

# Exeter General Plan: Air Quality Element

## Introduction

Assembly Bill 170, Reyes (AB 170), was adopted by state lawmakers in 2003 creating Government Code Section 65302.1, which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies and feasible implementation strategies designed to improve air quality. These amendments are due no later than one year from the due date specified for the next revisions of a jurisdiction's housing element.

AB 170 requires cities and counties to comply no later than one (1) year from the date specified in Government Code Section 6588 for the next revision of the housing element after January 1, 2004 (Section 65302.1.e). Based upon the schedule outlined in the bill, jurisdictions in Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties have until June 30, 2010 to comply.

AB 170 also requires cities and counties to submit their air quality amendments to the San Joaquin Valley Unified Air Pollution Control District (District) at least 45 days prior to adoption of those amendments, and the District then has 30 days to return comments (Section 65302.1.d ).

## I. Relationship to the General Plan

As required in Government Code Section 65302.1.b, cities and counties within the San Joaquin Valley must amend their general plan to include a discussion of the status of air quality in their region and strategies to improve air quality. In the case of the City of Exeter, the city will amend its general plan by adding an Air Quality Element to the document. The Exeter Air Quality Element will be composed of the following chapters.

Chapter I: The relationship between the General Plan and the air quality element.

Chapter II: A report describing existing local air quality conditions, attainment status, and state and federal air quality and transportation plans;

Chapter III: A summary of agencies that regulate air quality and the programs that they administer.

Chapter IV: A description of the San Joaquin Valley Air Basin.

Chapter V: A description of the air quality issues in the San Joaquin Valley.

Chapter VI: City of Exeter and air quality issues.

Chapter VII: Air quality goals, policies and implementation strategies.

Chapter VIII: Conclusions

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### II. Air Quality Agencies and Regulations

Air quality is regulated by several agencies including the Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the San Joaquin Valley Air Pollution Control District (SJVAPCD). Each of these agencies develops rules and/or regulations to attain the goals or directives imposed upon them through legislation. Although EPA regulations may not be superseded, both State and local regulations may be more stringent. In general, air quality evaluations are based upon air quality standards developed by the federal government and several State agencies. Emissions limitations are then imposed upon individual sources of air pollutants by local agencies, such as the SJVAPCD. Mobile sources of air pollutants are largely controlled through federal and State agencies, while most stationary sources are regulated by the Air District.

#### U.S. Environmental Protection Agency

The EPA is responsible for implementing the Federal Clean Air Act (FCAA), which passed in 1970 and was last amended in 1990 to form the foundation for the national air pollution control effort. The FCAA required the EPA to establish primary and secondary National Ambient Air Quality Standards (NAAQS), as shown in Table 1, and reevaluate, at least every five years, whether adopted standards are adequate to protect public health based on current scientific evidence.

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with non-attainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emission inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The EPA has responsibility to review all state SIPs to determine conformation to the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the non-attainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan in the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

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**Table 1: Federal and State Ambient Air Quality Standards -2008**

<u>Pollutant</u>	<u>Averaging Time</u>	<u>California Standards a</u> <u>Concentration</u>	<u>Federal Standards b</u> <u>Primary c</u>
<b>Ozone</b>	1 Hour	0.09 ppm (180 $\mu$ g/m <sup>3</sup> )	---
	8 Hour	0.07 ppm (137 $\mu$ g/m <sup>3</sup> )	0.075 ppm (147 $\mu$ g/m <sup>3</sup> )
<b>Respirable Particulate Matter (PM10)</b>	24 Hour	50 $\mu$ g/m <sup>3</sup>	150 $\mu$ g/m <sup>3</sup>
	Annual Arithmetic Mean	20 $\mu$ g/m <sup>3</sup>	---
<b>Fine Particulate Matter (PM2.5)</b>	24 Hour	No separate standard	35 $\mu$ g/m <sup>3</sup>
	Annual Arithmetic Mean	12 $\mu$ g/m <sup>3</sup>	15 $\mu$ g/m <sup>3</sup>
<b>Carbon Monoxide (CO)</b>	8 Hour	9.0 ppm (10 $\mu$ g/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )
<b>Nitrogen Dioxide (NO2)</b>	Annual Arithmetic Mean	0.030 ppm (56 $\mu$ g/m <sup>3</sup> )	0.053 ppm (100 $\mu$ g/m <sup>3</sup> )
	1 Hour	0.18 ppm (338 $\mu$ g/m <sup>3</sup> )	---
<b>Sulfur Dioxide (SO2)</b> Mean	Annual Arithmetic	---	0.030 ppm (80 $\mu$ g/m <sup>3</sup> )
	24 Hour	0.04 ppm (105 $\mu$ g/m <sup>3</sup> )	0.14 ppm (365 $\mu$ g/m <sup>3</sup> )
	1 Hour	0.25 ppm (655 $\mu$ g/m <sup>3</sup> )	---
<b>Lead</b>	30 Day Average	1.5 $\mu$ g/m <sup>3</sup>	---
	Calendar Quarter	---	1.5 $\mu$ g/m <sup>3</sup>
<b>Visibility Reducing Particles</b>	8 Hour	---	---
<b>Sulfates</b>	24 Hour	25 $\mu$ g/m <sup>3</sup>	---
<b>Hydrogen Sulfide</b>	1 Hour	0.03 ppm (42 $\mu$ g/m <sup>3</sup> )	---
<b>Vinyl Chloride</b>	24 Hour	0.010 ppm (26 $\mu$ g/m <sup>3</sup> )	---

a California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter - PM10, PM2.5, and visibility reducing particles, are values not to be exceeded. All others are not to be equaled or exceeded.

b National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year.

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

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### California Air Resources Board (CARB)

CARB is responsible for coordination and oversight of state and local air pollution control programs and for implementing the California Clean Air Act (CCAA). The CCAA requires that all air districts in the state endeavor to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The act specifies that districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

The CARB is primarily responsible for developing and implementing air pollution control plans to achieve the NAAQS. The CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. However, local air districts are still relied on to provide additional strategies for sources under their jurisdiction. The CARB combines local district data and submits the completed SIP to the EPA.

Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing the CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

### San Joaquin Valley Air Pollution Control District (SJVAPDC)

The San Joaquin Valley Air Pollution Control District (SJVAPDC) attains and maintains air quality conditions in Tulare 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 the Air District includes the preparation of plans for the attainment of air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The Air District also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA and the CCAA.

In January of 2002, the Air District released a revision to the previously adopted guidelines document. This revised document, Guide for Assessing and Mitigating Air Quality Impacts, is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The Guide contains the following applicable components:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;

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- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- Methods available to mitigate air quality impacts; and
- Information for use in air quality assessments and EIRs that will be updated more frequently such as air quality data, regulatory setting, climate, topography, etc.

### Rules 9510 and 3180

As population continues to grow and more vehicles occupy the roads, air quality will continue to be an issue. To address this concern, the Air District adopted Rules 9510 and 3180, which will mitigate construction, area, and operational emissions created by development occurring in the San Joaquin Valley. The Air District conducts a thorough review of development projects in its role as a commenting agency under CEQA.

The Air District's Indirect Source Rules (ISR) require new or modified development projects to reduce indirect source emissions by mitigating emissions through project design, paying a fee to reduce emissions off-site, or a combination of the two. An indirect source is any facility, building, or installation that generates or attracts mobile source activity. Cities that prepare a general plan that provides for multiple forms of transportation will make it easier for developers to meet the requirements of the proposed program.

Any of the following projects require an application to be submitted to the District for review and comment unless the project has mitigated emissions to less than two tons per year each of NOX and PM10. They are:

- o 50 residential units;
- o 2,000 square feet of commercial space;
- o 9,000 square feet of educational space;
- o 10,000 square feet of government space;
- o 20,000 square feet of medical or recreational space;
- o 25,000 square feet of light industrial space;
- o 39,000 square feet of general office space;
- o 100,000 square feet of heavy industrial space; or
- o 9,000 square feet of any land use not identified above.

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### Air Quality Plans

The Air District submitted the 1991 Air Quality Attainment Plan in compliance with the requirements set forth in the CCAA. In addition, the CCAA requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of this assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The CCAA requirement for a first triennial progress report and revisions of the 1991 Air Quality Attainment Plan was first fulfilled with the preparation and adoption of the 1995-1997 Triennial Progress Report and Plan Revision. Triennial reports were also prepared for 1995-1997, 1997-1999, and 1999-2001 in compliance with the CCAA.

In an effort to reach attainment for ozone, the Air District submitted the 1994 Ozone Attainment Demonstration Plan. This plan stresses ozone attainment and focuses on strategies reducing NO<sub>x</sub> and ROG air emissions by promoting active public involvement, enforcement of compliance with rules and regulations, public education in both the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles traveled (VMT) in the region, and implementation of stationary and mobile source control measures.

In addition to the above mentioned items, the Air District has submitted numerous plans with respect to ozone, PM<sub>10</sub>, and CO in compliance with the FCAA and CCAA.

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### III. The San Joaquin Valley Air Basin

The SJVAB is approximately 250 miles long and averages 35 miles wide, and is the second largest air basin in the state (see Exhibit No.1). The SJVAB is defined by the Sierra Nevada in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is relatively flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley (Valley), thus, could be considered a “bowl” open only to the north.

The Air Basin is composed of eight counties and 60 incorporated cities. The population of the Basin as of 1/1/2010 was 4,034,478 persons. This population figure is up from the Basin’s 2000 population figure of 3,324,951. The Basin’s population has been growing at an average annual rate of 2.1 percent.

During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the Valley and flows in a south-southeasterly direction through the Valley, through Tehachapi pass, into the Southeast Desert Air Basin. In addition, the Altamont Pass also serves as a funnel for pollutant transport from the San Francisco Bay Area Air Basin into the region.

During the winter, wind speed and direction data indicate that wind occasionally originates from the south end of the Valley and flows in a north-northwesterly direction. Also during the winter months, the Valley generally experiences light, variable winds (less than 10 mph). Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high carbon monoxide (CO) and particulate matter (PM10 and PM 2.5) concentrations.

The SJVAB has an “Inland Mediterranean” climate averaging over 260 sunny days per year. The valley floor is characterized by warm, dry summers and cooler winters. For the entire Valley, high daily temperature readings in summer average 95°F. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45°F.

The vertical dispersion of air pollutants in the Valley is limited by the presence of persistent temperature inversions. Solar energy heats up the Earth’s surface, which in turn radiates heat and warms the lower atmosphere. Therefore, as altitude increases, the air temperature usually decreases due to increasing distance from the source of heat. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Inversions can exist at the surface or at any height above the ground, and tend to act as a lid on the Valley, holding in the pollutants that are generated here.

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### IV. Air Quality in the San Joaquin Valley

#### A. Criteria Air Pollutants

The CARB and the U.S. EPA currently focus on the following air pollutants as indicators of ambient air quality in the San Joaquin Valley: ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), and lead (Pb). Because these are the most prevalent air pollutants known to be deleterious to human health in the Valley, they are commonly referred to as “criteria air pollutants.” EPA has established primary and secondary NAAQS for these criteria air pollutants. The primary standards protect the public health and the secondary standards protect the public welfare. In addition to the NAAQS, CARB has established CAAQS for the following criteria air pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter. In most cases the CAAQS are more stringent than the NAAQS. The NAAQS and CAAQS as discussed above are listed in Table 1.

Criteria air pollutant concentrations are measured at numerous monitoring stations located throughout the 8-county San Joaquin Valley Air Basin, including three monitoring stations in Tulare County. The Church Street site in Visalia was chosen to represent the ambient air quality nearest Exeter. Table 2 summarizes air quality data from the Church Street site since 2000. Ambient air quality conditions with respect to each separate criteria pollutant are described below.

**Table No. 2: Ambient Air Quality - Ozone and Particulate Matter  
Days Exceeding Standards, Church Street Station, City of Visalia**

Year	Ozone				Particulate Matter	
	State Standard		National Standard		State	National
	1-hour	8-hour	1 hour	8 hour	PM 10	PM-2.5
2009	23	68	0	48	121	24
2008	44	94	3	60	161	52
2007	11	56	0	31	91	60
2006	30	72	0	51	156	30
2005	27	62	0	46	146	35
2004	17	73	1	40	91	NA
2003	43	89	0	65	108	31
2002	35	87	1	59	179	82
2001	36	79	2	53	168	NA
2000	46	87	1	70	196	72

Both CARB and EPA use monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of the 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,

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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.

### 1. Ozone

Ozone (O<sub>3</sub>) 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 Reactive Organic Gases (ROG) and NO<sub>x</sub> 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<sub>x</sub> are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level or "bad" ozone is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog because sunlight and heat serve as catalysts for the reaction between ozone precursors, peak ozone concentrations typically occur during the summer in the Northern Hemisphere. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric or "good" ozone layer extends upward from about 10 to 30 miles and protects the earth from the sun's harmful ultraviolet rays (UV-B).

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 asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 ppm for 1 to 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 leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection.

With respect to the NAAQS, Tulare County is currently designated as a Severe Non-Attainment area for the National 8-hour ozone standard. In addition, Tulare County is currently designated as a Severe Non-Attainment area for the state 8-hour ozone standard.

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As shown in Table 2, the national 1-hour and 8-hour ozone standards at the Church Street site has shown marked improvement in the past nine years: from 1 to zero episodes for the 1-hour standard, and 70 to 48 episodes for the 8-hour standard. This improvement trend has also been evident with the California ozone standards for 1-hour and 8-hour durations. The number of days that the California ozone standard has been exceeded has fallen from 46 to 23 events for the 1-hour standard, and 87 to 68 events for the 8-hour standard.

### 2. Particulate Matter

Particulate matter pollution consists of very small particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gaseous pollutant undergo chemical reactions in the atmosphere. Respirable particulate matter (PM10) and fine particulate matter (PM2.5) represent fractions of particulate matter.

PM10 refers to particulate matter 10 microns or less in diameter and PM2.5 refers to particulate matter that is 2.5 microns or less in diameter. Major sources of PM2.5 include diesel fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. PM10 sources include all PM2.5 sources as well as emissions from dust generated by construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands, and atmospheric chemical and photochemical reactions. The adverse health effects associated with PM10 depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances absorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos.

Generally, adverse health effects associated with PM10 may result from both short-term and long-term exposure to elevated PM10 concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death. PM2.5 poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health. Tulare County is currently designated as a Non-Attainment area for the state and national PM10 standards. As shown in Table 2, the national 24-hour PM10 standard at the Church Street site fell from 196 days per year where the standard was exceeded to 121 days; the PM2.5 standard fell from 72 days per year where the standard was exceeded to 24 days per year. Both trends show a marked improvement in the reduction of PM emissions.

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### 3. Carbon Monoxide

Unlike ozone, carbon monoxide (CO) is released directly into the atmosphere by stationary and mobile sources and typically found at high concentrations near the source of emission. CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile source emissions (vehicles) and other secondary source emissions (wood-burning stoves, incinerators, and industrial sources).

Tulare County is currently designated as an Unclassified or Unclassified/Attainment area for the state and national CO standards. With respect to CO air quality trends according to CARB's 2009 Almanac of Emissions and Air Quality, the maximum peak 8-hour trend for the SJVAB shows a fairly consistent downward trend from 1993 to 2007, with year-to-year variability due to meteorological conditions. Both the state and national CO standards have not been exceeded since 1991 and the decline in ambient CO is attributable to the introduction of cleaner fuels and newer, cleaner motor vehicles.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells; however, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases.

### 4. Nitrogen Dioxide

NO<sub>2</sub> is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO<sub>2</sub> are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO<sub>2</sub>. The combined emissions of NO and NO<sub>2</sub> are referred to as NO<sub>x</sub>, which are reported as equivalent NO<sub>2</sub>. Because NO<sub>2</sub> is formed and depleted by reactions associated with photochemical smog (O<sub>3</sub>), the NO<sub>2</sub> concentration in a particular geographical area may not be representative of the local NO<sub>x</sub> emission sources.

Inhalation is the most common route of exposure to NO<sub>2</sub>. Because NO<sub>2</sub> 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 4 to 12

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hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO<sub>2</sub> intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions. Tulare County is currently designated as an attainment or unclassified/attainment area for the state and national NO<sub>2</sub> standards.

### 5. Sulfur Dioxide

SO<sub>2</sub> is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO<sub>2</sub> exposure pertain to the upper respiratory tract. SO<sub>2</sub> is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO<sub>2</sub> at 5 ppm or more. On contact with the moist mucous membranes, SO<sub>2</sub> produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO<sub>2</sub> concentrations may result in edema of the lungs or glottis and respiratory paralysis. Tulare County is currently designated as an Attainment or Unclassified/Attainment area for the state and national SO<sub>2</sub> standards.

### 6. Lead

Lead is a metal found naturally in the environment as well as in manufactured products. Lead emissions have historically been primarily from mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of EPA's regulatory efforts, levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions.

The decrease in lead emissions and ambient lead concentrations over the past 25 years is one of California's most dramatic success stories. All areas of the state are designated as Attainment for the state lead standard (the 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, the CARB has identified lead as a toxic air contaminant.

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### B. Air Quality Challenges

The San Joaquin Valley has a serious air pollution problem that will require the collaborative efforts of many entities to solve, including cities, counties, the development community, the Air District, and the public. The solution to the problem is daunting. It requires:

- 1) a fundamental shift from the use of the private automobile to alternative modes of transportation (walking, biking, buses, and trains);
- 2) a shift from a sprawling land use pattern to one that promotes a compact, concentric and contiguous urban land form;
- 3) a modification in the design of our circulation systems that promotes greater connectivity; and
- 4) a change in the arrangement of land uses within a community or city from conventional zoning to a zoning scheme that promotes a mixed-use arrangement, which is less reliant on the private automobile.

### C. Enforcement of Air Quality Regulations

The US EPA designates the San Joaquin Valley Air Basin as Non-Attainment for ozone and fine particulate matter (PM10 and PM2.5). However, the Air District is currently designated attainment for PM10 at the Federal level and non-attainment at the State level. This means that Air District plans for achieving National Ambient Air Quality Standards (NAAQS) must include stringent emission control measures to attain standards by the deadlines specified in the federal Clean Air Act (CAA). If the Air District's plans fail to meet all requirements, the EPA will take action to exert increasing federal presence in controlling emissions, ranging from sanctions to preparation of a federal plan for attaining ambient standards.

Effective local action is needed to ensure that planning for a healthy air environment is done in concert with economic development activities. Under the federal CAA, the EPA is required to impose automatic sanctions under the following conditions: State failure to submit a complete State Implementation Plan; EPA disapproval of a State Implementation Plan; and State failure to implement its plan. Sanctions must be imposed within 18 to 24 months after a sanction clock is started. The EPA can apply two sanctions: (1) a 2-to-1 emissions offset for newly constructed or modified major sources, which would require new or modified facilities to reduce emissions from other sources equal to twice the amount they project to emit; and (2) a restriction on federally funded highway projects.

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The first sanction could make most industrial expansion prohibitively expensive in the Valley. The second sanction could seriously delay needed highway improvements and jeopardize the money they provide to the local economy. To summarize, the District must submit approvable plans to the EPA, and the plans must reach their goals of a healthy air environment by the federal CAA deadlines. Failure to do so would harm the health of Valley residents, jeopardizes the Valley's economy, and could lead to a loss of local control of the air quality management process.

Mobile sources generate a substantial portion of the air pollution in the San Joaquin Valley. Although cars and trucks are getting cleaner, rapid population growth and increases in vehicle miles traveled can offset significant improvements achieved through tailpipe controls and engine technology.

Rapid increases in population and projected vehicle miles traveled over the next 15 years could overwhelm the improvements in engine technology and may actually cause overall mobile source emissions to begin increasing early in the next decade. This potential trend will not comply with federal air quality standards. In the case of ozone emissions, federal law requires a reduction of ozone precursors by at least three percent per year until air quality standards are attained. Any increases due to motor vehicle emissions must be made up from stationary sources - industries, office complexes, shopping centers, etc. Failure to address these federal air quality standards will invoke federal action.

Failure to reduce mobile source emissions will have a number of significant consequences. Most important is the impact on the health of residents in the Valley. Also important is the impact on the economy if state and federal air quality mandates are not complied with. Economic development and business recruitment will be difficult if the Valley is plagued with unhealthy air.

### D. Mobile Sources and Air Quality

In 1990, the California Air Resources Board concluded that mobile sources comprised a substantial portion of the pollutant inventory in the San Joaquin Valley - 56 percent of the NO<sub>x</sub>, 31 percent of the ROG, 70 percent of the CO and 34 percent of the PM<sub>10</sub>. The Air Resources Board concluded that although motor vehicles are getting cleaner, the rapid growth in population and the increase in vehicle miles traveled (VMT) has somewhat offset improvements in emission controls associated with engines and tailpipes. From 1990 to 2020, the Air Resources Board projected that the population in the Valley would increase by 220 percent while the VMT would be double this figure.

Failure to reduce mobile source emissions will result in numerous health and economic problems. Poor air quality adversely impacts persons with respiratory problems, especially young children and senior citizens. Failure to reduce emissions could discourage economic investment in the Valley as well as causing some existing

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businesses to move to other regions in the country where air quality is better.

Encouraging people to drive less, rideshare or seek alternative modes of transportation is difficult. Even when people understand the consequences of their actions (transportation choices) on the Valley's air quality, they still adhere to their travel habits, even when the price of gasoline has surpassed three dollars a gallon. There are some bright spots on the horizon. Use of fireplaces has been curtailed, agricultural burning is being replaced with tilling and shredding, diesel powered pumps are being replaced with electric engines, and the number of hybrid cars being driven in the Valley is increasing. The greatest challenge, however, will be to entice people to walk or ride a bike to their destination or use some form of public transportation or carpool. It is important that the above strategies work for without their implementation, the Valley's air quality will continue to deteriorate causing health and economic problems.

To effectively design programs and strategies that will reduce mobile emissions, it is imperative that decision-makers understand the characteristics of an operating motor vehicle. Vehicles emit different levels of air pollution during three distinct phases of a trip - cold start, running exhaust and evaporative.

"Cold start" emissions occur during the first minutes of a trip when the engine and catalytic converter are operating cold. Relatively high levels of pollution are emitted during this phase of an operating vehicle. The "running exhaust" mode emits relatively low levels of pollution because the engine has warmed up and the catalytic converter is operating at peak efficiency. The "evaporative" phase generates emissions after the vehicle is turned off, as gasoline evaporates into the air from the engine and carburetor.

Total emissions from a vehicle trip depend upon the length and speed of a trip and the number of stops. Based on an understanding of the operating characteristics of a motor vehicle, the following conclusions are provided:

- Once a vehicle has been started and driven for a few miles, much of the adverse impact on air quality has taken place. To minimize adverse impacts on the air environment, strategies should be devised that reduce the number of trips.
- More emissions are released on longer trips than shorter trips. To minimize adverse impacts on the air environment, strategies should be devised that reduce trip length.
- Emissions from a warm engine are fewer than emissions from a cold engine. By "linking" second and third trips with the first trip (within one hour), fewer emissions result on a per trip basis. To minimize adverse impacts on the air environment, strategies should be devised that aggregate destination points - shopping, banks, offices and service commercial uses; and schools, day-care centers, churches, parks and residential uses.

To effectively minimize development's impact on the air environment, residential land

## **Exeter General Plan: Air Quality Element**

uses should be linked to circulation and transportation networks. As an example, high density residential development could incorporate a bus stop into the design of the project, making it convenient for residents of that development to utilize public transportation. Linking residential development to commercial development with a pedestrian or bike path would be another example. People might opt to walk or bike to the commercial center rather than drive their car.

## Exeter General Plan: Air Quality Element

### V. City of Exeter and Air Quality Issues

Exeter is located in Tulare County at the southern end of the San Joaquin Valley. It is bisected by State Route 65 (Kaweah Avenue), which runs north and south, and it is situated one and one-half miles south of State Route 198, a major east/west route that connects the coast range with the Sierra.

Exeter is seven miles east of Visalia, the county seat of Tulare County, two and one-half miles east of Farmersville and eight miles northwest of Lindsay (see Exhibit No.2 ).

#### A. Land Use

Exeter is a compact community occupying approximately two square miles of land. Urban development has extended in all directions from its original 1888 townsite, which straddled the Southern Pacific (SP) Railroad that ran from the southeast to the northwest. Exeter's downtown and its older residential neighborhoods are contained within a triangular area that is formed by the SP Railroad on the west, the Visalia Electric Railroad on the north and State Route 65 (Kaweah Avenue) on the east. Exeter's industrial districts, which are dominated by agriculturally-related uses such as packing houses and cold-storage facilities, are located along the Southern Pacific Railroad, the A.T. & S.F. Railroad and Industrial Drive, located immediately south of the original townsite.

Single family residential development has occurred in all quadrants of the city, with most of this type of development occurring on the west side of town since 1990. Development of multiple family residential development has been limited. Scattered corner lots in the original townsite have been developed with duplexes and triplexes and a cul-de-sac street in the southeast quadrant of town was developed with 11 duplex units. The most recent multiple family developments included a 45-unit complex at the northeast corner of Visalia Road and Jacobs Place and an 18-unit complex at the northeast corner of F Street and Palm Avenue. These units provided housing opportunities for low- to moderate-income families in the community.

Commercial development is centered in the downtown and to a lesser extent, along Visalia Road and Kaweah Avenue (State Route 65). Recent developments included fast-food franchises on Visalia Road, an office complex on north Kaweah Avenue, a Best Western Hotel on south Kaweah Avenue, and numerous remodels of retail space in the downtown.

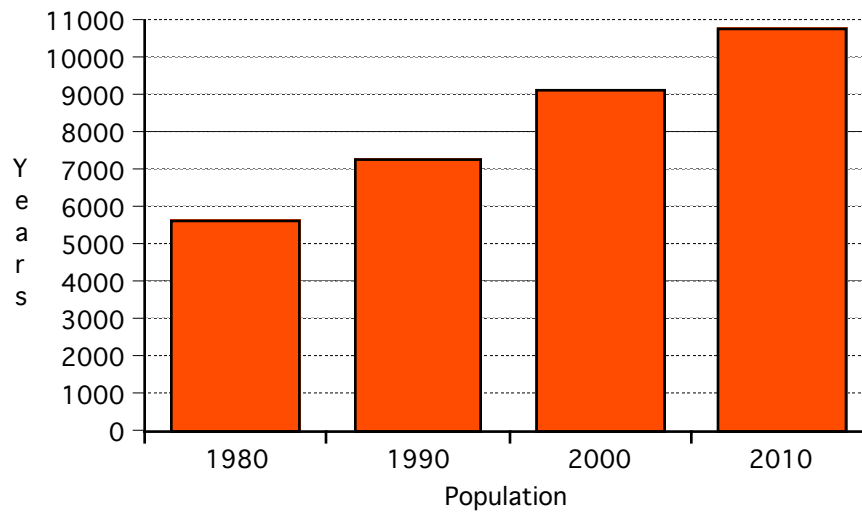
Schools and parks are scattered throughout the community, locating in neighborhoods that are experiencing a demand for these types of public facilities. An elementary school was constructed on Sequoia Drive in the northeast quadrant of the city and the school district recently purchased a future elementary school site in the southwest quadrant of Exeter.

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### Population

Unlike many of the cities in Tulare County, Exeter has not experienced a rapid growth in population. Between 1990 and 2000, the City's population increased 18.7 percent. During the next decade, 2000 to 2010, Exeter increased by only 17.6 percent, a small population increase given the housing boom that occurred during the first half of this decade.

**Figure No. 1  
Exeter Population Growth**



**Table No. 3  
Population Growth Trends**

Year	Population	Numerical Change	Percent Change	Average Annual Growth Rate
1980	5,649			
1990	7,296	1647	29.1 %	2.9 percent
2000	9,169	1873	18.7 %	1.9
2007	10,675	1506	16.4 %	2.3
2008	10,656	-19	-.1 %	-.1
2009	10,646	-10	-.1%	-.1
2010	10,752	106	1.0 %	1.0

Source: 1990 and 2000 US Census, DOF

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According to Table No. 4: Population Trends of Neighboring Jurisdictions, among the county's eight incorporated cities only the City of Lindsay had a lower growth rate than Exeter.

**Table No. 4  
Population Trends - Neighboring Jurisdictions**

Jurisdiction	2001	2010	Change	Percent Change
Dinuba	16844	21542	4698	27.9
Exeter	9168	10752	1584	17.3
Farmersville	8737	10791	2054	23.5
Lindsay	10297	11800	1503	14.6
Porterville	39615	52960	13345	33.7
Tulare	43994	59535	15541	35.3
Visalia	91891	125971	34080	37.1
Woodlake	6653	7927	1274	19.1
Balance Of County	140822	146356	5534	3.9
Incorporated	227199	301458	74259	32.7
County Total	368021	447814	79794	21.7

Source: State Department of Finance

### C. Local Planning Strategies (Exeter) and Air Quality

Persuading people in the Valley to use alternatives modes of transportation instead of their vehicles is a uphill battle. It is made harder by the current design of Valley cities, which promote residential subdivisions that are gated, overloaded with cul-de-sacs and lack connectivity with adjacent subdivisions. Further, residential densities for cities in the Valley are low when compared to other cities in California.

For the last fifty years or so, Exeter and other communities have designed and built roadways that cater to the automobile rather than the pedestrian. Overly wide streets, corners with excessive turn radiuses, and streets that lack street trees, bulbouts, and visible crosswalks are all examples of where the the interests of the automobile have trumped the pedestrian.

In order to modify this trend, Exeter must have a set of public policies and development standards that promote development patterns, building and site designs, and transportation strategies that support alternatives to the automobile and reduced vehicle miles traveled. Towards this end, Exeter recently adopted the Southwest Exeter Specific Plan (See Exhibit No. 3) which will provide for a mix of land uses in a

## Exeter General Plan: Air Quality Element

320-acre planning area that will be connected by a series of boulevards, streets and bike paths. The planning area will eventually support a population of over 5,000 persons, commercial and office development, four park/pond facilities and a 23-acre middle school. The Specific Plan provides policies and development standards that will serve to reduce vehicle miles traveled, encourage alternative modes of travel - walking, biking, and bus, reduce travel speeds, and encourage school-aged children to walk to school.

Exeter's general plan and zoning ordinance are two other documents that can foster change in regards to the nexus between planning and development, and air quality. Exeter's General Plan, Land Use and Circulation Elements, provide a comprehensive set of goals and policies many of which have secondary air quality benefits such as reducing vehicle trips or vehicle miles traveled. The Exeter Air Quality Element will support these elements as well as providing a more focused commitment to certain land use, transportation, and building/design strategies that affect air quality. These strategies include commitments to:

- mitigate project level and cumulative air quality impacts under the California Environmental Quality Act (CEQA);
- integrate land use plans, transportation plans, and air quality plans;
- plan land uses in ways that support a multi-modal transportation system;
- take local action to support programs that reduce congestion and vehicle trips;
- plan land uses to minimize public exposure to toxic air pollutant emissions from industrial and other sources;
- reduce particulate emissions from sources under local jurisdiction; and
- support Air District and public utility programs that reduce emissions from energy consumption and area sources (water heaters, barbecues, etc.).

A city that comprehensively plans an area so that land uses are supportive of walking, bicycling, and transit can achieve long-range trip reductions of 5 to 10 percent compared to standard suburban development patterns. Many communities in the Central Valley are attempting to plan their growth in ways that not only addresses air quality but a number of other problems such as traffic congestion, loss of farmland, urban sprawl, and lack of money to support public infrastructure and services. These planning objectives are achieved through the application of urban design techniques, compact and concentric urban development patterns, and more efficient transportation systems.

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Supporting Exeter’s General Plan is it’s design review process outlined in the Zoning Ordinance. This process ensures that the design of specific projects (subdivisions, planned unit developments, commercial developments, etc.) is responsive to better air quality strategies. Strategies might include grid-style street patterns in a subdivision, a covered bus stop in a commercial development, or a bike path system integrated into a planned unit development.

### 1. Commuting Patterns

Information on the commuting patterns of Exeter’s labor force - how long it takes them to get to work and what mode of transportation they use to get to work - can influence air quality in the local region. If workers are using public transportation to get to work or are walking to work their “air quality footprint” is not as great as the worker who drives to work alone. Table No. 5 shows commuting statistics for Tulare County’s eight incorporated cities; Table No. 6 provides the same statistics for California and the United States. All of these statistics are an indicator of how local air quality might be influenced by commuting patterns. For example, workers in Lindsay have an average travel time to work of 27.5 minutes while Visalia has the shortest commute time, 19.1 minutes. Generally, longer commute times translate into more air pollution. Conversely, thirty-one percent of Lindsay’s commuters carpooled while only 12.4 percent of Visalia’s commuters carpooled. This statistic means that less air pollution was generated per commuter because two or more persons shared the same vehicle.

**Table No. 5**  
**Commuting to Work Data (expressed as a percent of total commuters)**

Commute Statistic	V	T	PV	FV	L	D	E	W
Average Travel Time	19.1	20	20.9	25.6	27.5	23.3	23.1	26 min.
Drive Alone	79.4	78.6	70.5	71	60.1	69.3	73.6	60.8 percent
Carpooled	12.4	14.2	20.5	23	31.3	22.4	16.5	30
Public Transportation	1.2	1.1	1.3	.2	0	0	.8	.2
Walked	1.5	1.5	2.1	1.4	2.8	2.8	3.7	3.3
Worked at Home	3.3	2.8	2.6	1.4	3.3	2.0	3.3	3.1

Source: US Census 2000  
V=Visalia, T=Tulare, PV=Porterville, FV=Farmersville, L=Lindsay, D=Dinuba,  
E=Exeter, W=Woodlake

## Exeter General Plan: Air Quality Element

**Table No. 6**  
**Commuting to Work Data (expressed as a percent of total commuters)**

<b>Commute Statistic</b>	<b>California</b>	<b>United States</b>
Average Travel Time	27.7 min.	25.5 min.
Drive Alone	71.8 percent	75.7 percent
Carpooled	14.5	12.2
Public Transportation	5.1	4.7
Walked	2.9	2.9
Worked at Home	3.8	3.3

Source: US Census 2000

### **2. Transportation Control Measures (TCM)**

One of the tools cities and regions can use to minimize air pollution generated by vehicles is Transportation Control Measures (TCM). TCMs are defined as any program that reduces vehicle trips and miles traveled, or increases average vehicle ridership. The California Clean Air Act (CCAA) defines transportation control measures (TCMs) as:

“any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions”.

There are many TCM policies and development standards contained in Exeter’s General Plan, Zoning Ordinance and Southwest Specific Plan. The General Plan promotes TCMs through its land use polices. These policies generally promote infill and a “squaring-off” of the city limits. This strategy advances lower travel times throughout the community because the average distance from the edge to the center of the community is not substantially increased. Examples of policies contained in the land use element of the general plan are:

**Maintain the city’s 1990 Annexation Policy that promotes residential infill and discourages urban sprawl.**

**Promote Smart Growth planning principals in order to discourage urban sprawl and the premature urbanization of agricultural land.**

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Exeter's Zoning Ordinance has been amended to add a Smart Development Combining District. This combining district promotes higher residential densities, reduced yard standards, narrower streets and architecturally unique dwellings. This district can be combined with any of Exeter's residential zone districts thereby allowing a developer to take advantage of the development standards outlined in the combining district.

Exeter's Southwest Specific Plan, a 320-acre planning area, is designed to implement smart growth principles. Design features included in this Plan are:

1. a grid street pattern that maximizes connectivity, which reduces trip length and travel time;
2. a bike/pedestrian pathway system that runs along the perimeter of the planning area that will encourage persons to walk or bike to their destination and avoid using their vehicle;
3. a mix of land uses that will reduce trip length, number of trips and cold starts;
4. narrow streets with bulbouts at intersections, which slows traffic down and reduces air emissions;
5. tree-lined streets with wider sidewalks, which will promote more walking because sidewalks are shaded and safer; and
6. strategically located bus shelters that are covered.

### 3. Zoning Strategies

There are numerous zoning strategies that can be employed that will have a positive affect on air quality. Residential zone classifications that allow higher residential densities help support a more effective and efficient public transportation system. Placing high density residential zone districts near or adjacent to non-residential uses like schools, parks, offices and shopping centers reduces vehicle trip lengths and may even promote walking or bicycling. It will also serve to aggregate destination points thereby reducing scattered vehicle trips.

More unique zoning strategies that will have a positive impact on air quality include mixed use development where residential living units are mixed in with retail and office uses; home occupations where a business is conducted out of a home but the home is located in a residential neighborhood; and live-work units where a person can live behind or above their business and clients or shoppers are allowed to come to the business site. Currently, two of these zoning strategies is provided for in Exeter's zoning ordinance, home occupation permits and mixed-use development.

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These zoning strategies help to reverse the current job-housing imbalance that exists in Exeter. In 2000, over 79 percent of Exeter's labor force commuted out of town for work. Among the eight cities in Tulare County, only Farmersville had a higher commute percentage - 87 percent. Persons living in Exeter are required to travel to other locations for employment. The median commute time for the Exeter workforce was 23 minutes - the time it takes to drive to Visalia. Close to seven percent of the workforce had a commute time of one hour or more.

This jobs-housing imbalance places more traffic on roadways, creates more air pollution and results in a lower quality of life standard because time during the day must be devoted to the "commute". In addition to air pollution, other negative impacts include wear and tear on roads as well as increased fuel consumption.

Cities should provide a balance between jobs and housing so persons are not having to commute out of town for work. The State of California, Department of Housing and Community Development, suggests that cities should strive for a jobs to housing ratio of 1.5 jobs for every housing unit.

Based on data from the 2000 US Census, Exeter had a jobs to housing ratio of 1.23 (1.23 jobs per dwelling unit). This ratio is close to the State's optimum ratio, however, based on the census data above regarding "place of work", it seems that most of the jobs are outside of Exeter thereby requiring persons to commute.

### 4. Density

Farmland protection, better air quality and efficient use of city services and infrastructure are inextricably connected to a city's strategy on urban growth. Higher population densities generally translates into less farmland converted to urban uses, better air quality and more effective use of services and infrastructure when compared to lower population densities, often called urban sprawl. In the case of air quality, do cities with higher population densities generate less air pollution than cities with lower population densities? What if a "high density city" has few jobs and employees must commute long distances to work thereby polluting the air. Conversely, what if a "low density city" has a substantial number of employers in town and employees can drive short distances to work (or even walk or bike to work). Different scenarios could be constructed if the work commute was replaced with services, like medical, shopping or recreational needs. For example, what if a "high density city" has few services available to its citizens and they had to commute to a nearby city to secure goods and services.

If a city has a good "jobs-housing balance" and a range of services available to its residents then one could argue that the "higher density city" would generate less air pollution than the "low density city." In other words, all things being equal higher residential density translates into better air quality.

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To give the reader a perspective of population densities of Central Valley cities and elsewhere, the following statistics for selected cities are provided. The figures contained in Table No. 7 were derived by dividing a city's 1990 population by its area measured in acres and square miles. Unfortunately, the area measurement includes not only land used for residential purposes but also land used for commercial, industrial, public (e.g. airports, waste water treatment plants, education facilities, etc.) and open space uses (e.g. golf courses, lakes, regional parks, etc.). From purely an air quality perspective, it would be interesting to know how many tons of air emissions (CO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub>, ROG, and CO) 103,030 persons in a square mile of Hong Kong generate versus the 7,168 persons per square mile on Los Angeles generate.

**Table No. 7  
Densities of Selected Cities**

City	Persons per Acre	Persons per Sq. Mile
Hong Kong	161.0	103,030
New York	35.7	22,848
San Francisco	23.4	14,976
Los Angeles	11.2	7,168
Modesto	8.5	5,440
Sacramento	6.0	3,840
<b>Exeter</b>	5.7	3,648
Fresno	5.6	3,584
Bakersfield	3.0	1,920
Redding	2.0	1,280

Source: County and City Extra: Annual Metro, City and County Data Book, 1992.

A report prepared by Alvin D. Sokolow entitled Municipal Density and Farmland Protection: An Exploratory Study of Central Valley Patterns, documented the population densities of cities in the Central Valley, measured in persons per acre. The Valley cities had an average density of 4.5 persons per acre (Note: Exeter was 5.7 persons per acre). Coastal cities had higher persons per acre densities than its Valley counterparts, averaging 5.7 persons per acre. Some of the more notable coastal cities that exceeded this average included Santa Barbara, 7.1; San Luis Obispo, 7.3; Carmel, 6.0; and Fillmore, 7.2 persons per acre. Of the major cities in the Valley that exceeded the Valley average, the top three were Modesto, 8.5; Stockton, 6.3 and Sacramento, 6.0 persons per acre.

Sokolow's report also calculated population density by dividing a city's total population by the acres of land devoted to residential development, a better metric for measuring population density because some cities have large swaths of land devoted to non-residential uses. Using this method, Sokolow calculated the average persons per

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residential acre for 16 cities in the Valley. It was 15.7 persons per residential acre (10,048 persons per square mile). The top three cities were Madera, Delano and Selma at 24.8, 20.1 and 19.5 persons per acre, respectively. The three cities with the lowest densities were Tulare at 11.8, Modesto at 12.0 and Clovis at 12.2 persons per acre.

Using Sokolow's Study, one could argue that Madera residents generate less vehicular-generated air pollution than Clovis residents because Madera has a higher residential density. However, Clovis workers spend less time commuting to work (20.6 minutes versus 25.1 minutes for Madera workers) but a greater percentage of Madera workers carpooled (24.3 percent versus 9.5 for Clovis workers). It is obvious that depending upon the variable selected - density, commute time, percent of workers carpooling, percentage of people walking to work - it is difficult to ascertain a city's "air pollution footprint." What is needed is a mathematical formula that factors in a number of variables that affect air quality. To date, this formula has not been set forth.

As stated earlier, all things being equal "higher density cities" generate less vehicle-generated air pollution than "lower density cities." The distance between a resident's dwelling and a destination point - work, services, shopping, recreation, worship - will be shorter than in a high density city than a low density city. Fewer miles driven translates into less air pollution generated.

Table No. 8 shows the densities in 2009 of all the cities in the San Joaquin Valley's southern four counties - Kern, Kings, Tulare and Fresno. This density was calculated by dividing the city's 2009 population by its area measured in square miles. The city with the highest population density was Huron in Fresno County with a density of 7,554 persons per square mile; the lowest was Taft in Kern County with a density of 615 persons per square mile.

The density figures for the 35 cities listed in this table are rough in that the area measurement of some of the cities have large tracts of land devoted to prisons (Taft, Coalinga, Delano, Corcoran), lakes (Woodlake), universities (Fresno and Bakersfield), major airports (Fresno, Bakersfield and Visalia), oil fields (Bakersfield) or regional parks (Visalia). The figures do, however, provide a glimpse of which cities in the Southern San Joaquin Valley might be doing a good planning job in terms of minimizing sprawl, increasing residential densities and minimizing the urban environment's impact on air quality. Further, the statistics provided below give decision-makers and air quality analysts a numerical baseline from which to work from. In other words, if decision-makers in Lemoore wish to reduce the city's impact on air quality by increasing population densities through its general plan and zoning ordinance, they would have the baseline measurement of 2,883 persons per square mile in 2009 to gauge their future planning efforts on this metric.

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**Table No. 8 Densities of San Joaquin Valley Cities**

	2009 Population	Size of City in Sq. Miles	Density in Persons/Sq. Mile
<b>Kern County Cities</b>			
Arvin	16,517	6	2753
Bakersfield	328,692	138	2382
California City	14,365	20	718
Delano	53,855	13	4143
Maricopa	1,132	1	1132
McFarland	13,390	2	6695
Shafter	15,609	18	867
Taft	9,228	15	615
Tehachapi	13,089	6	2182
<b>City Average</b>	<b>51,764</b>	<b>24</b>	<b>2387</b>
<b>Kings County Cities</b>			
Avenal	16,609	20	830
Corcoran	26,047	7	3721
Lemoore	24,502	8.5	2883
Hanford	51,965	15	3464
<b>City Average</b>	<b>29,781</b>	<b>13</b>	<b>2725</b>
<b>Fresno County Cities</b>			
Clovis	94,289	22.27	4234
Coalinga	19,064	5	3813
Firebaugh	6,812	2	3406
Fowler	5,573	2.45	2275
Fresno	486,171	110	4420
Huron	7,554	1	7554
Kerman	13,880	2.75	5047
Kingsburg	11,259	3	3753
Mendota	9,788	3	3263
Orange Cove	10,775	2	5388
Parlier	13,326	2.3	5794
Reedley	25,587	4.5	5686
Sanger	25,404	5	5081
Selma	23,286	5	4657
<b>City Average</b>	<b>53,769</b>	<b>12</b>	<b>4,598</b>
<b>Tulare County Cities</b>			
Dinuba	20,993	4.9	4284
Exeter	10,656	2.25	4736
Farmersville	10,524	2.8	3759
Lindsay	11,546	3	3849
Porterville	51,638	15	3443
Tulare	57,375	18	3188
Visalia	120,958	36.16	3345
Woodlake	7,489	2	3745
<b>City Average</b>	<b>36,397</b>	<b>11</b>	<b>3,793</b>

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### 5. Connectivity

To connect or not to connect. That is a question that transportation planners across the country struggle with. Not connecting a street in one subdivision to street in an adjacent neighborhoods means less traffic on the two streets. However, the lack of traffic on one street means more traffic on another street. There are winners and losers in the neighborhood traffic game. Both camps have strong reasons for their opposing positions. These positions are outlined in the book, Planning for Street Connectivity by Sandy Handy, Robert G. Patterson and Kent Butler. Those who favor higher connectivity argue that it will:

- decrease traffic on collector and arterial streets;
- provide for continuous and more direct routes that facilitate travel by non-motorized modes such as walking and bicycling and that facilitate more efficient transportation service;
- provide greater emergency vehicle access and reduced response time, and conversely, provide multiple routes of evacuation in case of disasters such as wildfires; and
- improve the quality of utility connections, facilitate maintenance, and enable more efficient trash and recycling collection and other transport-based community services.

Those who favor less connectivity argue that it will:

- raise levels of through traffic on existing residential streets;
- require more land to develop the same number of units;
- increase infrastructure costs and impervious surfaces;
- increase safety concerns because traffic will be traveling a higher rates of speed and more traffic will threaten children playing in the streets;
- decrease the affordability of housing; and
- threaten the profitability of developments.

Early city design had streets arranged in grid patterns, typically running east/west and north/south. Blocks were relatively short and street frontage for buildings was maximized. In the the 1930's, the Federal Housing Administration (FHA) published Planning Neighborhoods for Small Houses wherein the cul-de-sac street was encouraged and the grid street pattern was discouraged. What planners and traffic engineers have discovered with the shift away from the grid pattern is that it is difficult to get from one location to another thereby using more gas, generating more air pollution and wasting more time. Cary, North Carolina, responded to this dilemma when they approved a Connectivity Ordinance (1999) that stated:

“The purpose of the Ordinance is to support the creation of a highly connected transportation system within the Town in order to provide choices for drivers, bicyclists, and pedestrians; promote walking and cycling; connect neighborhoods to each other and to local destinations such as schools, parks, and shopping centers;

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reduce vehicle miles of travel and travel times; improve air quality; reduce emergency response times; increase effectiveness of municipal service delivery; and free up arterial capacity to better serve regional long distance travel needs.”

A city or a neighborhood that lacks “connectivity” generally requires persons to travel greater distances to reach their destination. This causes more air pollution to be generated. This lack of connectivity also has other drawbacks such as slower response times for emergency vehicles, less effective solid waste collection, and reduced human interaction.

General plan policies and design strategies can promote greater connectivity and reduce air pollution. Examples of policies and strategies that could enhance connectivity in a city are:

- Design neighborhoods that avoid the use of walls, entry gates, and roadways that dead-end into adjacent neighborhoods.
- Design residential subdivisions so that effective connectivity is achieved - two or more entrances into a neighborhood.
- Design residential subdivisions so that effective connectivity is achieved - fewer cul-de-sacs and more through roadways.

### 6. Congestion Management

The ability of a roadway to carry traffic is a function of many factors, including street width, the number of travel lanes, the number of intersecting streets, the presence of signals, and the existence of medians. A roadway's traffic volume increases during "peak-hour" times - 7:00 to 8:30 a.m., 12:00 to 1:00 p.m., and 4:30 to 6:00 p.m.. To measure the traffic capacity of a roadway, a Level of Service (LOS) rating system is used. An LOS of "A" signifies a roadway that has traffic that is free flowing while a roadway with a LOS of "F" is very congested. Roadways that are congested typically generate more air pollution than roadways that are free-flowing. Table No. 4 provides an interpretation of the various LOS ratings, which also could be used to measure air pollution. A roadway with a LOS of "A" generates less air pollution per vehicle mile traveled than a roadway with a LOS of "F", which has traffic at gridlock.

Traffic volume projections for 2020 for selected roadways in Exeter are delineated in Table No. 9. These projections are based on data from the Tulare County Association of Government's traffic model for Tulare County and for the Exeter area. Projections for State Highway 65 (Kaweah Avenue) and State Highway 198 are not provided because the city does not have jurisdiction over these roadways nor does it finance improvements along these highways.

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**Table No. 9  
Projected Traffic Volumes, 2020**

<u>Roadway Segment</u>	<u>Projected Traffic Volumes</u>	<u>LOS</u>
<b>East/West</b>		
Visalia Road, Elberta to Belmont	11,000 ADT	A (.45)
Visalia Road, Belmont to Orange	11,000	A (.45)
Visalia Road, Orange to Filbert	11,000	E (.91)
Palm Avenue, Kaweah to F Street	7,500	C (.75)
Firebaugh Avenue, Third to Kaweah	2,000	A (.22)
Firebaugh Avenue, Kaweah to Filbert	9,000	F (1.0)
Firebaugh Avenue, Filbert to Belmont	3,800	A (.42)
Pine Street, Kaweah to F Street	6,000	B (.66)
Glaze Avenue, Kaweah to Filbert	2,000	A (.22)
Glaze Avenue, Filbert to Belmont	1,600	A (.17)
<b>North/South</b>		
Belmont Avenue, Vine to Visalia Rd.	8,000	D (.88)
Belmont Avenue, Visalia Rd. to Glaze	9,000	F (1.0)
Kaweah Avenue, Sequoia to Firebaugh	18,000	C (.75)*
Spruce Road, Ave. 268 to Firebaugh	15,700	C (.65)*
Spruce Road, Firebaugh to Rocky Hill	16,300	C (.68)*

Source: TPG Consulting, 2000.

A review of Table No. 9 shows that in the future many of Exeter's roadways will become congested - LOS of C or worse. This condition will also lead to more air emissions from vehicles traveling along these roadways. Minimizing future roadway congestion reduces vehicle air emissions because less pollution is generated by a vehicle that is traveling in a manner that avoids numerous starts and stops. The City of Exeter should provide for the long-term financing of street construction and maintenance to minimize congestion on its roadways. Transportation funds, gas tax and redevelopment monies could be used to implement this objective.

### 7. Alternative Modes of Transportation

Alternative modes of transportation are important to different groups of people for different reasons. For low-income, handicapped or non-driving age persons, public transit may be the only means of travel. For a person who is concerned about polluting the air, riding a bus or bike may be their way of minimizing their impact on the air

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environment. For recreational and health reasons, people may wish to walk or bike around town. All of these modes of transportation minimize the traveling public's impact on air quality.

Exeter has experienced a certain amount of success towards encouraging the use of alternative modes of travel. For the elderly, non-driving, school aged children and disabled persons, Exeter's Dial-A-Ride has been a transportation staple for many years. This system allows the elderly to travel to medical appointments, school-aged children to school and disabled persons to a wide variety of destinations. Ridership in Fiscal Year 2009/10 was 13,059 persons.

For persons wishing to travel to Visalia for shopping and education (College of Sequoias) purposes, two routes (Nos. 9 and 12) have been extended from Visalia to Exeter. These routes, operated by Visalia Transit, have experienced ridership of 82,217 persons for Route No. 9 and 46,098 persons for Route No. 12 for the year ending on July 1, 2010. These routes were inaugurated in 2009.

Exeter has also experienced active bike ridership since bike events started being staged in Visalia and Exeter in the 1990s. Most recently, the AMGEN Tour passed through Visalia, Exeter, Lindsay and Porterville. Persons often ride from Exeter to destinations north and south of Exeter. Most of these rides are recreational rather than commutes but over time they may provide increased interest in using a bike to travel to and from work.

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### VI. Air Quality Goals, Policies and Implementation Strategies

This Element provides a comprehensive set of goals, policies and implementation strategies that promote development patterns, site designs, and transportation strategies that serve to minimize air emissions in Exeter by reducing vehicle trips and vehicle miles traveled as well as encouraging the use of alternative modes of transportation.

This section of the Element contains specific land use strategies that promote alternatives to single occupancy vehicle travel; land use patterns to encourage walking, bicycling and public transit for a significant number of daily trips; develop in a compact and efficient urban form to minimize vehicle miles traveled; and project site designs and subdivision street and lot designs that will foster walking, bicycling and transit use.

This Element also contains specific circulation strategies that provide ways in which Exeter can plan for the transportation needs of the community while improving air quality.

#### Goal 1

#### **Effective communication, cooperation, and coordination in developing and operating community and regional air quality programs.**

**Policy 1:** The City shall quantify project air quality impacts using analysis methods and significance thresholds recommended by the District.

**Policy 2:** The City shall reduce the air quality impacts of proposed development projects that may be insignificant by themselves, but are cumulatively significant.

**Policy 3:** The City shall encourage innovative mitigation measures to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties.

#### **Implementation Strategies:**

- Ensure that development projects are submitted to the SJVAPCD for CEQA comments. Train staff planners preparing CEQA documents on how to use the *Guide for Assessing and Mitigating Air Quality Impacts* manual.
- Consult with the SJVAPCD regarding the effectiveness of mitigation measures. When using measures from the SJVAPCD list of suggested measures, consider site-specific factors that that make measures feasible.
- Impacts of small residential, commercial, and industrial projects may be addressed by standard conditions that institutionalize mitigation measures, making

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them applicable to all projects regardless of size.

- Innovative measures can be identified during a pre-application consultation process and during city/applicant negotiation over CEQA mitigation.

**Policy 4:** Exeter shall consult with neighboring jurisdictions, affected agencies, and the SJVAPCD to address cross-jurisdictional and regional transportation and air quality issues.

**Policy 5:** Exeter shall coordinate with other jurisdictions (e.g Tulare County and Visalia) and other regional agencies in the San Joaquin Valley to establish parallel air quality programs and implementation measures (trip reduction ordinances, indirect source programs, etc.).

### Implementation Strategies:

- Encourage staff to keep up with activities in neighboring jurisdictions and regional agencies by sending representatives to appropriate meetings, by contacting other agencies, and by active participation in regional programs.
- When development is being considered by another agency, air quality issues should be examined, such as:
  - Congestion on roads in Exeter from increased traffic caused by the project.
  - Proposed circulation amendments that may restrict traffic flow to or from Exeter or that increase urban sprawl.
  - Proposed projects that may minimize the effectiveness of regional bike paths, transit, and pedestrian-oriented development.
- Work with TCAG on programs implementing transportation control measures to reduce vehicle trips and vehicle miles traveled.
- Work with Tulare County or neighboring cities and counties to ensure programs are complimentary.
- Be involved in the rule development process.

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### Goal 2

#### Reduce air emissions through effective land use and circulation strategies

**Policy 6:** Exeter shall consider air quality when planning land use and transportation systems to accommodate expected growth in the community.

**Policy 7:** Exeter submittals of transportation improvement projects to be included in regional transportation plans (RTP, RTIP, CMP, etc.) shall be consistent with air quality goals and policies of the General Plan.

**Policy 8:** Exeter shall consult with transit providers to determine project impacts on long range transit plans and ensure that impacts are mitigated.

**Policy 9:** Exeter shall work with Caltrans and the Tulare County Association of Governments to minimize the air quality, mobility, and social impacts of large scale transportation projects on existing neighborhoods.

#### Implementation Strategies:

- Ensure that land uses proposed in the general plan are supported by a multi-modal transportation system, including coordination with local transit providers.
- Analyze project submittals for consistency with the Air Quality Element. Examples of inconsistent projects are a road widening project that does not consider transit, bicycling, and pedestrian needs, or an intersection signalization project that does not involve signal actuators that can be activated by pedestrians or bicyclists.
- Provide safe pedestrian and bicycle connections between neighborhoods, shopping areas, and the downtown.

**Policy 10:** Exeter shall work to improve the public's understanding of the link between air quality and land use and transportation issues.

**Policy 11:** Groups that provide air quality education programs should be encouraged by the City of Exeter.

#### Implementation Strategies:

- Exeter should assist in educating developers and the public on the benefits of local programs that can reduce vehicle trips and miles traveled.
- It is recommended that Exeter, working with the SJVAPCD and Exeter Schools, develop educational materials regarding air quality, the impact of air quality on people, plants, and animals, and measures that help to improve air quality.

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- Exeter should work with the Farm Bureau, the University of California Extension Service, and farm organizations on educational programs that focus on the relationship between farming and air quality.

### Goal 3

#### **Reduce local air emissions generated by the City of Exeter through the utilization of clean-burning fuels and reducing vehicles miles traveled by Exeter employees**

**Policy 12:** Exeter's fleet vehicle operators should consider replacing or converting conventional fuel vehicles with clean fuel vehicles.

**Policy 13:** Exeter shall support the use of teleconferencing in lieu of employee travel to conferences and meetings when feasible.

**Policy 14:** Exeter shall encourage departments to set up trip reduction programs for their employees.

#### **Implementation Strategies:**

- City Departments should consider implementing trip reduction programs to reduce staff commute trips. Examples of trip reduction programs include:
  - Establishment of flexible work schedules for city employees and a 4/10 weekly work schedule.
  - Department-sponsored carpooling efforts and rideshare programs.
  - Incentives for employees who use alternative means of transportation (biking, walking, carpooling, etc.).
- Budget for clean fuel vehicles in capital expenditure plans.
- Participate in the San Joaquin Valley Clean Cities Coalition to identify fleet vehicle purchase and shared infrastructure investment opportunities.
- Incorporate infrastructure to facilitate the use of clean-fuel vehicles, such as a L/CNG refueling stations for clean fuel vehicles.
- Identify departments where telecommuting is feasible, or where video and web-based conferencing options can result in travel cost and employee time savings.

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### Goal 4

**Reduce traffic congestion and vehicle trips in Exeter through a more efficient circulation system and support for trip reduction programs.**

**Policy 15:** Exeter shall consider measures to increase the capacity of the existing road network prior to constructing more capacity (additional lanes, etc.).

**Policy 16:** Exeter shall work with employers and developers to provide employees and residents with affordable transportation alternatives.

#### **Implementation Strategies:**

- Measures that may increase capacity and reduce congestion on existing roads include:
  - Where possible, synchronize traffic signals to assure smooth-flowing traffic through intersections.
  - Modify intersections using turn restrictions, channelization, etc., where necessary and feasible. Consider the use of roundabouts or traffic circles on some local and collector roadways
  - Redirect truck traffic.
- Some methods employers may use to encourage trip reduction include rideshare and vanpool matching, flexible work schedules, telecommuting, and preferential parking for ride-sharing vehicles.
- Developers can provide site designs that increase the ability to walk, bicycle, or use transit.

### Goal 5

**Minimize exposure of the public to toxic air emissions and odors from industrial, manufacturing, and processing facilities.**

**Policy 17:** Exeter shall require residential projects and other sensitive receptors to be located an adequate distance from existing and potential sources toxic emissions such as industrial sites and hazardous material locations.

**Policy 18:** Exeter shall require new air pollution point sources such as industrial, manufacturing, and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.

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### Implementation Strategies:

- Consult with the SJVAPCD to identify sources of toxic air emissions and determine the need for and requirements of a health risk assessment for a proposed development, including developments that may be exempt from CEQA.
- Require project proponents to prepare health risk assessments in accordance with SJVAPCD procedures when the proposed industrial process has toxic emissions designated by the state as a toxic air contaminant or, similarly, by the federal government as a hazardous air pollutant.
- Designate industrial land in areas well-separated from sensitive uses. Protect vacant industrial sites from encroachment by residential or other sensitive uses through appropriate zoning.

### Goal 6

#### Reduce particulate emissions from sources under the jurisdiction of the City of Exeter.

**Policy 19:** Exeter shall work with the SJVAPCD to reduce particulate emissions from construction, grading, excavation, and demolition.

**Policy 20:** Exeter shall require all access roads, driveways, and parking areas serving new development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use.

**Policy 21:** Exeter shall reduce PM10 emissions from city-maintained facilities to the maximum extent feasible.

### Implementation Strategies:

- The City should include PM10 control measures as conditions of approval for subdivision maps, site plans, and grading permits. This will assist in implementing the SJVAPCD's Regulation VIII, Fugitive PM10 Prohibitions.
- In addition to Regulation VIII, apply the following mitigation measures to reduce PM10 emissions:
  - a. Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
  - b. Prohibit all grading activities during periods of high wind (over 15 mph).

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- c. Apply chemical soil stabilizers on disturbed lands within construction projects that are unused for at least four consecutive days.
  - d. Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations
  - e. Haul trucks shall maintain at least 2'0" of freeboard.
  - f. Plant vegetative ground cover in disturbed areas as soon as possible.
  - g. Cover inactive storage piles.
  - h. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours.
  - i. Continually maintain the existing pavement keeping it clear of dirt, dust, and mud until the project is accepted by the City and install gravel filters with minimum 1-inch base rock at each construction entrance extending across the entrance and a minimum of 55-feet into the site.
- Use strategies to minimize soil disturbance including:
    - Use alternatives to disking, such as mowing, to the extent feasible.
    - Condition grading permits to require that graded areas be stabilized from the completion of grading to commencement of construction.
  - Include paving requirements as part of the development standards of the Subdivision Ordinance.
  - Develop a street cleaning program aimed at removing heavy silt loading that result from sources such as storm water runoff and construction sites.
  - Pave shoulders and pave or landscape medians.

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### Goal 7

#### Reduce emissions related to energy consumption and area sources.

**Policy 22:** The City shall cooperate with the local building industry, utilities and the SJVAPCD to promote enhanced energy conservation standards for new construction.

**Policy 23:** The City shall encourage new residential, commercial, and industrial development to reduce air quality impacts from area sources and from energy consumption.

#### Implementation Strategies:

- Encourage the incorporation of energy conservation features in the design of all new construction and the installation of conservation devices in existing development.
- Encourage the use of passive design concepts that make use of the natural climate to increase energy efficiency.
- Incorporate the most energy-efficient design feasible for all local government facilities and equipment.
- One medium-sized tree (20-40 foot canopy at full growth) shall be provided on each interior residential lot front yard. Two medium-sized trees shall be provided for each corner lot, with one placed on each street frontage. The trees shall be so placed as to provide shade to the street at full growth.
- As many energy-conserving features as possible shall be included in each new project. Examples include, but are not limited to, increased wall and ceiling insulation, EPA-certified fireplace inserts and/or wood stoves or natural gas fireplaces, electrical and natural gas outlets installed around the exterior of the units to encourage use of electric yard maintenance equipment and gas-fired barbecues, and each home wired for computers/internet and electronic meter reading.
- Support the use of weatherization programs for existing residential units and businesses.
- Examine the possibility of requiring solar water heaters for new residential units.
- Encourage the use of solar water and pool heaters, and energy efficient lighting.
- Encourage developers to orient housing units and landscape building sites to maximize solar heating and cooling.
- Support the use of electric and/or hybrid vehicles, including golf carts and NEVs, where appropriate.

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### Goal 8

#### **Reduce motor vehicle trips and vehicle miles traveled and increase average vehicle ridership.**

**Policy 24:** Exeter shall consider air quality and mobility when reviewing any proposed change to the land use pattern of the community.

**Policy 25:** Exeter shall encourage projects proposing pedestrian-oriented designs at suitable locations.

**Policy 26:** Exeter shall encourage mixed-use developments that provide a combination of residential, commercial services, employment, and cultural amenities.

**Policy 27:** Exeter shall promote the downtown as the primary pedestrian-oriented, specialty commercial and financial center in the city.

**Policy 28:** Exeter shall encourage subdivision design that provides neighborhood parks in proximity to activity centers and schools.

**Policy 29:** Exeter shall work closely with the Exeter Schools to choose school sites and street systems that allow students to safely walk or bicycle from their homes.

**Policy 30:** The City shall plan park and ride lots to serve local commuters.

#### **Implementation Strategies:**

- Pursue projects to improve the image of pedestrian-oriented neighborhoods and the downtown (pedestrian amenities, street trees, transit facilities, etc.).
- Designate high and medium-density housing at sites within walking distance of neighborhood commercial services and transportation corridors during general plan updates and developer-initiated general plan amendments.
- Encourage upper story residential uses above commercial within the downtown.
- Promote mixed-use development in Downtown Exeter and Southwest Exeter Specific Plan area.
- Require developers to dedicate park sites as a condition of project approval at sites that are accessible by walking and bicycling.
- Incorporate school sites into larger neighborhood activity centers which could include parks, day care facilities, and limited commercial uses.

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- Work with Caltrans to identify suitable park and ride sites along Hwy 65.
- Encourage all development to incorporate pedestrian-oriented design and work with the developer and other appropriate parties in the design and approval of development

**Policy 31:** Exeter shall provide for an orderly outward expansion of new urban development so that it is contiguous with existing development, allows for the incremental expansion of infrastructure and public services, and minimizes impacts on the environment.

**Policy 32:** Exeter shall encourage infill of vacant parcels.

### Implementation Strategies:

- Identify areas that can be most efficiently served and cause the fewest environmental impacts and designate those areas for development during major general plan updates.
- Support projects that infill vacant areas and areas contiguous on at least one side to a developed area.
- Work with landowners to re-designate vacant lands suitable for higher densities during general plan updates and periodic reviews.
- Encourage projects that increase pedestrian activity and mixed-uses.
- Encourage commercial uses that are complimentary to employment centers.
- Strategically locate high-density development to provide access to transportation corridors.

**Policy 33:** Exeter shall encourage project sites designed to increase the convenience, safety and comfort of people walking or cycling, and for future transit use.

**Policy 34:** Exeter shall review all subdivision street and lot designs, commercial site plans, and multifamily site plans to identify design changes that can improve access by transit, bicycle, and walking.

### Implementation Strategies:

- Require as a part of the site plan review or subdivision process a description of design measures proposed for the site. Some specific design features include:
  - Subdivision street and lot designs that promote pedestrian, bicycle, and

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transit use

- Pedestrian access improvements and amenities (sidewalks, benches, water fountains, landscaping, etc.)
- Parking lot designs that enhance rather than detract from pedestrian access
- The location and type of bicycle improvements (bicycle parking/lockers, relation to bike paths or routes serving the site)

**Policy 35:** The City shall plan for a multi-modal transportation system that meets the mobility needs of the community and improves air quality.

**Policy 36:** The City shall vigorously pursue and use local, state, and federal funds earmarked for bicycle and transit improvements.

**Policy 37:** The City shall ensure to the extent feasible that pedestrian, bicycle, and automobile connections are maintained in existing neighborhoods affected by transportation and other development projects.

### **Implementation Strategies:**

- Ensure that updates to the Circulation Element and submittals of regional transportation improvement projects to the Tulare COG reflect designs and facilities that support a multi-modal system.
- Ensure that Regional Transportation Improvement Plans include alternative transportation mode projects best suited to the community.

**Policy 38:** The City shall require transit improvements at sites deemed appropriate and necessary by the transit provider and consistent with long-range transit plans.

**Policy 39:** The City shall ensure that a comprehensive system of bikeways and pedestrian paths is planned and constructed in accordance with the adopted Tulare County Bike Plan.

**Policy 40:** The City shall ensure that regional and commuter bikeways are extended to serve the community consistent with an adopted bikeway plan.

**Policy 41:** The City shall ensure that upgrades to existing roads (widening, curb and gutter, etc.) include bicycle and pedestrian improvements in their plans and implementation where appropriate.

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### Implementation Strategies:

- Work with transit providers to develop a comprehensive long range transit plan. Revise street and road design standards to include bus turn-out designs and passenger loading area designs where appropriate.
  
- To maximize bicycle use, the following actions may be included in street design standards:
  - Bikeways should be part of a network that connects major destination points within the community
  - Provide separate bike paths in areas where motor vehicle speed or volume make on-street bike lanes unsafe or unpleasant to use
  - Provide adequate paved shoulder on arterial and collectors to keep cyclists and motorist separate
  
- On-site improvements that can increase bicycle use include the provision of bike racks or enclosed bicycle storage at major activity centers, office and commercial establishments and the downtown.
  
- Identify all planned and existing regional bikeways in a comprehensive bikeways plan. Use local, state and federal funds to fund the system.
  
- Require bicycle lanes on larger streets.
  
- Require pedestrian pathways between existing developments to existing and planned transit or multimodal facilities. Identify potential paths during general plan updates.

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### VII. Conclusions

The San Joaquin Valley Air Basin is a bathtub that fills up daily with air emissions generated by cars and trucks; tractors and trains; commercial and industrial uses; utilities; agriculture and nature. The emissions “soup” is composed of all sorts of chemical compounds some of which combine with each other to yield a different compound, like smog. Many of these emissions are harmful to human health, especially the young, old and persons with breathing problems. These emissions can also adversely impact crop productivity, which is a big deal in the San Joaquin Valley given that this region is one of the productive agricultural regions in the world.

Failure to address air quality in the San Joaquin Valley is similar to a person failing to address a particular health problem. Given time, bad things happen. As air quality problems get worse more people get ill, crop productivity falls and the Valley’s “image” gets tainted because it becomes a place where people wish to avoid in regards to living or investing.

How do decision-makers get their arms around this historic problem given the decision-making team is composed of so many entities - federal government, State of California, Public Utilities Commission, the San Joaquin Valley Air Pollution Control District, eight counties and 60 cities. How does this team affect emission standards for vehicles driven in the Valley given that the federal government is in charge of setting these standards, which often becomes a pitched political battle over cost versus promoting cleaner burning, more fuel-efficient cars and trucks.

Solving the “air quality problem” will require the implementation of many strategies at different levels of government. The fuel-efficiency of cars and trucks will be tackled at the federal level. To a great degree the shift to more fuel-efficient vehicles will be driven by the cost of gasoline and the public’s acceptance of the new wave of hybrid vehicles rather than federal regulations.

On the state level, stationary sources of air pollution such as industries, commercial and residential uses, and agriculture will be regulated by the California Air Resources Board (CARB). Also on the State level, the Public Utilities Commission (PUC) has promoted the use of alternative forms of energy, such as solar. As the utilities companies in California shift their sources of energy from fossil fuels towards renewable sources like wind, solar, geothermal, and tidal, air emissions will be reduced. The same trend will occur with industries and agriculture as these sectors use cleaner burning engines and fit their operations with better air pollution control technology.

On the local level - cities and counties - much can be done to affect people’s driving patterns. The strategies to affect this change are outlined in the previous chapter of this element. Here are five strategies that should translate into a positive trend regarding air quality in the Valley:

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### **Compact Development**

Compact development generally reduces travel distances to destinations such as work, shopping, services, school and recreation. Fewer miles traveled translates into fewer emissions generated. Compact development can be facilitated by infill land use strategies and higher density zoning.

### **Congestion Management**

Free-moving traffic, whether it be along a stretch of roadway or through an intersection, generates less air pollution than slow moving, stop and start traffic flow. As cities use their transportation funds, gasoline taxes and CMAQ monies to widen roadways, improve intersections or add dedicated turn lanes, congestion is reduced and air quality is improved.

### **Land Use Mix**

When a variety of land uses are planned in close proximity to one another (e.g. residential development next to schools, shopping centers near offices, and residential development next to employment) the travel distance between land uses is reduced. If the distance is very short, three to five blocks for example, persons may forgo the use of their vehicle and walk or ride a bike to their destination. This condition eliminates air pollution altogether because motor vehicles are avoided.

### **Public Transportation**

A city's public transportation system can significantly reduce the "air quality footprint" of a city. The more persons that utilize the public transportation system the less air pollution generated on a per capita basis. A secondary reward is that there is less traffic congestion because fewer people are using their vehicles to travel to services, work or shopping. A good public transportation system actually puts money in people's pocket. If one were to compare the cost of taking the bus from Exeter to Visalia three times per week, the cost of using the bus is significantly less than if the individual used their own car. The cost of using ones car includes gasoline, oil, wear on the tires, insurance and the depreciation of the value of the car as more miles are added.

Two public transportation systems are available to residents of Exeter.

1. The City's Dial-A-Ride system provides a 17-passenger bus that transports people to destinations within the city limits, including doctor's offices, school and shopping centers. The system operates between the hours of 8:30 am and 4:30 pm, Monday through Friday. In Fiscal Year 2009/10 the Exeter Dial-A-Ride system carried 13,000 passengers.

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2. The Visalia's transit system which extended two routes (No. 9 and No. 12) through Farmersville to Exeter in Fiscal Year 2009/10. This system provides ten pick-ups/drop-offs per day at three stops in Exeter. The system operates six days a week. In Fiscal Year 2009/10 Route No. 9 carried 82,217 passengers and Route No. 12 carried 46,098 passengers.

Public transportation in smaller communities like Exeter started with a Dial-A-Ride system. Seniors and disabled persons were transported to the doctor's office, the senior citizen center, and shopping centers. Over time, parents discovered that they could utilize this system to transport their children to school and back. In other words, the system supplemented the local school bus system.

When Tulare County started its transit system, it discovered that people needed to travel between the county's cities for reasons of work, services or visits with family or friends. This system was replaced with Visalia's transit system in Fiscal Year 2008/09. Exeter discovered that most of the transit trips emanating from Exeter were to destinations in Visalia - shopping, medical visits and College of Sequoias.

### **Density**

The more persons per acre or persons per square mile that live in the community the shorter the distance these persons must travel to destinations, which means less air pollution per trip. Conversely, if this same population is spread out over a larger geological area the travel distance to various destinations (work, school, medical service, recreation, etc.) is increased. If this increased density is combined with a land use pattern that includes a mix of uses, travel distances can be further reduced and different modes of travel might result, such as biking or walking. This scenario potentially provides for double air quality benefits - shorter travel distances and less reliability on motorized vehicles.