozone in 2005. Recent monitoring data does indicate that the Bay Area was meeting the 8-hour NAAQS for ozone; however, BAAQMD and CARB did not request attainment redesignation. EPA recently approved a newer slightly more stringent 8-hour ozone NAAQS.

Other Criteria Pollutants

For all criteria pollutants other than ozone, the San Francisco Bay Area air basin is in attainment of the NAAQS. The Bay Area counties, including Santa Clara County, have not measured ambient air pollutant concentrations in excess of those allowed by the NAAQS for all other criteria air pollutants. However, violations of the new 24-hour NAAQS for $PM_{2.5}$ have been recorded in the Bay Area. These violations have occurred in Vallejo and San José. $PM_{2.5}$ in the Bay Area is treated as a regional air pollutant, even though there can be localized sources that can contribute to exceedances of the standard. U.S. EPA, in agreement with CARB, recently acted to designate the Bay Area as nonattainment for $PM_{2.5}$.

Clean Air Act SIP Conformity

Under Section 176(c) of the 1990 Clean Air Act Amendments, the "conformity" provisions for Federal projects are outlined. Federal actions are required to conform to the requirements of a SIP and must not jeopardize efforts for a region to achieve the NAAQS. Section 176(c) also assigns primary oversight responsibility for conformity assurance to the federal agency undertaking the project, not the EPA, state, or local agency. For conformity, federally-supported or funded activities must not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other SIP milestone aimed at bringing the region into attainment.

In 1993, the U.S. EPA issued conformity regulations that addressed transportation projects (Transportation Conformity) and conformity of all other non-transportation federal actions (General Conformity). The primary requirements of the transportation conformity rule are that implementation of transportation plans or programs cannot produce more emissions of pollutants than budgeted in the latest SIP.

EPA also has programs for identifying and regulating toxic air contaminants. The Clean Air Act requires EPA to set standards for air toxics and sharply reduce emissions of controlled chemicals. Industries were classified as major sources if they emitted certain amounts of toxic air contaminants.

California Air Quality Regulations

The California Clean Air Act of 1988, amended in 1992, outlines a program for areas in the State to attain the CAAQS by the earliest practical date. The CARB is the state air pollution control agency and is a part of the California Environmental Protection Agency. The California Clean Air Act set more stringent air quality standards for all of the pollutants covered under national standards, and additionally regulates levels of vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. If an area does not meet CAAQS, CARB designates the area as a nonattainment area. Based on the California standards, the Bay Area is a serious nonattainment area for ozone (since the area cannot forecast attainment of the state ozone standard in the foreseeable future). It is also a state nonattainment area for PM_{10} and $PM_{2.5}$. The Bay Area has met CAAQS for all other air pollutants. CARB requires regions that do not meet CAAQS for ozone to submit clean air plans that describe plans to attain the standard.

CARB regulates the amount of air pollutants that can be emitted by new motor vehicles sold in California. Motor vehicle emissions standards have always been more stringent than federal standards since they were first imposed in 1961. CARB has also developed on-road vehicle Inspection and Maintenance programs known as "Smog Check" programs with the California Bureau of Automotive Repair[1]. The Smog Check program is administered by the Bureau of Automotive Repair. Inspection programs for trucks and buses have also been implemented. CARB has authority to set standards for fuel sold in California. Air pollution requirements for consumer products sold in California are also controlled by CARB.

CARB provides oversight for local air pollution control programs and compiles or develops innovative control measures. CARB is responsible for submitting State Implementation Plans (SIPs) to the U.S. EPA that demonstrate how each nonattainment air basin will meet the NAAQS. These plans are developed by the regional air pollution control districts and then submitted to CARB for review and eventual submittal to the EPA.

In many parts of the State, CARB monitors air quality levels and measures toxic air contaminants. CARB also studies the exposure of California's population to these pollutants and contaminants.

Regional Air Quality Regulations

Regional air quality is regulated by BAAQMD. BAAQMD regulates stationary sources (with respect to federal, State, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies and conducts public awareness programs. BAAQMD has also developed CEQA guidelines that establish significance thresholds for evaluating new projects and plans and provide guidance to lead agencies for evaluating air quality impacts of projects and plans.

The Air Toxic "Hot Spots" Information and Assessment Act was enacted by the California Legislature. This act, known also as AB2588, is intended to identify toxic air contaminant hot spots where emissions from specific sources may expose individuals to elevated risk of adverse health effects. Businesses or establishments (including dry cleaning facilities) identified as a significant source or toxic air emissions are required to

[1] Inspection and Maintenance (I/M) refers to the federally mandated requirements for State's to perform checks on in-use vehicle emissions for areas identified by EPA as nonattainment or maintenance under the federal Clean Air Act. Smog Check is California's program to conduct these inspections.

notify the affected population and provide them with information about the associated health risk. The implementation and enforcement provisions of this Act are the responsibility of BAAQMD.

BAAQMD administers the Toxic Air Contaminant Control Program. The main objective of this program is to reduce public exposure to toxic air contaminants. BAAQMD has regulated air toxics since the 1980's. To date, a risk-based approach, meaning that decisions over what sources and pollutants to control and the degree of control have been based on results of health risk assessments.

After the level of risk from a new project has been determined, a decision must be made as to the significance of this risk level. If a new source has a cancer risk of one in a million or less over a 70-year-lifetime exposure period, and will not result in non-cancer health effects, it is considered a non-significant risk and no further review of all health impacts is required. If a project has a risk greater than one in a million, it must be further evaluated in order to determine acceptability. Factors that affect acceptability include the presence of controls on the rate of emissions, the location of the site in relation to residential areas and schools, and contaminants reductions in other media such as water. In general, projects with risks greater than one in a million, but less than ten in a million, are approved if other determining factors are acceptable, but projects with risks greater than ten in a million are not approved. Non-approved projects may be reevaluated if emissions are reduced thus reducing their risks.

On July 9, 2008, the BAAQMD Board adopted Regulation 6, Rule 3: Wood-burning Devices, which will reduce emissions that come from residential wood burning. This new rule restricts wood burning when air quality is unhealthy and wintertime Spare the Air Advisory is issued. The rule also requires that only cleaner burning EPA certified stoves and inserts be installed in new construction or remodels, including natural gas fireplaces. The regulation also places limits on excessive smoke, prohibits the burning of garbage and other harmful materials, and also requires the labeling of firewood and solid fuels sold within the Bay Area.

Air Quality Planning

Clean Air Plans

As discussed above BAAQMD, along with the other regional agencies (i.e., Association of Bay Area Governments and the Metropolitan Transportation Commission), has prepared the Ozone Attainment Plan to address the federal standard for ozone. A Carbon Monoxide Maintenance Plan was also prepared in 1994 (and approved by the U.S. EPA in 1998) to demonstrate how the federal carbon monoxide standard would be maintained.

The Bay Area Clean Air Plan was prepared in 1991 to address the more stringent requirements of the California Clean Air Act with respect to ozone. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter State air quality standards, as mandated by the California Clean Air Act. The plan was designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans addressing the California Clean Air Act are developed on a triennial basis, with the latest approved update to the plan developed in 2005 (i.e., *2005 Bay Area Ozone Strategy*). This plan included implementation of transportation control measures (TCMs) and programs such as *Spare the Air*. Some of these measures or programs rely on local governments for implementation.

BAAQMD is beginning a process to develop the 2009 Clean Air Plan per the requirements of the California Clean Air Act. The 2009 Clean Air Plan will include an update to the Ozone Strategy. The plan will also address PM_{10} and $PM_{2.5}$ as well as climate change. Adoption of the Plan is expected in 2009.

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. The most important is vehicle activity. BAAQMD uses population projections made by the Association of Bay Area Governments (ABAG) and vehicle use trends made by the Metropolitan Transportation Commission (MTC) to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When individual projects are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region. The 2005 Bay Area Ozone Strategy was developed using ABAG 2003 Projections.

The clean air planning efforts for ozone will also reduce PM_{10} and $PM_{2.5}$, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions (e.g., Winter Spare the Air alerts). SB 656 requires further action by CARB and air districts to reduce public exposure to PM_{10} and $PM_{2.5}$. Efforts identified by BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NOx and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. NOx emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter. The Bay Area experiences the highest PM_{10} and $PM_{2.5}$ in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest. It is illegal for Bay Area residents and businesses to burn wood or manufactured fire logs in fireplaces, wood stoves and inserts, pellet stoves, and outdoor fire-pits on nights where BAAQMD declares a Spare the Air alert in winter. Building permits issued after January 1, 2009 may not permit conventional fireplaces, non-U.S. EPA certified woodstoves, and/or fireplace inserts. Natural gas fueled fireplaces are allowed.

BAAQMD CARE Program

BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area (*see http://www.baaqmd.gov/CARE/*). The program examines TAC emissions from point sources, area sources and on-road (e.g., cars and trucks) and off-road (e.g., construction equipment, trains, and aircraft) mobile sources with an emphasis on diesel particulate matter (DPM), which is the major contributor to airborne health risk in California. The goal is to identify areas with high emissions of TACs that have sensitive populations nearby and then use that information to guide policies, regulations, incentive funding, and other programs to reduce exposures to the sensitive populations.

In Phase 1 of the program, a 2-kilometer by 2-kilometer gridded inventory of TAC emissions was developed for the year 2000. The data were analyzed and then updated to include the most recent 2005 emission data. This emissions inventory was risk-weighted to reflect the differences in potency of the various TACs. For example, benzene has far higher cancer potency than many other compounds such as MTBE. While DPM is not as potent as benzene, the emissions are much more prevalent. The Phase 1 report documents results and presents the emissions inventory along with demographics regarding sensitive populations and asthma hospitalization rates for children (BAAQMD 2006). The Phase I study identifies diesel emissions from heavy-duty trucks as a major source of TAC emissions and identifies programs available to reduce these emissions. New (model 2007 or newer) trucks have much lower emission rates. However, turnover of the fleet will only slowly reduce these emissions as trucks tend to be in place on roadways for many years. The Phase I study identifies the high cost of targeting BAAQMD funding mechanisms to reduce these emissions.

In Phase II of the CARE program, BAAQMD is performing regional and local-scale modeling to determine the significant sources of DPM and other TAC emissions locally in the priority communities as well as for the entire Bay Area. The BAAQMD has partnered with CARB, the Port of Oakland, Pacific Institute, West Oakland Environmental Indicators Project, and the railroads to prepare specific health risk assessments.

One of highlights of the CARE program is the development of the Mitigation Action Plan where risk reduction activities are focused on the most at-risk communities. This plan identified 6 different at-risk communities that would benefit from targeted mitigation that were based on TAC emissions and presence of sensitive receptor groups. One of the six communities is San José. The mitigation action plan calls for the following:

- Allocating grant and incentives to the priority communities;
- Conducting outreach efforts in these communities to solicit and gain feedback from the community as how best to address and reduce TAC emissions;
- Working with local city and county health departments to reduce TAC emissions in these communities;
- Developing local land use guidance to assist city and county planners, community

members, and developers in assessing risks from land use projects and exposure to mobile and stationary sources of TAC emissions (note that this guidance is likely to be included as part of a major update to the BAAQMD's CEQA Guidelines);

- Developing rules and regulations that would require reduction of TAC emissions from significant sources.

In Phase III, BAAQMD plans to conduct an extensive exposure assessment to identify and rank the communities as to their potential TAC exposures and determine the types of activities that places them at highest risk. BAAQMD will also pursue additional mitigations and attempt to develop a metric to measure the effectiveness of these measures.

San José General Plan

The San José General Plan includes the following policies intended to control or reduce air pollution impacts:

- *Air Quality Policy 1* states that the City should take into consideration the cumulative air quality impacts from proposed developments and should establish and enforce appropriate land uses and regulations to reduce air pollution consistent with the region's Clean Air Plan and State law.

- *Air Quality Policy 2* states that expansion and improvement of public transportation services and facilities should be promoted, where appropriate, to both encourage energy conservation and reduce air pollution.

- *Air Quality Policy 3* states the City should urge effective regulation of those sources of air pollution, both inside and outside of San José, which affect air quality. In particular, the City should support Federal and State regulations to improve automobile emission controls.

- *Air Quality Policy 4* the City should foster educational programs about air pollution problems and their solutions.

- *Air Quality Policy 5* states that in order to reduce vehicle miles traveled and traffic congestion, new development within 1,000 feet of an existing or planned transit station should be designed to encourage the usage of public transit and minimize the dependence on the automobile through the application of site design guidelines.

- *Air Quality Policy 6* states City should continue to actively enforce its ozone-depleting compound ordinance and supporting policy to ban the use of chlorofluorcarbon compounds (CFCs) in packaging and in building construction and remodeling to help reduce damage to the global atmospheric ozone layer. The City may consider adopting other policies or ordinances to reinforce this effort.

The following Energy Conservation and Transportation policies and programs included in the General Plan would also help improve air quality:

- *Energy Policy 1* states that the City should promote development in areas served by public transit and other existing services. Higher residential densities should be encouraged to locate in areas served by primary public transit routes and close to major employment centers.

- *Energy Policy 2* states that decisions on land use should consider the proximity of industrial and commercial uses to major residential areas in order to reduce the energy used for commuting.

- *Energy Policy 3* states public facilities should be encouraged to locate in areas easily served by public transportation.

- *Transportation, Pedestrian Facilities, Policy 17* states that pedestrian travel should be encouraged as a mode of movement between residential and non-residential areas throughout the City and in activity areas.

- *Transportation, Pedestrian Facilities, Policy 19* states that the City should encourage walking, bicycling, and public transportation as preferred modes of transportation.

- *Transportation, Pedestrian Facilities, Policy 23* states that each land use has different pedestrian needs. Street and sidewalk designs should relate to the function of the adjoining land use(s) and transit access points.

- *Transportation, Transportation Systems Management/Transportation Demand Management, Policy 28* states that the City should promote participation and implementation of appropriate Transportation Demand Management measures such as carpooling and vanpooling, preferential parking and staggered work hours/flextime, as well as bicycling and walking, by all employers.

- *Transportation, Bicycling, Policy 51* states that the City should develop a safe, direct, and well-maintained transportation bicycle network linking residences, employment centers, schools, parks and transit facilities and should promote bicycling as an alternative mode of transportation for commuting as well as for recreation.

- *Transportation, Bicycle, Policy 53* states that priority improvements to the Transportation Bicycle Network should include: bike routes linking light rail stations to nearby neighborhoods, bike paths along designated trails and pathway corridors, and bike paths linking residential areas to major employment centers.

- *Hazardous Waste Management Policy 5* states all proposals for hazardous waste facilities shall be consistent with the plans and policies of air and water quality regulatory agencies (i.e., Air Quality Management District, and the Regional Water Quality Control Board and this City).

BAAQMD CEQA Guidelines

BAAQMD has prepared CEQA Guidelines to assist lead agencies, analysts, project proponents, and other interested parties in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. The guidelines recommend procedures for evaluating projects or plans and thresholds to determine whether the impacts are significant. These guidelines also provide direction for identifying measures to mitigate impacts. The current guidelines (as of this writing) were last updated in 1999. BAAQMD is currently updating these guidelines and plans to adopt new guidelines by late summer 2009.

BAAQMD CEQA Guidelines recommend significance thresholds as follows:

- Construction Impacts. BAAQMD normally considers on-site construction-related emissions as short-term in duration. PM_{10}, caused by onsite dust generation, is the pollutant of greatest concern. Other emissions from construction equipment are included in emission inventories that are the basis for regional air quality planning. The BAAQMD CEQA Guidelines identify feasible control measures for emissions of PM_{10} that would greatly reduce the impacts from construction activities. Under the guidelines, proper incorporation of these measures would result in less than significant construction-related impacts to air quality. Currently, there are no quantifiable significance thresholds for temporary construction impacts.

- Local Carbon Monoxide Concentrations. A project would have a significant adverse impact if it causes a violation of any air quality standard or contributes substantially to an existing or projected air quality violation. A significant impact to local air quality is defined under the guidelines as increased carbon monoxide concentrations at the closest sensitive receptors that cause a violation of the most stringent ambient standard for carbon monoxide (20 ppm for the one-hour averaging period, 9.0 ppm for the eight-hour averaging period).

- Total Emissions. A significant impact on air quality is defined under the guidelines as an increase in emissions of any ozone precursor pollutant (i.e., reactive organic gases or nitrogen oxides) or PM_{10} exceeding 80 pounds per day (or 15 tons/year). Total operational emissions include direct and indirect emissions.

- Toxic Air Contaminants. Exposing sensitive receptors or the public to substantial levels of toxic air contaminants would be considered significant. A significant impact is defined as follows: 1) the probability of contracting cancer for the Maximally

Exposed Individual (MEI) exceeds ten in one million; or 2) ground-level concentrations of non-carcinogenic toxic air contaminants would result in a hazard index greater than one for the MEI[2].

- Odors. Any project with the potential to expose members of the public frequently to objectionable odors would be considered significant. Analysis of potential odor impacts should be analyzed for both of the following situations: 1) sources of odorous emissions locating near existing receptors, and 2) receptors locating near existing odor sources. The BAAQMD CEQA Guidelines identify screening distances between potential odor sources and receptors that should be considered when evaluating odor impacts.

- Acute Hazardous Air Emissions or Accidental Releases. A determination of significance for potential impacts from accidental releases of acutely hazardous materials should be made in consultation with the local administering agency of the Risk Management Prevention Program (RMPP). This determination should be made for both projects using or storing acutely hazardous materials proposed near existing receptors as well as proposed projects locating near existing facilities that use or store these materials.

- Cumulative Impacts. Any project that would individually have a significant air quality impact is also considered to have a significant cumulative air quality impact. For other projects (i.e. General Plan amendments), the determination of a significant cumulative air quality impact should be based on the consistency of the project with the Bay Area's most recently adopted Clean Air Plan. In order to show consistency with the Clean Air Plan, the project must be consistent with the Countywide Plan (i.e., not requiring a General Plan Amendment) and the Countywide Plan must be found to be consistent with population and travel assumptions used to develop the Clean Air Plan. In addition, the project and Countywide Plan must incorporate the control measures contained in the Clean Air Plan. The Clean Air Plan uses the latest population and travel estimates developed by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). Projects located in a jurisdiction where the general plan is not consistent with the Clean Air Plan would be required to compare the impacts of the project along with recent past, present and reasonably foreseeable future projects to the thresholds described above.

Note: Although the effects of a pre-existing contaminated environment upon a proposed project may be beyond the scope of CEQA, BAAQMD recommends that impacts of existing sources of air pollution on proposed project occupants be analyzed. Such impacts include those from toxic air contaminants, odors, and dust.

[2] The hazard index is the ratio of the predicted concentration to the concentration in which that hazardous contaminant would cause an adverse health effect. These impacts are addressed at the MEI, which could be a sensitive receptor or a worker type exposure where the maximum exposure for each different receptor type is predicted.

The BAAQMD is currently developing a major update to their CEQA Guidelines. This update is expected to include new significance thresholds with expanded coverage to include construction activities. The BAAQMD is considering different thresholds for air pollution burdened areas, mainly to address TAC emissions and their associated health risks. The update will likely include guidance to evaluate greenhouse gas emissions that lead to global warming. Current schedules indicate that the updated guidelines will be adopted in mid- to late-summer 2009.

CARB Air Quality and Land Use Handbook

In 2005, CARB released the final version of the Air Quality and Land Use Handbook, which is intended to encourage local land use agencies to consider the risks from air pollution prior to making decisions that approve the siting of new sensitive receptors (e.g., homes or daycare centers) near sources of air pollution. Unlike industrial or stationary sources of air pollution, siting of new sensitive receptors does not require air quality permits, but could create air quality problems. The primary purpose of the document is to highlight the potential health impacts associated with close proximity to common air pollution sources and to have those issues considered in the planning process. CARB makes recommendations regarding the siting of new sensitive land uses near freeways, truck distribution centers, dry cleaners, gasoline dispensing stations, and other air pollution sources. CARB acknowledges that land use agencies have to balance other siting considerations such as housing and transportation needs, economic development priorities and other quality of life issues. These "advisory" recommendations, summarized in Table 2, are based primarily on modeling information and may not be entirely reflective of conditions in San José. The siting of new sensitive land uses within these advisory distances may be possible, but only after site-specific studies are conducted to identify the actual health risks.

<u>Freeways or Busy Arterials</u>

Interstate 280, Interstate 680, Interstate 880, U.S. 101, State Routes 17, 82, 85, 87 and 237 are the primary freeways that run through San José. In addition, there are several large expressways running through San José. Many of the freeway segments in San José carry more than 100,000 daily traffic trips. All of the expressways in San José have less than 50,000 daily traffic trips. CARB recommends that land use decisions avoid placing new sensitive receptors near freeways or busy arterials. CARB has recommended that new sensitive land uses should avoid being placed within 500 feet of freeways and urban roadways with 100,000 or more vehicles per day.

TABLE 2 CARB RECOMMENDED SETBACK DISTANCES FOR COMMON SOURCES OF TOXIC AIR CONTAMINANTS

Source Type	Recommended Buffer Distance
Freeways and busy arterial roadways[1]	- 500 feet
Distribution Centers with 100 or more daily truck trips or 40 daily truck trips that use refrigeration units	- 1,000 feet
Rail Yards	- 1,000 feet from a major service or maintenance rail yard (consider possible siting limitations and mitigation approaches within one mile)
Dry cleaners (onsite dry cleaning)	- 300 feet for any dry cleaning operation - at least 500 feet for operations with 2 or more machines
Large gasoline stations (i.e. over 3.6 million gallons pumped per year)	- 50 feet for typical gas stations - up to 300 feet for large gas stations
Chrome Plating Operations	- 1,000 feet from a chrome plating operation that emits hexavalent chromium

Notes: [1] For roadways with 100,000 daily trips.

A review of air pollution studies by CARB indicates that residing close to freeways or busy roadways may result in adverse health effects beyond those typically found in urban areas. Several studies found an association between adverse non-cancer health effects (e.g., asthma) and living or attending school near heavily traveled urban roadways. Many of these studies focused on children and developed causal links. That is they have linked proximity of the freeway with hospital or medical visits. However, these proximity studies (and others) found that the roadway and truck traffic densities were key factors affecting the strength of association with adverse health impacts. For urban roadways, the association of traffic-related emissions with adverse health impacts was generally strongest between 300 and 1,000 feet.

Proximity to freeways increases cancer risk and exposure to particulate matter. Diesel particulate matter, or DPM, poses the greatest cancer risk from roadways. On average, CARB reports that DPM represents about 70 percent of the potential cancer risk from vehicle travel. The number and type of diesel-fueled vehicles on any roadway is key in understanding the potential cancer risks. Benzene and 1,3 butadiene are carcinogenic toxic air contaminants that are also emitted from motor vehicles and contribute to potential cancer risks. There are other contaminants emitted from motor vehicles, but their potential risks are much smaller.

CARB reviewed studies that found measured air pollution concentrations from motor vehicles drop off dramatically between the source and 500 feet. These studies were consistent with CARB air quality modeling and risk analyses performed for freeways. The estimated risk from DPM exposure was found to vary substantially due to meteorology, where typical downwind areas had much higher risk than upwind areas. Freeways with low truck volumes had lower risks. CARB based their 500-foot buffer recommendation on review of the studies and air dispersion modeling. CARB's modeling was based on year 2000 truck and automobile information that included higher DPM emissions rates. New vehicle standards, diesel fuel reformulation, and CARB adopted Diesel Risk Reduction Measures has resulted in lower potential cancer risks near freeways.

Truck Distribution Centers

CARB identified proximity to truck distribution centers or warehouses as a potential source of DPM exposure. The range of exposure for these centers varies greatly, based on size, number of diesel trucks, types of trucks, on-site diesel equipment, and use of auxiliary diesel-powered equipment (e.g., diesel-powered transport refrigeration units). CARB modeled a distribution center that had over 40 transport refrigeration units (TRUs), each loading and unloading for one hour each day, seven days per week. CARB modeling results for based on year 2000 truck emission rates indicate that significant cancer risks could extend out about 500 meters or about 1,600 feet from such a facility. CARB recommends a buffer of 1,000 feet between large distribution centers and sensitive receptors. Buffers for smaller facilities should be considered on a case-by-case basis that depends on the size, activity and types of trucks or equipment used at the facilities.

Dry Cleaning Operations

Perchlorethylene (Perc) is a solvent used commonly in dry cleaning. Perc is a TAC, because it has the potential to cause cancer. Other non-cancer health effects can occur at higher exposures. Dry cleaning operations are typically located in urban areas. Some of these operations occur in the same buildings that have residential occupants. CARB reviewed air-sampling studies and found a wide range of exposures, depending on the type and maintenance of dry cleaning equipment. For exposures in the same building, a well maintained state of the art system results in cancer risks in the range of 10 in one million, while a poorly maintained machine with leaks can have risk much higher. The risk created by dry cleaning operations that use Perc is dependent on the amount of Perc emissions, proximity of sensitive receptors to the source, and how the emissions are dispersed (local meteorology).

Most dry cleaning operations in California have one dry cleaning machine per facility. Some larger facilities may have two machines. The South Coast Air Quality

Management District estimated an average risk of 80 in one million for residential exposures at 75 feet from a facility (SCAQMD 2002). The range of risks found at 75 feet ranges from 25 to 140 in one million. Based on these estimates, CARB recommended a buffer of 300 feet between new sensitive land uses and any dry cleaning operation (i.e., a facility that conducts dry cleaning using Perc on site). An increased buffer of 500 feet was recommended for any facility that has two machines.

As a result of identifying Perc as a TAC, CARB developed an Air Toxic Control Measure (ATCM) addressing Perc emissions from dry cleaning operations in 1993. A study conducted by CARB staff in 2003 found that emissions had been reduced by 70 percent, but further reductions were achievable. In 2007, CARB approved amendments to the Dry Cleaning ATCM and the adoption of requirements for Perc manufacturers and distributors. The amendments, which became State law in December 2007, will over time phase out the use of Perc dry cleaning machines and related equipment by 2023. CARB has identified alternative cleaning methods to replace perc that include water-based cleaning processes, use of liquid CO_2, alternative solvents, and use of other newly developed products and technology. The sale or lease of any new Perc dry cleaning equipment was unlawful beginning in 2008. Beginning July 2010, all Perc machines at buildings co-located with residences must be removed and any machine over 15 years of age cannot be operated. The anticipated exposures from Perc will be reduced significantly as a result of the new ATCM amendments that affect dry cleaning operations. Cancer risks, upon which CARB based their recommended buffers, are computed over a 70-year almost continuous exposure. The Perc exposures would be reduced by 80% or more as a result of the new ACTM amendments. As a result, siting of new sensitive receptors may be allowed within 100 feet of these operations. It should be noted that many dry cleaners contract to have the cleaning done off site.

Gasoline Dispensing Stations

Benzene, a potent carcinogen, is released into the air during motor vehicle refueling. Most benzene is emitted from motor vehicle and motor vehicle related activity. Refueling results in a small fraction of overall benzene emissions. However, gasoline-dispensing stations can have high-localized emissions as benzene is part of the volatile gases that evaporate into the atmosphere during refueling. Benzene emissions have been reduced by over 75% in California since 1990.

Some gasoline dispensing stations are located in areas close to residential areas. CARB estimates that the benzene emissions from the largest gasoline stations may result in elevated health risks in the local proximity. Well maintained vapor recovery systems, which are required in the Bay Area, can decrease benzene emissions by 90%. CARB reported that almost all gasoline dispensing stations in California had an annual throughput of 2.4 million gallons per year or less. The highest four percent had an average annual throughout of 3.6 million gallons per year. These were very large gasoline dispensing stations. CARB found the cancer risks associated with these stations to be about 10 in one million at a distance of 50 feet. Fueling stations throughout California are currently upgrading vapor recovery systems on fuel pumps to reduce VOC emissions that contribute to ozone formation. These systems will also reduce benzene emissions. Although CARB has allowed local air districts to exercise discretion in requiring stations to meet the April 2009 deadline, approximately 80 percent of stations have either complied or are in the process of complying with these new requirements.

Rail Yards

Rail yards are a major source of DPM emissions from train, loading/unloading diesel-powered equipment, and truck traffic. Rail yards tend to include inter-modal facilities. Diesel particulate matter emitted from train locomotives and trucks are the primary pollutant of concern. CARB recommends a siting setback of at least 1,000 feet from large active rail yards. The recommendation is general and does not distinguish between different types of rail yards in California or the prevailing dispersion conditions that are site specific.

To date, CARB has evaluated the public health risks associated with many different yards covered in the agreement with the railroads. Originally, potential cancer risk was evaluated by CARB for the Union Pacific rail yard in Roseville, CA. Comprehensive emissions analysis and air dispersion modeling were conducted to identify potential cancer risks. The analysis identified a large area of elevated potential cancer risk associated with the rail yard operations. Much of the emissions came from locomotive operations. Based on this analysis, the CARB *Air Quality and Land Use Handbook* recommended that communities "avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard" and "within one mile of a rail yard, consider possible siting limitations and mitigation approaches."

The Roseville rail yard is one of the largest service and maintenance yards along the Pacific Coast. The CARB handbook indicates the rail yard emitted about 25 tons of DPM per year. CARB recently evaluated the BNSF Railways rail yard in Richmond, CA and found that emissions were less than one-fifth those of the Roseville rail yard or less than five tons per year[3]. There is no available information regarding the activity at the Milpitas Yard that would provide some comparison to the Richmond or Roseville yards. The Richmond study did show existing elevated cancer risks of 10 in one million or greater extending 3,000 to 5,000 from the rail yard. These risks are expected to be reduced in future years. CARB has not identified any major rail yards in San Jose. However, Caltrain does have a maintenance facility located near West Taylor Street.

IV EXISTING AIR QUALITY CONDITIONS

Air quality is affected by the rate of pollutant emissions and by meteorological conditions such as wind speed, atmospheric stability, and mixing height, all of which affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

[3] CARB. 2007. Health Risk Assessment for the BNSF Railway Richmond Railyard, Stationary Source Division. November 20.

Criteria Air Pollutants

Bay Area

The San Francisco Bay Area annually exceeds the California Ambient Air Quality Standard for one-hour ozone, 8-hour ozone and 24-hour average PM_{10} levels. Throughout the Bay Area, the previous national one-hour ozone standard (revoked in 2005) was exceeded at one or more stations from zero to three days annually over the last five years and the new 8-hour ozone standard was exceeded from zero to 12 days annually. The number of days that, on an annual basis, exceeded the more stringent one-hour State ozone standard at one or more stations in the Bay Area ranged from 7 to 22 days over the last five years. The NAAQS for PM_{10} is not exceeded anywhere in the Bay Area, but the more stringent state standard is routinely exceeded in the Bay Area and most other parts of the state. The new NAAQS for $PM_{2.5}$ is routinely exceeded at monitors in Vallejo and San José. As a result, U.S. EPA acted to designate the entire region as nonattainment for $PM_{2.5}$. Some monitors in the Bay Area exceed the State annual $PM_{2.5}$ standard. No other air quality standards are exceeded in the Bay Area. As a result, the San Francisco Bay region is considered nonattainment for ground-level ozone and $PM_{2.5}$ at both the State and Federal level, and nonattainment for PM_{10} at the State level only. The San Francisco Bay region currently complies with State and Federal standards for all other air pollutants (e.g., carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead).

Progress has been made in reducing ozone levels. Over the last 20 years, the peak one-hour concentrations throughout the Bay Area have declined more than 20 percent. The number of days that standards were exceeded shows a similar trend. The trend has not been consistently downward. Concentrations and number of exceedances generally declined from 1980 to 1994 but increased sharply from 1995 to 1998. Levels in 1999 through 2005 have declined from levels in 1995. There were more exceedances in 2006, mainly due to an abnormal extended heat wave that occurred in July. Indications are that the Bay Area will attain NAAQS in a timely manner; however, continued progress is required to meet the more stringent State ozone standards.

PM_{10} and $PM_{2.5}$ are the other pollutants of concern since the area exceeds the State ambient air quality standards. Since PM_{10} sampling in the Bay Area began in 1988, mean annual levels have decreased by about 25 percent. The calculated number of annual exceedances of the 24-hour standard has decreased from a high of over 100 days in 1991 to about 50 days in 2001. The national 24-hour PM_{10} standard was last exceeded in 1991.

Carbon monoxide concentrations have declined substantially over the last 20 years. Current peak levels in the Bay Area are less than half of 1980 levels and neither state nor national standards have been exceeded since 1991. As a result, the area has attained the standard. Much of the decline is attributed to cleaner motor vehicles and use of cleaner burning fuels.

San José

In 2007, the BAAQMD operated a network of 27 permanent monitoring stations in the Bay Area. In addition, CARB operated one station. These stations monitored air pollutant levels continuously. The BAAQMD operates a station in San José on Jackson Street. Previously, a station on Tully Road was operated to monitor PM_{10}. The station was closed in 2007 because the site no longer met EPA siting criteria for PM_{10} due to development near the site. A summary of air quality monitoring data is shown in Table 3. The values in the table are the highest air pollutant levels measured at these stations over the past 5 years (2003-2007). In the most recent 3 years, this site recorded one exceedance of the national 8-hour ozone standard, 32 exceedances of the revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, and seven exceedances of the California 24-hour PM_{10} standard. Air quality conditions in San José are described for each criteria air pollutant in Table 3. The number of days that measured concentrations exceeded the NAAQS or CAAQS are given in Table 4.

Ozone. Over the last five years in San José, NAAQS for 8-hour ozone was exceeded once in 2006. The Bay Area, as a whole, exceeded the 8-hour ozone NAAQS on 0 to 12 days annually and the 8-hour CAAQS on 9 to 22 days (statistics kept since 2005). In San José, the 1-hour State standard for ozone was exceeded on 1 to 5 days annually while that same standard was exceeded on 4 to 19 days annually in the Bay Area as a whole. Most exceedances of ozone standard in the Bay Area occur in downwind portions of the basin, such as Livermore, Concord, and Gilroy.

Carbon Monoxide. Highest carbon monoxide concentrations measured in San José have been well below the national and state ambient standards. Since the primary source of carbon monoxide in is automobiles, highest concentrations would be found near congested roadways that carry large volumes of traffic. Carbon monoxide emitted from a vehicle is highest near the origin of a trip and considerably lower when vehicles are operating in a hot-stabilized mode (usually five to ten minutes into a trip). However, this is different for vehicles of different ages, where older cars require a longer time to reach a hot-stabilized running mode. A vehicle sitting idle for over an hour is normally considered to return to a cold-start mode. Vehicles near the origin of a trip are considered to be in cold-start mode. Vehicle operation on freeways is usually in a hot-stabilized mode so the individual emission rates are much lower than those encountered on arterial roadways leading to the freeway.

TABLE 3 HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS

Pollutant	Average Time	Measured Air Pollutant Levels				
		2003	**2004**	**2005**	**2006**	**2007**
SAN JOSE						
Ozone (O_3)	1-Hour	**0.12** ppm	0.09 ppm	**0.11** ppm	**0.12** ppm	0.08 ppm
	8-Hour	0.08 ppm	0.07 ppm	0.08 ppm	0.09 ppm	0.07 ppm
Carbon Monoxide (CO)	1-Hour	5.5 ppm	4.4 ppm	4.3 ppm	4.1 ppm	3.5 ppm
	8-Hour	4.0 ppm	3.0 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	NA	0.07 ppm	0.07 ppm	0.07 ppm	0.07 ppm
	Annual	NA	NA	0.019 ppm	0.018 ppm	0.017 ppm
Respirable Particulate Matter (PM_{10})	24-Hour	**60 ug/m^3**	**58 ug/m^3**	**54 ug/m^3**	**73 ug/m^3**	**69 ug/m^3**
	Annual	**23 ug/m^3**	**23 ug/m^3**	**22 ug/m^3**	**21 ug/m^3**	**22 ug/m^3**
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	56 ug/m^3	52 ug/m^3	55 ug/m^3	**64 ug/m^3**	**58 ug/m^3**
	Annual	12 ug/m^3	12 ug/m^3	12 ug/m^3	11 ug/m^3	11 ug/m^3
BAY AREA (Basin Summary)						
Ozone (O_3)	1-Hour	**0.12** ppm	**0.11** ppm	**0.12** ppm	**0.12** ppm	**0.12** ppm
	8-Hour	**0.10** ppm	**0.08** ppm	**0.09** ppm	**0.11 ppm**	**0.09 ppm**
Carbon Monoxide (CO)	8-Hour	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.021ppm	0.019ppm	0.019ppm	0.018ppm	0.017ppm
Respirable Particulate Matter (PM_{10})	1-Hour	**60** ug/m^3	**65** ug/m^3	**81** ug/m^3	**73** ug/m^3	**78** ug/m^3
	Annual	**25** ug/m^3	**26** ug/m^3	**24** ug/m^3	**23** ug/m^3	**26** ug/m^3
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	56 ug/m^3	52 ug/m^3	55 ug/m^3	**75** ug/m^3	**58** ug/m^3
	Annual	12 ug/m^3	12 ug/m^3	12 ug/m^3	11 ug/m^3	11 ug/m^3

Source: BAAQMD, Air Pollution Summaries 2003 - 2007

Note: ppm = parts per million

Values reported in bold exceed ambient air quality standard

NA = data not available

TABLE 4 SUMMARY OF DAYS EXCEEDING AMBIENT AIR QUALITY STANDARDS

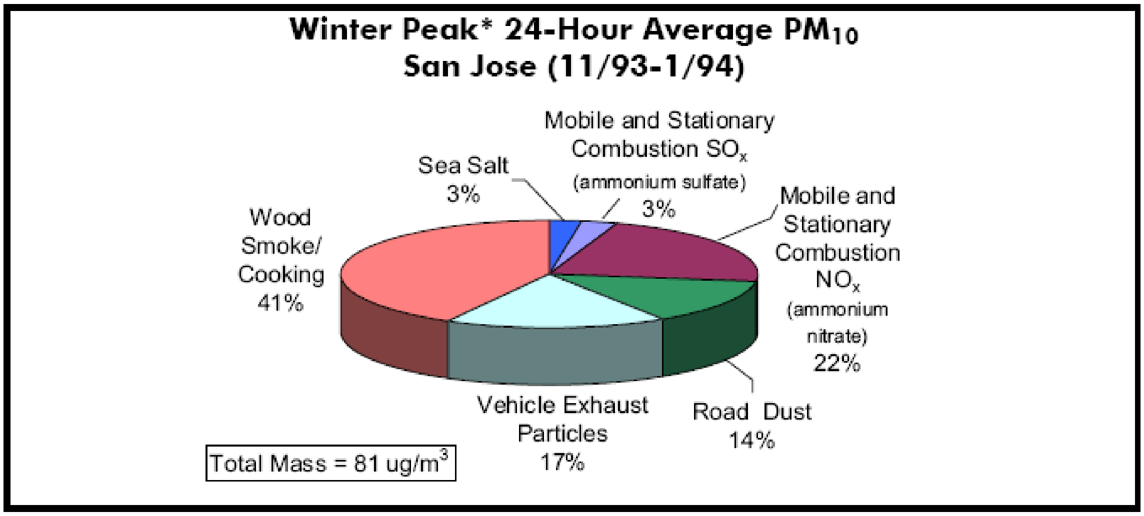
Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2003	2004	2005	2006	2007
Ozone (O_3.)	NAAQS 1-hr	San Jose	0	0	X	X	X
		BAY AREA	1	0	X	X	X
	NAAQS 8-hr	San Jose	0	0	0	1	0
		BAY AREA	7	0	1	12	1
	CAAQS 1-hr	San Jose	4	0	1	5	0
		BAY AREA	19	7	9	18	4
	CAAQS 8-hr	San Jose	--	--	1	5	5
		BAY AREA	--	--	9	22	9
Respirable Particulate Matter (PM_{10})	NAAQS 24-hr	San Jose	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	San Jose	2	3	2	2	3
		BAY AREA	6	7	6	15	4
Fine Particulate Matter ($PM_{2..5}$)	NAAQS 24-hr	San Jose	0	0	0	6	9
		BAY AREA	0	1	0	10	14
All Other (CO, NO_2, Lead, SO_2)	All Other	San Jose	0	0	0	0	0
		BAY AREA	0	0	0	0	0

Source: BAAQMD, Bay Area Air Pollution Summaries 2003-2007

PM_{10} and $PM_{2.5}$. Measured exceedances of the State PM_{10} standards occurred on 12 separate sampling days over the last five years in San José (two to three times per year). Statistics on the new NAAQS for $PM_{2.5}$ have only been kept since 2006. Fifteen exceedances have occurred in San Jose since then (2006 – 2007). PM_{10} and $PM_{2.5}$ are only measured once every sixth day at the San José monitoring station (most monitoring stations measure particulates every sixth day according to a national schedule). Many stations in the Bay Area reported exceedances of the State standard on the similar fall/winter days as reported in San José. This indicates a regional air quality problem. The primary sources of these pollutants are wood smoke, traffic, and diesel-powered equipment. Meteorological conditions that are common during this time of the year result in calm winds and strong surface-based inversions that trap pollutants near the surface. The buildup of these pollutants is greatest during the evenings and early morning periods. The high levels of PM_{10} and $PM_{2.5}$ result in not only health effects, but also reduced visibility.

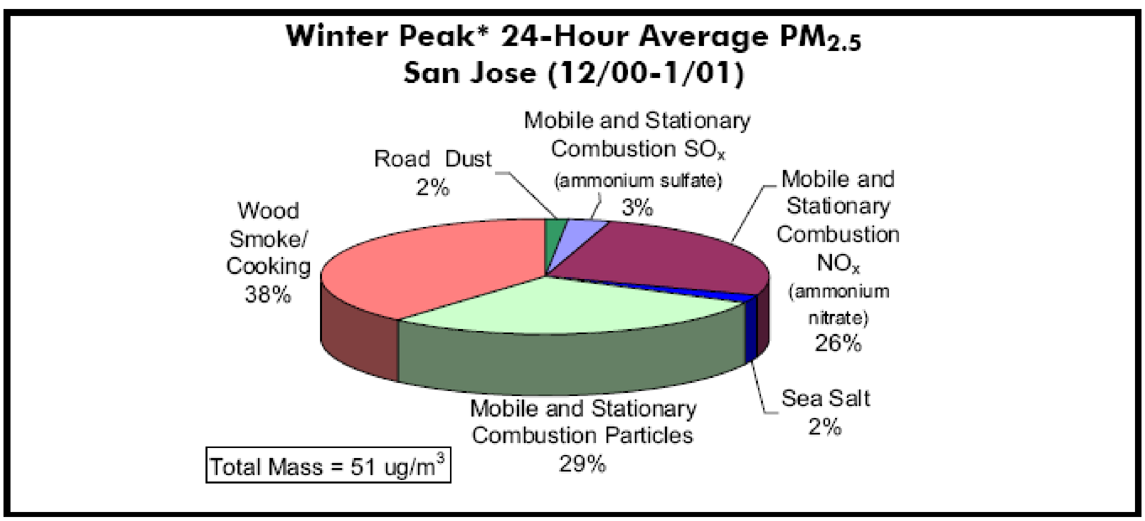
Figures 2 and 3 illustrate the sources of PM_{10} and $PM_{2.5}$ during the winter in San José. The data are from the source apportionment analysis conducted by the BAAQMD during two special studies. During the winter in San José high PM concentrations are associated with high levels of wood smoke, primarily from residential wood combustion, and cooking. NOx emitted from mobile and stationary combustion sources, in combination with ammonia, contributes about one-fourth of the PM levels in the form of ammonium nitrate. Particle emissions from mobile and stationary combustion sources are also a major contributor to $PM_{2.5}$. Road dust is a significant contributor to PM_{10}, but not $PM_{2.5}$.

FIGURE 2 PM_{10} SOURCES DURING WINTER IN SAN JOSÉ



* Average of days with PM_{10} > 50 ug/m3

FIGURE 3 $PM_{2.5}$ SOURCES DURING WINTER IN SAN JOSÉ



* Average of days with $PM_{2.5}$ > 40 ug/m3

Other Pollutants. Other criteria pollutants, such as nitrogen dioxide, sulfur dioxide, and lead have always been measured at low levels in San José and should not pose a major air pollution concern in the city.

Toxic Air Contaminants

Concentrations of air toxics throughout the Bay Area are measured by BAAQMD and CARB. Typical compounds measured by BAAQMD include benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl tert buytl ether (MTBE), methylene chloride, acetaldehyde, perchloroethylene, toluene, 1,3-butadiene, formaldehyde, and PAH's. Since the ambient concentrations of these toxic air contaminants are very small, they are measured and reported as part per billion (ppb) or nanograms per cubic meter (ng/m^3) on a volume basis. Table 5 contains a summary of the measured concentrations at the Jackson Street monitoring station in San José of the ten compounds posing the greatest known health risk in California. These data are for 2006 for all compounds except for carbon tetrachloride which is for measurements made in 2003. Also included in Table 5 are the overall Bay Area monitoring results for 2006 along with the calculated cancer risk. The information used to develop this table was obtained from the California Air Resources Board 2008 Almanac of Emissions and Air Quality. Risks associated with DPM were calculated for 2000, based on modeling information from CARB. It should be noted that there are no established methods for directly measuring DPM in ambient air.

Table 5 reports concentrations of air toxic contaminants that pose the greatest health risk. The health risk reported in the table reflects only those compounds listed in the table. There may be other significant compounds that are not monitored or may contribute to health risk that are not included. As can be seen from Table 5, the maximum measured toxic air contaminant concentrations in San José are similar or slightly lower than overall Bay Area values.

TABLE 5 SUMMARY OF MOST RECENT MEASURED TOXIC AIR CONTAMINANT CONCENTRATIONS

Toxic Contaminant	Concentration (in ppb) San José 2006	Concentration (in ppb) Bay Area 2006	Cancer Risk (chance in one million) Bay Area
Gaseous TACs - Annual Concentration (in ppb)			
1,3-Butadiene	0.09	0.07	26
Benzene	0.38	0.33	30
Carbon Tetrachloride*	0.10	0.10	25
Formaldehyde	1.88	1.59	12
para-Dichlorobenzene	0.03	0.15	10
Acetaldehyde	0.82	0.66	3
Perchloroethylene	0.03	0.03	1
Methylene Chloride	0.14	0.16	<1
Particulate TACs - Annual Concentration in ng/m^3			
Chromium (hexavalent)	0.05	0.06	9
Diesel Particulate Matter (DPM)	--	--	480.0**
Total for all TACs excluding diesel particulate matter			**116**

Source: (1) Air Resources Board Almanac 2008 - Chapter 5

* Carbon tetrachloride values are for 2003.

** Risk in reported for 2000, but expected to be much lower in 2006.

PPB = parts per billion; ng/m3 = nanograms of contaminant per cubic meter of air

Emissions of the major air toxic contaminants are as follows:

- Diesel particulate matter or DPM: Heavy-duty trucks, buses, construction equipment, and electrical generation. DPM by far makes up the greatest inhalation health risk in the Bay Area.
- 1,3 Butadiene: Primarily on-road motor vehicles. Like carbon monoxide, older model vehicles without adequate catalytic converters have much higher emission rates.
- Benzene: Primarily on-road motor vehicles and gasoline evaporation.
- Carbon tetrachloride: Primary sources of this include chemical and allied product manufacturers and petroleum refineries.
- Formaldehyde and Acetaldehyde: Emitted both directly and indirectly into the atmosphere. It is primarily formed through photochemical oxidation in the atmosphere with elevated levels of ozone and nitrogen oxides. Sources of emissions leading to elevated levels of these compounds are fuel combustion from a variety of mobile and stationary sources. A primary source is from motor vehicle operations.
- para-Dichlorobenzene: Primarily emitted from area-wide sources from consumer products such as non-aerosol insect repellents and solid/gel air fresheners. The CARB adopted an Air Toxics Control Measure in 2004 to prohibit the use of para-dichlorobenzene in products, with a complete ban on sale of products by December 31, 2006.
- Methylene Chloride – Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the ingredient in many paint stripping formulations.
- Perchloroethylene: Perchloroethylene is used as a solvent, primarily in dry cleaning operations. It is also used in degreasing operations, paints and coating, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents.

Bay Area cancer risks represents the number of excess cancer cases per million people based on a lifetime exposure (70-year) to the annual average toxic air contaminant concentration in the Bay Area. The cancer risk reported in Table 5 is based on those annual averages reported and changes from year-to-year based on current monitoring results. CARB published maps showing the 2001 total inhalation health risk in the State. According to these maps, the health risk in San José ranged from above 500 to above 750 case per million, which is above the average for the Bay Area (see Figure 4) . More densely urban areas, such as San Francisco, Oakland and San José have higher risks of up to 1,000 in a million. With all diesel risk reduction measures implemented, CARB predicts that the overall inhalation health risk in San José would decrease to less than 500 cases per million by 2010 (see Figure 4). It is important to note the following regarding air toxic contaminants: (1) The health risks are based on the average concentration for the entire region and the health risk at individual locations will vary considerably; and (2) since 1990, average concentrations of toxic air contaminants and the associated health risks have been reduced (by 50 percent or more for many compounds).

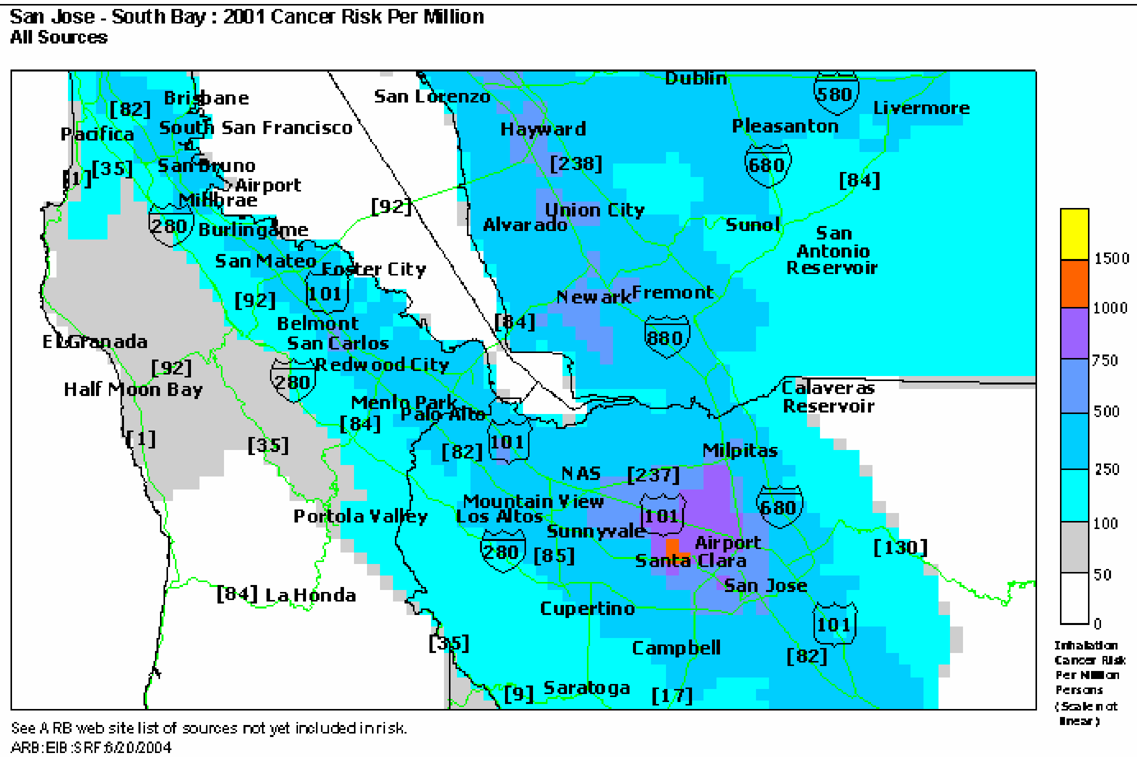
Attainment Status

Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. Areas that do not violate ambient air quality standards are considered to have attained the standard. The Bay Area as a whole does not meet State or federal ambient air quality standards for ground level ozone and State standards for PM_{10} and $PM_{2.5}$. Table 6 describes the current attainment status of the Bay Area and San Jose with respect to the NAAQS and CAAQS.

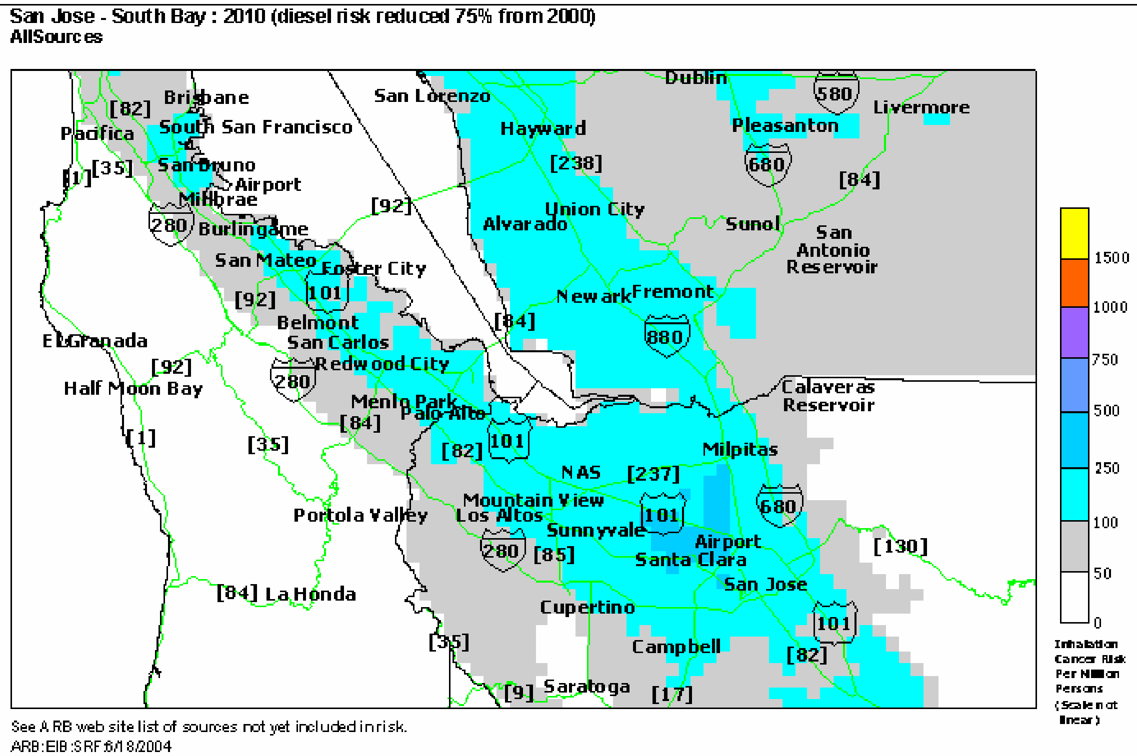
Under the Federal CAA, the U.S. EPA has classified the region as marginally nonattainment for the 8-hour ozone standard. EPA required the region to attain the standard by 2007. U.S. EPA has determined that the Bay Area has met this standard, but a formal redesignation request and maintenance plan would have to be submitted before redesignation could be made. In May 2008, U.S. EPA lowered the 8-hour ozone standard from 0.08 to 0.075 ppm. Final designations based upon the new 0.075 ppm standard will be made by March 2010. The BAAQMD is not likely to make a redesignation request for the older standard since that will be revoked after designations are made with the newer standard. The U.S. EPA recently designated the region as nonattainment for the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ as recent monitoring data indicate levels above the standard in San José and Vallejo. The U.S. EPA's action designated the entire Bay Area air basin nonattainment for the standard. The region has until 2012 to develop a plan to attain the standard and until 2014 to attain the standard. The Bay Area has met the CO standards for over a decade and is classified attainment maintenance by the US EPA. The US EPA grades the region unclassified for all other air pollutants, which include PM_{10}.

At the State level, the region is considered serious nonattainment for ground level ozone and nonattainment for PM_{10} and $PM_{2.5}$. California ambient air quality standards are more stringent than the national ambient air quality standards. The region is required to adopt plans on a triennial basis that show progress towards meeting the State ozone standard. The area is considered attainment or unclassified for all other pollutants.

FIGURE 4 MAPS SHOWING TOTAL ESTIMATED CANCER RISK IN SOUTH BAY AREA



2001 Estimated Cancer Risk



2010 Estimated Cancer Risk with Implementation of Diesel Risk Reduction Measures

TABLE 6 ATTAINMENT STATUS FOR BAY AREA AND SAN JOSÉ

Pollutant	Federal Status	State Status
Ozone (O_3) – 1-Hour Standard	Not Applicable	Serious Nonattainment
Ozone (O_3) – 8-Hour Standard	Marginal Nonattainment	Nonattainment
Ozone (O_3) – 1-Hour Standard	--	Serious Nonattainment
Respirable Particulate Matter (PM_{10}) 24-hour Standard	Unclassifiable/Attainment	Nonattainment
Respirable Particulate Matter (PM_{10}) Annual Standard	--	Nonattainment
Fine Particulate Matter ($PM_{2.5}$) 24-hour Standard	Nonattainment (effective in 2009)[1]	Not Applicable
Fine Particulate Matter ($PM_{2.5}$) Annual Standard	Attainment	Nonattainment
Carbon Monoxide (CO) 8-Hour Standard	Attainment/Maintenance	Attainment
Carbon Monoxide (CO) 1-Hour Standard	Attainment	Attainment
Nitrogen Dioxide (No_2) 1-Hour Standard	--	Attainment
Nitrogen Dioxide (No_2) 24-Hour Standard	Attainment	--
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates	--	Attainment
Lead	--	Attainment
Hydrogen Sulfide	--	Unclassified
Visibility Reducing Particles	--	Unclassified

[1] Note that the attainment designations were made in December 2008 under President Bush. Subsequently, President Obama ordered a freeze on all pending federal rules; therefore, the effective date of the designation is unknown at this time.

Existing Sources of Air Pollution

Sources of air pollution in and around San José are primarily traffic or on-road vehicles. Emissions inventories are updated for each county by CARB. Table 7 summarizes emissions for Santa Clara County and the Bay Area. Traffic accounts for about 40 to 50 percent of the emissions of ozone precursor pollutants (NOx and ROG). Area wide sources, which include construction activities, residential wood smoke, off-road travel, and agriculture, account for the greatest portion of PM_{10} emissions (about 80 percent). These sources account for over 50 percent of the $PM_{2.5}$ emissions. However, $PM_{2.5}$ is also formed from reactions of NOx and other gaseous air pollutants in the atmosphere.

TABLE 7 2006 AIR POLLUTANT EMISSIONS INVENTORY FOR OZONE PRECURSORS AND PARTICULATE MATTER

	Emissions (tons per day)			
	ROG	**NOx**	**PM_{10*}**	**$PM_{2.5}$**
SANTA CLARA COUNTY				
Stationary Source	11.84	8.82	2.73	1.83
Area-Wide Sources	21.36	4.59	43.58	11.58
Mobile Sources –- On-Road	31.00	51.07	2.40	1.68
Mobile Sources –- Off-Road	15.19	34.27	1.85	1.67
TOTAL (rounded)	81.05	98.75	50.55	16.76
BAY AREA				
Stationary Source	7.30	47.60	15.30	11.40
Area-Wide Sources	88.00	19.70	176.10	53.0
Mobile Sources –- On-Road	128.40	233.70	10.40	7.40
Mobile Sources –- Off-Road	79.40	191.10	11.10	9.90
TOTAL (rounded)	369.20	492.00	212.80	81.70

* PM_{10} includes $PM_{2.5}$

Source: California Air Resources Board (http://www.arb.ca.gov/ei/emissiondata.htm)

Mobile sources of air pollution make up a large portion of the emissions inventory for Santa Clara County. Mobile sources include traffic, boats, construction equipment, trains, and aircraft. Approximately 57 percent of the ROG and 86 percent of the NOx emitted in Santa Clara County are from mobile sources resulting primarily from traffic.

In recent years the City of San José and the Mineta San José International Airport (Airport) have implemented programs and infrastructure to reduce vehicle emissions. As part of the City's Green Vision, one of the 15-year goals is to ensure that 100 percent of public fleet vehicles run on alternative fuels. In 2007, 36 percent of the City's vehicles and equipment operated on alternative fuels. In 2003, a compressed natural gas (CNG) fueling station was opened at the Airport. The station was developed primarily for vehicles servicing the airport, but is also open to the public. The Airport has converted its entire bus fleet of airport shuttles from diesel to CNG, and about 25 percent of the Airport's fleet of vehicles are now using CNG. The Airport also has an Alternative Fuels Program (AFP) that provides incentives to tenants to convert their vehicles to CNG or other alternative, cleaner burning vehicles.

Stationary Sources

Excluding gas stations, dry cleaning facilities, print shops, and auto repair shops, CARB's emission inventory database (http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php) of stationary sources for 2006 lists about 450 facilities throughout San José.

There are also about 80 dry cleaner operations, many of which emit perchlorethylene, a solvent commonly used for dry cleaning. The largest stationary sources in San José, with emissions greater than 10 tons per year, are listed in Table 8. The largest stationary sources in San José are the SFPP[4], LP petroleum terminal facility (ROG), the San José/Santa Clara Water Pollution control facility (NOx) and Guadalupe Rubbish Disposal (PM_{10}). These individual sources not only generate emissions directly from the facilities but also from truck traffic associated with their operations. The locations of larger stationary air pollutant sources in San José are shown in Figure 5.

Toxic Air Contaminants

Emissions of toxic air contaminants from stationary sources in San José can be found in the most recent version of BAAQMD's annual Toxic Contaminant Control Report (see website http://www.baaqmd.gov/pmt/air_toxics/annual_reports/index.htm). A majority of these sources are dry cleaning facilities, which emit perchloroethylene. However, the most prevalent toxic contaminants in San José and Santa Clara County (excluding diesel particulate matter) are benzene and 1,3-Butadiene from mobile sources and formaldehyde that comes from a variety of sources. Other sources of toxic air contaminants include sanitary districts or landfills and manufacturing facilities. Table 9 summarizes the emissions of the top ten compounds causing the greatest health risk in the state for the Bay Area and Santa Clara County.

TABLE 8 SAN JOSE EMISSION SOURCES WITH MORE THAN 10 TONS PER YEAR OF ROG, NOX OR PM10

Facility Name	Address	ROG	NOx	PM_{10}
SFPP, LP	2150 Kruse Drive	46.8	0.0	0.0
Chevron Products Company	1020 Berryessa Street	36.3	0.0	0.0
Hubbell Lenoir City Inc	615 N King Road	28.4	0.0	0.1
San José/Santa Clara Water Pollution	700 Los Esteros Road	25.3	135.3	8.8
Mitico Metal Finishers, LLC	1291 Old Oakland Rd	20.4	0.0	0.0
Hitachi Global Storage Technology	5600 Cottle Road	16.8	9.2	1.2
City Of San José (Singleton Rd)	885 Singleton Road	14.4	3.7	0.6
Coast Oil Company	2075 Alum Rock Ave	12.0	0.0	0.0
Guadalupe Rubbish Disposal	15999 Guadalupe Mines Rd	11.8	1.3	19.0
Philips Lumileds Lighting, Inc	370 W Trimble Road	11.0	1.3	0.2
Gas Recovery Systems, Inc	1804 Dixon Landing Rd	0.2	111.0	4.7
Gas Recovery Systems, Inc	15999 Guadalupe Mines Rd	0.1	69.3	2.2
San Jose State University (Cogen Plant)	San Carlos Street	0.8	38.3	3.0
O L S Energy-Agnews	3530 Zanker Road	2.6	29.9	11.5
Los Esteros Critical Energy Fa	800 Thomas Foon Chew Way	4.8	22.5	17.4
Santa Clara Valley Health & Hospital	751 So Bascom Avenue	0.4	14.5	0.4
Zanker Road Resource Management	705 Los Esteros Road	3.4	10.2	5.2
Zanker Road Material Processing	675 Los Esteros Road	1.1	0.7	16.5

Source: Air Resources Board 2008

[4] SFPP, L.P. is an operating partnership of Kinder Morgan Energy Partners L.P. that owns and operates a petroleum terminal facility, which transfers and stores piped petroleum products from refineries.

TABLE 9 2006 TOXIC AIR CONTAMINANT EMISSIONS INVENTORY (IN TONS PER YEAR)

Toxic Air Contaminant	Bay Area	Santa Clara County
Acetaldehyde	1,521	298
Benzene	1,836	395
1,3-Butadiene	394	78
Carbon Tetrachloride	0.94	< 0.01
Chromium, Hexavalent	0.08	0.02
para-Dichlorobenzene	279	71
Formaldehyde	3,488	682
Methylene Chloride	963	265
Perchloroethylene	709	172
Diesel Particulate Matter	4,697	863

Source: Air Resources Board Almanac 2008

Dust

Construction and vehicle travel result in the generation of dust, which leads to elevated PM_{10} levels in the region. Dust from construction activities can affect nearby active land uses. Activities that generate visible dust clouds extending beyond their boundaries are a source of air pollution that can be controlled.

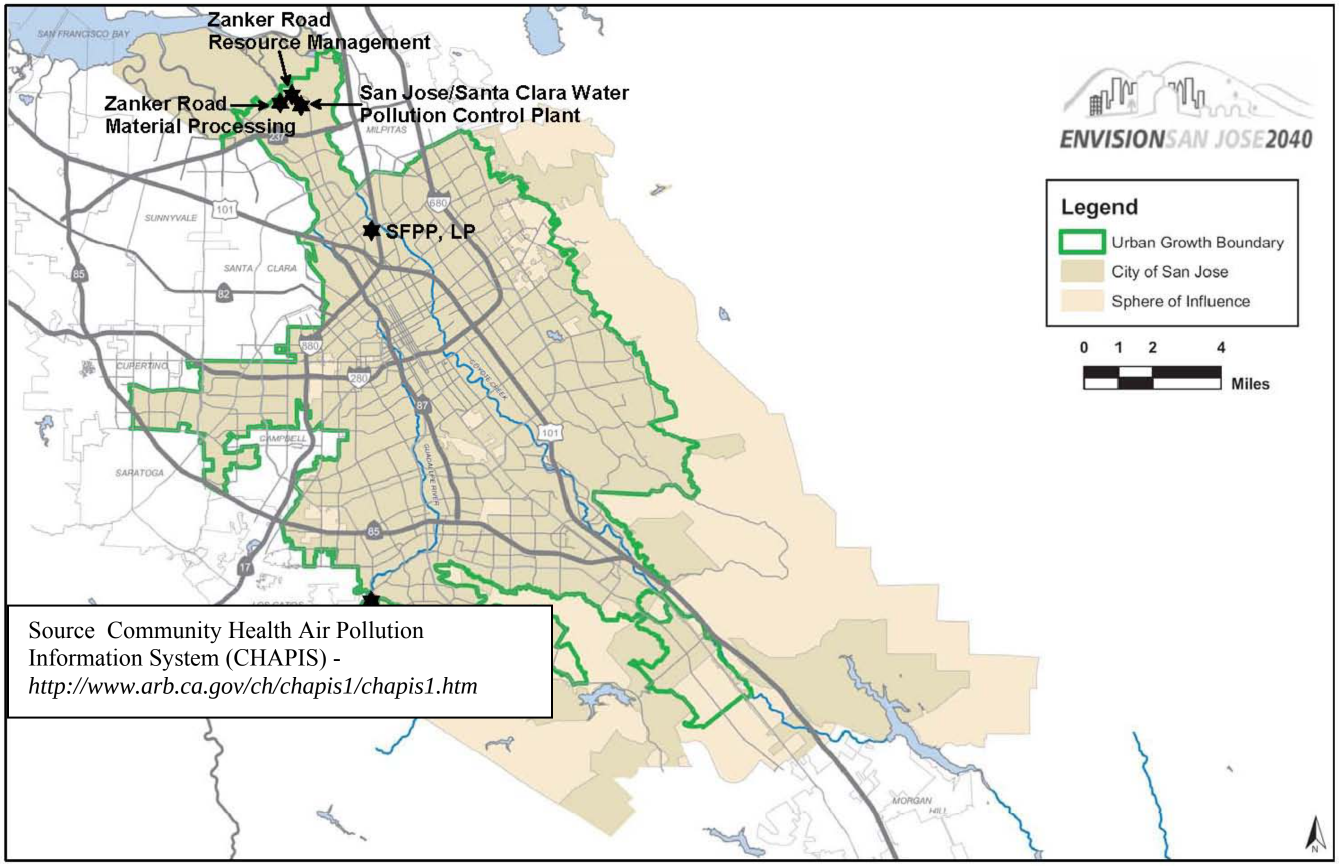
Odors

Significant sources of offending odors are typically identified based on complaint histories received and compiled by BAAQMD. It is difficult to identify sources of odors without requesting information by facility from BAAQMD. Typical large sources of odors that result in complaints are wastewater treatment facilities, landfills, food processing facilities and agricultural operations. Other sources typically result in very localized sources of odors. Locations of odor sources in San José are also shown in Figure 5.

Sensitive Receptors

Sensitive receptors include hospitals, schools, playgrounds, childcare facilities, and convalescent facilities. BAAQMD considers residences to also be sensitive receptors. In the past, maps have been developed that show locations of schools, hospitals, and convalescence homes to represent sensitive receivers. These maps are not particularly useful since air quality standards are applicable to all areas and not just sensitive receptors. Many people who are susceptible to air pollution (e.g., asthmatics) also reside in residences. Both State and National ambient air quality standards were developed with intent to protect sensitive receptors from the adverse impacts of air pollution.

FIGURE 5 LOCATIONS OF LARGE STATIONARY AIR POLLUTANT SOURCES AND POTENTIAL SOURCES OF ODORS



Source Community Health Air Pollution Information System (CHAPIS) - *http://www.arb.ca.gov/ch/chapis1/chapis1.htm*

V AIR QUALITY TRENDS

Efforts to reduce air pollutant levels are aimed primarily at reducing emissions from various sources. Other efforts, such as programs like *Spare the Air,* are aimed at temporarily reducing emissions when weather forecasts indicate the potential for elevated air pollutant levels. BAAQMD, along with CARB, conduct detailed computer modeling of ozone levels both in the Bay Area and levels transported to other areas. The modeling is a large effort used to identify sources of air pollution to further reduce. The modeling is also conducted to predict attainment of air quality standards. Results of these studies are the basis of current air quality regulations and plans.

Table 10 shows the trend in the emission inventory for the Bay Area since 1975. Emissions of ozone precursors have decreased considerably over the last 15 years. During the past 10 years, these emissions have decreased by 30 to 40 percent. Figure 6 shows that, although ozone precursor emissions decreased substantially, the effect on ozone levels is subtle. However, the trend toward lower ozone levels has been fairly consistent for the last 20 years. In fact, the downward trend appears to have been sufficient to show attainment of NAAQS for ozone. Ozone precursor emissions are projected to decrease by 25 to 40 percent over the next 15 years, while population and vehicle use increases. The reductions are the result of rules and regulations that are or will be implemented over the future. For instance, new vehicle standards require time to reduce emissions as the population of vehicles ages where older, more polluting vehicles are retired.

TABLE 10 TREND IN BAY AREA AIR BASIN EMISSIONS (ANNUAL AVERAGE IN TONS PER DAY)

	Emissions (tons/day, annual average)									
Pollutant	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
Nox	943	918	821	797	720	622	496	423	348	301
ROG	1430	1320	1047	764	646	525	382	330	302	290
PM_{10}	181	182	195	194	189	218	210	220	230	241
$PM_{2.5}$	81	79	79	83	81	84	81	83	84	87
Sox	210	196	106	109	67	64	58	57	62	68
CO	9075	8334	7011	5325	3917	2961	2041	1617	1363	1230

PM_{10} emissions have increased by about 10 percent over the last 10 years and are anticipated to increase by another 9 percent over the next 10 years. The trend in $PM_{2.5}$ has been subtler, since $PM_{2.5}$ is primarily a by-product of combustion. Large sources of PM_{10} emissions are area sources that are difficult to control. The past trends in PM_{10} and $PM_{2.5}$ concentrations are shown in Figures 7 and 8, respectively. PM_{10} concentrations in the Bay Area have remained almost unchanged during the past 10 years. Although PM_{10}

emissions are expected to increase slightly, some additional reductions in PM_{10} concentrations are expected. Many of the sources that contribute to ozone formation also lead to PM_{10} and $PM_{2.5}$ formation through chemical reactions in the atmosphere. For example, NOx contributes to ammonium nitrate formation in the atmosphere that makes up over 20 percent of the PM_{10} and $PM_{2.5}$ composition on the days with highest levels in San José (see Figure 3). These secondary particulates contribute to overall PM_{10} and $PM_{2.5}$ concentrations. NOx emissions are expected to decrease substantially in the future. Wood smoke is a major contributor to elevated PM_{10} and $PM_{2.5}$ levels in San Jose. New rules prohibiting wood burning on days when high particulate levels are expected to also reduce both $PM_{2.5}$ and PM_{10} concentrations.

FIGURE 6 RECENT 20-YEAR TREND IN BAY AREA OZONE LEVELS

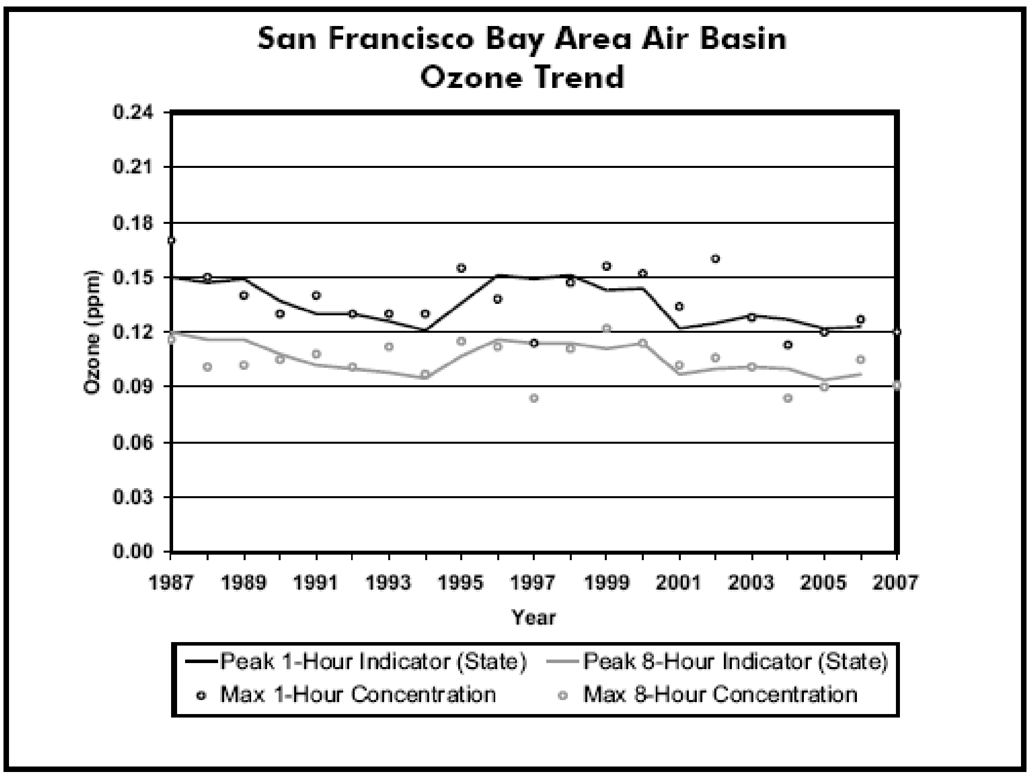


FIGURE 7 RECENT TREND IN BAY AREA ANNUAL PM_{10} LEVELS

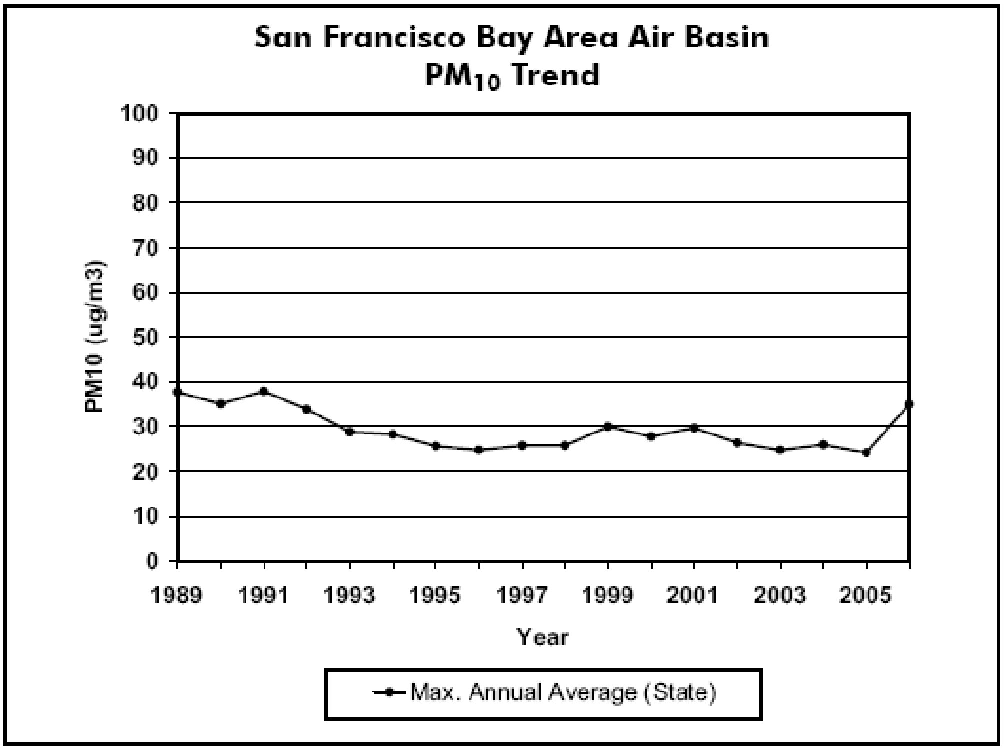
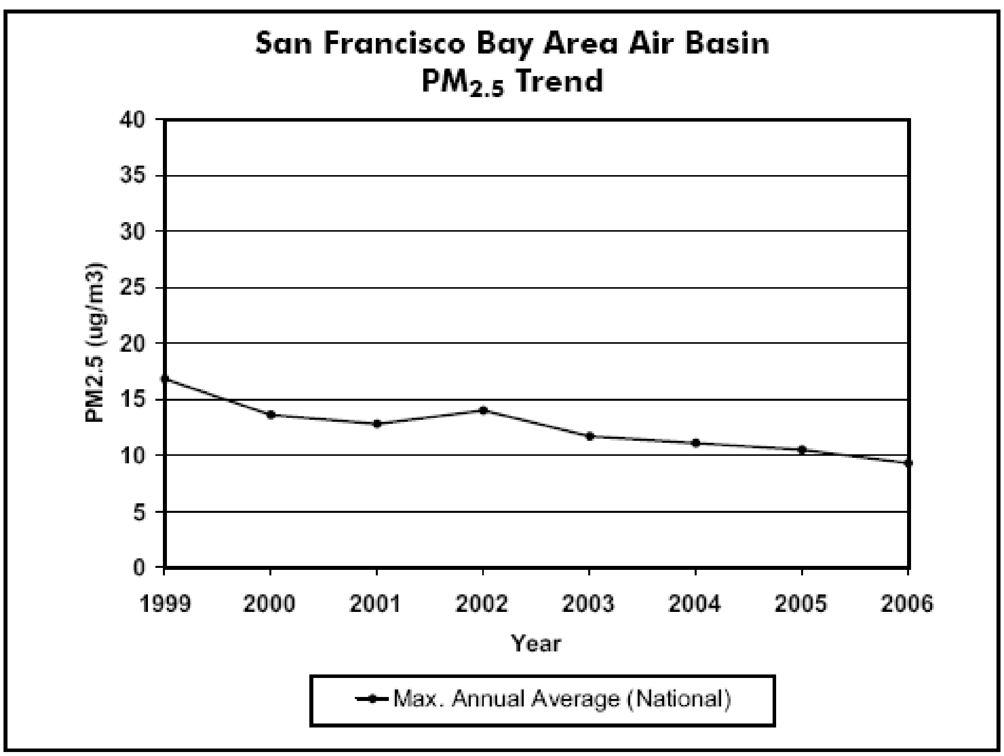


FIGURE 8 RECENT TREND IN BAY AREA ANNUAL $PM_{2.5}$ LEVELS



VI REFERENCES

Bay Area Air Quality Management District. *Bay Area Air Pollution Summaries 2004-2007*

Bay Area Air Quality Management District. 2006. *Community Air Risk Evaluation Program – Phase I Findings and Policy Recommendations Related to Toxic Air Contaminants in the San Francisco Bay Area.* September.

Association of Bay Area Governments and Bay Area Air Quality Management District. Improving Air Quality through Local Plans and Programs - A Guidebook for City and County Governments. April 1994.

Association of Bay Area Governments and Bay Area Air Quality Management District. *Design Strategies for Encouraging Alternatives to Auto Use through Local Development Review.* April 1994.

Bay Area Air Quality Management District. *BAAQMD CEQA Guidelines - Assessing the Air Quality Impacts of Projects and Plans.* April 1996, revised December 1999.

Bay Area Air Quality Management District. *2005 Bay Area Ozone Strategy.* Adopted by Board of Directors January 2006.

Bay Area Air Quality Management District. *Toxic Contaminant Control Program - Annual Report* 2003. *Volume I and II. 2007.*

California Air Resources Board. *2008 Almanac of Emissions and Air Quality.* 2008.

California Air Resources Board *Fact Sheet - California's Plan to Reduce Diesel Particulate Matter Emissions.* October 2000.

California Air Resources Board. http://www.arb.ca.gov/aqd/aqd.htm *Air Quality Data 1995-2007.*

California Air Resources Board *Air Quality and Land Use Handbook.* April 2005.