4.3 AIR QUALITY

This section includes a summary of applicable regulations, a description of existing air quality conditions in the planning area, and an analysis of potential air quality impacts of adoption and implementation of the Draft General Plan and GGRP.

4.3.1 REGULATORY SETTING

Air quality in Citrus Heights is regulated by the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and the Sacramento Metropolitan Air Quality Management District (SMAQMD). Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

Concentrations of criteria air pollutants indicate the quality of ambient air, and are therefore the premise of air quality regulations. Air quality regulations also focus on toxic air contaminants (TACs), referred to as hazardous air pollutants (HAPs) by federal agencies. In general, for those TACs that may cause cancer, all concentrations present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These statutes and regulations, in conjunction with additional rules set forth by SMAQMD, establish the regulatory framework for TACs.

Applicable regulations associated with criteria air pollutants and TACs are described below.

FEDERAL PLAN, POLICIES, REGULATIONS, AND LAWS

Criteria Air Pollutants

At the federal level, EPA implements the national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), enacted in 1970. The most recent major amendments were made by Congress in 1990.

The CAA requires EPA to establish national ambient-air quality standards (NAAQS). As shown in Table 4.3-1, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone (O_3); CO; NO_2; SO_2; PM_{10}; $PM_{2.5}$; and lead.

The primary standards protect public health and the secondary standards protect public welfare. The CAA also requires each state to prepare an air quality control plan, which is referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. EPA reviews all state SIPs to determine whether they conform to the mandates of the CAA and its amendments and whether implementing them will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan that imposes additional control measures may be prepared for the nonattainment area. If the state fails to submit an approvable SIP or to implement the plan within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basins.

Hazardous Air Pollutants

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to issue national emissions standards for HAPs (NESHAP). The NESHAP may be different for major sources than for area sources

Table 4.3-1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards[2,3]	Sacramento County Attainment Status[4]	Primary[3, 5]	Secondary[3, 6]	Sacramento County Attainment Status[7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (serious)	–	–	–
	8-hour	0.07 ppm (137 µg/m^3)	N (serious)	0.075 ppm (147 µg/m^3)	Same as Primary Standard	N (severe)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	A
	1-hour	0.18 ppm (339 µg/m^3)	A	0.100 ppm (188 µg/m^3)	–	–
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (364 µg/m^3)	0.5 ppm (1300 µg/m^3)	A
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	A
	1-hour	0.25 ppm (655 µg/m^3)	A	75 ppb (195 µg/m^3)	–	–
	Annual Arithmetic Mean	-	-	0.03 ppm (78 µg/m^3)	-	A
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	-	Same as Primary Standard	N
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	Same as Primary Standard	N
	24-hour	–	–	35 µg/m^3		
Lead	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	A

Table 4.3-1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards[2,3]	Sacramento County Attainment Status[4]	Primary[3, 5]	Secondary[3, 6]	Sacramento County Attainment Status[7]
	Rolling 3Month Average	–	–	0.15 µg/m^3	Same as Primary Standard	No designation
Sulfates	24-hour	25 µg/m^3	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	U			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

Notes: µg/m_3 = micrograms per cubic meter; ppm = parts per million.

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency (EPA) for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards (CAAQS) are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was issued (i.e., ppm or µg/m^3). Equivalent units given in parentheses are based on 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.

[4] Unclassified (U): A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): A pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): A pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

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

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

[7] Air quality meets Federal PM_{10} Standards. SMAQMD has requested redesignation to attainment.
Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.

Sources: ARB 2010

of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs. All other sources are considered area sources.

The emissions standards are to be issued in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable and are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to issue emissions standards based on health risks where the standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also requires EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 requires the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Criteria Air Pollutants

ARB coordinates and has oversight of state and local programs for controlling air pollution in California and implements the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires ARB to establish California ambient-air quality standards (CAAQS) (Table 4.3-1). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources. The act provides districts with the authority to regulate indirect sources.

ARB also oversees local air district compliance with federal and state laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

ARB and local air pollution control districts adopted plans for meeting new NAAQS for ozone and $PM_{2.5}$ in September 2007. California's adopted 2007 State Strategy was submitted to EPA as a revision to the SIP in November 2007 (ARB 2008g).

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [Statutes of 1983]) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 [Statutes of 1987]). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. This process includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. ARB has identified more than 21 TACs to date and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM (DPM) was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an airborne toxics control measure (ATCM) for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

The ARB has classified particulate matter from diesel engines as a toxic air contaminant. As defined by California Health and Safety Code, Section 39655 (a): an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. ARB adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions including transit buses, and off-road diesel equipment (e.g., tractors, generators). Recent and upcoming milestones for transportation-related mobile sources include a low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, DPM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies.

With implementation of ARB's Risk Reduction Plan, it is expected that DPM concentrations will be 75% less than the estimated year-2000 level in 2010 and 85% less in 2020. The ARB has not yet evaluated whether the 2010 target has been met (Taricco, pers. comm., 2010). Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005) provides guidance concerning land use compatibility with TAC sources. While not a law or adopted regulation, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, railyards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help keep children and other sensitive populations out of harm's way.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Criteria Air Pollutants

Sacramento Metropolitan Air Quality Management District

SMAQMD is responsible for attaining and maintaining air quality standards in Sacramento County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of SMAQMD includes the preparation of plans and programs for the attainment of ambient-air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources.

SMAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and CCAA. In addition, SMAQMD recently developed plans for meeting new NAAQS for 8-hour ozone attainment.

California Environmental Quality Act Guidelines

In December 2009, SMAQMD released an update to its previously adopted guidelines document. This updated *Guide to Air Quality Assessment* (SMAQMD 2009) is an advisory document that provides lead agencies, consultants, and project applicants with methods for analysis and review of air quality impacts from land use development projects being considered within the boundaries of the SMAQMD. The handbook includes:

- criteria and thresholds for determining whether a project may have a significant adverse impact on air quality;
- specific procedures and modeling protocols for quantifying and analyzing impacts on air quality;
- methods available to mitigate impacts on air quality; and
- information for use in air quality assessments that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography.

Rules and Regulations

SMAQMD has adopted rules and regulations that apply to stationary sources of air pollutant emissions. Some apply to construction-related emissions. Specific rules applicable to construction at the time of preparation of the Draft General Plan include the following:

- **Rule 201:** General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may be required to obtain permit(s) from SMAQMD before equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact SMAQMD early to determine whether a permit is required, and to begin the permit application process. Portable construction equipment (e.g., generators, compressors, pile drivers, lighting equipment) with an internal combustion engine greater than 50 horsepower must have a SMAQMD permit or ARB portable equipment registration.
- **Rule 403:** Fugitive Dust. The developer or contractor is required to control dust emissions from earthmoving activities or any other construction activity to prevent airborne dust from leaving the project site.
- **Rule 417:** Wood Burning Appliances. Installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments is prohibited.
- **Rule 442:** Architectural Coatings. The developer or contractor is required to use coatings that comply with the content limits for volatile organic compounds specified in the rule.
- **Rule 902:** Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of material containing asbestos.

In addition, effective as of October 10, 2005, if modeled construction-generated emissions for a project are not reduced to SMAQMD's threshold of significance (85 pounds per day [lb/day]) after the standard construction mitigation is applied, then an off-site construction mitigation fee is recommended. The fee must be paid before a grading permit can be issued. This fee is used by SMAQMD to purchase off-site emissions reductions. Such purchases are made through SMAQMD's Heavy Duty Incentive Program, through which select owners of heavy-duty equipment in Sacramento County can repower or retrofit their old engines with cleaner engines or technologies. The fee is generally imposed by the local land use agency as part of the environmental review process at the time the project is approved.

Sacramento Area Council of Governments (SACOG)

The Sacramento Area Council of Governments (SACOG) is an association of local governments in the six-county greater Sacramento region, including El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties, as well as the region's incorporated cities. SACOG provides planning for transportation and other regional issues, including the distribution of affordable housing, bicycle networks, air quality issues, airport land uses, and public transit.

SACOG is responsible for regional transportation planning for the six-county area. Most of this area is designated a federal nonattainment area for ozone, indicating that the transportation system is required to meet stringent air quality emissions budgets to reduce pollutant levels that contribute to ozone formation. To receive federal funding, transportation projects nominated by cities, counties and agencies must be consistent with the Metropolitan Transportation Plan (MTP). A project is considered consistent if it is contained in the MTP and is included in the computer modeling of transportation and air quality impacts by SACOG. In addition, any regionally significant transportation project planned for a city or county must be included in the MTP because of its potential effect on travel demand and air pollution.

SACOG is also working closely with local governments in the region to plan development in accordance with the Blueprint Project, which promotes smart growth principles for land development and transportation projects within the region. More specifically, the Blueprint process depicts a way for the region to grow through the year 2050 in a manner generally consistent with seven principles of "Smart Growth:" 1) increasing compact land use patterns, 2) establishing a mix of residential densities, 3) promoting mixed-use projects, 3) facilitating a range of transportation choices as alternatives to the automobile, 4) offering a variety of housing types and range of densities, 5) encouraging infill, 6) seeking high quality design, and 7) conserving the region's natural resources.

Air Quality Plans

SMAQMD, in coordination with the air quality management districts and air pollution control districts of El Dorado, Placer, Solano, Sutter, and Yolo Counties, prepared and submitted the *1991 Air Quality Attainment Plan* (AQAP) in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and CO, and although not required, PM_{10}.

The AQAP stresses attainment of ozone standards and focuses on strategies for reducing emissions of ozone precursors (ROG and NO_X). It promotes active public involvement, enforcement of compliance with SMAQMD rules and regulations, public education in both the public and private sectors, development and promotion of transportation and land-use programs designed to reduce VMT within the region, and implementation of stationary- and mobile-source control measures.

The federal CAAA set specific planning requirements to ensure that attainment goals are met. Foremost among these requirements is adoption and implementation of an ozone attainment plan. The Sacramento Area Regional Ozone Attainment Plan (OAP) was developed in 1994 to meet that requirement for the Sacramento Metropolitan Area. The ozone attainment plan was submitted to EPA as part of California's SIP. The OAP consists of adopted measures, commitments to adopt new measures (including adoption and implementation schedules), emission inventories, air quality modeling results, contingency measures, and a demonstration of emission reductions sufficient for attainment and rate-of-progress milestones.

For projects that exceed the long-term operational thresholds for NO_X and ROGs all feasible mitigation measures must be implemented. The SMAQMD has established a standard goal of reducing NO_X and ROG emissions by 15%. The SMAQMD has developed a *Guidance for Land Use Emissions Reductions* which provides a description of the most current feasible mitigation measures with their potential NO_X and ROG emissions reductions.

In July 1997, EPA promulgated a new 8-hour ozone standard. This change lowered the standard for ambient ozone from 0.12 ppm averaged over 1 hour to 0.08 ppm averaged over 8 hours. In general, the 8-hour standard is

more protective of public health and more stringent than the 1-hour standard. The region has been designated as a nonattainment (severe) area for the national (8-hour) ozone standard with an attainment deadline of June 15, 2019.

As of this writing, the region is designated as a nonattainment area for federal and state PM_{10} standards. However, in 2002, EPA officially determined that Sacramento County had attained the PM_{10} NAAQS based on PM_{10} air quality monitoring data recorded during 1998 to 2000, which showed no measured exceedances of the 24-hour PM_{10} NAAQS or violations of the annual standard between 1998 and 2000. To reclassify Sacramento County as attainment for the national PM_{10} standards, SMAQMD submitted their PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County on October 28, 2010. The plan shows that the 1987 standard for PM_{10} was attained and establishes a strategy for maintaining the standard through 2022.

As of this writing, the region is also designated as a nonattainment area for federal and state $PM_{2.5}$ standards. On October 16, 2006, the EPA promulgated a new 24-hour standard for $PM_{2.5}$, which lowered the daily standard from 65µg/m3 to 35µg/m^3. Because Sacramento County does not meet these new standards, in October, 2007, the Air District completed a boundary analysis based on the EPA's nine factor requirements. In December, 2007, the California Air Resources Board (CARB) made their recommendations to the EPA for the nonattainment area boundary. The EPA Administrator signed the final $PM_{2.5}$ nonattainment designations for Sacramento on October 8, 2009, and an attainment plan must be submitted not later than 3 years after the effective date of the designation, which must include transportation conformity budgets and control measures.

4.3.2 ENVIRONMENTAL SETTING

The City of Citrus Heights is located in Sacramento County, which is within the Sacramento Valley Air Basin (SVAB). Ambient concentrations of air pollutant emissions are determined by the amount released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The SVAB is a relatively flat area bordered by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta (Delta) from the San Francisco Bay area.

The Mediterranean climate type of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50°F to more than 100°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature. Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest, during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February). For the SVAB as a whole the average winter temperature is 49°F. Also characteristic of SVAB winters are periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. The highest frequency of poor air movement occurs in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods, combined with the reduced vertical flow caused by a decline in surface heating, reduces the influx of air and leads to the concentration of air pollutants under stable metrological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or with temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X), which result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind to shift southward and blow air pollutants back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to violations of ambient air quality standards.

The local meteorology of the planning area is represented by measurements recorded at the Folsom Dam station. The normal annual precipitation, which occurs primarily from November through March, is approximately 24 inches (NOAA 1992). January temperatures range from an average minimum of 38°F to an average maximum of 54°F. July temperatures range from an average minimum of 60°F to an average maximum of 94°F (NOAA 1992). The predominant wind direction and speed is from the south-southwest at approximately 10 mph (ARB 1994).

EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants are used to indicate the quality of the ambient air: ozone; carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}); fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$); and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and because there is extensive documentation available on health effects criteria for these pollutants, they are commonly referred to as "criteria air pollutants." A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below, along with the most current attainment area designations and monitoring data for the Citrus Heights vicinity.

Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004: 51–55).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as people with asthma and children, but healthy adults, as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1-2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest

tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia. Such increased permeability means that the respiratory system must increasingly respond to the ozone exposure and to the increased infections that result because the immune system loses the ability to defend against them (Godish 2004: 169–170).

Emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. During the last 20 years, the peak 8-hour indicator decreased slightly and the overall peak ozone values declined almost 12%. Although the trend for numbers of days above the state and national standards has been variable, the number of 8-hour exceedance days declined by nearly 37% since 1988. (ARB 2009a: 4-59).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In the SVAB, motor vehicles are the largest source of CO emissions. Since 1991, CO indicator values have decreased substantially. Between 1991 and 2007, CO emissions decreased by 71%. The national CO standards have not been exceeded since 1991, and the state standards were last exceeded in 1993. Much of the decline in ambient CO concentrations is attributable to the introduction of cleaner fuels and motor vehicles. (ARB 2009a).

Carbon monoxide can cause harmful health effects by reducing oxygen delivery to the body's organs (e.g., heart, brain) and tissues. The health threat from CO exposure is most serious for those who suffer from heart disease (e.g., angina, clogged arteries, congestive heart failure). For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise. Repeated exposures may contribute to other cardiovascular effects. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death (EPA 2010).

The highest concentrations of CO are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO tends to cause localized problems.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is one of a group of highly reactive gases known as "oxides of nitrogen," or "nitrogen oxides" (NO_X). NO_2 forms quickly from emissions from cars, trucks and buses, power plants, and off-road equipment. In addition to contributing to the formation of ground-level ozone and fine particle pollution, NO_2 is linked with a number of adverse effects on the respiratory system (EPA 2010). Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately four to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema (inflammation of or fluid accumulation in the lungs) with breathing abnormalities, cough, cyanosis (a bluish or purplish discoloration of the skin resulting from insufficient oxygenation of the blood), chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has occasionally been linked with prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung functions (EPA 2008a).

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant that causes constriction of the bronchioles when 5 ppm or more of SO_2 is inhaled. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration, rather than duration of exposure, is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or the glottis (the space between the vocal cords) and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less.

The size of particulate matter is directly linked to the potential for causing health problems. Small particles of less than 10 micrometers in diameter pose the greatest problems because they can get deep into the lungs and bloodstream. Exposure to such particles can affect both the lungs and the heart. Small particles of concern include "inhalable coarse particles" (found near roadways and dusty industries), which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter, and "fine particles" (found in smoke and haze), which are 2.5 micrometers in diameter and smaller. Particulate matter, particularly fine particles, contains microscopic solids or liquid droplets that get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, for example;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks; and
- premature death in people with heart or lung disease.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure (EPA 2010).

PM_{10} emissions in the SVAB are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly over the last 20 years and are projected to continue to increase. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of $PM_{2.5}$ in the SVAB are dominated by the same sources as emissions of PM_{10} (ARB 2009a).

Lead

Lead is a metal found naturally in the environment and in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline (discussed in detail below), metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

The rapid decrease in lead concentrations over the past 25 years can be attributed primarily to phasing out the lead in gasoline. Subsequent ARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate

areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a TAC.

Monitoring-Station Data and Attainment-Area Designations

Criteria air pollutant concentrations are measured at several monitoring stations in the SVAB. The North Highlands-Blackfoot Way station is the closest monitoring station to the planning area with recent data for ozone, CO, NO_2, and PM_{10}. When data was not available at the North Highlands station, air pollutant monitoring data was obtained from the Del Paso Manor station in Sacramento, which is next closest monitoring station to the planning area. In general, the ambient air quality measurements from these monitoring stations are representative of the air quality in the vicinity of Citrus Heights. Table 4.3-2 summarizes the available air quality data from the most recent 3 years (2007-2009) for these two monitoring stations.

Both ARB and EPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." "Unclassified" is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called "nonattainment-transitional." The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. Attainment designations for the year 2008 with respect to Citrus Heights are shown in Table 4.3-1, beginning on page 4.3-2 for each criteria air pollutant. As shown in Table 4.3-1, the area is generally either unclassified or in attainment with ambient air quality standards for the pollutants for which standards have been adopted. The area is not in attainment, however, with ambient air quality standards (either state or federal) for the following pollutants: ozone, PM_{10} and $PM_{2.5}$.

Emission Sources

Exhibit 4.3-1 shows the emissions of criteria air pollutants within Sacramento County for various source categories. According to Sacramento County's emissions inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG, CO, and NO_X, accounting for approximately 58%, 87% and 91% respectively, of the total emissions. Areawide sources account for approximately 89% and 73% of the County's PM_{10} and $PM_{2.5}$ emissions, respectively (ARB 2009b).

Stationary Sources

Major stationary sources of air pollutant emissions within Sacramento County include industrial processes, fuel combustion from electric utilities and other processes, waste disposal, surface coating and cleaning, petroleum production, and other sources. Local air districts issue permits to various types of stationary sources. Sources that emit more than specified levels of air pollutants must demonstrate implementation of Best Available Control Technologies (BACT).

Areawide Sources

Areawide sources of emissions include consumer products, application of architectural coatings, residential fuel combustion, farming operations, construction and demolition, road dust, fugitive dust, landscaping, fires, and other miscellaneous sources. Unpaved road dust is the largest contributor to PM_{10} emissions within Sacramento County, while residential fuel combustion is the largest contributor to $PM_{2.5}$ emissions.

Table 4.3-2
Summary of Annual Ambient Air Quality Data (2007–2009)

	2007	2008	2009
Ozone			
Maximum concentration (1-hour/8-hour average, ppm)	0.109/0.096	0.121/0.082	0.097/0.086
Number of days state 1-hour/8-hour standard exceeded	1/4	2/4	1/18
Number of days national 1-hour/8-hour standard exceeded	0/2	0/2	0/7
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$) [b]	59.0	97.0	34.0
Number of days state standard exceeded (measured/estimated) [c]	2/13.0	6/*	0/0.0
Number of days national standard exceeded (measured/estimated) [c]	0/0.0	0/*	0/0.0
Annual Average ($\mu g/m^3$) (state/national)	24.7/24.0	*/29.0	19.1/*
Fine Particulate Matter ($PM_{2.5}$) [a]			
Maximum concentration ($\mu g/m^3$) [b]	61.0	93.1	71.7
Number of days national standard exceeded (measured) [c]	22	8	3
Number of days national standard exceeded (estimated) [c]	26.1	24.1	8.9
Annual Average ($\mu g/m^3$) (state/national)	12.3/12.2	18.9/13.2	15.5/10.6
Carbon Monoxide (CO)			
Maximum concentration (1-hour/8-hour average, ppm) [b]	5.1/1.73	2.3/1.80	*/1.66
Number of days state standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hour, ppm)	0.127	0.115	0.054
Annual average concentration (ppm)	0.013	*	0.010
Number of days state 1-hour standard exceeded	0	0	0

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

* Insufficient or no data to determine the value.

[a] Data was obtained from the Del Paso Manor monitoring station at 2701 Avalon Drive in Sacramento, which is the closest monitoring station to the planning area that monitors $PM_{2.5}$.

[b] Maximum concentration shown are based on California monitoring methods.

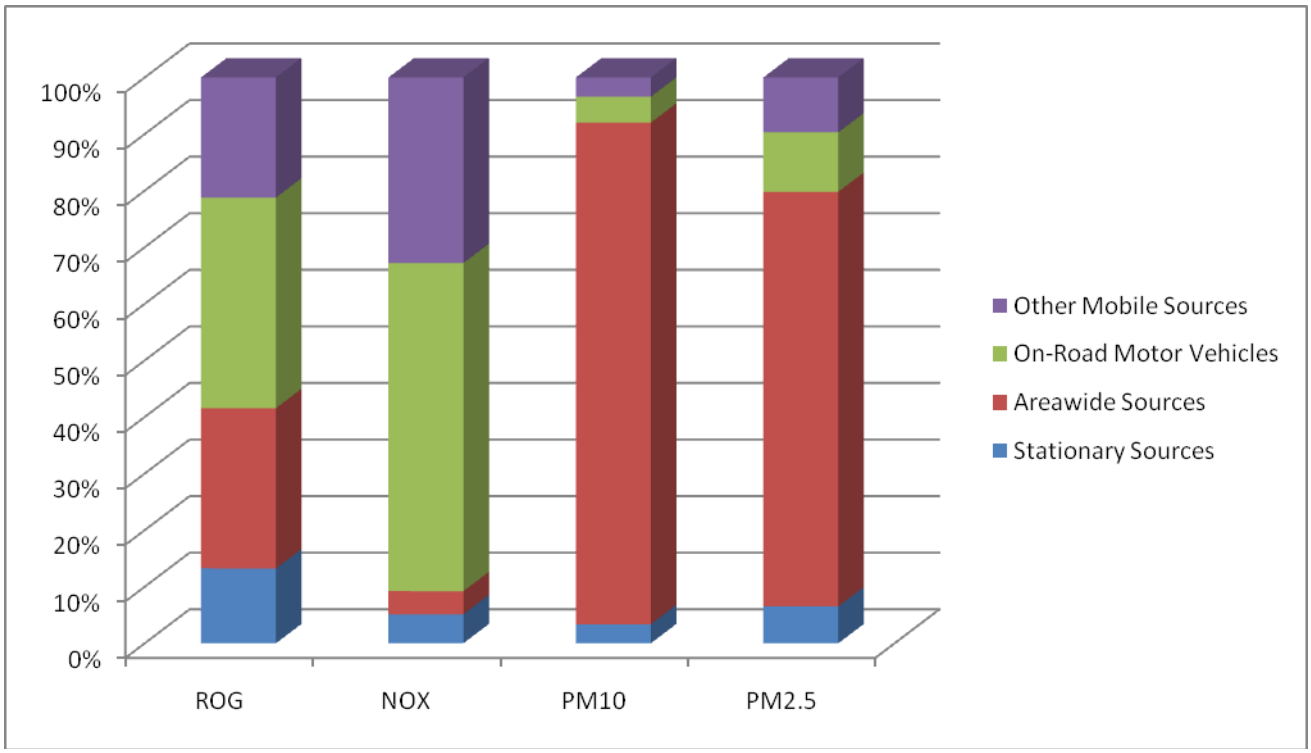
[c] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Estimated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2010, EPA 2010

Mobile Sources

Vehicle Traffic

On-road and other mobile sources are the largest contributors of ozone precursor emissions within Sacramento County. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles while off-road vehicles and other mobile sources comprise heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment. The major roadway in Citrus Heights is Interstate 80 (I-80), between Greenback Avenue and Antelope Road, which handles an average of approximately 179,000 vehicles per day (Caltrans 2010).



Notes: On-road sources include automobiles, motorcycles, and trucks; other mobile sources (off-road mobile sources) include small off-road engines and equipment, off-road recreational vehicles, farm and construction equipment, forklifts, locomotives, commercial marine vessels, and marine pleasure craft. Stationary sources include non-mobile sources such as power plants, refineries, and manufacturing facilities. Areawide sources of pollution are those where the emissions are spread over a wide area, such as consumer products, fireplaces, road dust, and farming operations. Natural sources are nonhuman-made emission sources, which include biological and geological sources, wildfires, windblown dust, and biogenic emissions from plants and trees.

Source: ARB 2009b

Sacramento County 2008 Emissions Inventory—Relative Contributions from Emission Sources **Exhibit 4.3-1**

Rail Traffic

There are no rail lines that operate in Citrus Heights. The J. R. Davis Railyard (Railyard) is located approximately 1.5 miles to the northwest of the planning area. The Railyard is a large source of NO_X, diesel particulate matter (DPM), and CO_2 emissions. Depending on wind speed and direction, and the proximity of sensitive receptors, the Railyard could result in exposures to DPM. Emissions of several criteria pollutants and toxics for the Railyard for the year 2008 are shown in Table 4.3-3.

The Railyard encompasses approximately 950 acres and is the largest service and maintenance railyard in the Western US, with over 30,000 locomotives passing through annually (ARB 2004). For the majority of the arriving locomotives, approximately 75% are processed through the service area, where they undergo routine service or maintenance. The other 25% are refueled at an area within the Railyard referred to as "the Subway," which is used for rapid turn-around and eventual departure from the Railyard.

In October 2004, ARB released the *Roseville Rail Yard Study* that provided a health risk assessment (HRA) of DPM from locomotives at the Railyard (ARB 2004). The HRA used meteorological data from both the Roseville meteorological station and from the McClellan Air Force Base meteorological station. To summarize, the key findings of the study were:

- The DPM emissions in 2000 from locomotive operations at the UPRR Railyard were estimated to be approximately 25 tons per year (tpy).

Table 4.3-3 2008 Facility-Wide Estimated Emissions Roseville Railyard						
Activity	NO_X (tpy)	DPM (tpy)	CO_2 (MT/y)	N_2O (MT/y)	CH_4 (MT/y)	CO_2e (MT/y)
Thru Train Total	45.3	1.11	2,560.4	0.06	0.20	2,584.6
Freight (Idling & Movement)	70.8	2.17	5,699.5	0.14	0.45	5,753.4
Local, Rockpile, & Power Moves	10.8	0.29	625.7	0.02	0.05	631.6
Hump & Trim	275.6	6.00	12,945.7	0.33	1.02	13,068.0
Service Idling & Movements	61.9	1.81	5,032.5	0.13	0.40	5,080.0
Shop Idling	11.2	0.35	973.1	0.02	0.08	982.3
Load Tests	109.2	2.77	6,903.2	0.17	0.54	6,968.4
Non-Locomotive Sources	8.6	0.21	552.2	0.00	0.00	552.7
Total	593	14.7	35,292	0.9	2.7	35,621
Total – In Yard Only	548	13.6	32,732	0.8	2.5	33,036
Notes: DPM = diesel particulate matter, tpy = tons per year, MT/y = metric tons per year Source: Union Pacific Railroad 2008.						

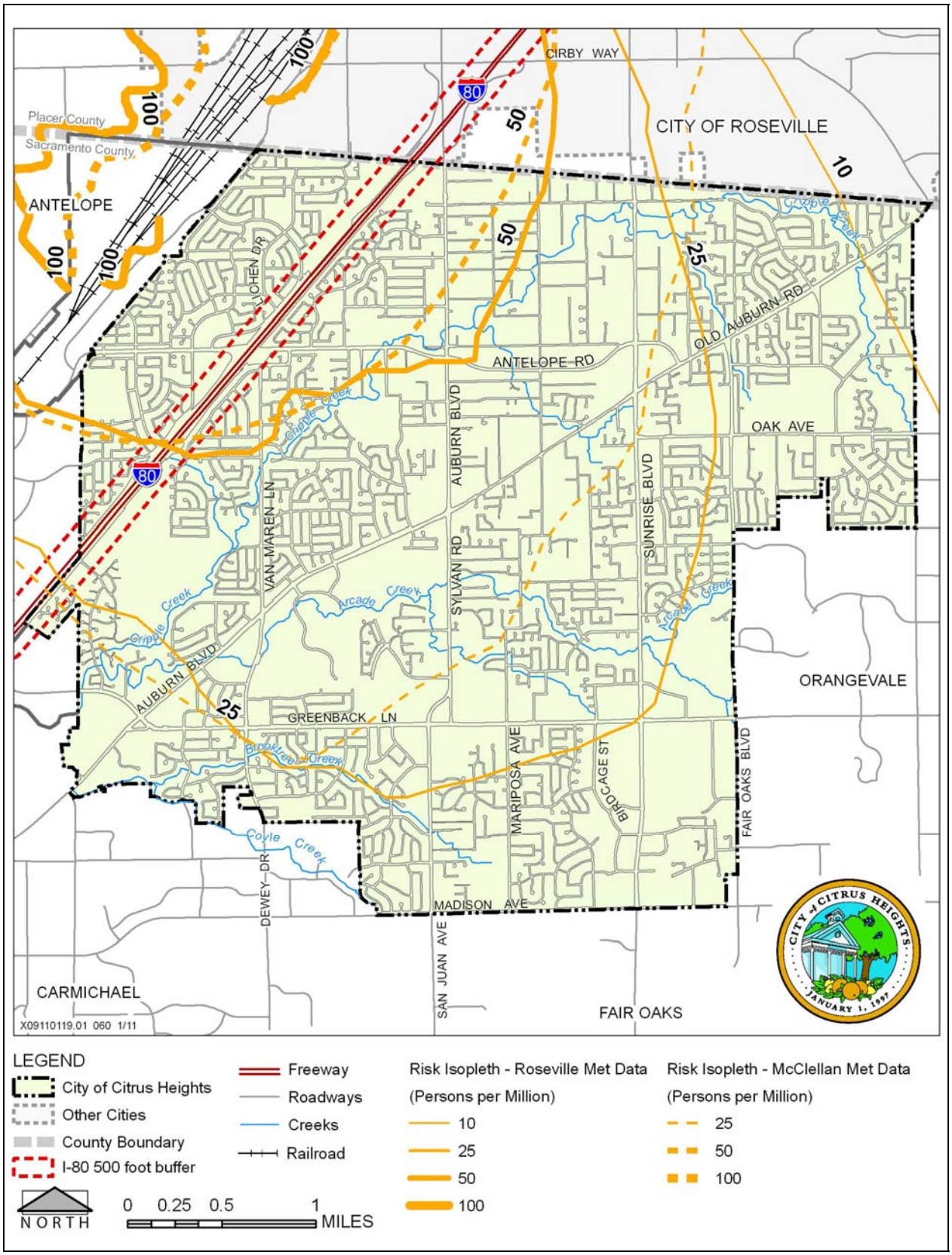
- Moving, idling, and testing of locomotives were estimated to account for approximately 50%, 45%, and 5%, respectively, of the total DPM at the Railyard.

- The HRA predicted potential cancer risks greater than 500 in a million (based on 70 years of exposure) northwest of the service track area, and the hump and trim area.

- The HRA showed elevated concentrations of DPM and associated cancer risk impacting a large area. These elevated concentrations of DPM, which are above the regional background level, contribute to an increased risk of cancer and premature deaths due to cardiovascular disease and non cancer health effects such as asthma and chronic obstructive pulmonary disease.

Exhibit 4.3-2 shows the estimated cancer risk contours in excess cases per one million for 2003 conditions as presented in the study (ARB 2004). These risk levels represent the predicted risk due to DPM above the existing background risk levels. This means that the pollutant contours, or isopleths, presented represent solely the added effect of the DPM from the Railyard; they do not include background risk levels associated with I-80. In addition, these risks assume a continuous exposure period of 70 years and an 80th percentile breathing rate. The risk levels displayed in this exhibit were calculated prior to the availability of the latest research on toxicity of $PM_{2.5}$ (ARB 2008i). Current efforts to reduce DPM emissions from locomotive and railyard sources include state and local agreements with the rail industry to implement cleaner emissions technology. As Exhibit 4.3-2 shows, due to the presence of the Railyard, a small portion of the northeast corner of Citrus Heights has DPM levels deemed by the SMAQMD to be acceptable with respect to TAC exposure (i.e., fewer than 10 cases of potential cancer risk per million); throughout the balance of the planning area, the risk associated with DPM TAC exposure is estimated to be greater than 10 cases of potential cancer risk per million.

Exhibit 4.3-2 also identifies portions of I-80 running through the northwestern portion of the planning area. I-80 has been identified by the SMAQMD as having greater than 100,000 annual average daily trips (AADT) (SMAQMD 2006). California Department of Transportation (Caltrans) recent estimates for peak hourly traffic rate on this segment identify 21,700 ADT at Madison Avenue. The SMAQMD developed their "Recommended Protocol for evaluating the location of sensitive Land Uses Adjacent to Major Roadways" in January 2010. The protocol defines a high volume roadway as one with greater than 100,000 AADT. For future projects proposed within 500 feet of a high volume roadway, SMAQMD recommends that the local agency require preparation of a health risk assessment.



Source: Compiled by AECOM in 2005 from ARB 2004.

Cancer Risk Contours for Roseville Railyard **Exhibit 4.3-2**

EXISTING AIR QUALITY—TOXIC AIR CONTAMINANTS

Concentrations of TACs are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality*, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being DPM. DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of gases, vapors, and particles, many of which are known human carcinogens. Most researchers believe that diesel exhaust particles contribute the majority of the risk because the particles in the exhaust carry many harmful organic chemicals and metals. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of DPM. In addition to DPM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene (ARB 2009a).

DPM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, ARB estimated its health risk to be 360 excess cancer cases per million people in the SVAB in the year 2000. Since 1990, the health risk associated with DPM has been reduced by 52%. Overall, levels of most TACs, except para-dichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009a).

For sources of TAC emissions in the project area, please refer to the Draft General Plan land use diagram (Exhibit 3-3 in Chapter 3, "Project Description") for areas currently designated as industrial (areas most likely to be stationary sources of emissions). Other sources of TACs located throughout the planning area could include, but are not limited to, gasoline dispensing stations, dry cleaners, auto body painting establishments, and crematoriums.

Mobile Sources

On-site mobile sources of TACs would be associated primarily with the operation of on-road heavy-duty diesel trucks used for proposed on-site commercial/industrial activities (e.g., unloading/loading). According to the ARB guidance document *Air Quality and Land Use Handbook: A Community Health Perspective*, ARB recommends avoiding the siting of new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences) (ARB 2005). The ARB guidance document is advisory, not regulatory. Operational activities that require the use of diesel-fueled vehicles for extended periods, such as commercial trucking facilities or delivery/distribution areas, may generate DPM emissions that could expose sensitive receptors to DPM emissions. Although commercial and industrial uses that could be developed under the Draft General Plan have not been identified, some of the tenants would require large delivery and shipping trucks that use diesel fuel. The diesel exhaust PM emissions generated by these uses would be produced primarily at single locations on a regular basis (e.g., loading dock areas). Idling trucks, including TRUs, increase DPM levels at these locations. Occupants of nearby existing and proposed residences may be exposed to diesel exhaust PM emissions on a reoccurring basis.

ARB has adopted an idling restriction ATCM for large commercial diesel-powered vehicles, which became effective February 1, 2005. In accordance with this measure, vehicles subject to the regulation are required to limit idling to no longer than 5 minutes under most circumstances. ARB is currently evaluating additional ATCMs intended to further reduce TACs associated with commercial operations, including a similar requirement to limit idling of smaller diesel-powered commercial vehicles. In addition, the Draft General Plan contains goals,

policies, and implementation strategies designed to minimize exposure of sensitive receptors to concentrations of TACs from mobile sources.

The ARB guidance document *Air Quality and Land Use Handbook: A Community Health Perspective* recommends avoiding the placement of new sensitive land uses (e.g., residences, schools) within 500 feet of major freeways (those with 100,000+ vehicles per day). I-80 through the planning area handles an average of approximately 179,000 vehicles per day (Caltrans 2010). As discussed earlier, SMAQMD has developed a protocol for evaluating the sighting of sensitive receptors near major roadways. The screening tables contained in the protocol show estimated cancer risks with regard to roadway volume and distance from the roadway. According to the screening tables, for the traffic volumes on I-80 at the ARB-recommended 500 feet, the increase to cancer burden is approximately 178 per million north of the freeway, and 83 per million south of the freeway.

Rail Traffic Sources

The Union Pacific Railroad (UPRR) main line and southern end of the Roseville Railyard lie adjacent to the planning area. The railroad operations at the Roseville Railyard include freight and passenger train operations on UPRR tracks and activities at the Railyard. Rail activities are sources of diesel particulate matter and as such a potential source of TACs to surrounding receptors.

As shown in Exhibit 4.3-2 above, the Rail Yard Study indicates that locomotive-related activities at the Railyard would result in the exposure of sensitive receptors in Citrus Heights to a cancer risk level of 50 excess chances in one million. This predicted cancer risk level in Citrus Heights would be in addition to the existing background conditions for which the Study showed a cancer risk level of 360 in a million. The study is conservative, in that it assumes a continuous exposure period of 70 years and an 80$_{th}$ percentile breathing rate. This increased cancer risk could limit future siting of sensitive land uses, such as hospitals and schools.

On June 24, 2005, the Executive Officer of ARB entered into an agreement with UPRR to implement short-term measures for DPM emissions reductions (ARB 2005b). The agreement focused on reducing DPM on and around rail yards by approximately 20 percent. Actions included as part of the agreement are summarized below:

- Install idling reduction devices on 70% of unequipped intrastate locomotives by June 30, 2007.
- Ensure that at least 80% of the fuel supplied to locomotives fueled in California after December 31, 2006 meets the specifications for either ARB diesel fuel or EPA on-highway diesel fuel.
- Evaluate remote sensing to identify high-emitting locomotives.
- Evaluate the feasibility of developing diesel particulate filters or diesel oxidation catalysts for use on a typical switch locomotive representative of the current California switcher fleet.

The most recent semi-annual status report on the implementation of the agreement shows that the railroads and staff have met, or are on schedule to meet, the requirements specified for the implementation of the agreement. ARB staff estimates that these efforts have provided about a 15% reduction in railyard DPM emissions between 2005 and 2007. Measures to be applied between 2007 and 2010 are expected to provide another 30 to 50% reduction in that period (Taricco, pers. comm., 2010).

The Roseville Railyard Air Monitoring Project focused on air quality monitoring at locations upwind and downwind of the UPRR Railyard from 2005 through 2007 for black carbon, an indicator of DPM; NO_X; $PM_{2.5}$; and, wind speed and direction. There are four sites established for monitoring pollutants from the UPRR Railyard as a part of this monitoring project including Denio, Church, Pool, and Vernon. Concentrations of NO, NO_x, $PM_{2.5}$ and black carbon (an indicator of DPM) at the Denio and Church downwind sites are significantly higher than at the upwind Pool and Vernon sites. The predominant wind direction is verified to be from the southeast to the northwest, as a part of this monitoring study (PCAPCD 2006b).

Sensitive Land Uses

Sensitive land uses or sensitive receptors are people or facilities that generally house people (e.g., schools, hospitals, residences) that may experience adverse effects from unhealthful concentrations of air pollutants. There are numerous types of these receptors throughout Citrus Heights. Please refer to the land use diagram (Exhibit 3-3) for areas currently designated as residential and public (areas most likely to be sensitive land uses).

EXISTING AIR QUALITY—ODORS

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

The ability to detect odors varies considerably among the population and is quite subjective. Some individuals have the ability to smell minute quantities of specific substances. Others may not have the same sensitivity, but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor. An odor that is offensive to one person (e.g., from a fast food restaurant) may be acceptable to another. Unfamiliar odors are more easily detected than familiar odors and are more likely to cause complaints. This is because of a phenomenon known as "odor fatigue," in which a person can become desensitized to almost any odor and recognition occurs only with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the intensity of the odor weakens and eventually becomes so low that detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

There are no existing major odor sources in Citrus Heights. This area is mostly residential with commercial corridors. Activities associated with these land uses generally do not generate objectionable odors. Potential odor sources from diesel activity include the Roseville Railyard and I-80. Minor sources of odors can include restaurants, auto service stations, metal fabricators and miscellaneous construction activities. There may be some odors associated with the industrial area located adjacent to the northwestern portion of the City.

4.3.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Regional and local emissions of criteria air pollutants and precursors, TACs, and odors during construction and operation of the Draft General Plan were assessed in accordance with the methodologies described below.

Construction-related emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (ROG and NO_X) were assessed in accordance with methodologies recommended by ARB and SMAQMD. Where quantification was required, emissions were modeled using the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model. Model default parameters were assumed where project-specific data (e.g., construction equipment types and number requirements, maximum daily acreage disturbed) were not available at the general plan level. Construction-related emissions were compared to applicable SMAQMD thresholds to determine significance.

Regional operational emissions of criteria air pollutants and precursors (e.g., mobile and area sources) were also quantified using the URBEMIS 2007 Version 9.2.4 computer model. Modeling was based on buildout

assumptions in the Draft General Plan and information about vehicle trip generation from the traffic analysis prepared to support the Draft General Plan and EIR (see Section 4.2, "Transportation and Mobility," in this DEIR).

Other air quality impacts (i.e., local emissions of CO, odors, operation-related TACs) were assessed in accordance with methodologies recommended by ARB and SMAQMD.

THRESHOLDS OF SIGNIFICANCE

For the purpose of this analysis, the following thresholds of significance, as identified by the State CEQA Guidelines (Appendix G) and SMAQMD have been used to determine whether implementation of the Draft General Plan would result in significant air quality impacts.

Based on Appendix G of the State CEQA Guidelines, an air quality impact is considered significant if the proposed project would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations; or,
- create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, according to SMAQMD, an air quality impact is considered significant if the proposed project would:

- Generate 85 lb/day or more of NO_X during construction, or
- Generate 65 lb/day or more of NO_X or ROG during operational phases.

For stationary sources the SMAQMD also considers an air quality impact as significant if the proposed project would:

- result in an incremental increase in cancer risk greater than 10 in one million at any off-site receptor, or
- result in ground-level concentration of project-generated TACs that would result in a Hazard Index greater than 1 at any off-site receptor.

SMAQMD recommends that for the analysis of general plans, the air quality impacts would be considered significant if:

- the plan is inconsistent with the adopted Sacramento Regional Ozone Attainment Plan (OAP) and the Sacramento Area Council of Government's (SACOG) Metropolitan Transportation Plan; or
- the plan does not provide buffer zones around sources of odors and TACs.

IMPACT ANALYSIS

IMPACT 4.3-1 **Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors.** *Emission of Criteria Air Pollutants and precursors during construction of future land uses consistent with the Draft General Plan would exceed SMAQMD's significance thresholds of 85 lb/day for NO_X. Policies and actions contained in the Draft General Plan would support compliance with SMAQMD-recommended standard construction mitigation practices. This would substantially reduce construction-generated air pollutant emissions. However, due to the amount of total development that could potentially occur consistent with the Draft General Plan, construction-generated emissions of criteria air pollutants and precursors is considered substantial, and could violate an ambient air quality standard, contribute substantially to an existing or predicted air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered* ***significant****.*

Construction-related emissions are described as short-term or temporary in duration and have the potential to represent a significant impact with respect to air quality. The timing or phasing of general plan buildout is dependent on economic, demographic, and other factors that are not known at this time.

Individual projects brought forward under the Draft General Plan would continue to define phasing at a detailed level and be reviewed by the City to ensure that development occurs in a logical manner consistent with policies in the Draft General Plan, and that additional environmental review is conducted under CEQA, as needed.

Construction-related activities would result in emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG, NO_X) from:

- site preparation (e.g., excavation, grading, clearing);
- exhaust from off-road equipment, material delivery vehicles, and worker commute vehicles;
- vehicle travel on paved and unpaved roads; and
- other miscellaneous activities (e.g., building construction, asphalt paving, application of architectural coatings, trenching for utility installation).

Emissions of Ozone Precursors and Fugitive Dust

Emissions of ozone precursors are associated primarily with exhaust from off-road construction equipment. Worker commute trips and other construction-related activities also contribute to short-term increases in such emissions.

Emissions of fugitive PM dust (e.g., PM_{10}, $PM_{2.5}$) are associated primarily with ground disturbance activities during site preparation (e.g., grading) and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT on- and off-site. Exhaust emissions from diesel equipment and worker commute trips also contribute to short-term increases in PM_{10} emissions, but to a much lesser extent (see Table 4.3-3). Construction-related activities would result primarily in project-generated emissions of fugitive PM_{10} dust from site preparation (e.g., excavation, grading, clearing).

Construction-related emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were modeled using the URBEMIS 2007 Version 9.2.4 computer program. URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Detailed phasing and construction information (e.g., construction equipment type and number requirements, maximum daily acreage disturbed, number of workers, hours of operation) is not possible to determine at the general plan level.

Modeling was performed assuming a 25-year planning horizon. It is assumed that 1/25 or roughly 4% of the proposed uses would be constructed during any given year over a 25-year time frame. This would represent approximately 8 acres of development per year over 25 years. The area available for construction is based on current available acres by land use type and maximum coverage for each land use type. This is a conservative assessment since it assumes that the maximum area that can be covered will be covered so if any future development were to cover less area than the maximum allowable than the estimated emissions would be less. Modeling was conducted for the year 2011. If construction would not occur until future years, emission factors associated with off-road construction equipment would be lower due to the regulatory trend of more stringent emissions standards for engines. As older models of equipment are replaced by newer models with cleaner engines, fleetwide emission factors would decline. Therefore, the modeling in 2011 can be considered "conservative" in representing daily construction emissions associated with Draft General Plan buildout.

Table 4.3-4 summarizes the estimated construction-related emissions of criteria air pollutants and ozone precursors from site preparation (e.g., grading) and building construction activities from buildout of the Draft General Plan, which includes concurrent buildout of the existing (pre-update) General Plan. Construction-related air quality impacts were determined by comparing these modeling results with applicable SMAQMD significance thresholds. Refer to Appendix B for detailed modeling input parameters and results.

Table 4.3-4
Summary of Modeled Construction-Related Emissions of Criteria Air Pollutants and Precursors—Buildout of the Proposed Draft General Plan in the Worst-Case Year (2011)

	Emissions (lb/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Future Construction of Land Uses Consistent with the Draft General Plan				
Grading	3.94	31.61	202.80	42.35
Building Construction	4.46	20.88	1.52	1.31
Asphalt Paving	3.05	17.06	1.49	1.36
Architectural Coatings	60.67	0.03	0.00	0.00
Net New Unmitigated (Worst-case) Daily Emissions	**72.12**	**69.58**	**205.81**	**45.02**
SMAQMD Significance Threshold	-	85	-	-

Notes:
lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter ROG = reactive organic gases; Emissions totals may not sum exactly due to rounding.
*Calculated mitigated worst case daily emissions are emissions estimates according to URBEMIS calculations.
SMAQMD does not have mass emissions thresholds for PM_{10} and $PM_{2.5}$.
No emissions were modeled for demolition activities. Existing land uses to be demolished are unknown at this time.
It was assumed that a maximum of 8 acres/day would be actively disturbed associated with construction projects that could occur as a result of future land uses consistent with the Draft General Plan.
Refer to Appendix B for detailed input parameters and modeling results.
Source: Modeling performed by AECOM 2010

As summarized in Table 4.3-4, construction-related activities associated with the buildout of the reasonable worst-case year (2011) would result in annual unmitigated emissions of approximately 72.12, 69.58, and 205.81 lb/day of ROG, NO_X, and PM_{10} respectively. The total unmitigated emissions estimates for the Draft General Plan buildout in 2035 would be 126.75 tons of ROGs, 88.50 tons of NO_X, 102.75 tons of PM_{10} and 25.75 tons of $PM_{2.5}$. Based on the modeling conducted, construction-related activities associated with buildout of the Draft General

Plan would result in emissions of NO_X that do not exceed SMAQMD's significance thresholds. SMAQMD does not have mass emissions thresholds for $PM_{2.5}$ and PM_{10}.

Draft General Plan Policies and Actions

The Draft General Plan includes a policy and action that would mitigate the effects of construction-related emissions.

Policy

- **53.1:** Promote measures that improve air quality and help meet air quality attainment standards.

Action

53.1.C. Enforce air pollution control measures during construction.

Construction-related emissions could violate an air quality standard, contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. Because of the amount of development and potential for simultaneous construction of multiple sites, the nonattainment status of Sacramento County for PM, and modeled emissions that could exceed applicable thresholds (Table 4.3-3) pre- and post-mitigation, implementation of the Draft General Plan could result in or substantially contribute to an air quality violation.

Implementation of the policy and action shown above would reduce short-term, construction-related emissions. However, the policy and action alone cannot guarantee that construction emissions generated during future construction activities would not violate existing or projected air quality violations and/or expose sensitive receptors to substantial pollutant concentrations. For this reason, this impact is considered **potentially significant**, and mitigation is required.

Mitigation Measures

Mitigation Measure 4.3-1: Require Implementation of SMAQMD *Basic Construction Emission Control Practices*. Where needed to reduce potentially significant impacts, the City shall require project applicants, as a condition of project approval, to incorporate the most current basic control measures recommended by SMAQMD to reduce fugitive PM_{10} dust emissions, where required. These practices (as of February 2011) are described at the following location:

http://www.airquality.org/ceqa/cequguideupdate/Ch3BasicConstructionEmissionControlPracticesFINAL.pdf

Mitigation Measure 4.3-2: Require Compliance with SMAQMD PM Screening Criteria and Implementation of SMAQMD *Enhanced Fugitive PM Dust Control Practices*. For projects with a maximum daily disturbed area (i.e., grading, excavation, cut and fill) greater than 15 acres, project applicants, as a condition of project approval, shall perform screening level analysis of PM_{10} emissions during construction, and shall perform dispersion modeling if screening level analysis indicates that concentration-based limits may be exceeded (less than 50 $\mu g/m^3$ 24-hour standard; 20 $\mu g/m^3$ Annual Arithmetic Mean for PM_{10}; and less than 12 µg/m3 Annual Arithmetic Mean for $PM_{2.5}$ for the maximally exposed individual sensitive receptor). If dispersion modeling indicates that these limits may be exceeded, and where needed to reduce potentially significant impacts, project applicants shall incorporate the most current enhanced fugitive PM dust control practices recommended by SMAQMD. These practices (as of February 2011) are described at the following location:

http://www.airquality.org/ceqa/cequguideupdate/Ch3EnhancedFugitivePMDustControlPracticesFINAL.pdf

Conclusion

Implementation of Mitigation Measures 4.3-1 and 4.3-2, as detailed by SMAQMD guidance at the time of future project construction, would further reduce impacts on air quality as a result of construction related emissions. The mitigation, along with compliance with the policy and action listed above, would reduce PM impacts. Therefore, emissions from future projects occurring within the planning area would not violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered **less than significant** with mitigation incorporated.

IMPACT 4.3-2 Consistency with Air Quality Planning Efforts. *Draft General Plan policies and actions would not conflict with the Ozone Attainment Plan or Regional Transportation Plan, policies, or agency regulation with jurisdiction over the project. However, future land uses consistent with the Draft General Plan would generate emissions of criteria air pollutants (PM_{10} and $PM_{2.5}$) and ozone precursors, both of which affect regional air quality. Anticipated population and development consistent with the Draft General Plan could lead to operational (mobile-source and area-source) emissions that would exceed SMAQMD thresholds. This impact would be significant.*

Regional air quality plans in effect for the City of Citrus Heights include the OAP and MTP (which includes growth principles from the Preferred Blueprint Scenario). SMAQMD guidance for evaluation of general and area plans pursuant to CEQA recommends consideration of the Draft General Plan's consistency with OAP and MTP growth projections, the relationship of the Draft General Plan's VMT and population growth rates, and the extent to which the Draft General Plan incorporates OAP transportation control measures.

The Draft General Plan is based on the promotion of smart growth principles for future development. Please refer to Impact 4.1-4 in Section 4.1, "Land Use, Population, and Housing" for discussion regarding consistency of the Draft General Plan with the Preferred Blueprint Scenario. Please refer to Impact 4.2-1 in Section 4.2, "Transportation and Mobility" for discussion regarding anticipated growth rates of both VMT and population with implementation of the Draft General Plan and incorporation of applicable transportation control measures. Please refer to Section 6.0, "Other CEQA Considerations" for discussion regarding consistency of the Draft General Plan population and employment projections with those of the MTP. As discussed in each of these sections, the Draft General Plan and GGRP promote the goals of the regional air quality plans (i.e., attainment of federal and state ozone standards) and would not obstruct their attainment.

However, there could be specific conflicts with SMAQMD policies regarding ozone control if consequent net emissions of NOx and ROG with the proposed General Plan would exceed the SMAQMD quantitative significance thresholds. Future changes to air pollutant emissions in Citrus Heights were calculated based on vehicle travel data provided in the traffic analysis prepared for the project, and area-source emissions from proposed land uses. ARB's motor vehicle emissions model (EMFAC 2007) factors, as contained in the URBEMIS 2007 (Version 9.2.4) computer model, were used along with VMT estimates from the traffic analysis prepared for this project (see Section 4.2, "Transportation and Mobility") to calculate net new emissions in units of lb/day for future (2035) conditions upon buildout of the Draft General Plan relative to existing (on-the-ground) conditions. The net change in daily air pollutant emissions is shown in Table 4.3-5.

Emissions of PM_{10} and ozone precursors (ROG and NO_X) associated with future land uses consistent with the Draft General Plan are treated as new to the region. This is a conservative (worst-case) assumption because many new vehicle trips may actually be moved from one part of the region to another. This analysis assumes that in the year 2035, all possible future construction enabled by the Draft General Plan will be complete and in use. Because the Draft General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment, this could conflict with SMAQMD air quality planning efforts.

As shown in Table 4.3-5, the Draft General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment.

Table 4.3-5
Summary of Modeled Operational Emissions of Criteria Air Pollutants and Precursors—2035 Conditions upon Buildout of the Draft General Plan

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Net New Draft General Plan Land Uses				
Area Sources[2]	239.52	71.78	0.45	0.45
Mobile Sources[3]	232.78	138.99	1,058.78	201.48
Net New Draft General Plan Daily Unmitigated Emissions	**472.30**	**210.77**	**1,059.23**	**201.48**
SMAQMD Significance Threshold	65 lb/day	65 lb/day	-[4]	-[4]
Impact	**Yes**	**Yes**		

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 50 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROG = reactive organic gases

[1] *Emissions* modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on trip generation rates obtained from the analysis prepared for this project and proposed land uses identified in Chapter 3, "Project Description," and Section 4.4, "Transportation and Circulation," of this DEIR.

[2] For this estimate, SMAQMD-recommended model assumptions were used for the number of residences that would contain hearth features.

[3] Trip generation rates were obtained from the traffic analysis for the respective land uses (see Section 4.4, "Transportation and Circulation").

[4] SMAQMD does not have mass emissions thresholds for PM_{10} and $PM_{2.5}$.

Refer to Appendix B for detailed assumptions and modeling output files.

Source: Data modeled by AECOM 2010

Goal 29 of the Draft General Plan states that the City will "plan, design, construct, and manage a Complete Streets transportation network that accommodates the needs of all mobility types, users, and ability levels." For this reason, a net reduction of VMT between the existing General Plan buildout condition and the Draft General Plan buildout condition is anticipated (See Chapter 6.0, "Alternatives"). Reductions in mobile-source emissions of NO_x, ROGs and PM_{10} would occur relative to the existing General Plan. Improvements to vehicle emissions technology are already reflected in emissions projections associated with air quality planning efforts. This is due to the decrease in average VMT/vehicle trips compared to the existing General Plan. In other words, the rate of emissions per person in Citrus Heights would be lower under the Draft General Plan than under the existing General Plan because of the Complete Streets program.

Draft General Plan Policies and Actions

Various elements of the Draft General Plan include policies and actions that seek to reduce air pollution and minimize the air quality impacts of new development. Air pollution emission reduction strategies are predominantly captured in land use and complete streets policies and actions. The following Draft General Plan policies and actions and GGRP measures and actions are designed to achieve consistency with regional air quality planning efforts.

Policies

- **3.5:** Plan, design, and construct neighborhood streets to encourage walking and bicycling while discouraging high vehicle speeds and volumes consistent with Policy 29.1.

- **4.5:** Ensure that requests for rezoning to increase the allowable residential density in all neighborhoods shall only be approved for projects providing superior design and enhanced community benefit. It shall be the responsibility of the applicant to demonstrate how the rezoning will allow for the development of a project that exceeds the City's minimum requirements by proving superior design and enhanced community benefit. In addition, rezonings shall only be approved if the following findings can be made.

    - The proposed rezoning shall result in a project that contributes to and enhances the best characteristics of the surrounding neighborhood.

    - The applicant has demonstrated that the increased density will not negatively impact storm drainage within the local area. Proponents shall be required to provide adequate topographic and flow characteristics information to demonstrate their project will not contribute to or worsen any flooding problems in the locale.

    - The applicant has demonstrated that adequate public infrastructure, including streets, water, and sewer, is available to serve the project.

    - The proposed rezoning will assist the City in meeting the goals of the General Plan.

- **7.6:** Plan, design, and construct rural residential streets to encourage walking and bicycling and discourage high vehicle speeds and volumes consistent with Policy 29.1.

- **29.1:** When constructing or modifying transportation facilities, strive to provide for the movement of vehicles, commercial trucks, alternative and low energy vehicles, transit, bicycles and pedestrians appropriate for the road classification and adjacent land use.

- **29.2:** Measure customer satisfaction related to vehicle travel using level of service (LOS) according to procedures in the latest version of the Highway Capacity Manual published by the Transportation Research Board. The City will strive to achieve LOS E or better conditions for City roadways and intersections during peak hours (these may include weekday AM, Mid-Day, and PM hours as well as Saturday Mid-Day or PM peak hours). The intent of the policy is to effectively utilize the roadway network capacity while balancing the desire to minimize potential adverse effects of vehicle travel on the environment and other modes.

    Exceptions to LOS E are allowed for both roadway segments and intersections along the following streets:

    - Sunrise Boulevard – south City limits to north City limits
    - Greenback Lane – west City limits to east City limits
    - Old Auburn Road – Sylvan Road to Fair Oaks Boulevard
    - Antelope Road – I-80 to Auburn Boulevard
    - Auburn Boulevard – Old Auburn Road to north City limits

    No road widening to provide additional vehicle capacity of the above listed streets will be permitted. Development projects that impact these locations according to the City's transportation impact study guidelines would require mitigation, including, but not limited to, the following items:

    - actions that reduce vehicle trips or provide non-auto improvements to the transportation network or services

    - lengthening of turn pockets

    - signal timing modifications

Additional exceptions may be allowed by the City Council at both exempt and non-exempt locations where mitigation is infeasible or would conflict with other community values such as those listed below:

- impacts on general safety, particularly pedestrian, bicycle, and transit safety
- the right-of-way needs and the physical impacts on surrounding private or public properties
- the visual aesthetics of the required improvement and its impact on community identity and character
- environmental impacts including air quality and noise impacts
- impacts on quality of life as perceived by residents

- **29.3:** Require development proposals to analyze future transportation impacts and mitigate significant impacts consistent with Policies 29.1 and 29.2.

- **29.4:** Support safe, complete and well-connected neighborhood street, bicycle, and pedestrian access and connections that balance circulation needs with the neighborhood context.

- **30.3:** Discourage the construction of private streets to ensure full public access to the City circulation system.

- **31.1:** Strive to increase fixed-route and demand responsive (i.e., paratransit) transit service coverage and frequency to Citrus Heights residents and employees.

- **31.2:** Strive to provide public transit that is an attractive, convenient, dependable and safe alternative to the automobile.

- **31.3:** Consider express commuter bus service between Citrus Heights and major employment and transit centers.

- **31.4:** Require new development to provide transit enhancements, where appropriate, that decrease transit travel times, improve access to transit stops, or improve the amenities, security, or travel information at transit stops.

- **32.1:** Evaluate and utilize technologies that can improve the performance, reliability, and safety of the transportation system (such as signal coordination, centralized traffic control, red-light and speed enforcement cameras, and real-time travel information).

- **33.1:** Maintain open communication and cooperation with all public agencies that serve residents and businesses in Citrus Heights.

- **33.2:** Establish formal and informal processes with regional agencies, the City of Roseville, Sacramento County, and Placer County to review and provide input on proposed development within one half mile of the City limits.

- **51.2:** Protect citizens against potential or undiscovered unexploded ordnance at the Union Pacific Roseville Railyard.

- **53.1:** Promote measures that improve air quality and help meet air quality attainment standards.

- **53.2:** Minimize the impacts of vehicle emissions on air quality.

- **53.3:** Promote use of clean alternative fuel vehicles and construction equipment.

- **53.4:** Enable use of electric (rather than gasoline-powered) equipment and natural gas appliances, including outdoor grills.

- **53.5:** Discourage the development of potential stationary sources of toxic air contaminants sources near sensitive receptors, and the siting of sensitive receptors near sources of toxic air contaminants.

- **54.1:** Encourage alternative modes of transportation and trip-reducing strategies such as telecommuting and mixed-use development.

- **54.2:** Participate in educational efforts aimed at improving air quality, such as notifying residents and businesses during "Spare the Air" days designated by the Sacramento Air Quality Management District.

- **55.1:** Implement a comprehensive greenhouse gas reduction plan to reduce communitywide greenhouse gasses through community engagement and leadership; land use, community design, and transportation choices; energy and water conservation techniques; solid waste reduction and building green infrastructure.

- **55.2:** Emphasize Citrus Heights' role as an environmental steward by conducting City business in a manner that increases community understanding of the healthy and balanced relationships between developed and natural environments.

Actions

53.1.A. Work with local and regional agencies to develop a consistent and effective approach to air quality planning and management.

53.1.C. Enforce air pollution control measures during construction.

53.1.D: Synchronize traffic signals on roads susceptible to high emission levels from idling vehicles.

53.3.A: Incorporate alternative fuel vehicles into the City fleet to achieve the objective of using clean fuels in 70 percent of City vehicles.

Greenhouse Gas Reduction Plan Measures and Actions

The following GGRP measures and actions seek to reduce VMT, and therefore reduce air quality impacts and align with regional air quality planning efforts. By reducing VMT, these measures will also reduce air pollutant emissions other than GHGs.

Measures

- **3-1.A:** Continue to implement the smart-growth principles established in SACOG's Metropolitan Transportation Plan to the extent feasible.

- **3-2.A:** Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.

- **3-2.B:** Work with employers to offer incentives and services to increase use of alternatives to single-occupant autos (commute trip reduction programs such as parking cash-out, transit subsidy).

- **3-3.A:** Conduct a parking management study to monitor implementation of revised 2006 parking standards (CHMC 106.36.080).

- **3-5.A:** Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.

- **3-5.B:** Increase bicycle infrastructure by requiring bicycle parking in new development, retrofitting parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities, and participating in a regional bikesharing program.

- **3-6.A:** Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.

- **3-6.B:** Work with Regional Transit, E-Tran, Roseville Transit, Amtrak and other transit agencies to develop a regional pass system.

Actions

3-1.A.A. Collaborate with adjacent cities and other regional partners to promote SACOG's smart-growth principles to develop and support alternative transportation.

3-1.B.A. Work with SJUSD to develop an outreach program that promotes alternative travel modes for school-related trips.

3-2.A.A. Create rideshare-designated parking spaces near bus stops, employment centers and commercial areas (e.g., Sunrise MarketPlace, Auburn Boulevard).

3-2.A.B. Amend the Zoning Code to require preferential parking spaces within new or substantially improved commercial, employment and civic projects designated for carpool and/or vanpool use.

3-2.A.C. Provide information for employers about potential benefits of car-share programs and the presence of local car rental opportunities.

3-2.B.A. Develop an outreach program to City employers and collaborate with them to identify various commuter trip reduction programs for their employees.

3-3.A.A. Conduct a feasibility study to evaluate shared parking opportunities for compatible adjacent land uses (e.g., offices next to commercial or multi-family residential uses).

3-3.A.B. Evaluate opportunity areas to reduce travel speeds and improve pedestrian use (e.g., Auburn Boulevard Specific Plan).

3-3.A.C. Conduct a parking management study to identify vacant or underused parking lots and spaces to convert them to other uses such as park-and-ride lots, motorcycle parking, and shared parking spaces.

3-5.A.A. Re-evaluate the Bicycle Master Plan. Conduct a citywide gap analysis to identify missing links in the bicycle network and prioritize filling gaps to enhance bike travel.

3-5.A.B. Adopt a Pedestrian Master Plan and implement near-term improvements. Conduct a citywide pedestrian walkway analysis to identify locations with physical obstacles within sidewalks, walkways, and trails such as utility poles and prioritize removing these barriers to encourage pedestrian use.

3-5.B.A. Continue to implement City bicycle parking standards (CHMC 106.36.060) for new development and identify ways to retrofit existing development to match these requirements.

3-5.B.B. Identify areas lacking adequate bike parking. Retrofit parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities.

3-5.B.C. Partner with transit agencies and adjacent cities to develop a regional bikeshare program.

3-6.A.A. In collaboration with regional transit agencies, evaluate potential to add public transit service types, including Bus Rapid Transit and community or neighborhood shuttles to regional rail stops.

3-6.B.A. Partner with SACOG and local transit agencies to develop a regional transit pass program.

The Draft General Plan and GGRP contain policies, measures, and actions intended to reduce per-capita VMT, which would result in a reduction in air pollution from that which would occur without implementation of the policies, actions, and measures. However, as shown in Table 4.3-4, the Draft General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment. This could conflict with SMAQMD air quality planning efforts. Therefore, this impact is considered **significant**.

Mitigation Measures

No mitigation measures are available beyond policies, measures, and actions in the Draft General Plan and GGRP.

Conclusion

The Draft General Plan and GGRP promote the goals of the regional air quality plans (i.e., attainment of federal and state ozone standards). Although the Draft General Plan and GGRP policies, actions, and measures intend to reduce future air emissions in a manner consistent with the intention of air quality planning efforts, it cannot be demonstrated with certainty that implementation of the policies, measures, and plans would reduce air quality impacts enough to be below existing SMAQMD significance thresholds. Therefore, as a conservative approach, this impact is considered **significant and unavoidable**.

IMPACT 4.3-3 **Generation of Long-Term Operational Regional Emissions of Criteria Air Pollutants and Precursors.** *Long-term land uses consistent with the Draft General Plan would result in emissions of ROG and NO_X that exceed SMAQMD's significance thresholds of 65 lb/day and result in emissions of PM_{10} that would contribute to the County's nonattainment status. Thus, operational emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would be* ***significant****.*

Implementation of the Draft General Plan would result in long-term regional emissions of ROG, NO_X, and PM_{10} associated with area sources, such as natural gas emissions, landscaping, applications of architectural coatings, in addition to operational vehicle-exhaust emissions. According to the traffic data used to prepare Section 4.2, "Transportation and Mobility," buildout of the Draft General Plan would result in a net increase in daily VMT compared to existing conditions. Operational emissions were modeled using the URBEMIS 2007 Version 9.2.4 computer program (Rimpo and Associates 2008), as recommended by SMAQMD. Model defaults were adjusted to reflect project-specific data, where available including the sizes and types of proposed land uses. Modeled operational emissions for the Draft General Plan are presented in Table 4.3-4. Refer to Appendix B for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Based on the modeling conducted, and as summarized in Table 4.3-4, implementation of the Draft General Plan would result in a net increase in unmitigated long-term regional emissions of approximately 473.30 lb/day of ROG, 210.77 lb/day of NO_X, 1,059.23 lb/day of PM_{10}, and 201.48 lb/day of $PM_{2.5}$.

The Draft General Plan does not change planned land uses within the City but instead focuses on changing the way traffic moves in and around the City. Since there are no changes to the currently planned land uses, there would be no new impacts from land use. Implementation of the Draft General Plan policies and actions as well as complying with the SMAQMD best management practices would reduce operational emissions of ROG, NO_X,

and PM_{10}, but the City cannot demonstrate that these measures would reduce impacts to a less-than-significant level.

Draft General Plan Policies and Actions

The various elements of the Draft General Plan include numerous policies and actions that seek to reduce air pollution and minimize the air quality impacts of new development. Air pollution emissions reduction strategies are predominantly captured in the changes to traffic patterns and volume of flows. The following Draft General Plan policies and actions are designed to reduce generation of long term operational regional emissions of criteria air pollutants and precursors.

Policies

- **3.5:** Plan, design, and construct neighborhood streets to encourage walking and bicycling while discouraging high vehicle speeds and volumes.

- **4.5:** Ensure that requests for rezonings to increase the allowable residential density in all neighborhoods shall only be approved for projects providing superior design and enhanced community benefit. It shall be the responsibility of the applicant to demonstrate how the rezoning will allow for the development of a project that exceeds the City's minimum requirements by proving superior design and enhanced community benefit. In addition, rezonings shall only be approved if the following findings can be made.

    - The proposed rezoning shall result in a project that contributes to and enhances the best characteristics of the surrounding neighborhood.

    - The applicant has demonstrated that the increased density will not negatively impact storm drainage within the local area. Proponents shall be required to provide adequate topographic and flow characteristics information to demonstrate their project will not contribute to or worsen any flooding problems in the locale.

    - The applicant has demonstrated that adequate public infrastructure, including streets, water, and sewer, is available to serve the project.

    - The proposed rezoning will assist the City in meeting the goals of the General Plan.

- **7.6:** Plan, design, and construct rural residential streets to encourage walking and bicycling and discourage high vehicle speeds and volumes consistent with Policy 29.1.

- **29.1:** When constructing or modifying transportation facilities, strive to provide for the movement of vehicles, commercial trucks, alternative and low energy vehicles, transit, bicycles and pedestrians appropriate for the road classification and adjacent land use.

- **29.2:** Measure customer satisfaction related to vehicle travel using level of service (LOS) according to procedures in the latest version of the Highway Capacity Manual published by the Transportation Research Board. The City will strive to achieve LOS E or better conditions for City roadways and intersections during peak hours (these may include weekday AM, Mid-Day, and PM hours as well as Saturday Mid-Day or PM peak hours). The intent of the policy is to effectively utilize the roadway network capacity while balancing the desire to minimize potential adverse effects of vehicle travel on the environment and other modes.

    Exceptions to LOS E are allowed for both roadway segments and intersections along the following streets:

    - Sunrise Boulevard – south City limits to north City limits
    - Greenback Lane – west City limits to east City limits

- Old Auburn Road – Sylvan Road to Fair Oaks Boulevard
- Antelope Road – I-80 to Auburn Boulevard
- Auburn Boulevard – Old Auburn Road to north City limits

No road widening to provide additional vehicle capacity of the above listed streets will be permitted. Development projects that impact these locations according to the City's transportation impact study guidelines would require mitigation, including, but not limited to, the following items:

- actions that reduce vehicle trips or provide non-auto improvements to the transportation network or services
- lengthening of turn pockets
- signal timing modifications

Additional exceptions may be allowed by the City Council at both exempt and non-exempt locations where mitigation is infeasible or would conflict with other community values such as those listed below:

- impacts on general safety, particularly pedestrian, bicycle, and transit safety
- the right-of-way needs and the physical impacts on surrounding private or public properties
- the visual aesthetics of the required improvement and its impact on community identity and character
- environmental impacts including air quality and noise impacts
- impacts on quality of life as perceived by residents

- **29.3:** Require development proposals to analyze future transportation impacts and mitigate significant impacts consistent with Policies 29.1 and 29.2.
- **29.4:** Support safe, complete and well-connected neighborhood street, bicycle, and pedestrian access and connections that balance circulation needs with the neighborhood context.
- **30.3:** Discourage the construction of private streets to ensure full public access to the City circulation system.
- **31.1:** Strive to increase fixed-route and demand responsive (i.e., paratransit) transit service coverage and frequency to Citrus Heights residents and employees.
- **31.2:** Strive to provide public transit that is an attractive, convenient, dependable and safe alternative to the automobile.
- **31.3:** Consider express commuter bus service between Citrus Heights and major employment and transit centers.
- **31.4:** Require new development to provide transit enhancements, where appropriate, that decrease transit travel times, improve access to transit stops, or improve the amenities, security, or travel information at transit stops.
- **32.1:** Evaluate and utilize technologies that can improve the performance, reliability, and safety of the transportation system.

- **33.1:** Maintain open communication and cooperation with all public agencies that serve residents and businesses in Citrus Heights.
- **33.2:** Establish formal and informal processes with regional agencies, the City of Roseville, Sacramento County, and Placer County to review and provide input on proposed development within one half mile of the City limits.
- **51.2:** Protect citizens against potential or undiscovered unexploded ordnance at the Union Pacific Roseville Railyard.
- **53.1:** Promote measures that improve air quality and help meet air quality attainment standards.
- **53.2:** Minimize the impacts of vehicle emissions on air quality.
- **53.3:** Promote use of clean alternative fuel vehicles and construction equipment.
- **53.4:** Enable use of electric (rather than gasoline-powered) equipment and natural gas appliances, including outdoor grills.
- **53.5:** Discourage the development of potential stationary sources of toxic air contaminants sources near sensitive receptors, and the siting of sensitive receptors near sources of toxic air contaminants.
- **54.1:** Encourage alternative modes of transportation and trip-reducing strategies such as telecommuting and mixed-use development.
- **54.2:** Participate in educational efforts aimed at improving air quality, such as notifying residents and businesses during "Spare the Air" days designated by the Sacramento Air Quality Management District.
- **55.1:** Implement a comprehensive greenhouse gas reduction plan to reduce communitywide greenhouse gasses through community engagement and leadership; land use, community design, and transportation choices; energy and water conservation techniques; solid waste reduction and building green infrastructure.
- **55.2:** Emphasize Citrus Heights' role as an environmental steward by conducting City business in a manner that increases community understanding of the healthy and balanced relationships between developed and natural environments.

Actions

53.1.A. Work with local and regional agencies to develop a consistent and effective approach to air quality planning and management.

52.1.B. Support the Sacramento Metropolitan Air Quality Management District in its development of improved ambient air quality monitoring capabilities and establishment of standards, thresholds and rules to address the air quality impacts of new development.

53.1.C. Enforce air pollution control measures during construction.

53.1.D. Synchronize traffic signals on roads susceptible to high emission levels from idling vehicles.

53.3.A. Incorporate alternative fuel vehicles into the City fleet to achieve the objective of using clean fuels in 70 percent of City vehicles.

Greenhouse Gas Reduction Plan Measures and Actions

The following GGRP measures and actions seek to reduce generation of long term operational regional emissions of criteria air pollutants and precursors. By reducing VMT, these measures will also reduce air pollutant emissions other than GHGs.

Measures

- **2-1.C:** Evaluate existing and planned neighborhood commercial areas and increase bike and pedestrian access to these areas from surrounding residential neighborhoods.
- **3-1.A:** Continue to implement the smart-growth principles established in SACOG's Metropolitan Transportation Plan to the extent feasible.
- **3-2.A:** Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.
- **3-2.B:** Work with employers to offer incentives and services to increase use of alternatives to single-occupant autos (commute trip reduction programs such as parking cash-out, transit subsidy).
- **3-3.A:** Conduct a parking management study to monitor implementation of revised 2006 parking standards (CHMC 106.36.080).
- **3-3B:** Continue to build an intelligent traffic management system to synchronize traffic signals and allow easy traffic flow movement and reduce GHG emissions caused by vehicle idling.
- **3-4.B:** Promote communitywide use of alternative fuels by providing public outreach and education regarding the benefits of low-carbon and alternative fuels.
- **3-5.A:** Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.
- **3-5.B:** Increase bicycle infrastructure by requiring bicycle parking in new development, retrofitting parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities, and participating in a regional bikesharing program.
- **3-6.A:** Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.
- **3-6.B:** Work with Regional Transit, E-Tran, Roseville Transit, Amtrak and other transit agencies to develop a regional pass system.
- **3.7.A:** Improve fuel-efficiency of the City fleet by purchasing low or zero-emission vehicles when vehicles are retired from service.
  (Public safety vehicles are exempted from this requirement.)
- **3-7.B:** Provide financial incentives to encourage ridesharing and/or public transit use among City employees.

Actions

3-1.A.A. Collaborate with adjacent cities and other regional partners to promote SACOG's smart-growth principles to develop and support alternative transportation.

3-1.B.A. Work with SJUSD to develop an outreach program that promotes alternative travel modes for school-related trips.

3-2.A.A. Create rideshare-designated parking spaces near bus stops, employment centers and commercial areas (e.g., Sunrise MarketPlace, Auburn Boulevard).

3-2.A.B. Amend the Zoning Code to require preferential parking spaces within new or substantially improved commercial, employment and civic projects designated for carpool and/or vanpool use.

3-2.A.C. Provide information for employers about potential benefits of car-share programs and the presence of local car rental opportunities.

3-2.B.A. Develop an outreach program to City employers and collaborate with them to identify various commuter trip reduction programs for their employees.

3-3.A.A. Conduct a feasibility study to evaluate shared parking opportunities for compatible adjacent land uses (e.g., offices next to commercial or multi-family residential uses).

3-3.A.B. Evaluate opportunity areas to reduce travel speeds and improve pedestrian use (e.g., Auburn Boulevard Specific Plan).

3-3.B.A. Continue to enforce speed limits on City streets to maximize gasoline use and minimize GHG emissions.

3-3.B.B. Implement traffic signal coordination on major roadways.

3-3.B.C. Use changeable message signs to divert traffic during peak hours to reduce queuing and idling of vehicles at major intersections.

3-3.A.C. Conduct a parking management study to identify vacant or underused parking lots and spaces to convert them to other uses such as park-and-ride lots, motorcycle parking, and shared parking spaces.

3-5.A.A. Re-evaluate the Bicycle Master Plan. Conduct a citywide gap analysis to identify missing links in the bicycle network and prioritize filling gaps to enhance bike travel.

3-5.A.B. Adopt a Pedestrian Master Plan and implement near-term improvements. Conduct a citywide pedestrian walkway analysis to identify locations with physical obstacles within sidewalks, walkways, and trails such as utility poles and prioritize removing these barriers to encourage pedestrian use.

3-5.B.A. Continue to implement City bicycle parking standards (CHMC 106.36.060) for new development and identify ways to retrofit existing development to match these requirements.

3-5.B.B. Identify areas lacking adequate bike parking. Retrofit parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities.

3-5.B.C. Partner with transit agencies and adjacent cities to develop a regional bikeshare program.

3-6.A.A. In collaboration with regional transit agencies, evaluate potential to add public transit service types, including Bus Rapid Transit and community or neighborhood shuttles to regional rail stops.

3-6.B.A. Partner with SACOG and local transit agencies to develop a regional transit pass program.

Even with incorporation of these policies, measures, and actions, operational area- and mobile-source emissions of NO_X from implementation of the Draft General Plan would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, and would result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS. As a result, the long-term impact is considered **significant**, requiring mitigation.

Mitigation Measure

Mitigation Measure 4.3-3: Implement SMAQMD Design Recommendations for Development Projects. The City shall require that development applicants include all feasible elements from SMAQMD's best available mitigation measures that are available at the time of project design, where required to reduce project level impacts to a less-than-significant level. The applicant shall coordinate with SMAQMD to determine which design recommendations are appropriate for the project and collaborate to develop new mitigation if required. These may include, but are not limited to using certain types of wood burning appliances, architectural coatings, designing certain types of land uses patterns, providing bicycle parking, etc. Please refer to Section 4.4.1 of the SMAQMD CEQA Guide and the SMAQMD *Guidance for Land Use Emissions Reduction*.

Conclusion

Even with implementation of Draft General Plan policies and actions and GGRP measures and actions, and Mitigation Measure 4.3-3, operational emissions under buildout conditions are still estimated to exceed the 65 lb/day and significance thresholds for ROG and NO_X and emissions of PM_{10} that would contribute to the County's nonattainment status (see Table 4.3-4). As a result, this impact is considered **significant and unavoidable**.

IMPACT 4.3-4 Generation of Long-Term, Operational, Local Mobile-Source Emissions of CO. *Local mobile-source emissions of CO would not be expected to substantially contribute to emissions concentrations that would exceed the one-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. As a result, this impact would be less than significant.*

The concentration of CO is a direct function of motor vehicle activity, particularly during periods of peak travel demand, and of meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land uses (e.g., residential areas, schools, and hospitals). SMAQMD has established preliminary screening criteria for long-term, local mobile-source emissions of CO. If these criteria are exceeded with implementation of the Draft General Plan, such CO emissions could result in, or substantially contribute to emissions concentrations exceeding the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. SMAQMD's preliminary screening criteria for significance are as follows (SMAQMD 2009):

Tier 1

The proposed project would result in a less-than-significant impact to air quality for local CO if:

- Traffic generated by the proposed project would not result in deterioration of intersection level of service (LOS) to LOS E or F; or
- The project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

If the first tier of screening criteria is not met then the second tier of screening criteria shall be examined.

Tier 2

If all of the following criteria are met, the proposed project would result in a less-than-significant impact to air quality for local CO.

- The project would not result in an affected intersection experiencing more than 31,600 vehicles per hour.
- The project would not contribute traffic to a tunnel, parking garage, under pass, urban canyon or below grade roadway or where horizontal or vertical mixing of air would be limited.
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the county average.

According to the traffic analysis prepared for the Draft General Plan (see Section 4.2, "Transportation and Mobility"), several intersections currently exceed the Tier 1 LOS criteria, as of 2009 and would experience similar conditions in 2035.

However, according to the traffic analysis prepared for the Draft General Plan described in Section 4.2, "Transportation and Mobility", no signalized roadway intersections would experience Tier 2 volumes (31,600 vehicles per hour in 2035 either a.m. or p.m. peak hours). Furthermore, implementation of the Draft General Plan would not contribute traffic to a roadway where horizontal or vertical mixing of air would be limited, and Citrus Heights' vehicle mix does not deviate substantially from that within Sacramento County as a whole.

Draft General Plan Policies and Actions

The Draft General Plan contains the following policies and action designed to reduce long term operational local mobile source emissions of CO:

Policies

- **54.1.** Encourage alternative modes of transportation and trip-reducing strategies such as telecommuting and mixed-use development.
- **54.2:** Participate in educational efforts aimed at improving air quality, such as notifying residents and businesses during "Spare the Air" days designated by the Sacramento Air Quality Management District.

Action

52.1.D. Synchronize traffic signals on roads susceptible to high emission levels from idling vehicles.

Greenhouse Gas Reduction Plan Measures and Actions

The following GGRP measures and actions seek to reduce long term operational local mobile source emissions of CO. By reducing VMT, these measures will also reduce air pollutant emissions other than GHGs, including CO.

Measures

- **3-1.A:** Continue to implement the smart-growth principles established in SACOG's Metropolitan Transportation Plan to the extent feasible.
- **3-2.A:** Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.
- **3-2.B:** Work with employers to offer incentives and services to increase use of alternatives to single-occupant autos (commute trip reduction programs such as parking cash-out, transit subsidy).
- **3-3.B:** Continue to build an intelligent traffic management system to synchronize traffic signals and allow easy traffic flow movement and reduce GHG emissions caused by vehicle idling.

- **3-6.A:** Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.

Actions

3-1.A.A. Collaborate with adjacent cities and other regional partners to promote SACOG's smart-growth principles to develop and support alternative transportation.

3-2.A.A. Create rideshare-designated parking spaces near bus stops, employment centers and commercial areas (e.g., Sunrise Marketplace, Auburn Boulevard).

3-2.A.B. Amend the Zoning Code to require preferential parking spaces within new or substantially improved commercial, employment and civic projects designated for carpool and/or vanpool use.

3-2.A.C. Provide information for employers about potential benefits of car-share programs and the presence of local car rental opportunities.

3-2.B.A. Develop an outreach program to City employers and collaborate with them to identify various commuter trip reduction programs for their employees.

3-3.B.A. Continue to enforce speed limits on City streets to maximize gasoline use and minimize GHG emissions.

3-3.B.B. Implement traffic signal coordination on major roadways.

3-3.B.C. Use changeable message signs to divert traffic during peak hours to reduce queuing and idling of vehicles at major intersections.

3-5.B.C. Partner with transit agencies and adjacent cities to develop a regional bikeshare program.

3-6.A.A. In collaboration with regional transit agencies, evaluate potential to add public transit service types, including Bus Rapid Transit and community or neighborhood shuttles to regional rail stops.

Conclusion

Because local mobile-source CO impacts meet SMAQMD screening-level criteria, CO concentrations are considered to be below localized concentrations of concern and further modeling was not conducted. Thus, the proposed project would not be anticipated to result in or contribute to local CO concentrations that exceed the California 1-hour or 8-hour ambient air quality standards of 20 ppm or 9 ppm, respectively. Furthermore, the intention of the policies, measures, and actions listed above is to specifically reduce future mobile-source emissions, including CO, to levels below existing emission levels. As a result, the impact of long-term operational emissions of local CO associated with the Draft General Plan is considered **less than significant**.

IMPACT 4.3-5 Exposure of Sensitive Receptors to Emissions of Toxic Air Contaminants (TACs). *With implementation of the Draft General Plan, proposed sensitive land uses and TAC sources could potentially not be sited to adequately minimize exposure to substantial concentrations of TACs. This impact is* ***significant.***

Emissions of TACs during future construction of land uses consistent with the Draft General Plan (e.g., emissions from on-site heavy-duty diesel equipment) and from operation of future land uses consistent with the Draft General Plan (e.g., emissions from both on-site and off-site area, stationary, and mobile sources) are discussed and their resulting levels of TAC exposure of sensitive receptors are analyzed separately below.

Construction-Related Emissions

Construction-related activities would result in short-term emissions of DPM from the:

- exhaust of off-road heavy-duty diesel equipment for site preparation (e.g., excavation, grading, clearing);
- paving;
- application of architectural coatings; and
- other miscellaneous activities.

DPM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of DPM, as discussed below, outweighs the potential for all other health impacts (ARB 2003).

Emission rates from construction equipment are expected to be reduced over the period of buildout of the Draft General Plan. In January 2001, EPA promulgated a final rule to reduce emissions standards for heavy-duty diesel engines in 2007 and subsequent model years. These emissions standards represent a 90% reduction in NO_X emissions, 72% reduction of nonmethane hydrocarbon emissions, and 90% reduction of PM emissions in comparison to the emissions standards for the 2004 model year. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and PM starting in 2010 that are more than 90% lower than 2004 levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines (US CFR 2004).

The dose to which receptors are exposed is the primary factor used to determine health risk (potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time.

According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period. However, such assessments should be limited to the period and duration of activities associated with the project, in this case the Draft General Plan (Salinas, pers. comm., 2004). Use of off-road heavy-duty diesel equipment would be temporary and intermittent, and emissions resulting from such use would combine with the highly dispersive properties of DPM (Zhu et al. 2002). Reductions in exhaust emissions would also occur with incorporation of construction emission control requirements. Thus, construction-related TAC emissions would not expose sensitive receptors to substantial emissions of TACs.

Operational Emissions

The Draft General Plan anticipates construction of commercial land uses, which may potentially include stationary sources of TACs, such as dry-cleaning establishments, gasoline-dispensing facilities, and diesel-fueled backup generators. In addition, mobile sources of TACs include areas of heavy traffic volumes. Most notably, the segment of I-80 from the southern City limit to the Antelope Road exit currently has one of the highest average daily traffic volumes in the region, exceeding 100,000 AADT. Future development of sensitive land uses could be limited in areas where TAC emissions are particularly high.

These sources, in addition to any other sources that may emit TACs, would be subject to SMAQMD rules and regulations. Thus, as discussed above, SMAQMD would analyze such sources (e.g., health risk assessment) based on their potential to emit TACs. If it is determined that the sources would emit TACs in excess of SMAQMD's applicable significance threshold, Maximum Available Control Technology (MACT) or BACT would be implemented to reduce emissions. If the implementation of MACT or BACT would not reduce the risk below the applicable threshold, SMAQMD would deny the required permit. As a result, given compliance with applicable

rules and regulations, operation of stationary sources would not result in the exposure of sensitive receptors to TACs at levels exceeding SMAQMD significance thresholds.

On March 18, 2005, Citrus Heights received a letter from SMAQMD formally notifying the City of a risk assessment study performed on the Roseville Railyard in 2004 by the ARB. The ARB study assesses the diesel particulate matter emissions from existing Railyard operations. As the City of Citrus Heights is located within the vicinity of the Roseville Railyard, it has a potential to be affected by the emissions from the Railyard.

The Roseville Railyard Study used PM_{10} as a surrogate for diesel particulate matter (DPM), and established health risk assessment procedures. There are several assumptions in the study that cause the results to be conservative, so the risks described in the study are greater then would likely be the actual case. It should also be noted that the individual risk from exposure to a toxin is greatly variable. Therefore, it is impossible to identify how each person will respond to different exposures. For these reasons, there is a great deal of uncertainty associated with this type of study.

The risk assessment from the study shows elevated concentrations of DPM and associated cancer risk impacting a large area. These elevated concentrations of DPM are above the regional background level and SMAQMD thresholds. These concentrations of DPM can contribute to an increased risk of cancer and premature deaths due to cardiovascular disease and non cancer health effects such as asthma and chronic obstructive pulmonary disease. The increased cancer risk ranges from 10 per million to 100 per million. The results of the study also indicate that the DPM emissions from the Railyard are widely dispersed out over the greater Roseville area and portions of Sacramento County, including most of Citrus Heights, at levels that pose a cancer risk concern. ARB used the findings of this health risk assessment in the *Air Quality and Land Use Handbook* to recommend the following statewide siting criteria for sensitive land uses:

- Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard.
- Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.

Draft General Plan Policies

The Draft General Plan contains the following policy designed to reduce exposure of sensitive receptors to concentrations of TACs and help reduce future land use incompatibilities of sources that could potentially emit TACs and exposure of sensitive uses to harmful air pollutants:

Policies

- **29.1:** When constructing or modifying transportation facilities, strive to provide for the movement of vehicles, commercial trucks, alternative and low energy vehicles, transit, bicycles and pedestrians appropriate for the road classification and adjacent land use.

- **53.5:** Discourage the development of potential stationary sources of toxic air contaminants near sensitive receptors, and the siting of sensitive receptors near sources of toxic air contaminants.

Actions

53.5.A. Avoid siting new sensitive land uses within 1,000 feet of the Roseville Railyard.

53.5.B. Consider health risks for new sensitive uses proposed within one mile of the Roseville Railyard or within 500 feet of I-80 south of Antelope Road.

Construction-related emissions would be short term in nature and comply with the SMAQMD best management practices. The major source of operational emissions from stationary sources identified by the ARB within ½ mile of the planning area is the Roseville Railyard. Union Pacific has implemented a program to reduce TACs at the

Railyard. Draft General Plan policies and actions would avoid siting new sensitive receptors within the highest risk areas and would require siting limitations and mitigation approaches within the next-highest risk areas. Nevertheless, most of the planning area, with the exception of the northeast corner, remains subject to elevated health risks that exceed SMAQMD thresholds due to DPM emissions from the Railyard. In addition, I-80 passes through the planning area, which contributes operational emissions from mobile sources.

The City will need to continue to work with SMAQMD and SACOG to address the use of low emission vehicles in and near the planning area. Working with the regional agencies will also help establish better vehicle flow in and around the planning area. However, for the reasons described above, the implementation of the above Draft General Plan policies and actions would have no practical effect on reducing TACs. Therefore, this impact is considered **significant**.

Mitigation Measures

No mitigation measures are available beyond policies, measures, and actions in the Draft General Plan and GGRP.

Conclusion

There is no feasible available mitigation the City can implement, either individually or in conjunction with other agencies, that would reduce the impact to a less-than-significant level during the timeframe of the Draft General Plan. This impact would therefore be **significant and unavoidable.**

IMPACT 4.3-6 Exposure of Sensitive Receptors to Emissions of Odors. *There are no major sources of odors located within the planning area, so implementation of the Draft General Plan could result in the exposure of sensitive receptors to emissions of objectionable odors. As a result, this impact would be* ***less than significant****.*

The human response to odors is subjective, and sensitivity to odors varies greatly among the public. SMAQMD has identified screening-level distances for the siting of major sources or sensitive receptors in proximity to one another. Minor sources of odors, such as exhaust from mobile sources, garbage collection areas, and charbroilers associated with commercial uses, are not typically associated with numerous odor complaints, but are known to have some temporary, less concentrated odorous emissions. Major and minor sources of odors are discussed separately below.

Major Sources of Odors

SMAQMD has identified the following as potential major sources of odors: wastewater treatment facilities, sanitary landfills, transfer stations, composting facilities, petroleum refinery, asphalt batch plant, chemical manufacturing, fiberglass manufacturing, painting/coating operations, rendering plants, coffee roasters, food processing facilities, feed lot/dairy, green waste and recycling operations, and metal smelting plants (SMAQMD 2009). This list is meant not to be entirely inclusive, but to act as general guidance. There are not any major odor sources of concern in Citrus Heights and the Draft General Plan does not envision development of any major odor sources. As a result, it is not expected that land use conflicts between a major odor sources and proposed sensitive receptors would occur under the Draft General Plan.

Minor Sources of Odors

Minor sources of odors associated with the Draft General Plan would be associated with the construction of the proposed land uses. The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. Similarly, diesel-fueled trucks traveling on local roadways would produce associated diesel exhaust fumes.

However, because odors associated with diesel fumes would be temporary and would disperse rapidly with distance from the source, construction-generated and mobile-source odors would not result in the frequent exposure of on-site receptors to objectionable odor emissions.

Other minor sources of odors can include restaurants, auto service stations, metal fabricators and miscellaneous construction activities are potential minor sources of odors within the planning area.

Conclusion

In summary, minor sources of odors (e.g., construction equipment, I-80) would not result in exposure of sensitive receptors (on- or off-site) to excessive project-generated odor sources. In addition, sensitive receptors would not be exposed to any excessive odors from existing land uses on a recurring basis. As a result, this impact would be **less than significant**.