4.4 AIR QUALITY

INTRODUCTION

This section describes the impacts of the Second Street Crossing project on local and regional air quality and was prepared using thresholds of significance recommended by the Yolo-Solano Air Quality Management District. This section includes a discussion of the existing air quality in the region; construction-related air quality impacts resulting from grading and equipment emissions; direct and indirect emissions associated with the project; the impacts of these emissions on both the local and regional scale; and mitigation measures warranted to reduce or eliminate any identified significant impacts. The air quality discussion is based primarily on an Air Quality Impact Analysis[1] provided by Donald Ballanti, Certified Consulting Meteorologist. Information for this section was also drawn from the *City of Davis General Plan*[2], and the YSAQMD Yolo-Solano Air Quality Attainment Plan *Air Quality Handbook*, May 1996.

ENVIRONMENTAL SETTING

The amount of a given pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major factors affecting transport and dilution are terrain, wind, atmospheric stability, and, for photochemical pollutants, sunshine.

Air Pollution Climatology

The project is located in southern Yolo County, which is within the Sacramento Valley Air Basin (SVAB). The basin is relatively flat and bordered by mountains on the east, west and north. Movement of air into the SVAB is through the Carquinez Strait in a northeasterly direction from the Sacramento-San Joaquin River Delta. Quality of the air is either fresh from the marine environment or polluted from the urbanized San Francisco Bay area, depending on the meteorological conditions. Davis' climate includes primarily hot, dry summers and cool, rainy winters. Prevailing winds are from the south-southwest. Atmospheric temperature inversions occur frequently that limit the vertical dispersion of pollutants. These inversions may result in elevated levels of carbon monoxide (CO) during the winter months and high ozone levels during summer and fall.

Ambient Air Quality Standards

Criteria Pollutants

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air

quality standards are levels of contaminants, which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The federal and State ambient air quality standards are summarized in Table 4.4-1.

Table 4.4-1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.09 ppm 0.07 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.05 ppm --	-- 0.25 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm --	-- 0.04 ppm 0.5 ppm
PM_{10}	Annual 24-Hour	50 ug/m^3 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	15 ug/m^3 65 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. Month Avg.	-- 1.5 ug/m^3	1.5 ug/m^3 --
Sulfates	24-Hour	25 ug/m^3	--
Hydrogen Sulfide	1-Hour	0.03 ppm	--
Vinyl Chloride	24-Hour	0.01 ppm	--

ppm = parts per million
ug/m^3 = Micrograms per Cubic Meter
Source: California Air Resources Board, Ambient Air Quality Standards (7/9/03); http://www.arb.ca.gov.aqs/aaqs2.pdf

The federal and State ambient standards were developed independently with differing purposes and methods, although both processes attempt to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the California standards are more stringent, particularly for ozone and particulate matter (PM_{10} and $PM_{2.5}$).

The U.S. Environmental Protection Agency established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The existing 1-hour ozone standard of 0.12 PPM microns or less is to be phased out and replaced by an 8-hour standard of 0.08 PPM. Implementation of the 8-hour standard was delayed by litigation,

but was determined to be valid and enforceable by the U. S. Supreme Court in a decision issued in February of 2001.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003.

On April 28, 2005 the California Air Resources Board established a new 8-hour standard for ozone (0.07 PPM), expected to become effective in early 2006.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. Toxic Air Contaminants (TACs) are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Many different types of TACs, with varying degrees of toxicity, exist. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important in terms of health risk are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Current Air Quality

The California Air Resources Board (CARB) operates an air quality monitoring site within the UC Davis campus that monitors the gaseous pollutants of ozone, nitrogen dioxide, and carbon monoxide. The closest particulate monitoring site is operated by the Yolo-Solano Air Quality Management District (YSAQMD), which operates a monitoring site on Gibson Street in the City of Woodland. The Woodland monitoring site measures several gaseous pollutants as well as PM_{10}. A three-year summary of air quality data from these two monitoring sites is shown in Table 4.4-2. Table 4.4-2 shows that the federal/State standards for ozone, $PM_{10,}$ and $PM_{2.5}$ are sometimes exceeded in the project area.

Table 4.4-2
Ambient Air Quality at Davis and Woodland

Pollutant/Standard	Year	Days Exceeding Standard	
		Davis Monitoring Site	Woodland Monitoring Site
Ozone/State 1-Hour	2002	3	9
	2003	2	3
	2004	0	0
Ozone/Fed. 1-Hour	2002	0	0
	2003	0	0
	2004	0	0
Ozone/Fed. 8-Hour	2002	2	4
	2003	0	0
	2004	0	0
Carbon Monoxide State/Fed. 8-Hour	2002	0	-
	2003	0	-
	2004	0	-
Nitrogen Dioxide State 1- Hour	2002	0	-
	2003	0	-
	2004	0	-
PM_{10}/State 24-Hour	2002	-	6
	2003	-	2
	2004	-	2
PM_{10}/Federal 24-Hour	2002	-	0
	2003	-	0
	2004	-	0
$PM_{2.5}$/Federal 24-Hour	2002	-	1
	2003	-	0
	2004	-	0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2004. (http: //www.arb.ca.gov./adam/cgi-bin/adamtop/d2wstart)

Health Effects of Pollutants

The primary air quality problems in the Sacramento Valley Air Basin are with ozone and particulate matter levels. Carbon monoxide has been a problem in the past within urban Sacramento. The following is a discussion of the health effects of these significant pollutants.

Ozone

Ozone is produced by sunlight-activated chemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROGs). Nitrogen oxides are created during combustion

of fuels, while reactive organic gases are emitted during combustion and evaporation of organic solvents. Because ozone is not directly emitted into the atmosphere, but is formed as a result of photochemical reactions, ozone is considered a secondary pollutant. In the Sacramento Valley Air Basin, ozone is a seasonal problem, occurring roughly from April through October.

Ozone is a strong irritant that attacks the respiratory system, leading to the damage of lung tissue. Asthma, bronchitis, and other respiratory ailments, as well as cardiovascular diseases, are aggravated by exposure to ozone. A healthy person exposed to high concentrations may become nauseated or dizzy, develop headaches, and experience coughing or a burning sensation in the chest.

Research has shown that exposure to ozone damages the alveoli (the individual air sacs in the lung where the exchange of oxygen and carbon dioxide between the air and blood takes place). Research has shown that ozone also damages vegetation.

The YSAQMD is classified as a "severe" non-attainment area for the federal one-hour ozone standard and a "serious" non-attainment area for the State ozone standard.

Suspended Particulate

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid particles small enough to remain suspended in the atmosphere indefinitely. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust, although the major components of suspended particulate are dust particles, nitrates, and sulfates. A portion of suspended particulate is directly emitted into the atmosphere as a by-product of combustion, wind erosion of soil, and unpaved road travel. Small particles are also created in the atmosphere through chemical reactions.

Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove much of these particles, but smaller particles are able to pass through the body's natural defenses and the mucous membranes of the upper respiratory tract, and enter into the lungs. The particles can damage the alveoli. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

"Inhalable" PM consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}.

The YSAQMD is an attainment area for the federal PM_{10} standard and a non-attainment area for the State PM_{10} standard.

Carbon Monoxide

Carbon monoxide (CO) is a local pollutant because high concentrations occur only very near the source. The major source of carbon monoxide, a colorless, odorless, and poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes.

Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Carbon monoxide concentrations are highly seasonal, with the highest concentrations occurring in the winter. This phenomenon is partly due to the fact that automobiles create more carbon monoxide in colder weather, and partly due to the very stable atmospheric conditions that exist on cold winter evenings when winds are calm. Concentrations typically are highest during the stagnant air period of November through January.

The YSAQMD is an attainment-area for the federal CO standard and the State standard.

REGULATORY CONTEXT

Regulation of air quality is achieved through both federal and State ambient air quality standards and emission limits for individual sources of air pollutants.

Federal Regulations

Yolo County is included in the Greater Sacramento ozone non-attainment area as delineated by the U. S. Environmental Protection Agency.

The Federal Clean Air Act Amendments (FCAAA) of 1990 set deadlines for attaining the ozone standard. The Sacramento Area was classified as a "serious" non-attainment area and given a date of 1999 by which to achieve attainment. Because achieving attainment by this date was later found to be infeasible, the region was "bumped up" to "severe" classification and an attainment date of 2005 was designated. The Clean Air Act Amendments also set specific planning requirements to ensure that the attainment goal would be met. In 1994, the Air Resources Board, in cooperation with the air districts of the Sacramento non-attainment area, fulfilled one of these requirements by preparing the 1994 Sacramento Area Regional Ozone Attainment Plan. The plan identified a detailed comprehensive strategy for reducing emissions to the level needed for attainment and showed how the region would make expeditious progress toward meeting this goal.

On April 15, 2004 the Environmental Protection Agency (EPA) designated the Greater Sacramento ozone non-attainment area as a "serious" non-attainment area for the federal 8-hour ozone standard. The 8-hour ozone standard, 0.08 parts per million (ppm),

averaged over eight hours, replaces the 1-hour standard that has been in place since 1979. The region has been given an attainment date of June, 2013.

State Regulations

The California Air Resources Board (CARB), California's air quality management agency, regulates mobile emissions sources and oversees the activities of County Air Pollution Control Districts (APCDs) and regional Air Quality Management Districts (AQMDs). The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through its planning and coordinating activities.

California has adopted ambient standards that are in some cases more stringent than the federal standards for the criteria air pollutants and shown in Table 4.4-1. Under the California Clean Air Act (CCAA), patterned after the federal CAA, areas have been designated as attainment or non-attainment with respect to State standards. As previously mentioned, the project region is considered to be in attainment for the State CO standard, non-attainment for the State ozone standard, and non-attainment for the State PM_{10} standard.

Local Regulations

The YSAQMD is the agency responsible for implementing emissions standards and other requirements of federal and State laws in Yolo County. The YSAQMD Yolo-Solano Air Quality Attainment Plan (1992) addresses the requirement to attempt to bring the district into compliance with the federal and State ambient air quality standards. The plan includes carefully planned strategies for progressive reduction of air pollutants by promoting active public involvement, encouraging compliance through positive influence and behavior, and through public education in both the public and private sectors. The YSAQMD also provides a handbook of guidelines for determining air quality thresholds of significance and mitigation measures for proposed development projects that generate emissions from motor vehicles.[3]

The closest monitoring site for other gaseous pollutants such as carbon monoxide and nitrogen dioxide is the UCD campus in Davis. Concentrations of these pollutants at this monitoring site are well within the State and federal standards.

City of Davis General Plan

The following goals and policies from the City of Davis General Plan pertain to air quality:

Air Quality

Goal AIR 1. Maintain and strive to improve air quality.

Policy AIR 1.1 Take appropriate measures to meet the AQMD's goal for improved air quality.

Actions:

a. Continue to participate in regional planning activities to meet air quality goals.
b. Identify potential emission sources of airborne toxics from mobile and stationary sources within a two year period following adoption of the General Plan. This may be in coordination with the California Air Resource Board and the Yolo-Solano AQMD, as appropriate. The results of the identification process shall be made public within one month of identification.
c. Enforce rigid high standards to restrict fumes, smoke, dust, or other environmental pollutants from stationary sources of pollution.
d. Work with UC Davis, the Air Resources Board, Yolo-Solano AQMD and the Davis Joint Unified School District (DJUSD) to develop educational materials regarding air quality, impact of air quality on people, plants and animals, and what youth can do to improve air quality. The air quality materials shall include specific fugitive dust-control, ROG, and NO_x measures that are required by the YSAQMD to reduce both construction and operations-related emissions of these pollutants. Include such materials in the DJUSD curriculum. Examples of educational materials include guidelines for burning practices, which would promote clean air and information on wood stoves, which comply with standards of the Environmental Protection Agency.
e. Implement transit- and pedestrian-oriented land use and design strategies outlined in the Land Use, Design and Mobility chapters of this General Plan.
f. Explore options, such as the distribution of educational material, with the Yolo-Solano Air Quality Management District to encourage Davis residents and business to use alternatives to gas powered garden tools to reduce air and noise pollution and reduce costs.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The YSAQMD has established the following quantitative standards of significance:

- The District considers increases in emissions during construction or operation of 82 pounds per day of ozone precursors (ROG or NO_x) or 150 pounds per day of PM_{10} as significant;
- A predicted violation of any California Ambient Air Quality Standard (CAAQS) during both construction or operation of the project would be considered a significant impact; or,

- A project is considered to contribute substantially to an existing or project violation of the CAAQS if it emits pollutants at a level equal to or greater than five percent of the CAAQS.

The YSAQMD has also established the following qualitative standards of significance:

- Potential to create or be near an objectionable odor;
- Potential for accidental release of air toxic emissions or acutely hazardous materials;
- Potential to emit an air toxic contaminant regulated by the District or on a federal or State air toxics list;
- Burning of hazardous, medical, or municipal waste as waste-to-energy facilities;
- Potential to produce a substantial amount of wastewater or potential for toxic discharge;
- Sensitive receptors (e.g., schools, households, etc.) located with a quarter mile of air toxic emissions or near CO hot spots; or,
- Carcinogenic or air toxic contaminant emissions that exceed or contribute to exceeding the District's action level for cancer, chronic and acute risks.

Development projects are considered cumulatively significant under YSAQMD significance criteria if the following occur:

- The project requires a change in the existing land use designation (i.e., General Plan Amendment); and
- Projected emissions (ROG, NO_x or PM_{10}) of the Proposed Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

Method of Analysis

Construction

The URBEMIS-2002 program[4] was applied to the project to estimate the maximum construction emissions from site grading, equipment exhaust, construction worker vehicle trips and other construction activities. Construction was assumed to be completed over a 12-month period. The types and amounts of equipment to be utilized during the different phases of construction were based on published guidance. The URBEMIS-2002 model output is included in the Appendix of the Air Quality Report, which is attached in the DEIR's Appendix E.

Local Carbon Monoxide Concentrations

A screening procedure for estimating carbon monoxide concentrations was applied to two signalized intersections affected by project traffic under existing and future traffic conditions. Concentrations at signalized intersection would be expected to be the highest

carbon monoxide concentrations due to the deceleration, idling and acceleration of vehicles at these locations. Two intersections were selected for analysis as signalized intersections where the Level of Service (LOS) is forecast to be D or worse under cumulative conditions. These locations are worst-case locations in that they should be the location of the highest concentrations of carbon monoxide.

A screening-level form of the CALINE-4 program was used to predict concentrations.[5] Normalized concentrations for each roadway size (2 lanes, 4 lanes, etc.) are adjusted for the two-way traffic volume and emission factor. Calculations were made for a receptor at a corner of the intersection, located at the curb. Emission factors were derived from the California Air Resources Board EMFAC7-2002 computer program based on a 2006 and 2010 Yolo County vehicle mix.

The screening-level form of the CALINE-4 program was developed for Bay Area (coastal valley) meteorology. The assumed worst-case assumed wind speed in the model is 1.0 meters per second. To adjust for the lighter winds typically assumed for the Sacramento Valley (interior valley meteorology), the normalized concentrations were doubled based on the assumption of a 0.5 meter per second worst-case wind speed.

The screening procedure provides a worst-case estimate of concentrations of carbon monoxide generated by vehicles impacting an intersection. Concentrations were calculated at the corner of the intersection, which would be expected to be the location of the highest carbon monoxide concentrations due to the deceleration, idling and acceleration of vehicles at these locations. Concentrations were estimated for a distance of 7 meters (20 feet) from the roadway edge.

The other contribution to the total concentration is the background level attributed to more distant traffic. The background concentration was estimated using the highest concentration of carbon monoxide measured at the UC Davis monitoring site during the period 2002-2004.

Operation

Estimates of regional emissions generated by project traffic and area sources were made using the URBEMIS-2002 program. URBEMIS-2002 estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. Inputs to the URBEMIS-2002 program include trip generation rates, vehicle mix, average trip length by trip type, and average speed. Average trip lengths and vehicle mixes for the Lower Sacramento Valley air basin were used. Average speed for all types of trips was assumed to be 35 MPH.

The URBEMIS-2002 program was run to calculate daily operational emissions during the summer months with an ambient temperature of 85 degrees Fahrenheit. Analysis year was 2006.

Project Impacts and Mitigation Measures

4.4-1 Exhaust emissions and fugitive particulate matter emissions from project-associated construction activities.

Maximum construction emissions would occur during the first phases of project construction when clearing, earthmoving, and grading occur. Table 4.5-3 shows expected maximum daily construction emissions for the project without the incorporation of mitigation. According to Table 4.5-3, ROG, NO_x, and PM_{10} emissions would not exceed the YSAQMD thresholds. However, because particulate matter emitted during construction activities would occur near existing residences (thereby causing a nuisance), PM_{10} could be considered to have an adverse impact even though the YSAQMD threshold for PM_{10} would not be exceeded. Residences currently exist north of the project site.

Table 4.4-3
Maximum Construction Emissions (Pounds Per Day)

Pollutant	Site Grading	Building Construction	Paving	YSAQMD Significance Threshold
ROG	8.8	8.8	9.4	82.0
NO_x	58.9	58.7	62.2	82.0
PM_{10}	50.1	2.4	2.6	150.0

Note: The three emission categories listed in Table 4.4-3 are not additive; rather, emissions in each category are generated during different phases of the construction process.

Source: Don Ballanti, 2005.

The majority of the PM_{10} from construction (as shown in Table 4.4-3) would be soil particles, while a small fraction would be from diesel exhaust (During construction, various diesel-powered vehicles and equipment would be used on the site). Diesel exhaust particulate is a pollutant that has come under increased scrutiny in recent years.

In 1998, the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[6] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truckstops) were identified as having the highest associated risk. In terms of the project, the diesel-powered vehicles and equipment used during the construction of the project would generate TACs.

Health risks from TACs are a function of both concentration and duration of exposure. Construction diesel emissions are temporary, affecting an area for intermittent periods throughout the duration of construction of the project.

Additionally, construction-related sources are mobile and transient in nature. Where air districts have developed guidelines for diesel risk assessments for CEQA documents, the identified situations requiring analysis are locations with extended truck idling (truck stops, warehouse/distribution centers, transit centers), ship hoteling at ports and train idling (See Impact discussion 4.4-4 for more detailed discussion). Therefore, health risks from temporary construction emissions of diesel particulate would be considered less-than-significant. In addition, the particulate matter generated by the project's construction activities would not exceed the District's thresholds. Adverse impacts associated with the generation of pollutants during project construction would be considered ***less-than-significant***.

Mitigation Measure(s)

Although the level of particulate matter generated by the project's construction activities would not exceed the District's threshold, the following mitigation measure would ensure that particulate matter emitted during construction activities is not considered a nuisance to adjacent residences.

4.4-1 *Prior to initiation of grading operations, the applicant shall submit a dust control plan to the City Engineer and the Yolo-Solano Air Quality Management District. This plan shall ensure that adequate dust controls are implemented during all phases of project construction, including the following:*

- *Apply nontoxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded areas inactive for ten days or more).*
- *Reestablish ground cover in disturbed areas quickly.*
- *Water active construction sites at least three times daily to avoid visible dust plumes.*
- *Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.*
- *Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).*
- *Enforce a speed limit of 15 MPH for equipment and vehicles operated on unpaved areas.*
- *All vehicles hauling dirt, sand, soil, or other loose materials should be covered or should maintain at least two feet of freeboard.*
- *Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.*

4.4-2 Increased carbon monoxide concentrations at project-area intersections.

The proposed project involves the construction of a 19.06-acre site for commercial/retail uses. On the local scale, the pollutant of greatest interest is carbon monoxide (CO). Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections. Traffic data provided by the traffic consultant was used in this analysis. Predicted worst-case carbon monoxide concentrations for existing conditions and future conditions with the project are shown in Table 4.4-4.

Table 4.4-4
Worst-Case Carbon Monoxide Concentration in Parts Per Million

Intersection	Existing (2006)		Existing + Project (2006)		Cumulative+ Project (2010)	
	1-Hr.	8-Hr.	1-Hr.	8-Hr.	1-Hr.	8-Hr.
Second Street/ Mace Blvd.	9.6	6.4	10.7	7.2	9.8	6.6
Mace Blvd./Chiles Road	8.1	5.4	8.2	5.5	7.9	5.3
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0

Source: Don Ballanti, 2005.

The concentrations in Table 4.4-4 are for worst-case locations under theoretical worst-case meteorological conditions. Table 4.4-4 shows that concentrations with existing and project traffic meet the 1-hour and 8-hour standards. Traffic from the proposed project would increase concentrations by up to 1.1 Parts Per Million (PPM), but concentrations would remain below the most stringent State or federal standards. Concentrations with project and cumulative traffic growth in 2010 would also not exceed the State/federal ambient air quality standards, and would be below current levels due to anticipated reductions in per-mile emission rates as newer, cleaner cars replace older, more polluting cars. Therefore, project impacts on local carbon monoxide concentrations would be ***less-than-significant***.

Mitigation Measure(s)
None required.

4.4-3 New air pollutant emissions within the air basin resulting from vehicle trips to and from the project site and area source emissions.

The proposed project involves the construction of a 19.06-acre site for commercial/retail uses. The project consists of a 126,842 square foot Target Store building plus a 10,000 square foot garden center for a total of 136,842 square feet. In addition, the project includes the construction of four accessory building pads for future retail development totaling 46,000 square feet. The construction of 182,842 square feet of commercial/retail space in the project vicinity would increase the number of vehicle trips on surrounding roadways. Furthermore,

project traffic emissions would not only have an effect on local air quality, but also air quality outside the project vicinity. Trips to and from the project site would result in air pollutant emissions within the air basin. Traffic data for the analysis was provided by the project traffic consultant.

The project would also create some area source emissions, primarily through the combustion of natural gas for water and space heating. The daily increases are shown in Table 4.4-5 for Reactive Organic Gases and Nitrogen Oxides (the two precursors of ozone) and PM_{10}. Table 4.4-5 shows that proposed project emissions would not exceed the YSAQMD thresholds of significance for ozone precursors or $PM_{10.}$ Therefore, the project would have a ***less-than-significant*** impact to regional air quality.

Table 4.4-5
Project Regional Emissions in Pounds Per Day

	ROG	NO_x	PM_{10}
Proposed Project:			
Area Sources	2.7	1.6	0.0
Vehicles	48.5	49.4	37.4
Total	51.2	51	37.4
YSAQMD Threshold of Significance	**82.0**	**82.0**	**150.0**

Source: Don Ballanti, 2005.

Mitigation Measure(s)
None required.

4.4-4 Impacts from delivery truck idling during project operations.

The project would result in delivery trucks accessing the receiving docks at southwest corner of the proposed Target store. The closest residences would be located approximately 500 feet north of the truck docks. In addition, according to the air quality consultant for the project, the nearest homes are not downwind of the receiving docks under normal prevailing west winds conditions.

In 1998, the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[7] The greatest diesel particulate risks from new development are generally associated with stationary diesel engines and locations where diesel engines are allowed to idle for extended periods. Where air districts have developed guidelines for diesel risk assessments for CEQA documents, the identified situations requiring analysis are locations with extended truck idling (truck stops, warehouse/distribution centers, transit centers), ship hoteling at ports and train idling.[8] The project applicant has indicated that the standard procedure for Target store delivery trucks with trailers is for trucks to

drop off their trailers and then exit the site; thereby, prohibiting extended idling periods.

Project diesel truck trip generation would be approximately 7-12 deliveries per week for tractor/trailer trucks and 8-10 deliveries per day by smaller local carrier and parcel delivery vans/trucks which may include diesel vehicles. Because of this relatively low level of truck activity, State laws forbidding extended truck idling, lack of receptors downwind of the loading dock area, and generally good ventilation characteristics of the project area during daylight hours when deliveries would occur, the project would not be expected to result in "carcinogenic or air toxic contaminant emissions that exceed or contribute to an exceedance of the District's action level for cancer, chronic and acute risks." Project impacts related to diesel truck exhaust are considered to be ***less-than-significant***.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

4.4-5 Long-term air quality impacts from the proposed project in combination with existing and future developments in the Davis area.

The YSAQMD has developed significance criteria for cumulative impacts (YSAQMD, 1996). Development projects are considered cumulatively significant if the following occur:

- The project requires a change in the existing land use designation (i.e., General Plan Amendment), and
- Projected emissions (ROG, NO_x or PM_{10}) of the proposed project are greater than the emissions anticipated for the site if developed under the existing land use designation.

The site is currently designated BP (Business Park), GC (General Commercial), and P/SP (Public/Semi-Public). The proposed project involves a request for a General Plan Amendment to redesignate the project site to General Retail (GR) in order to accommodate the proposed scale of the development. Table 4.5-6 compares emissions (as estimated by the URBEMIS-2002 program) for the proposed project as well as two development scenarios provided by City staff, which could be built out pursuant to existing zoning. Scenario A assumes development of the site as a commercial gym, a full service restaurant, hotel, service station, and office/light industrial park. Scenario B is similar to Scenario A, but replaces the hotel and restaurant uses with two automobile dealerships. Scenario A would generate higher emissions.

Table 4.5-6 shows that regional emissions generated by the proposed project would be higher than Scenario A for NOx and PM_{10}. Furthermore, emissions

generated by the proposed project would be higher than Scenario B in all categories. As a result, the project would have a ***significant*** cumulative air quality impact with respect to these two pollutants.

Table 4.4-6
Comparison of Project Emissions with Development under Existing Zoning Designations, in Pounds Per Day

	ROG	NO_x	PM_{10}
Proposed Project	56.2	56.2	41.3
Scenario A	50.0	47.6	34.3
Scenario B	41.0	37.8	27.5

Source: Don Ballanti; 2006.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce impacts to a *less-than-significant* level.

4.4-5 *Prior to obtaining clearance to grade the site or conduct earthwork activities, the applicant shall submit a transportation management plan and provide evidence, to the satisfaction of the Community Development Director, that indicates compliance with the following measures outlined in the transportation management plan:*

- *Provide preferential parking for carpool/vanpool vehicles.*
- *Provide secure and conveniently located bicycle parking and storage for workers and patrons.*
- *Provide electric vehicle charging facilities.*
- *Provide preferential parking for hybrid and alternative fuel vehicles.*

In addition, the following measures shall be included within the transportation management plan with specific criteria and standards to be reviewed and approved by the Community Development Director:

- *Specialty equipment (utility carts, forklifts, etc.) should be electrically, CNG or propane powered.*
- *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials to increase the reflectivity of*

roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.

- *Use energy-efficient lighting and process systems, such as low NO_x water heaters, furnaces and boiler units.*

The above mitigation program would be expected to reduce emissions by 5-10 percent. Assuming an average reduction within this range (7.5 percent), the above measures would not reduce project impacts to below that anticipated for development under the current zoning designations. As a result, the project's cumulative air quality impact would be considered *significant and unavoidable*.

Endnotes

1 Ballanti, Donald. *Air Quality Impact Analysis[1] for the Proposed Second Street Crossing Project, City of Davis.* December 2005.

2 *City of Davis General Plan*, May 2001.

3 Yolo-Solano Air Quality Management District, *Air Quality Handbook*, May 1996.

4 Jones and Stokes Associates, *Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module*, Version 8.7, 2005.

5 Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines*, 1996 (Revised 1999).

6 California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000.

7 California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, 2000.

8 South Coast Air Quality Management District, *Health Risk Assessment Guidelines for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, 2003.