

8.4 AIR QUALITY

ENVIRONMENTAL SETTING

Woodland lies in the southern part of the Sacramento Valley, a broad, flat valley bounded by the coastal ranges to the west and the Sierra Nevada to the east. A sea level gap in the Coast Range-- the Carquinez Strait -- is located to the southwest and the intervening terrain is very flat. The prevailing wind direction is southwesterly, which is the wind direction when marine breezes flow through the Carquinez Strait. Marine breezes dominate during the spring and summer months, and show a strong daily variation. Highest average windspeeds occur in the afternoon and evening hours; lightest winds occur in the night and morning hours. During fall and winter, when the sea breeze diminishes, northerly winds occur more frequently, but southwesterly winds still predominate.

Federal and state standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM-10) and lead. California has also set standards for pollutants not covered by national standards (sulfates, hydrogen sulfide, vinyl chloride, visibility reducing particles). The state and federal primary standards for major pollutants are shown in Table 8-3.

Pollutant	Averaging Time	Federal Primary Standard	California Standard
Ozone	1-hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-hour	9.0 PPM	9.0 PPM
	1-hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	---
	1-hour	---	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	---
	24-hour	0.14 PPM	0.05 PPM
	1-hour	---	0.35 PPM
Suspended Particulates	Annual	50 ug/m ³	30 ug/m ³
	24-hour	150 ug/m ³	50 ug/m ³
Lead	30-day avg.	---	1.5 ug/m ³
	3-month avg.	1.5 ug/m ³	---

PPM = parts per million
ug/m³ = micrograms per cubic meter

The Yolo-Solano Air Quality Management District (YSAQMD) and the California Air Resources Board (CARB) maintain several air quality monitoring sites in Yolo County. Currently the CARB monitors ozone levels in Davis, while the YSAQMD monitors PM-10 levels in Woodland and West Sacramento. Prior to 1994, the YSAQMD also monitored carbon monoxide and ozone levels in Woodland. During the 5-year

period of 1989-1993, exceedances of the state and federal standards were recorded in Yolo County for the state/federal ozone standards and state PM-10 standards. Both pollutants are regional problems affecting the entire Sacramento Valley Air Basin. All other standards were met during this time.

The federal Clean Air Act and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state where the federal or state ambient air quality standards are not met as "nonattainment areas." Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

Under the federal Clean Air Act, Yolo County is designated a "severe" nonattainment for the federal ozone standard, and attainment or unclassified for other pollutants. Under the California Clean Air Act the county is a "serious" nonattainment area for the state ozone standard, and is also considered nonattainment for the state PM-10 standard.

Authority for air quality planning is divided. Local air pollution control districts have full regulatory authority for achieving the state standards, while the designated Metropolitan Planning Organization (in this case SACOG) has air quality planning responsibility under the federal law.

METHODOLOGY

Local Air Quality Effects

Carbon monoxide is a poisonous gas emitted primarily by automobiles. High concentrations of this pollutant are normally only found near congested roadways. To estimate future concentrations of this pollutant a screening form of the CALINE-4 computer simulation model was applied to eight selected surface intersections within the city. These intersections were selected as having the higher total approach volumes of all intersections, and the analysis was performed assuming worst-case meteorological conditions. The CALINE-4 program and the assumptions made in its use are described in Appendix D.

Regional Impacts

Development in accordance with the *General Plan* would result in additional emissions from vehicles and stationary sources affecting the regional air basin. New emissions associated with development under the *General Plan* have been estimated using the EMFAC7F emission factors developed by the California Air Resources Board. New vehicle emissions resulting from the projected incremental population increase was estimated for the year 2020. A description of the methodology and assumptions made used in the analysis of regional vehicular emissions are included in Appendix D.

Residential uses contain a number of dispersed and intermittent sources of pollutants such as space and water heaters, household paints and solvents, fireplaces and woodstoves, lawn mowers and other equipment. These emissions have been estimate based on the number of new residential units. The calculation of these emissions is described in Appendix D.

Thresholds of Significance

The significance of project impacts on carbon monoxide has been determined by comparing projected concentrations to the applicable state and federal standards. For the purposes of this *EIR*, an impact is considered significant if adoption or implementation of the *General Plan* caused a violation of the air quality standards, or contributed substantially to an existing or projected air quality violation.

The significance of regional emission increases is determined by comparison of project-related emissions to "thresholds of significance" suggested by the Yolo-Solano Air Quality Management District. The significance thresholds are 82 pounds per day for ozone precursors (ROG and NOx), PM-10, and sulfur oxides (SOx). The significance threshold for carbon monoxide (CO) is 550 pounds per day.

A second regional criterion for significance was applied to the project. Since the regional air quality plans are based on projections of population within the District, a general plan that assumes population or employment projections substantially exceeding those assumed within the regional nonattainment plan is deemed to have a significant impact on regional air quality.

IMPLICATIONS OF THE LAND USE DIAGRAM

The adoption of the *General Plan* would not have a direct air quality effect. Indirectly, the *General Plan* would accommodate new growth in population and employment, affecting local and regional air quality.

Local Scale

Development in accordance with the *General Plan* would alter traffic volumes and change concentrations of localized pollutants such as carbon monoxide near streets and highways. Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The results of the CALINE-4 modeling are shown in Table 8-4. The one-hour concentrations in Table 8-4 are to be compared to the state one-hour ambient air quality standards of 20 PPM and the federal standard of 35 PPM. The eight-hour concentrations are to be compared to the state and federal standard of 9 PPM.

No violations of either standard are indicated in the year 2020. In general, concentrations with the mitigated roadway network are lower than the unmitigated case, although some intersections would have higher concentrations with the mitigated roadway network.

TABLE 8-4				
YEAR 2020 WORST CASE CARBON MONOXIDE CONCENTRATIONS 25 FEET FROM MAJOR INTERSECTIONS, IN PPM				
Intersection	Predicted Concentration			
	Unmitigated		Mitigated	
	1-hour	8-hour	1-hour	8-hour
Gibson/ Road 101	8.6	5.6	7.2	4.7
Gibson/Road 102	6.4	4.1	7.0	4.5
Gibson/East	8.1	5.3	8.1	5.3
Gibson/West	6.6	4.3	6.9	4.5
Main / Road 101	9.3	6.2	8.8	5.6
Main/East	7.5	4.9	7.1	4.6
Beamer/East	6.2	4.0	5.8	3.7
Beamer/Road 101	7.0	4.5	6.2	4.0
Source: Donald Ballanti, Certified Consulting Meteorologist				

Regional Scale

The incremental increase in daily emissions from projected population growth up to 2020 under the *General Plan* is shown in Table 8-5 for reactive hydrocarbons and oxides of nitrogen (two precursors of ozone), PM-10 and carbon monoxide. Area-source emissions are also shown.

TABLE 8-5				
POPULATION-RELATED YEAR 2020 REGIONAL EMISSION IMPACTS, IN POUNDS PER DAY				
Source	ROG	NO_x	CO	PM-10
Vehicle traffic	894	1,590	11,811	655
Area sources	1,028	205	592	67
Total	1,922	1,795	12,403	722
ROG = Reactive Organic Gases NO _x = Nitrogen Oxides CO = Carbon Monoxide PM-10 = Particulate matter, 10 microns				
Source: Donald Ballanti, Certified Consulting Meteorologist				

In addition to the emissions shown in Table 8-5, build out of the *General Plan* would result in new industry within Woodland. The type or amount of such emissions is not predictable, since industrial emissions can vary greatly depending on the processes and materials involved. Any future industrial sources would be subject to the rules and regulations of the Yolo-Solano Air Quality Management District, which currently requires major new stationary sources to utilize BACT (Best Available Control Technology) and provide off-sets.

The incremental increase in regional emissions shown in Table 8-5, would exceed the thresholds of significance recommended by the YSAQMD. However, this would be true for any general plan in an area with a growing population.

A more important significance threshold would be exceeded if the *General Plan* were based on population projections that substantially exceeded that assumed in regional air plans. This is because the regional air plan has assumed and accounts for an incremental amount of growth within the city of Woodland, and if actual population exceeds this assumed increment additional control measures will be required to attain the ambient air quality standards.

State and federal air quality plans are based on SACOG population and employment forecasts. Since the Plan is based on the latest SACOG forecasts, there should be no inconsistency between the *General Plan* and regional air quality plans.

GENERAL PLAN POLICY RESPONSE

The *General Plan Policy Document* includes the numerous policies and programs directly and indirectly related to the effects of growth on air quality. These are located in Chapter 7 of the *General Plan Policy Document* and various other sections of the *Policy Document* and are summarized below.

Citywide Growth and Development

- 1.A.2. *The City shall contain its urban growth within the Urban Limit Line as designated on the Planning Area Land Use Diagram. (Figures 1-4 of the Policy Document).*
- 1.A.6 *The City shall promote infill development and reuse of underutilized parcels in a manner compatible with the character of the surrounding neighborhood.*
- 1.A.9 *The City shall promote walking, bicycling, and transit use and access when designating and approving new development.*
- 1.A.10 *The City shall promote mixed-use developments and creative developments where appropriate and compatible with surrounding land uses. . . .*

Residential Development

- 1.B.7. *The City shall encourage multi-family housing to be located throughout the community, but especially near transportation corridors, Downtown, major commercial areas and neighborhood commercial centers.*

New Residential Neighborhoods

- 1.C.1 *The City shall promote new residential development in a range of residential densities that reflects the positive qualities of Woodland's existing residential neighborhoods (e.g., street trees, pedestrian-orientation, mix of housing types and sizes).*
- 1.C.2 *The City shall encourage the creation of well-defined residential neighborhoods. Each neighborhood should have a clear focal point, such as a park, school, or other open space and community facility, and shall be designed to promote pedestrian convenience. To this end, the City shall encourage the use of historic Woodland neighborhoods, including the use of a modified grid street system, as models for the planning and design of new residential neighborhoods.*
- 1.C.5 *Specific plans for Planned Neighborhood areas shall specify the locations of various residential land uses, parks, schools, child care facilities, neighborhood commercial uses, streets, bikeways, walkways, and other infrastructure. . . .*
- Each specific plan shall at a minimum address the following: . . .*
- i. *Provisions for linking residential neighborhoods, parks, schools, Downtown, shopping areas, and employment centers through a system of pedestrian pathways, bicycle routes, and linear open-space corridors.*
- 1.C.6 *The City shall require residential subdivisions to provide well-connected internal and external street, bicycle, and pedestrian systems.*
- 1.C.7 *The City shall promote architectural and landscape design features in new development that create more pedestrian-friendly neighborhoods, such as rear garages, detached garages, front porches, tree-lined narrow streets (refer to Implementation Program 3.5), and landscaped strips between street and sidewalks.*

Commercial Land Use

- 1.E.3. *Commercial facilities should be designed to encourage and promote transit, pedestrian, and bicycle access. The City shall require that new commercial development be designed to encourage and facilitate pedestrian circulation within and between commercial sites and nearby residential areas.*
- 1.E.4 *The City shall consider pedestrian and bicycle access in the design of walls, buffers, and fencing between commercial and residential uses.*
- 1.E.6. *The City shall encourage significant new office developments to locate near major transportation corridors, Downtown, and/or concentrations of higher density residential uses. New office development may serve as buffers between residential uses and higher-intensity commercial uses.*
- 1.14 *The City shall prepare commercial development design guidelines to promote walking, bicycling, and transit use and access.*

Downtown

- I.F.1. The City shall work jointly with the Redevelopment Agency to promote Downtown as the city's primary pedestrian, specialty-retail, entertainment, and office and financial center and gathering place for families, friends, and neighbors.*
- I.F.5. The City shall work jointly with the Redevelopment Agency to continue building and facade improvements, and streetscape, sidewalk, and street lighting improvements to promote Downtown as a pedestrian-oriented retail and services area, consistent with the Downtown Specific Plan.*

These land use policies provide for mixed land uses and encourage infill development as means of reducing vehicle trips, support the development of higher densities along transit routes or corridors to encourage transit use, or provide for pedestrian/bicycle amenities and paths connecting residential and commercial lands to encourage non-auto travel.

Street and Roadway System

- 3.A.2 The City shall develop and manage its roadway system to maintain LOS "C" or better on all roadways, except within one-half mile of state or federal highways and freeways and within the Downtown core. In these areas, the City shall strive to maintain LOS "D" or better." Exceptions to these level of service standards may be allowed in infill areas where the City finds that the improvements or other measures required to achieve the LOS standards are unacceptable because of the right-of-way needs, the physical impacts on surrounding properties, and/or the visual aesthetics of the required improvement and its impact on community character.*
- 3.A.3 The City shall strive to meet the level of service standards through a balanced transportation system that provides alternatives to the automobile and by promoting pedestrian, bicycle, and transit connections between industrial areas and major residential and commercial areas.*
- 3.A.8 The City shall continue to participate in the countywide Congestion Management Plan.*

Residential Streets

- 3.B.4 The City shall promote the use of grid and modified grid street patterns in new residential neighborhoods. Modified grids could include combinations of grid and curvilinear streets.*
- 3.B.5 The City shall consider the development of local streets with the minimum right-of-way width permitted by City standards in new residential development where appropriate, depending on the type and density of uses and projected traffic volumes, and on-street parking requirements.*
- 3.5. As part of the Street Master Plan update process, the City shall conduct a review of local street widths in connection with planning for major new residential areas to identify the circumstances under which the street width within the existing right-of-way may be reduced to promote a more aesthetic and pedestrian-friendly residential environment.*

Automobile Parking

- 3.C.4. The City shall promote priority parking in safe and convenient locations for employee car pools, park and ride lots, and cyclists.*

- 3.C.8 *Parking lots along street frontages shall be well designed to reduce their visual impact and maximize pedestrian and bicycle compatibility and safety.*

Transit Facilities and Services

- 3.D.1. *The City shall work with YoloBus to plan and implement additional transit services that are timely, cost-effective, and responsive to growth patterns and existing and future transit demand.*
- 3.D.2. *The City shall consider the need for future transit right-of-way in reviewing and approving plans for development. Rights-of-way may either be exclusive or shared with other vehicles.*
- 3.D.3. *The City shall consider the transit needs of senior, disabled, minority, low-income, and transit-dependent persons in making decisions regarding transit services and in compliance with the Americans with Disabilities Act.*
- 3.D.4. *The City shall continue to support feasible efforts to provide demand-responsive service ("paratransit") and other transportation services for those unable to use conventional transit.*
- 3.D.5. *The City shall require new development to provide sheltered public transit stops, with turnouts, where sufficient population or employment concentrations warrant an existing or future bus route.*
- 3.D.6. *The City shall work with YoloBus to ensure that bus routes serve areas with a large number of persons and that bus shelters are provided to protect individuals from adverse weather conditions.*
- 3.D.7. *The City shall consider families' needs in transportation planning efforts and shall promote safe and convenient methods of transportation between school, home, retail shopping, and child care.*
- 3.D.8. *The City shall continue to emphasize the central role of the Downtown in any transit planning.*
- 3.D.9. *The City shall continue to implement the Downtown Specific Plan's policies concerning transit planning.*
- 3.D.10. *The City shall investigate alternative transportation uses for existing rail rights-of-way if railroads consider their abandonment.*
- 3.D.11. *The City shall consider the development of commuter and intercity passenger rail service to Woodland if it is found to be cost-effective and the development of a multi-modal facility for bus, rail, bicycle, and automobile travel.*

Non-Motorized Transportation

- 3.E.1. *The City shall promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provide connections between the city's major employment and housing areas, between its existing and planned bikeways, and between schools, parks, retail shopping, and residential neighborhoods.*
- 3.E.2. *The City shall promote bicycling and walking through appropriate facilities, programs, and information.*

- 3.E.3. *The City shall consider alternative sources of funding for the development and improvement of bikeways and pedestrian pathways.*
- 3.E.4. *The City shall require developers to finance and install pedestrian pathways, bikeways, and multi-purpose paths in new development, as appropriate.*
- 3.E.5. *The City shall encourage the development of adequate, convenient, and secure bicycle parking at employment centers, schools, recreational facilities, transit terminals, commercial businesses, the Downtown core area, and in other locations where people congregate.*
- 3.E.6. *The City shall establish minimum bicycle parking standards for commercial land uses (e.g., office, retail, food service) to ensure bicycle parking for use by employees and customers.*
- 3.E.7. *The City shall require residential, commercial and industrial developments to include bicycle facilities in accordance with the Bikeway Master Plan.*
- 3.E.8. *The City and schools shall work with Yolobus to integrate public transportation systems with bicycling (i.e., bike racks on buses).*
- 3.E.9. *The City shall promote bicycle safety education to children and adults.*
- 3.E.10. *The City shall encourage employers to provide benefits/ bonuses to commuter bicyclists. To this end, the City will continue to implement the Trip Reduction Ordinance as required by law.*
- 3.E.11. *The City shall designate commuter bicycle routes as higher priorities than recreational routes. The City shall promote Class II bikeways as the preferred facility in areas with developed roadways.*
- 3.E.12. *The City shall consider the needs of bicyclists when new roadways are constructed and existing roadways are upgraded.*
- 3.E.13. *The City shall consider the needs of bicyclists when determining street widths.*
- 3.E.14. *The City shall periodically update the Bikeway Master Plan to reflect work completed, added or deleted bikeways, and other bikeway changes to accommodate the cycling public.*
- 3.E.15. *The City will work to expand and increase the efficiency of the bicycle licensing program.*
- 3.E.16. *The City will utilize grant monies, license fees, and fines, along with capital improvement monies to help fund the development and installation of bikeways and bicycle parking facilities.*
- 3.E.17. *The City shall require new development to provide sufficient right-of-way widths to accommodate bikeways on new collector and arterial streets, as called for in the Bikeway Master Plan, and to install these bikeways.*
- 3.E.18. *The City shall continue to develop off-street pedestrian and bicycle paths for access to schools and recreation facilities in existing and future neighborhoods in the city. The City shall consider safety and security issues in connection with development of these facilities.*

- 3.E.19. *The City shall develop safe and pleasant pedestrian ways. To this end, the City shall ensure sidewalks are wide enough for pedestrian convenience.*
- 3.E.20. *The City shall require separation of sidewalks from streets on arterials and major collector streets, where economically feasible.*
- 3.E.21. *The City shall encourage walking in the Downtown and shall continue to make streetscape improvements in the Downtown to encourage walking.*
- 3.E.22. *The City shall cooperate with the schools in maintaining and updating the Safe Routes to School program.*

These policies support transit incentives and expansion of transit options and support expansion of non-motorized travel.

Air Quality-General

- 7.E.1. *The City shall cooperate with other agencies to develop a consistent and effective approach to regional air quality planning and management.*
- 7.E.2. *The City shall support the Yolo-Solano Air Quality Management District (YSAQMD) in its development of improved ambient air quality monitoring capabilities and the establishment of standards, thresholds, and rules to more adequately address the air quality impacts of new development.*
- 7.E.3. *The City shall continue its active participation in the activities of the Yolo County Air Quality Management Board.*
- 7.E.4. *The City shall require major new development projects to submit an air quality analysis for review and approval. Based on this analysis, the City shall require appropriate mitigation measures.*
- 7.E.5. *In cooperation with the Yolo-Solano Air Quality Management District, the City shall develop emission thresholds to serve as the basis for requiring air quality analysis and mitigation.*
- 7.E.6. *The City shall solicit and consider comments from local and regional agencies on proposed projects that may affect regional air quality. The City shall submit development proposals to the YSAQMD for review and comment in compliance with the California Environmental Quality Act (CEQA) prior to consideration by the City.*
- 7.E.7. *The City shall require project-level environmental review to include identification of potential air quality impacts and to include design and other appropriate mitigation measures or offset fees to reduce impacts. The City shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures.*
- 7.E.8. *The City shall require development where feasible to be located and designed to minimize direct and indirect air pollutants.*

- 7.E.9. *In reviewing project applications, the City shall require consideration of alternatives or amendments that reduce emissions of air pollutants.*
- 7.E.10. *The City shall encourage the use of EPA-certified woodstoves and fireplace inserts in lieu of wood burning fireplaces in new development.*
- 7.E.11. *The City shall encourage inclusion of exterior electrical outlets and natural gas hookups in new residential development to encourage the use of electric, rather than gas-powered, equipment, and to encourage the use of natural gas-fired barbecues.*

Air Quality-Transportation

- 7.F.1. *Consistent with Policy 3.A.2, the City shall require new development to be planned to result in satisfactory traffic conditions for major roadways. This includes traffic signals and traffic signal coordination, parallel roadways, and intra- and inter-neighborhood connections where significant reductions in overall emissions can be achieved.*
- 7.F.2. *The City shall continue and, where appropriate, expand the use of synchronized traffic signals on roadways susceptible to emissions improvement through approach control.*
- 7.F.3. *The City shall encourage the use of alternative modes of transportation by incorporating public transit, bicycle, and pedestrian modes in City transportation planning and by requiring new development to provide adequate pedestrian and bikeway facilities.*
- 7.F.4. *The City shall continue to implement the Trip Reduction Ordinance as permitted by state and federal law and will promote other measures identified by the Yolo-Solano Air Quality Management District and incorporated into regional plans.*
- 7.F.5. *The City shall endeavor to secure adequate funding for transit services so that transit is a viable transportation alternative. New development shall pay its fair share of the cost of transit equipment and facilities required to serve new projects.*
- 7.F.6. *The City shall promote the use of clean alternative fuel vehicles.*

These policies call for City cooperation with national, state and local air quality agencies, encourage the use of Transportation Control Measures (TCMs) and indirect source review within the environmental review process to mitigate the impacts of individual projects.

IMPACTS

Growth in population and employment associated with development under the *General Plan* would result in a substantial increase in regional air pollutants. The incremental increase in regional emissions would exceed the Yolo-Solano Air Quality Management District thresholds of significance.

The *General Plan* policies comprise a comprehensive strategy for reducing the air quality impacts of development and transportation systems. Application of all *General Plan* air quality policies would reduce the impact of future development in Woodland, but not to a less-than-significant level. Impacts on regional air quality would remain significant and unavoidable even after implementation of all *General Plan* policies regarding air quality.

MITIGATION MEASURES

No mitigation measures are available that would reduce the impact to a less-than-significant level. Limiting the number of parking spaces for new development would assist, however, in promoting the use of alternative modes of transportation.