

AIR QUALITY

This memorandum provides an overview of existing air quality conditions in Vacaville and the region. It describes climate, air quality conditions, and typical air pollutant types and sources, and summarizes ambient air quality standards and the regulatory framework related to air quality. Lastly, it discusses air quality issues relevant to the General Plan Update.

This memorandum focuses on air pollutants. Greenhouse gases (GHGs) will be discussed in a separate memorandum to be prepared as part of the General Plan Update. The GHG memorandum is dependent upon receiving data currently being prepared by the Solano Transportation Authority. Its release date has not yet been determined.

A. Climate and Meteorology

The City of Vacaville is located primarily within the boundaries of the Sacramento Valley Air Basin (SVAB); however, a small portion of Vacaville, Lagoon Valley, is located within the San Francisco Bay Area Air Basin. The SVAB encompasses eleven counties, including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, as well as the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat. Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year, the temperature may range from 20 to 115 degrees Fahrenheit (°F) with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, and the rainy season generally occurs from November through March.

The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure

cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions, which are discussed further in Section B.1, that trap pollutants near the ground.

The ozone (O₃) season in the SVAB (May through October) is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the SVAB. During about half of the days from July to September, however, a phenomenon called the “Schultz Eddy” prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north, carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward Vacaville and the surrounding areas. This phenomenon exacerbates the pollution levels in the area and increases the likelihood of violating federal and/or State standards. The eddy normally starts in the afternoon or evening, then dissipates around noon the following day when the delta sea breeze arrives.¹

B. Existing Air Quality Conditions

This section summarizes the existing air quality conditions in the Vacaville General Plan study area, which mainly comprises the land within the combined limits of the Sphere of Influence and Urban Growth Boundary.

1. Criteria Pollutants and Monitored Air Pollutant Levels

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment.

¹ Yolo-Solano Air Pollution Control District, 2007, *Handbook for Assessing and Mitigating Air Quality Impacts*.

Pollutants can be diluted by both vertical and horizontal mixing in the atmosphere. Vertical mixing and dilution of pollutants are often suppressed by inversion conditions, when a warm layer of air traps cooler air close to the surface. During the summer, inversions are generally elevated above ground level, but are present over 90 percent of both the morning and afternoon hours. In winter, surface-based inversions dominate in the morning hours, but frequently dissipate by afternoon.

Pollutant monitoring results for the years 2007 to 2009 at the University of California - Davis Campus ambient air quality monitoring station (the closest monitoring station to the City of Vacaville), indicate that air quality in the Vacaville area has generally been moderate. These results are shown in Table 1.

a. Ozone (O₃)

Rather than being directly emitted, O₃ is formed by photochemical reactions between NO₂ and reactive organic gases (ROGs). O₃ is a pungent, colorless gas. Elevated O₃ concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children. O₃ levels peak during the summer and early fall months. State 1-hour O₃ standards were exceeded in 2007 and 2008 at the Davis monitoring station. Federal and State 8-hour O₃ standards were exceeded each of the three years at this monitoring station.

b. Carbon Monoxide (CO)

CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. CO passes through the lungs into the bloodstream, where it interferes with the transfer of oxygen to body tissues. State and federal CO standards have not been exceeded in the study area for the last three years.

TABLE I AIR POLLUTANT MONITORING DATA

Pollutant	Standard	2007	2008	2009
Carbon Monoxide (CO)				
Maximum 1-hour concentration (ppm)		3.3	2.7	ND
Number of days exceeded:	State: > 20 ppm	0	0	ND
	Federal: > 35 ppm	0	0	ND
Maximum 8-hour concentration (ppm)		2.7	1.9	ND
Number of days exceeded:	State: > 9 ppm	0	0	ND
	Federal: > 9 ppm	0	0	ND
Ozone (O₃)				
Maximum 1-hour concentration (ppm)		0.105	0.112	0.092
Number of days exceeded:	State: > 0.09 ppm	2	4	0
Maximum 8-hour concentration (ppm)		0.091	0.098	0.081
Number of days exceeded:	State: > 0.07 ppm	4	10	7
	Federal: > 0.075 ppm	3	5	1
Coarse Particulates (PM₁₀)^a				
Maximum 24-hour concentration (µg/m ³)		119.0	181.1	64.6
Number of days exceeded:	State: > 50 µg/m ³	3	8	2
	Federal: > 150 µg/m ³	0	1	0
Annual arithmetic average concentration (µg/m ³)		25	43	NA
Exceeded for the year:	State: > 20 µg/m ³	0	0	NA
Fine Particulates (PM_{2.5})^a				
Maximum 24-hour concentration (µg/m ³)		62.1	78.0	32.0

TABLE I **AIR POLLUTANT MONITORING DATA (CONTINUED)**

Pollutant	Standard	2007	2008	2009
Number of days exceeded:	Federal: > 35 $\mu\text{g}/\text{m}^3$	ND	ND	ND
Annual arithmetic average concentration ($\mu\text{g}/\text{m}^3$)		8.3	9.1	ND
Exceeded for the year:	State: > 12 $\mu\text{g}/\text{m}^3$	0	0	0
	Federal: > 15 $\mu\text{g}/\text{m}^3$	0	0	0
Nitrogen Dioxide (NO₂)				
Maximum 1-hour concentration (ppm)		0.046	0.048	0.040
Number of days exceeded:	State: > 0.18 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.008	0.009	0.007
Exceeded for the year:	Federal: > 0.053 ppm	0	0	0
Sulfur Dioxide (SO₂)^a				
Maximum 1-hour concentration (ppm)		0.02	0.08	ND
Number of days exceeded:	State: > 0.25 ppm	0	0	ND
Maximum 3-hour concentration (ppm)		.010	.006	ND
Number of days exceeded:	Federal: > 0.5 ppm	0	0	ND
Maximum 24-hour concentration (ppm)		0.004	0.003	ND
Number of days exceeded:	State: > 0.04 ppm	0	0	ND
	Federal: > 0.14 ppm	0	0	ND
Annual arithmetic average concentration (ppm)		0.001	0.001	ND
Exceeded for the year:	Federal: > 0.030 ppm	0	0	ND

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

ND = No data. There was insufficient (or no) data to determine the value.

^a Woodland-Gibson Road was the closest monitoring station for this pollutant.

Source: ARB and EPA , 2010.

c. Nitrogen Oxides (NO₂ and NO)

NO₂, a reddish-brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NO_x. NO₂ is a primary component of the photochemical smog reaction. NO₂ also contributes to other pollution problems, including a high concentration of fine particulates (PM_{2.5}), poor visibility, and acid deposition. NO₂ decreases lung function and may reduce resistance to infection. NO₂ standards have not been exceeded at the Davis monitoring station.

d. Sulfur Dioxide (SO₂)

SO₂ is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO₂ levels in the region. SO₂ irritates the respiratory tract, can injure lung tissue when combined with PM_{2.5}, and reduces visibility and the level of sunlight. SO₂ standards have not been exceeded at the Davis monitoring site in the last three years.

e. Particulate Matter (PM)

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns, or PM₁₀. PM_{2.5} refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM₁₀ and PM_{2.5}. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion; through abrasion, such as tire or brake lining wear; or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions.

Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces, and can enter the human body through the lungs. As indicated in the Davis monitoring results, there were multiple violations per year of the State PM₁₀ standard during the three-year period and

one violation of the federal PM₁₀ standard. PM_{2.5} levels did not exceed the State's standard in any of the past three years and no violations of the federal PM_{2.5} standard were recorded during the three-year period.

2. Existing Sources of Air Pollution

The primary source of air pollution in the City of Vacaville is from on-road mobile sources such as automobiles, trucks, motorcycles, buses, and motor homes. These sources account for the majority of the city's O₃ precursor emissions. On-road mobile source emissions are directly related to regional vehicle miles traveled (VMT) on both local roadways and interstate freeways. As population growth in the region occurs, VMT increases proportionately, resulting in increased O₃ precursor emissions. Particulate emissions are generated by woodsmoke from residential fireplaces and from construction activities. Consumer products, architectural coatings, fertilizers, and asphalt paving are also sources of air pollution within Vacaville. Agricultural operations such as harvesting and tilling in the region account for a portion of the area's PM emissions. Mobile source agricultural equipment emissions account for less than 10 percent of the region's mobile source emissions.

3. Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (ARB). Health risks from TACs are a function of both concentration and duration of exposure. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

While TACs are produced by many different sources, the largest contributor to inhalation cancer risk in California is particular matter from diesel-fueled engines (diesel PM). Exposure to diesel PM can result in an increased risk of cancer and an increase in chronic non-cancer health effects, including a greater incidence of cough, labored breathing, chest tightness, wheezing, and bron-

chitis. These risks generally affect sensitive receptors near the emission source. The ARB reports that the average cancer risk statewide from exposure to diesel PM was estimated to be over 500 potential cases per million in 2007. Diesel PM was estimated to be responsible for about 70 percent of total risks from all toxics. On a local scale, diesel PM can present varying cancer risks to the public, which can be greater or less than the statewide average.

The ARB developed the “Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles,” which sets a goal of 75 percent reduction of diesel PM by 2010 and an 85 percent reduction by 2020. High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers or schools with a high volume of bus traffic. The risk from diesel PM is expected to decrease over time.

4. Existing Sensitive Receptors

Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e. children, elderly, and the sick) and to certain at-risk sensitive land uses such as schools, hospitals, parks, or residential communities. Air quality problems arise when sources of air pollutants and sensitive receptors are located near one another. The potential for adverse air quality impacts increases as the distance between the source of emissions and members of the public decreases. Impacts on sensitive receptors are of particular concern when air emission sources are located nearby.

Residential areas are located throughout the City of Vacaville, as are schools and parks. Vacaville hospitals include Vaca Valley Hospital in central Vacaville and Kaiser Permanente Hospital in northeast Vacaville. Several convalescent hospitals are also located throughout the city.

5. Odors

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g. irritation, anger, or anxiety) to physiological (e.g. circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Typical sources of odors include: wastewater treatment plants, landfills, certain manufacturing operations and restaurants. Additionally, commercial services such as auto service stations, auto body shops, or other similar uses can be a source of odor complaints in urban areas where these uses are in close proximity to residential areas.

According to the Yolo-Solano Air Quality Management District (YSAQMD) odor complaint records, in the past three years there have been four complaints regarding odors from the Vacaville area. On June 6, 2007 and August 16, 2007, complaints from the nearby town of Elmira were filed with YSAQMD regarding odors from the Easterly Wastewater Treatment Plant (WWTP). The City has recently made upgrades to the Easterly WWTP, including measures to reduce odor generation through both on-site and off-site improvements, resulting in an overall net decrease in odor emissions at the Easterly WWTP.²

On August 26, 2008 a complaint on Mason Street in Vacaville was filed for odors from an unpermitted auto body shop. The shop is now permitted and in compliance with YSAQMD odor regulations. Additionally, there was one

² AES, January 2010, *Easterly WWTP Tertiary Project Draft EIR*.

complaint from Wakefield Drive on June 8, 2009 for paint odors from a residential garage; however, the homeowner was not in violation of any YSAQMD rules.

C. Regulatory Framework

This section summarizes existing local, State, and federal laws, policies, and regulations that apply to air quality in and around Vacaville.

In Vacaville, the YSAQMD is the primary agency responsible for regulating air pollution emissions from stationary sources (e.g. factories) and indirect sources (e.g. traffic associated with new development), as well as for monitoring ambient pollutant concentrations at the regional level. Air pollution emissions are regional in nature, so it is important for the cities within the region, such as Vacaville, to work together with YSAQMD to achieve State and federal clean air standards. In addition, the ARB and EPA regulate direct emissions from motor vehicles.

1. Federal Clean Air Act

The Federal 1970 Clean Air Act (FCAA) authorized the establishment of national health-based air quality standards and set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining National Ambient Air Quality Standards (NAAQS) as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the NAAQS are required to develop State Implementation Plans (SIP) to show how they will achieve the NAAQS by specific dates. Vacaville is included in the Sacramento Regional SIP prepared by the Sacramento Air Quality Management District in conjunction with the YSAQMD. Other jurisdictions located in Sacramento and Yolo Counties, and portions of Placer, El Dorado, Solano, and Sutter Counties are also included in this SIP.

The NAAQS identify levels of air quality for “criteria pollutants” that are considered the maximum levels of ambient (background) air pollutants con-

sidered safe, with an adequate margin of safety, to protect the public health and welfare. As shown in Table 2, the “criteria pollutants” regulated by the NAAQS are: O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5} and lead (Pb).

2. State Laws and Regulations

This section summarizes State laws and regulations pertaining to air quality in Vacaville.

a. California Clean Air Act

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards (CAAQS) for CO, O₃, SO₂, and NO₂ by the earliest practical date. The CCAA provides air districts with authority to regulate indirect sources and mandates that air districts focus particular attention on reducing emissions from transportation and area-wide emission sources. As indicated in Section C.2.b, the ARB designates areas as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive three-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how an air district would reduce emissions to achieve air quality standards. As shown in Table 2, State standards for these pollutants (i.e. the CAAQS) are generally more stringent than the national standards (i.e. the NAAQS).

As indicated in Section C.2.d, YSAQMD has adopted several attainment plans to achieve State and federal air quality standards and comply with CCAA requirements.

b. California Air Resources Board (ARB)

The ARB administers the air quality standards in California. Based on air monitoring results for areas within California, the ARB designates the areas as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved.

TABLE 2 FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards ^a	Federal Standards ^b	
		Concentration ^c	Primary ^{c,d}	Secondary ^{c,e}
Ozone (O ₃)	1-Hour	0.09 ppm (180 µg/m ³)	No federal standard	Same as Primary Standard
	8-Hour	0.07 ppm (137 µg/m ³)	0.075 ppm (147 µg/m ³)	
Respirable Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m ³	-	
Fine Particulate Matter (PM _{2.5})	24-Hour	No Separate State Standard	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m ³	15 µg/m ³	
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	None
	1-Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	
	8-Hour Lake Tahoe	6 ppm (7 mg/m ³)	-	
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.03 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	Same as Primary Standard
	1-Hour	0.18 ppm (339 µg/m ³)	0.100 ppm ^f	None
Lead (Pb) ^g	30-Day Avg	1.5 µg/m ³	-	-
	Calendar Quarter	-	1.5 µg/m ³	Same as Primary Standard
	Rolling 3-Month Avg ^g	-	0.15 µg/m ³	
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	-	0.030 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 (1300 µg/m ³)
	1-Hour	0.25 ppm (655 µg/m ³)	-	-

TABLE 2 **FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS**
(CONTINUED)

Pollutant	Average Time	California Standards ^a	Federal Standards ^b	
		Concentration ^c	Primary ^{c,d}	Secondary ^{c,e}
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.	No Federal Standards	
Sulfates	24-Hour	25 $\mu\text{g}/\text{m}^3$		
Hydrogen Sulfide	1-Hour	0.03 ppm (42 $\mu\text{g}/\text{m}^3$)		
Vinyl Chloride ^h	24-Hour	0.01 ppm (26 $\mu\text{g}/\text{m}^3$)		

Note: ppm = parts per million

^a California standards for O₃, CO (except for Lake Tahoe), SO₂ (1- and 24-hour), NO₂, suspended particulate matter—PM₁₀, PM_{2.5}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

^b National standards (other than O₃, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu\text{g}/\text{m}^3$ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

^c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

^d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

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

^f To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor must not exceed 0.100 ppm (effective January 22, 2010).

^g The ARB has identified Pb and vinyl chloride as “toxic air contaminants (TACs)” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

^h National Pb standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California ARB, February 16, 2010.

Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years.

The ARB has developed an Air Quality and Land Use Handbook (Handbook) that is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process.³ The Handbook recommends that planning agencies such as the City of Vacaville strongly consider proximity to air pollution sources when finding new locations for “sensitive” land uses such as homes, medical facilities, daycare centers, schools, and playgrounds.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook include taking steps to avoid siting new, sensitive land uses:

- ◆ Within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
- ◆ Within 1,000 feet of a major service and maintenance rail yard.
- ◆ Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries.
- ◆ Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet).
- ◆ Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The Handbook specifically states that its recommendations are advisory and acknowledges that land use agencies have to balance other considerations,

³ California Air Resources Board, 2005, *Air Quality and Land Use Handbook: A Community Health Perspective*.

including housing and transportation needs, economic development priorities, and other quality of life issues.

c. California Government Code

Under the General Plan requirements in the California Government Code, coverage or analysis of air quality is an optional component of the Conservation Element. 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. The City of Vacaville's existing General Plan addresses air quality, as discussed further in Section C.4. Local plans should also be consistent with regional air quality plans, discussed below.

d. Yolo-Solano Air Quality Management District (YSAQMD)

The YSAQMD is tasked with achieving and maintaining healthful air quality for its residents by establishing programs, plans, and regulations enforcing air pollution control rules in order to attain all State and federal ambient air quality standards and to minimize public exposure to airborne toxins and nuisance odors. The YSAQMD encourages local jurisdictions to include General Plan policies or elements that, when implemented, would improve air quality, as is done in the existing Vacaville General Plan. The YSAQMD has adopted several attainment plans to achieve State and federal air quality standards and comply with CCAA and FCAA requirements. The YSAQMD continuously monitors its progress in implementing attainment plans and must periodically report to the ARB and the EPA. The YSAQMD, in partnership with the five air districts in the Sacramento Metropolitan Area, the ARB, and the Sacramento Area Council of Governments (SACOG), periodically revises its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CCAA and FCAA.

The 1994 Sacramento Area Regional Ozone Attainment Plan is the current federal O₃ SIP for the YSAQMD, and sets out stationary source control programs and statewide mobile source control programs for attainment of the 1-hour O₃ standard. The air districts of the Sacramento region have also prepared an 8-hour Ozone Rate of Progress Plan that shows a 3 percent per year

emission reduction in volatile organic compounds (or the NO₂ equivalent) for six years through 2008. This plan continues the strategies found in the 1-hour O₃ SIP. The EPA's June 2005 revocation of the 1-hour O₃ standard and enactment of the 8-hour O₃ standard required the air districts and the ARB to prepare a new attainment demonstration SIP. The latest SIP for the 8-hour ozone standard, the 2009 Sacramento Metropolitan Area 8-Hour Ozone Attainment Plan, contains additional control measures to demonstrate that the region will attain the 8-hour standard by the target date of 2018.

The YSAQMD primary means of implementing air quality plans is by adopting rules and regulations. The Health and Safety Code (H&SC) §42300 et. seq. authorizes air quality management districts to adopt rules and regulations and to pursue civil and criminal penalties for violations. The YSAQMD rulebook contains more than 85 rules. Some new rules adopted by YSAQMD apply to sources never before regulated, such as Rule 2.40 – Wood Burning Appliances, which prohibits installation of any new traditional “open hearth” type fireplaces within YSAQMD’s jurisdiction.

In addition to the YSAQMD’s primary role of controlling stationary sources of pollution, the YSAQMD is required to implement transportation control measures and identify indirect source control programs to reduce mobile source emissions. To accomplish this, the YSAQMD works closely with cities, including the City of Vacaville, and with counties and regional transportation planning agencies.

The YSAQMD regulates agriculture emissions through a permitting process for stationary agriculture emission sources, confined animal facilities and agriculture engines. The YSAQMD has also enhanced its participation in CEQA by actively reviewing and commenting on prepared environmental documents, such as those prepared by the City of Vacaville.

3. Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based

on air pollutant monitoring data and are judged for each air pollutant. The YSAQMD, and therefore the City of Vacaville, do not meet CAAQS or NAAQS for ground level O₃, nor State standards for PM₁₀ and national standards for PM_{2.5}.⁴ Table 3 provides a summary of the YSAQMD's attainment status.

4. Vacaville General Plan

Table 4 presents guiding and implementing policies from the current City of Vacaville General Plan relevant to air quality; all air quality polices are contained within the Conservation Element.

D. Implications for the General Plan Update

Based on the information contained in this memorandum, the General Plan Update should consider policies and land use strategies that will improve air quality. The plan for air quality improvement should focus on different aspects of air quality improvement efforts including:

- ◆ Working with the YSAQMD to incorporate clean air strategies into City operations and policies that will help YSAQMD meet air quality standards.
- ◆ The General Plan Update could consider implementing VMT reduction strategies and other transportation demand measures that would reduce pollutant emissions from vehicles.
- ◆ The General Plan Update could consider the guidance provided by the ARB in the Land Use Planning Handbook, which recommends specific buffer zones for siting receptors near sources of pollution such as freeways, major roadways or manufacturing uses.

⁴ Although there were no exceedances of the federal PM_{2.5} standard recorded at the Davis monitoring station, other exceedances within the Yolo-Solano Air District prevent the District from meeting this standard.

TABLE 3 **YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT
ATTAINMENT STATUS**

Pollutant	Averaging Time	State Standards	National Standards
Ozone (O ₃)	1-Hour	Nonattainment	N/A ^a
	8-Hour	Nonattainment	Nonattainment
Carbon Monoxide (CO)	1-Hour	Attainment	Unclassified Attainment ^b
	8-Hour	Attainment	Unclassified Attainment
Nitrogen Dioxide (NO ₂)	1-Hour	Attainment	N/A
	Annual	N/A	Attainment
Sulfur Dioxide (SO _x)	1-Hour	Attainment	N/A
	24-Hour	Attainment	Attainment
	Annual	N/A	Attainment
Particulate Matter (PM ₁₀)	24-Hour	Nonattainment	Unclassified
	Annual Average	Nonattainment	N/A
Fine Particulate Matter (PM _{2.5})	24-Hour	N/A	Partial Nonattainment
	Annual Average	N/A	
Sulfates	24-Hour	Attainment	N/A
Lead (Pb)	30-Day Avg.	Attainment	N/A
	Calendar Qtr	N/A	Attainment
Hydrogen Sulfide	1-Hour	Attainment	N/A
Vinyl Chloride	24-Hour	Attainment	N/A
Visibility Reducing Particles	8-Hour	Attainment	N/A

^a N/A – Not applicable. State or federal standard does not exist for the combination of pollutant and averaging time.

^b Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.

Source: Yolo-Solano Air Quality Management District, 2010.

TABLE 4 **CITY OF VACAVILLE GENERAL PLAN POLICIES RELEVANT TO
AIR QUALITY**

Policy Number	Policy
Policy 6.4-I 3	Favor Transportation Systems Management (TSM) programs that limit vehicle use over those that extend the commute hour.
Policy 8.3-G 1	Maintain good air quality in the Vacaville Planning Area.
Policy 8.3-G 2	Cooperate with regional agencies in developing and implementing air quality management plans.
Policy 8.3-I 1	Encourage project design that conserves air quality and minimizes direct and indirect emissions of air contaminants.
Policy 8.3-I 2	Encourage transportation modes that minimize motor vehicle use and resulting contaminant emissions.

Source: Vacaville General Plan, 1990.

CITY OF VACAVILLE
GENERAL PLAN UPDATE
AIR QUALITY IN VACAVILLE