Chapter 8 -- Sustainable Development

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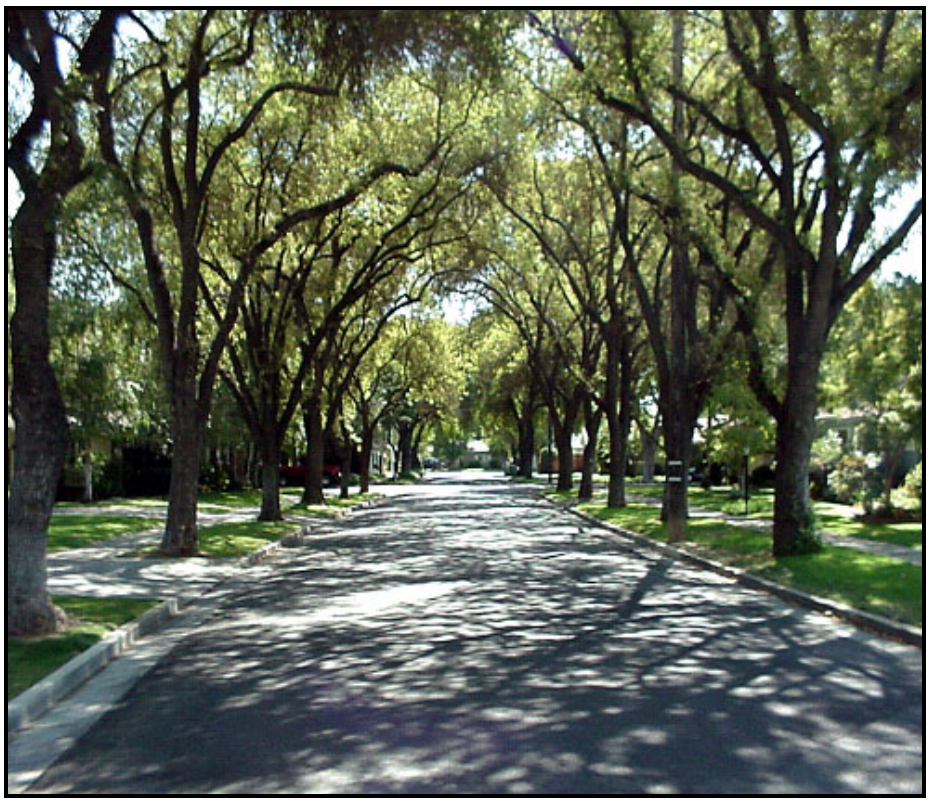


Chapter 8
Sustainable Development

8.1 INTRODUCTION AND INTENT

This chapter of the *Merced Vision 2030 General Plan* addresses the environmental, natural and cultural resources of the City and proposes policies to minimize adverse effects resulting from growth and development.

The intent of this Chapter is two-fold. The primary purpose is to promote *Sustainable Growth* in the City of Merced. In the context of the *Merced Vision 2030 General Plan*, "*Sustainable*" means meeting the needs of the present without compromising the ability of future generations to meet their needs.

In practical terms, sustainable growth in the City of Merced means accommodating growth and development without unnecessarily:

- Consuming our valuable and limited agricultural soils,
- Contaminating or over-taxing our water supplies,
- Destroying or diminishing the value of important wildlife habitat,
- Reducing our air quality to a point where our quality of life is threatened,
- Increasing production of greenhouse gasses,
- Consuming limited non-renewable energy resources, or,
- Destroying our cultural and historic resources.

As more people move to the City of Merced, the more planning and development policy needs to assure the sustainable use of our environment.

A second purpose of this Chapter is closely related to concerns over *Sustainable Growth*. This Chapter is intended to minimize duplication and overlap of the environmental regulatory system in the City.

Numerous federal, state and regional agencies have recognized the need to protect soil, water, wildlife, air, energy and cultural resources. These agencies have adopted rules, regulations and standards which are routinely applied through the City's development review processes.

This complex multi-agency regulatory system can create unnecessary time delays in processing development permits. Sometimes agencies propose regulations which are in conflict with other agency regulations. As an example, State wildlife conservation efforts often conflict with local

flood control agency efforts to remove brush from clogged streams and water courses.

The lack of adequate locally derived environmental and resource protection standards pose problems for San Joaquin Valley cities like Merced. When local standards are not in place, federal and state agencies attempt to fill the void with standards that are general in nature and development project driven. These standards frequently do not fit the circumstances of an individual project and often vary between similar projects.

As a result, local jurisdictions face the prospect of having to impose project conditions which lack consistency and may have little long-term beneficial impact. This typically results in inconsistent standards being proposed at the federal, state or regional level. This lack of consistency creates confusion for both community investors and the public at-large.

In a similar manner, lack of local environmental policy, based on good scientific information, can create confusion during public review processes. Lack of clear local environmental policy can result in public debate being focused on technical information rather than broad policy issues and implications of development. This also leads to situations where scientific data is misinterpreted.

As a net result, lack of clear local environmental policy which is based on good scientific data can have a negative overall effect on a community. The credibility of both government permit agencies and legitimate environmental organizations can be diminished through environmentally driven permit processes which appear arbitrary and ineffective.

In the years since the previous General Plan was developed, vast amounts of information have been generated regarding the environment, the causes of degradation, and the solutions to the problems associated with urban development. The internet has become a critical storehouse, where careful research can produce a number of answers to any given question. Studies, reports, papers and databases are routinely posted to the internet, making the information instantly retrievable. This information bonanza has been vital in the creation of this General Plan update, and will be more so during its lifespan.

This Chapter addresses important environmental and resource issues not addressed in other chapters of this Plan. A consistent and uniform environmental policy approach is proposed. Additionally, broader environmental questions are framed in such a manner so as to lead logical and consistent future environmental standards. As a result, the City's goal of promoting *sustainable development* and reducing environmental regulatory conflict can be achieved.

8.2 SETTING

The following section contains background information on the soil, water, wildlife, air, energy, and historic resources of the region and the City.

8.2.1 Soil Resources

The City of Merced is situated within an area containing very important soils capable of producing a wide range of agricultural products. Throughout the region, urban expansion has resulted in these valuable soils being converted to non-agricultural uses.

The long-term economic health and vitality of Merced is linked to maintaining the agricultural productivity of the region. Many factors influence agricultural production capability. Soil type is a basic measure of agricultural value. While other factors influence agricultural production capacity (water availability, support infrastructure, markets, nuisance and adjacent uses, etc.), soil capability is a primary limiting factor with respect to crop production. It is also important that these unique "prime" soils be in large enough concentrations that they can support an economically viable farming operation.

It should be noted that some types of agricultural productivity are not as dependent on quality soils as others. As an example, dairy and poultry farms do not need to be situated on quality soils. Some crops, such as rice, can be very productive on soils which are of lesser quality than needed for other types of crops.

The Merced Area California Soil Survey was prepared in the 1950's and published in 1962. It still contains the latest information available for the Merced Planning Area with respect to soil capabilities. This Survey has been used in this Inventory to describe the soil capabilities within the planning area.

Merced Planning Area soils are discussed and described in Section 8.5.1 of this Chapter.

8.2.2 Water Resources

Most water found in the San Joaquin Valley originates on the western slope of the Sierra. Valley rainfall in the Merced area averages nearly 11 inches per year while in the higher elevations of the Sierra, rainfall averages 55 inches at the 5,000 foot elevation and has been known to exceed 80 inches per year during extremely wet years at higher elevations.

Surface Water System

The most significant source of surface water in the Merced region is the Merced River which originates in Yosemite National Park. Ultimately the Merced joins the San Joaquin River northwest of the City of Merced.

The Merced Irrigation District (MID) relies on the Merced River for much of its water supply. The District stores Merced River water in Lake McClure, located in the northwestern portion of Mariposa County. The capacity of the Lake, approximately 1-million acre feet of water; is roughly equivalent to the average discharge of the river which is 955,000 acre-feet per year (see ***Figure 8.1***).

Note: An acre foot of water contains 325,829 gallons of water. A typical 3-bedroom detached home on metered water is estimated to consume approximately 164,000 gallons of water per year or nearly one-half an acre foot of water. Other factors affect urban water consumption, however, such as landscape irrigation, commercial and industrial uses, recreation (swimming pools) and water to meet other urban needs.

Not all of the water flowing through the Merced River is available for diversion for agriculture and urban uses, however. During the period between 1970 and 1999, MID and other downstream users of Merced River water withdrew an average of 523,000 acre-feet of water per year or nearly two-thirds of the average annual flow of the river. Unfortunately water flows vary greatly from year to year. During drought periods, flows as low as 276,000 acre feet have been recorded on the river. Prudent water planning must take into account the wide variation in annual water flows on the Merced River.

While the Merced River is the most significant source of surface water in the region, several natural creeks also dissect the area in and around the City of Merced. The most prominent are Black Rascal, Burns, Owens, Mariposa and Bear Creeks. These creeks originate in the foothills east of Merced and flow seasonally from east to west.

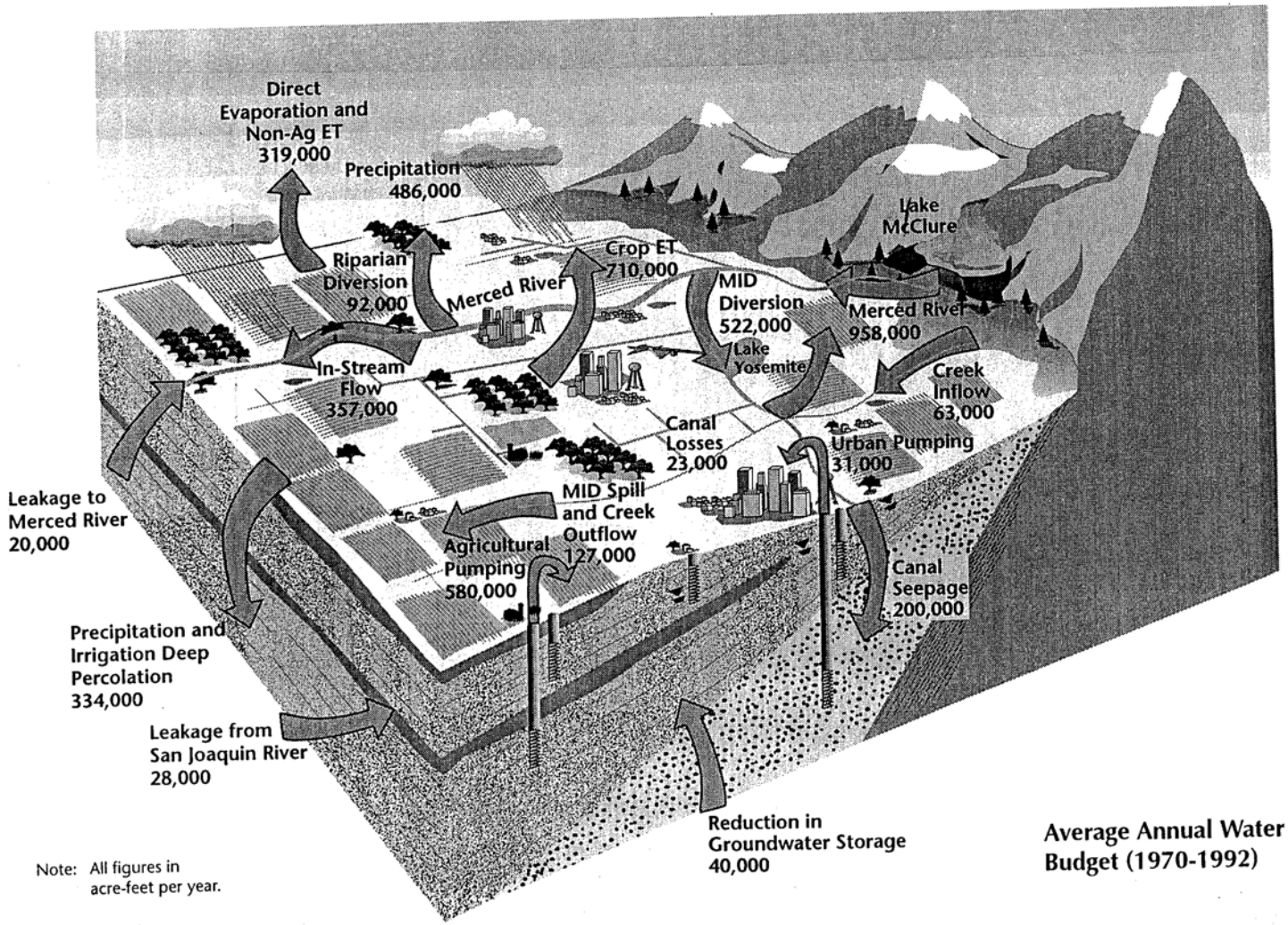
During an average year, peak runoff from Black Rascal, Mariposa, Bear, Owens, and Burns Creeks occurs during February and totals about 16,000 acre-feet. Total inflow from these creeks is estimated to be about 63,000 acre-feet during an average year.

Groundwater

The groundwater system of the Merced region is complex due to the manner by which water is added and withdrawn. Groundwater recharge occurs primarily from agricultural irrigation and rainfall; at the same time, agricultural and municipal pumping account for most of the groundwater withdrawals.

The groundwater basin beneath Merced consists of a wedge of unconsolidated sedimentary deposits of sand, gravel, silt and clay. This formation thickens from the edge of the Sierra foothills to its greatest depth, estimated to be more than 32,000 feet, near the San Joaquin River. Only the first 1,000 feet of these sedimentary deposits provides a usable aquifer because deeper areas contain salt water.

These sedimentary deposits represent a huge underground reservoir of fresh water, about 30 million acre-feet.



REGIONAL HYDROLOGICAL SYSTEM

Figure 8.1

Not all of this water can be withdrawn, however, because it would cause excessive declines in groundwater levels resulting in poor water intruding into currently clean aquifers. Overdrawing the aquifer would also result in subsidence of the land surface of the area.

The sedimentary deposits which contain the area's groundwater have been grouped into four distinct aquifers. The deepest aquifer is the Mehrten Formation which is the oldest and thickest of the sedimentary formations. It is the most important aquifer in the Merced area and is found at a depth ranging from 300 to 700 feet or more below ground level.

The Mehrten Formation is overlain by Continental alluvial deposits. This formation forms an aquifer which begins approximately 150 feet below the surface.

Above the Continental deposits lies the Older Alluvium, the most extensively developed aquifer in the area. Overlaying the Older Alluvium are the flood-basin deposits consisting of fine sand, silt, and clay.

Groundwater levels in the Merced region range from 1 to 15 feet below the surface. Groundwater flows tend to be from the northeast to southwest although groundwater pumping creates cones of depression complicating the natural flow patterns.

The general trend of groundwater movement is downward from the shallowest groundwater to the deeper aquifers. Consequently, degradation of shallow groundwater can potentially affect deeper water supply wells. Where this downward movement is significant and dilution and chemical/biological processes are insufficient to adequately reduce concentrations of groundwater contamination, wells located in the deeper Mehrten Formation can become contaminated

Groundwater Quality

Groundwater in the region has been characterized as belonging to the calcium-magnesium-bicarbonate type. Since 1983, Merced County has been collecting samples from each new domestic well. These data have identified broad areas of groundwater quality problems in the region.

Water Contaminates:	
Dibromochloropropane	DBCP
Tetrachloroethylene	PCE
Trichloroethylene	TCE

Regionally, nitrate and DBCP contamination have been found in the Livingston/Atwater area north of Highway 140 and west of Castle Airport. The Castle site also has a large TCE plume and a number of other solvents have been found in the area's groundwater. At the Kendall plant in southeast Merced, high levels of TCE and other chlorinated solvents have been found in the groundwater.

In 2006-2007, the California Department of Pesticide Regulation (DPR) has tested a number of wells in Merced County. The only pesticide detected was DBCP, which was found in 12 of 20 wells tested.

Several of the City's wells have been affected by PCE contamination linked to dry cleaning operations. Wells 3A, 3B, and 5 were closed because of PCE contamination in 1986 and replaced with deeper wells. Smaller traces of PCE contamination has also been detected in other wells.

8.2.3 Wildlife Resources

The majority of the undeveloped area within the Merced proposed SUDP/SOI area is cultivated with irrigated pasture, row crops, rice or orchards. As a result, little undisturbed natural habitat remains in this area. The major plant community and wildlife habitat types that occur in the SUDP/SOI include riparian corridors, non-native grassland, and irrigated pasture. Additionally, vernal pools and seasonal wetland habitats occur within the non-native grassland habitats (see ***Figure 8.2***). The occurrences of critical habitats for multiple species occur within the SUDP/SOI near the Lake Yosemite and UC Campus area. (See *Merced Vision 2030 General Plan Draft Environmental Impact Report* for details**.**).

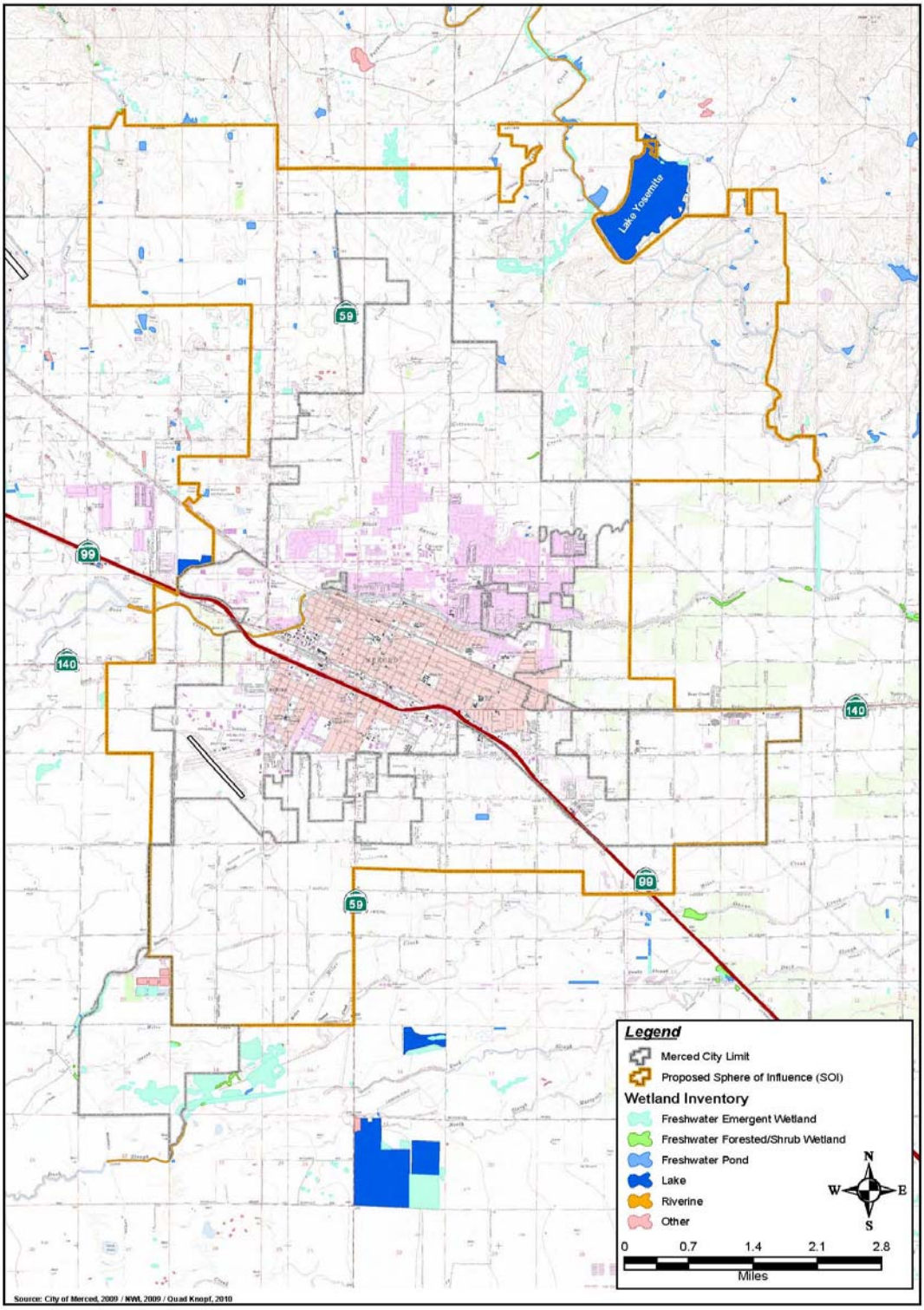
Riparian Corridors

Riparian corridors include creeks and sloughs which provide the natural drainage of the area. Major riparian corridors in the SUDP/SOI include Fahrens Creek, Cottonwood Creek, Black Rascal Creek, Bear Creek, Miles Creek, Owners Creek, Canal Creek and the Hartley Slough. As a result of urbanization and agricultural management practices, some of the native habitat along the area's riparian corridors no longer exists.

Dominant riparian tree species in these corridors include Narrow-leaved willow (*Salix exigua*), Fremont cottonwood (*Populus fremontii*), Northern California black *walnut (Juglans californica var. hindsii*) and willow (*Salix sp*.).

Non-Native Grassland

Non-native annual grassland is dominated by grasses that have been introduced by modern man, mostly to increase agricultural productivity. Annual and perennial herbaceous species and some native grasses may occur. Common introduced grass species found in this community include Slender wild oats (*Avena barbata*), Bermuda grass (*Cynodon dactylon*), Rip-gut brome (*Bromus diandrus*), and Mediterranean barley (*Hordeum murinum ssp. leporinum*). Native grasses that could occur in these areas include Annual Hairgrass (*Deschampsia danthonioides*), and Oldfield three-awn (*Aristida olingantha*). Common annual and perennial, non-native herbaceous species that occur in the study area include Torksbill filaree (*Erodium cicutarium*), Bur clover (*Medicago polymorpha*), and Smooth cat's ear (*Hypochaeris glabrata*).



PLANNING AREA
WETLANDS INVENTORY

Figure
8.2

Irrigated Pasture

Irrigated pasture in the SUDP/SOI growth area is composed principally of introduced annual grasses interspersed with a mixture of introduced and native herbaceous species. These same species that occur in irrigated pasture are also found in the non-native grassland habitat.

Seasonal Wetlands & Vernal Pools

Seasonal wetlands are wetlands that are temporarily saturated or inundated during winter and spring. Seasonal wetlands occur in depressions in the landscape that briefly retain water, or become saturated due to the presence of subsurface water. Seasonal wetland vegetation in the City's SUDP/SOI is similar to vernal pools, and may include sedges (*Carex sp*.), spike-rush (*Eleocharis spp*.), and rushes (*Juncus spp*.).

Vernal pools are types of seasonal wetlands found in grasslands and other habitats, underlain with a clay hardpan or other impermeable layer, that fill with water in the winter and slowly dry in the spring. Plant species found in vernal pools in the region include Popcorn flower (*Plagiobothrys sp.),* Goldfields (*Lasthenia glaberrima*), Downingia (*Downingia pulchella*), and Button-celery (*Eryngium vaseyi*).

These pools are part of a significant and highly sensitive habitat. Both state and federal agencies have strict requirements regarding any development on or around these pools.

Critical Habitat

Critical Habitat is a term defined and used in the Endangered Species Act (Act). It is a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.

An area designated as critical habitat is not a refuge or sanctuary for the species. Only activities that involve a federal permit, license, or funding, and are likely to destroy or adversely modify the area of critical habitat will be affected by the designation. In this event, the U.S. Fish and Wildlife Service will work with the federal agency and, where appropriate, private or other landowners to amend their project to allow it to proceed without adversely affecting the critical habitat. A critical habitat designation does not necessarily restrict further development. It is a reminder to federal agencies that they must make special efforts to protect the important characteristics of these areas.

The SUDP/SOI currently contains critical habitat areas near Lake Yosemite and UC Campus. The species that have critical habitat areas include:

- San Joaquin Valley Orcutt Grass
- Green Tuctoria
- Conservancy Fairy Shrimp
- Vernal Pool Fairy Shrimp
- California Tiger Salamander

Wildlife Habitat

The undeveloped portions of the SUDP/SOI provides habitat for many species of resident and transient terrestrial wildlife including mammals, birds, reptiles, and amphibians. Many of these species use the riparian habitats and eucalyptus woodlots for shelter, nest, or roost sites. Nearby agricultural fields and orchards are also used by wildlife as foraging habitat.

Large animal species found in the area include:

- Coyote (*Canis latrans*)
- Black-tailed jack rabbit *(Lepus californicus)*
- California ground squirrel(*Spermophilus beldingi*)
- Virginia opossum *(Didelphis virginiana*)
- Gray fox (*Urocyon cinereoargenteus*)
- Brush mouse (*Peromyscus boylii*)
- American beaver (*Castor canadensis*)
- Muskrat (*Ondatra zibethicus*)
- California meadow vole *(Microtus californicus*)
- Audubon's cottontail (*Sylvilagus audubonii*)
- Raccoon (*Procyon lotor*)
- Striped skunk (*Mephitis mephitis*)
- Spotted skunk (*Spilogale putorius*)

The numbers and species of birds within the area vary seasonally and from year to year, with some species being resident and others appearing only during migrations. Many species of birds forage and nest in riparian habitats. Grassland and irrigated pasture are used as foraging and nesting habitat for many species as well.

Raptors typically nest in large, tall trees. Cottonwoods and willows, as well as introduced species such as eucalyptus, provide potential nest trees. Grassland and irrigated pasture provide foraging habitat for raptors.

Reptiles and amphibians also occur in the area and include the terrestrial garter snake (*Thamnophis elegans*), Bullfrog (*Rana catesbeiana*), and Pacific chorus frog (*Pseudacris regilla*).

There are several species of plant and animal life that may be found in the City's SUDP/SOI. These species are listed in Chapter 7 (Open Space). This Chapter also contains goals, policies and actions for the preservation of important plant and animal habitat found in the area.

8.2.4 Air Resources

Air pollutant emissions are fairly constant throughout the year, yet the concentrations of pollutants in the air vary from day to day and even hour to hour. This variability is due to complex interactions of weather, climate, and topography. These factors affect the ability of the atmosphere to disperse pollutants. Conditions that move and mix the atmosphere help disperse pollutants. Conditions that cause the atmosphere to stagnate allow pollutants to concentrate.

With respect to the National Ambient Air Quality Standards and the California Ambient Air Quality Standards, Merced

County is currently designated as a non-attainment area for the 8-hour ozone standard and as a severe non-attainment area for the state 1-hour ozone standard and non-attainment for the state 8-hour ozone standard. Additionally, Merced County is currently designated as a non-attainment area for the state and national PM_{10} and $PM_{2.5}$ standards. The following describes the topography, weather, and climate of the San Joaquin Valley and discusses how these factors contribute to our air quality problems. A detailed discussion is included in the *Merced Vision 2030 General Plan Draft Environmental Impact Report*.

Topography

The San Joaquin Valley Air Basin occupies the southern half of the Great Central Valley and is the most distinctly bounded, large topographic basin in the state. The San Joaquin Valley is approximately 250 miles long and averages 35 miles in width. The valley is basically 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.

Meteorology and Climate

The mountain ranges have a strong influence on the climate of the region. The mountain ranges to the west and south induce winter storms from the Pacific to release much of their precipitation on the western slopes and to produce a partial rain shadow over the San Joaquin Valley. However, the major effect of the mountain ranges is to block free circulation of air to the east. This results in stable air being trapped by the bowl-like topography for extended periods during the colder half of the year.

Temperature and Humidity

Summer high temperatures often exceed 100 degrees Fahrenheit, averaging in the low 90's in the northern valley and high 90's in the south. Summer low temperatures average in the high 50's in the north and the upper 60's in the south.

The cloudless, hot days of summer and fall are favorable to ozone formation. Most breaches of the ozone standard occur during summer and fall. However, under extremely hot conditions, convective heating of the earth's surface lifts and mixes the pollutants so that concentrations drop to acceptable levels. This convective mixing, when combined with the afternoon winds, tends to cause pollutants to peak around noon and to decrease later in the day.

Precipitation

Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high pressure belt located off the Pacific coast (Pacific High). Precipitation on the valley floor and in the Sierra Nevada decreases from north to south. The winds and unstable air conditions experienced during the passage of storms result in periods of low pollutant concentrations and excellent visibility.

Between winter storms, high pressure and light winds allow cold moist air to pool on the valley floor. This creates strong low level temperature inversions and very stable air conditions. This situation leads to the Valley's famous Tule Fog and to conditions favorable to high concentrations of CO (carbon monoxide) and particulates. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights when a strong surface inversion is

present and large numbers of fireplaces are in use. A secondary peak in CO (Carbon Monoxide) concentrations occurs during morning commute hours when a large number of motorists are on the road and the surface inversion has not yet broken.

Fog

As was mentioned above, when conditions are favorable for fog to form, they are also favorable for high carbon monoxide and particulate concentrations. However, the water droplets in fog can act as a sink for CO and NO_x, (Oxides of Nitrogen) lowering pollutant concentrations. At the same time, fog could help in the formation of secondary particulates such as ammonium sulfate.

Winds

The topography of the San Joaquin Valley has a dominating effect on wind flow patterns. Winds tend to blow somewhat parallel to the valley and mountain range orientation. Seasonal weather patterns and the region's topography produce the high incidence of relatively strong northwesterly winds in the spring and early summer.

Summer wind conditions promote the transport of ozone and ozone precursors from the Bay Area through the Carquinez Strait, and through the low mountain passes such as Altamont Pass and Pacheco Pass. Wind brings the transported pollutants into the Valley and disperses locally generated pollutants.

8.2.5 Energy Resources/Climate Change

Consumption of energy resources is closely related to the problem of air quality. Steep oil prices of the 1970's had one positive effect, it reduced the nation's international energy bill by reducing the amount of energy we consumed. As the price of energy increased, consumption declined. Cars now get better gas mileage, homes are built to reduce heating and cooling costs, and appliances are designed to be more energy efficient.

Reduced energy consumption has had other benefits to our society. For each kilowatt-hour saved and for each therm conserved, the Earth has been spared additional smog, acid rain, and ozone depletion. Air quality problems are largely a result of burning fossil fuels (oil, coal, and natural gas) to power our cars, run our factories, and heat or cool our homes and offices.

World population is over 50 percent urban; in the U. S. about 85 percent of our population live in cities. As our urban centers grow, they are faced with increasing air and water pollution combined with dangerous levels of hazardous and solid waste accumulation. The problems of our cities also have global ramifications with depletion of the ozone layer, acid rain, deforestation, species extinction, toxic

contamination and climate change (global warming).

Many of these related environmental problems result from our dependence on non-renewable energy resources, such as oil and coal. Cities must reduce this energy dependency to remain as viable places to live and work into the new millennium.

Energy Use

In 1977, largely as a result of statewide drought conditions and high natural gas prices, 81 percent of California's electricity was generated by burning oil. By the early 2000's, oil burning generators represented less than one percent of the state's electrical power generating capacity. At the same time, renewable resources such as biomass, geothermal, wind and solar furnished over 38 percent of the State's generating capacity.

Another critical aspect of future energy use is the expected growth in the consumption of electrical energy. Between 2008 and 2018, California's overall energy demand for electricity is expected to grow at an average rate of 1.25% per year. Peak demand for electricity is forecast to grow at an average rate of 1.35% per year.

A significant portion of this increased peak demand is attributable to expected population growth in the inland areas of the state such as the San Joaquin Valley. Compared to the state's temperate coastal zone, the climate of California's Central Valley and desert is more extreme. As residential and commercial development expands throughout the Central Valley, more peak generating capacity will be needed to meet greater demands for summer air conditioning.

While the generation of electricity has reduced its reliance on fossil fuels, our use of fossil fuels for transportation has grown. Dependence of fossil fuels for energy has multiple consequences. The impact of burning fossil fuel on the environment is well documented. Over the long-term, dependence on non-renewable fuel resources cannot be sustained. Approximately 48 percent of all energy used in California in 1991 was used to provide transportation to the state's population. By 2006, this figure had dropped to 41 percent. ***Figures 8.3a & 8.3b*** depict the system of energy origin and use in the state.

Clearly, transportation is one of most environmentally-sound and cost effective areas within which we can reduce energy consumption of non-renewable fossil fuels. Caltrans predicts that if current development trends and modes of travel continue, the number of miles traveled on California's highways will increase 55 percent by 2020.

Figure 8.3a
California Energy Sources

Fuel Type	*Percent of California In-State Power*
Coal	1.8%
Large Hydro	12.2%
Natural Gas	56.7%
Nuclear	15.3%
Oil	0.0%
Other	0.0%
Renewables	13.9%
Biomass	2.8%
Geothermal	6.3%
Small Hydro	2.0%
Solar	0.4%
Wind	2.4%
Total	100.0%

Source: California Energy Commission, 2010

Figure 8.3b
California Energy Use by Sector – 2006

Source: Energy Aware Planning Guide Consultant Guide, December 2009

Climate Change

California has taken actions to reduce climate change emissions. The California Energy Commission has adopted energy efficiency standards for buildings and appliances that are extremely stringent. The California Air Resources Board (CARB) has adopted vehicle climate change standards that are the first of their kind in the United States. The State's Renewable Portfolio Standard was accelerated by the Governor to require by 2010 that 20 percent of all power used in California be generated by renewable resources. The California Public Utilities Commission recently adopted a Solar Building Initiative that continues California's progressive approach to economic growth and technological innovation hand in hand with protection of public health and the environment. Executive Order S-3-05 signed by the Governor on June 1, 2005, established statewide climate change emission reduction targets as follows:

- By 2010, reduce emissions to 2000 levels;
- By 2020, reduce emissions to 1990 levels;
- By 2050, reduce emissions to 80 percent below 1990 levels.

Most recently, the Governor signed Executive Order S-01-07 on January 18, 2007, establishing carbon reduction targets as follows:

- By 2020, reduce carbon intensity in California transportation fuels by at least 10 percent
- In 2006, the Legislature adopted AB 32 as California's "Global Warming Solutions Act" to begin the process of reversing the causes of global warming. (See Chapter 488 Statutes of 2006). This measure directs CARB to develop a statewide greenhouse gas (GHG) emissions cap for 2020 and to develop and implement regulations and market mechanisms to reduce GHG emissions.

Beyond the established statewide goals on emission reductions and caps, other state and regional agencies are developing strategies for incorporating energy efficiency and climate change emissions reduction measures into the policy framework governing land use and transportation. Some local air districts have begun to incorporate climate protection objectives into their ongoing local programs.

Santa Fe Railroad Station (1892)

8.2.6 Historic Resources

What sets Merced apart from many other communities in the state is its historic charm and character. While much of the City's historical resources have been lost over the years to fire and reconstruction, there is still a significant number of buildings, structures, trees and other reminders of the City's origins.

In 1985, in response to community concerns over the loss of some of the City's historic resources, and the perceived threats to many remaining resources, a survey of historic buildings was undertaken in the City. The survey focused on pre-1941 districts, buildings, structures, and objects of historical, architectural, and cultural significance. The survey area included a roughly four square mile area of the central portion of the City.

Chapter 1, Introduction, of this *Merced Vision 2030 General Plan* contains a narrative history of the City's overall growth and development (Section 1.3.3). The following section focuses mostly on individual buildings and neighborhoods and the historical or cultural context in which they were built.

Historic Setting

The first settlement in the vicinity of Merced, consisting of a general store, saloon, and a blacksmith shop, was established on Bear Creek in 1870, but it was the construction of the Central Pacific Railroad line through the Central San Joaquin Valley that gave rise to the present City of Merced.

As the company laid the track down the Central Valley in 1871, it established towns at strategic locations as shipping points for grain and other agricultural products. Charles Henry Huffman, known by some as the "Father of Merced," was the town site man for the railroad and responsible for locating the new town of Merced. Surveyors began laying out the town site of Merced on a treeless plain to the south of Bear Creek in November 1871. The street grid was aligned with the southeast trending railroad tracks resulting in the northwest to southeast orientation of Merced's numbered streets.

Temporary buildings, including a depot, hotel, stables, saloons, restaurants, a butcher shop, and residential sheds and tents began to rise along the tracks, but the first permanent structures in Merced were built following the auction of lots that took place on February 8, 1872. John C. Smith bought the first lot for $575 to put up a saloon. By the end of the month, the foundations of 15 to 20 buildings were laid, including those of the El Capitan Hotel. This four-story, luxury hotel served as the railroad terminus for tourists bound for Yosemite. Merced's role as the "Gateway to Yosemite" significantly affected the economic growth and development of the City throughout its history. The first volunteer fire department was established in 1873.

From the beginning, Merced's founding fathers envisioned the community as the county seat because of its location toward the center of the county and its proximity to the railroad. To prompt an election to move the county government from Snelling to Merced, the railroad offered the county the four city blocks of Courthouse Park at 21st and N Streets. An election was held within nine months and Merced won.

Merced High School (circa 1915)

Following the transfer of the county seat from Snelling to Merced, plans were made for the construction of a new county courthouse. Plans were submitted by Albert A. Bennett, one of the architects who had taken part in the design of the State Capitol in Sacramento. Bennett designed the ornate building in the Italianate style, and in May 1875, the Merced County Courthouse was dedicated.

By 1875, Merced's commercial and industrial districts were well established. Town promoters had envisioned that the main business section would be along Huffman Avenue (currently "M" Street) and Courthouse Avenue ("N" Street), but frugal buyers bought the less expensive lots near the tracks along Main Street and Front Street (16th Street). Commercial establishments located on the north side of Front Street with hotels, stables, and small stores situated on Main Street behind the Front Street business district. The railroad depot, warehouses, and other industrial buildings were located along the tracks. Water was supplied to this area by a large elevated water tank near Main and M Streets.

The early educational and spiritual needs of Merced's non-oriental community were met by buildings located in the vicinity of the Courthouse. The Academy (Merced's first school), St. Patrick's Catholic Church, and the Methodist Episcopal Church were all built in the area.

Downtown Merced Parade (1920's)

Merced had three distinctive residential districts after only three years of existence. Most of Merced's residences were located on 18th and 19th Streets between J and M Streets and the eastern end of Main extending to H Street. Most of the homes were simple single-story wooden structures. The first prestige neighborhood in Merced was "Little Snelling," settled by former residents of the old county seat. Little

Snelling was located south of the tracks across from the El Capitan Hotel, between N and O on 14th and 15th Streets and included more elaborate homes. Chinatown, a compact self-sustaining community, was located one block to the east of Little Snelling, but was built at a higher density and included a mix of homes and businesses and a Buddhist Temple (or Joss House).

Downtown Parade (circa 1940)

The population of Merced grew from 1,525 in 1880 to 2,009 in 1890--an increase of over 30 percent. During this decade, the more sparsely populated areas of Central Merced filled in and new commercial businesses were built on Front Street. Some fine residences built for Merced's more prosperous citizens also sprang up, including the Huffman Mansion situated on the north bank of Bear Creek at the end of M Street, completed in 1882 for a cost of $100,000.

Improvements were made to Merced's utilities during the last half of this decade. The Merced Gas and Electric Company provided current for the town's streetlight system which became operational in 1888. The construction of Lake Yosemite, which began to supply Merced with water in 1889, coincided with an increase in building activity in the downtown area.

Substantial brick buildings began to fill empty lots or replace wooden structures on Front and Main Streets. Main Street began to take on more significance as a commercial district. Merced was incorporated as a sixth class city on April 1, 1889.

Although the census of 1890 registered a slight decrease in Merced's population, several important developments affecting Merced's future growth took place in the 1890's. 21st Street began to emerge as Merced's preeminent neighborhood. By 1896, electrical power was being supplied to domestic and commercial customers by the Merced Falls Gas and Electric Company. The community's educational system was enhanced by the construction of Merced's first public high school in Courthouse Park in 1897.

Downtown Parade (1940's)

The most significant event of this decade took place when the San Francisco and San Joaquin Valley Railroad was granted a right-of-way through Merced. The railroad was given the use of 24th Street in the hope that the competition would force the Southern Pacific to lower its exorbitant freight rates. A station was built along the newly laid tracks near K Street in 1896. The elevated

road bed may have retarded later growth in northern Merced by greatly reducing access to this area which remained rural in character until the 1920's. The railroad became part of the Atchison, Topeka, and Santa Fe in 1900.

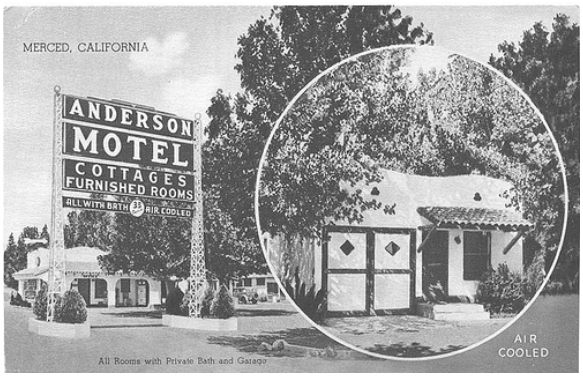
Merced Theater (1940)

The population trend of the preceding 10 years was reversed during the first decade of the 20th century but while the number of inhabitants grew by about 60 percent to 3,102, the expansion of the residential areas was relatively modest. The most significant residential development was the opening of the Bradley addition in 1903, located on an extension of 21st Street to the east of the canal which ran down G Street, a street that marked the eastern boundary of the original town plan. Large 10 to 20 acre parcels with large homes were characteristic of this area. The pace of commercial construction was relatively restrained.

Improvements in public services and utilities initiated during this period include the establishment of a sewer system (1901), the replacement of boardwalks and dirt paths with concrete sidewalks (1903), the construction of a new county hospital (1903), paved streets (1906), and 24-hour electric service (1907).

The construction of the Yosemite Valley Railroad (1905-1907) had a significant impact on the development of west Merced. The station was located off the end of Main Street in the present day Westgate Shopping Center while the roundhouse and support facilities were situated where Fremont School stands today. The tracks, laid down the middle of R Street, may have impeded growth in the west end of Merced, which did not develop until after the removal of the tracks in 1946.

The choice of Merced as the headquarters of the new railroad brought jobs to the City, increasing the demand for goods and services, and may have been a factor in the surge of both commercial and residential development that took place prior to World War I. Significant World War I era buildings included the new El Capitan Hotel, Shaffer Building, the Central Presbyterian Church (1916), Our Lady of Mercy (1917), the Masonic Lodge (1917), and the Santa Fe Railroad Station (1918). Merced's water system was improved by the construction of the water tower at pumping station number one, located behind the Huffman mansion, which replaced Lake Yosemite as Merced's source of water.



Anderson Motel (circa 1950)

By 1930, Merced's population had increased to 7,066, due in part to the great expansion of 1927 when four times more building permits were issued than the average of the preceding 14 years. Many of the City's most

important buildings were constructed during this period, including the Hotel Tioga (1928), the Main Street Post Office (1923), Mercy Hospital (1923), and the American Legion Hall and the Women's Club (both 1926).

With the opening of the Yosemite Highway (Highway 140) in 1926, 16th Street began to develop in response to increased automobile traffic. As a result, motels, restaurants, and automotive-related businesses were built along this stretch.

Main Street (circa 1950)

During the 1920's, Merced's residential districts expanded west to the Yosemite Valley railroad tracks on R Street, east to G Street, and north to Bear Creek filling in much of the area between the Santa Fe tracks and the creek. Duplexes and apartments began to take on an increased role in satisfying the housing needs of Merced's growing population. Several new schools (Merced High School, Galen Clark, and John Muir) were also built in the years preceding the Great Depression.

The economic disruption and stagnation brought about by the collapse of the stock market was documented in Merced by a dramatic drop in new construction, although a few important buildings (Ivers and Alcorn, Our Lady of Mercy School, and Golden State Theater, now the Merced Theatre) were completed in the early 1930's. Federal reconstruction programs provided the City with a new post office, the Bell Station (1933), and Merced's second water tower (1934).

Following a hiatus of several years, private capital was once again invested in Merced's business district. By 1940, the displacement of Front Street as Merced's primary commercial district was assured and Main Street became the community's banking, mercantile, professional, and entertainment center. Today, the foundations of the pioneer buildings that once lined Front Street lie beneath a veneer of asphalt while Main Street remains a visual reminder of Merced's later economic development.

The years following World War II brought more expansion and with it the need for more planning. The City Charter was adopted in April 1949, the City adopted its first zoning ordinance in 1950, and its first general plan and redevelopment project (15th Street) in 1959. The City expanded to the east with the first annexation in the East Merced Industrial Area in 1957 as well as to the north with the first annexation north of Bear Creek. The first annexation south of Childs Avenue occurred in 1958 and in southeast Merced in 1954.

Main Street (circa 1960)

By 1960, the City's population had reached 20,000 and growth was beginning to boom in North Merced. Merced Junior College was established in 1962 and annexed in 1964. The Merced Mall opened in 1969 in the City's first planned development. Single-family residential growth occurred east of G Street and north of Olive.

Another major change that would alter Merced's growth pattern also took place in the 1960's. In 1960, the elevated Highway 99 was constructed along 13th Street, effectively dividing South Merced from the downtown and creating three distinct sub-areas of Merced--1) North Merced, north of Bear Creek; 2) Central Merced, between Bear Creek and Highway 99; and 3) South Merced, south of Highway 99.

Hotel Tioga (2010)

8.3 ISSUES & INTENT

To accommodate future growth in the City of Merced, while maintaining the characteristics of the City which make it both a healthy and a special place to live, several concerns must be addressed.

8.3.1 Soil Resources

Conversion of "prime" agricultural soils to non-agricultural uses can result in an irreversible loss in the agricultural production capacity of the region. Goals and Actions contained in the Urban Expansion (2) and Open Space, Conservation, and Recreation (7) Chapters of this plan focus on the issue of agricultural soil loss. These policies attempt to balance the urban growth needs of the region with the need to minimize urban encroachment onto "prime" agricultural soils.

8.3.2 Water Resources

Long-term growth and development in Merced depends on adequate clean water resources. Sustained development can be accommodated through the implementation of goals and actions contained in the Open Space, Conservation, and Recreation (7) and Public Services and Facilities (5) Chapters of this plan. These goals and actions address the need to preserve and protect water quality while planning for the future water needs of the City and surrounding agricultural lands.

8.3.3 Wildlife Resources

Man's settlement of the San Joaquin Valley has had a profound impact on the wildlife resources of this region over the past 100 years. Today it is recognized that the health of our natural plant and animal communities is a barometer for the overall health of our environment.

It is also recognized that modern healthy human communities can co-exist beside healthy wildlife communities with the sound application of open space policy and technology. The Open Space, Conservation, and Recreation Chapter of this General Plan (Chapter 7) contains goals and actions which are directed to the preservation, protection and enhancement of the important wildlife habitat resources found in the Merced urban area.

8.3.4 Air Resources/Climate Change

Poor air quality has become a negative symbol of modern urban development. Our quality of life is often measured by the quality of the air in our urban places. Poor air quality is related to a number of factors. Air quality policies in this Plan address this complex environmental issue through goals, policies and actions contained in the Urban Expansion (2), Urban Design (6), and Transportation and Circulation (4) Chapters of this Plan. This chapter contains several specific air quality goals, policies and actions which support the overall City effort to restore the region's clean air, reduce impacts related to climate change, and to promote "healthy communities."

8.3.5 Energy Resources/Climate Change

Energy use is closely related to issues relating to air quality. The burning of fossil fuels as an energy source has been one of the most significant contributors to our deteriorating air quality. Long term growth is highly dependent upon how we use energy today and how we plan future energy use. This chapter contains specific goals and policies which address issues of energy conservation and encourage use of sustainable energy resources and climate change. The development of a Climate Action Plan for the City is one important task, which began in 2009. It should be noted, however, that like air quality, the use and conservation of energy are complex matters. It has a close relationship to topics such as urban design, land use, traffic and circulation and conservation. Many goals, policies and actions contained in other chapters of this Plan also have an indirect impact on energy use and conservation.

8.3.6 Historic Resources

Historic and cultural resources are important elements in appearance and atmosphere of Merced. The *Merced Vision 2030 General Plan* contains numerous references to the linkages between the past, present and expected future. This chapter contains specific goals and actions intended to guide future city-wide historic preservation efforts.

8.4 SUSTAINABLE DEVELOPMENT GOALS, POLICIES, AND ACTIONS

As previously noted, sustainable development goals, policies and actions are, by necessity, integrated into the entire *Merced Vision 2030 General Plan*. The following section of this chapter specifically addresses goals and actions exclusively relating to air quality, climate change, cultural resources, energy, and healthy communities, which are not covered in other chapters.

Goal Area SD-1: Air Quality and Climate Change

GOALS

- **Clean Air with Minimal Toxic Substances and Odor**
- **Clean Air with Minimal Particulate Content**
- **Effective and Efficient Transportation Infrastructure**
- **Coordinated and Cooperative Inter-Governmental Air Quality Programs**
- **Reduction in the Generation of Greenhouse Gases (GHG) from New Development**

POLICIES:

SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment**.**

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

SD-1.5 Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

SD-1.6 Reduce emissions of PM10 and other particulates with local control potential**.**

SD-1.7 Develop and implement a Climate Action Plan for the City.

SD-1.8 Implement Policies in Other General Plan Chapters to Address Air Quality and Greenhouse Gas Emissions Reduction Goals

Policy SD-1.1
Accurately Determine and Fairly Mitigate the Local and Regional Air Quality Impacts of Projects Proposed in the City of Merced.

The environmental assessment process required under the California Environmental Quality Act (CEQA) is by far the most important tool for local government to communicate with other agencies and the public on the air quality impacts of development within a community. CEQA, however, has only limited applicability with respect to development review and approval. The law focuses on "Discretionary" projects, as opposed to "administrative" development proposals. As a result, large scale developments, which typically require "discretionary" permits are often subjected to CEQA mitigation that is not required of "administrative" projects. While consistent application of CEQA can make a difference in project-level air quality impacts, uniform air quality standards for all projects could make a significant contribution toward limiting regional, cumulative air quality impacts.

Implementing Actions:

1.1.a Implement uniform standards, analysis methods, and significance thresholds recommended by the Air District for mitigating air quality impacts resulting from development.

The City will work closely with the San Joaquin Valley Air Pollution Control District (SJVAPCD) to develop and implement uniform standards for determining "thresholds of significance" for air quality impacts for use in the City's CEQA review process. The City will also identify cost effective and uniform mitigation standards and use these standards in a manner that they can be applied to all development in a consistent and uniform manner.

1.1.b Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated.

The City will work closely with the SJVAPCD, builders and other interested parties to develop uniform and appropriate mitigation measures in the City. City policies and provisions will attempt to eliminate mitigation policies and practices which discourage large-scale comprehensively planned projects.

1.1.c All air quality mitigation measures should be feasible, implementable, and cost effective.

City planning efforts have focused on development standards which discourage growth patterns that unnecessarily have an adverse impact on air quality. Further mitigation of air quality impacts, at the project specific level, should focus on the unique circumstances of the project and the site with respect to air quality impacts. Project specific mitigation measures will be developed to assure that they can be implemented in a manner so as to achieve the desired effect and that the benefits in improved air quality are justified in light of private and public expenditure.

1.1.d Work with the SJVAPCD to identify regional cumulative transportation and air quality impacts.

The City shall work with the SJVUAPCD, and other local governments in the region, to perform uniform air emissions modeling on the cumulative land use changes in the region. The City will participate in regional planning efforts which will fairly assess the air quality impacts of various local governmental growth policies. It is expected that this effort would lead to regional growth and development strategies (developed, administered and implemented at the local government level) which will substantially reduce the adverse impacts of new growth and development on regional air quality.

1.1.e Reduce the air quality impacts of development projects that may be insignificant by themselves, but cumulatively are significant.

Small residential and commercial projects usually do not cause significant air quality impacts, but when a number of small unrelated projects are developed in an area, they produce a cumulative impact. These potential impacts have been addressed in the development of the Merced General Plan Land Use Diagram. Individual projects which are consistent with these General Plan policies should be subject to limited air quality analysis which focuses on neighborhood level impacts. Other projects will need to be evaluated within the context of the net cumulative effect on regional air quality. These principles of review shall also be applied to development proposed outside of the City's SUDP/SOI which are subject to City review and comment.

1.1.f Encourage innovative measures to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties..

Innovative measures can be identified during a pre-application consultation process and during city staff/applicant consultation over CEQA mitigation approaches. The Air District should be involved in these discussions to the extent feasible.

1.1.g Include the evaluation of Greenhouse Gas Emissions and Climate Change in environmental review documents prepared by the City.

As required by recent changes in the California Environmental Quality Act (CEQA), the City shall include the issue of Climate Change and Greenhouse Gas Emissions in environmental documents prepared by the City. Techniques and best practices for evaluation these issues are currently being developed by various government agencies and interest groups and the City will keep track of these developments and endeavor to remain up-to-date in evaluation methods.

Policy SD-1.2
Coordinate Local Air Quality Programs With Regional Programs and Those of Neighboring Jurisdictions.

Effective coordination and cooperation between local agencies in the implementation of government air quality programs is critical. Air quality problems transcend local agency boundaries and management of these problems requires various units of government to search for comprehensive solutions to the problem. Local governments working together for a common interest can multiply the resources available to accomplish air quality goals.

Implementing Actions:

1.2.a Work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional transportation and air quality issues.

The City can create an environment that allows and encourages staff members to keep up with activities in neighboring jurisdictions and regional agencies. This may be accomplished by sending representatives to appropriate meetings, by contacting counterparts in other agencies when developing programs, and most important, by active participation in regional program planning.

The Planning Department, as required by law, maintains internal procedures to ensure that all affected jurisdictions and agencies are notified of development proposals. When another

agency notifies the City of a pending project, air quality related issues, such as the following, should be examined:

1) Congestion on City streets from increased traffic caused by the project;

2) Effects on the viability of transit and pedestrian-oriented developments in the area (i.e., approval of a low density development on the same transit corridor as a transit-oriented development could reduce the ability of the transit provider to provide reasonable headways);

3) Failure of the other jurisdiction to require the construction of a segment of a bikeway planned in the regional bikeway plan; and/or,

4) Proposed circulation amendments that may restrict traffic flow to or from the City or that produce urban sprawl.

1.2.b Consult with the SJVAPCD during CEQA review for discretionary projects.

Ensure that the SJVAPCD is on the distribution list for CEQA documents for discretionary projects with a potential to cause adverse air quality impacts. Conduct a pre-application air quality review to identify issues or problems that might require redesigning or major alterations of the project.

1.2.c Coordinate with other jurisdictions and other regional agencies in the San Joaquin Valley to establish consistent and uniform implementation measures (trip reduction ordinances, indirect source programs, etc.).

The City will work with the Merced County Association of Governments on programs implementing transportation control measures. Work with the County and neighboring cities to ensure programs are complementary. The City will maintain its involvement in the rule development process and provide representation on air quality steering and advisory committees.

1.2.d Support cost-effective multi-use modeling and geographic information system (GIS) technology.

Maintain participation in the Merced County Association of Governments (MCAG) GIS project which is part of the Valley-wide GIS project with the Valley Councils of Government and the SJVUAPCD. This land use data can be used to evaluate air quality impacts in the City.

1.2.e In cooperation with the San Joaquin Valley Air Pollution Control District, examine potential sources of revenue to pay for air quality improvement measures.

The City may elect to participate in nexus studies to demonstrate the need for and benefit of revenue collected to combat air pollution, when such revenue could be used for implementing the following air quality-oriented programs:

1. Computerization/synchronization of the City's traffic signals
2. Mass transit improvements and operation subsidy
3. Development of alternative modes of transportation such as bike lanes/paths and trails
4. Remedial improvement of existing congested intersections and underdeveloped planned City streets.
5. The planting of more trees and other landscaping in the City.

6. Development of renewable energy projects and programs such as liquefaction to convert methane gas from liquid and solid waste to LNG, residential and commercial solar energy installations, and cogeneration and power exchanges in new development and redevelopment.

Policy SD-1.3
Integrate Land Use, Transportation, and Air Quality Planning for the Most Efficient Use of Public Resources and for a Healthier Environment.

In the past, transportation planning emphasized the construction of new roadway capacity to reduce congestion and to meet the needs of planned development. Air quality legislation now mandates all transportation plans to consider air quality. This new emphasis requires our land use and transportation plans to create patterns of development and transportation infrastructure that reduce the need for new capacity and improve air quality.

Implementing Actions:

1.3.a The City of Merced will consider air quality when planning the land uses and transportation systems to accommodate the expected growth in this community.

Develop coordinated land use and transportation plans to meet federal, state, and local air quality requirements. Ensure that land uses proposed in general plan updates and general plan amendments are supported by a multi-modal (auto, transit, bicycling, pedestrian, etc.) transportation system and that the land uses themselves support the development of the transportation system.

1.3.b Transportation improvement should be consistent with the air quality goals and policies of the General Plan.

Analyze project submittals for consistency. Examples of inconsistent projects are a road widening project that does not consider transit, bicycling, and pedestrian needs along the route or an intersection signalization project that does not involve the installation of signal actuators that can be activated by bicyclists or pedestrians.

1.3.c The City of Merced will consult with transit providers to determine project impacts on long range transit plans and ensure that impacts are mitigated.

Work with transit providers to develop long range transit plans based on land use plans supportive of future transit service. Consult with transit providers during the CEQA process to determine the impacts of development projects on the transit system.

1.3.d Encourage the construction of low income housing developments that use transit-oriented and pedestrian-oriented design principles.

The Village Plan policies provide sufficient density to make public transit feasible. The City, in cooperation with other public agencies, may explore the use of special funding sources which could assist in financing necessary infrastructure which would enhance residential development and maintain affordability for low and moderate income households.

1.3.e The City of Merced will work with Caltrans and MCAG, the Regional Transportation Planning Agency, to minimize the air quality, and mobility impacts of large scale transportation projects on existing neighborhoods.

Use existing rail right of ways where feasible. Provide safe pedestrian and bicycle connections between neighborhoods and shopping areas when they become separated by new rail or freeway projects

1.3.f Provide for installation and maintenance of additional landscaping which helps maintain and improve air quality, by continuing to increase the extent of landscaped areas in the City using street trees, parking lot shading, median islands, and landscape buffers.

The City has a strong history of requiring the planting of trees (i.e. street trees, parking lot trees) and landscaping on residential, commercial, and industrial projects and that tradition will continue.

(Notes: The Urban Design goals and policies contain specific standards for land use which incorporate the Urban Villages design concepts for developing land uses which support development and operations of public transportation systems and other alternative modes of transportation.)

Policy SD-1.4
Educate the Public on the Impact of Individual Transportation, Lifestyle, and Land Use Decisions on Air Quality.

Without the understanding and support of the general public, local air quality programs cannot be expected to achieve the desired results. Programs to educate the public on air quality issues are a vital component of a successful air quality program.

Implementing Actions:

1.4.a Work to improve the public's understanding of the land use, transportation, and air quality link.

The City should support the SJVUAPCD efforts to educate developers and the public on the benefits of pedestrian and transit friendly development and should participate in local programs that can reduce vehicle trips and miles traveled

1.4.b Support SJVAPCD efforts to encourage formation of local groups that provide air quality education programs.

The City supports the SJVAPCD efforts in forming a community-wide public/private air quality organization to promote air quality education programs. To this end, the City will work with the SJVAPCD, Farm Bureau, the University of California Extension Studies, farm organizations, and other community-based air quality groups on educational programs.

Policy SD-1.5
Provide Public Facilities and Operations That Can Serve as a Model for the Private Sector in Implementation of Air Quality Programs.

City and county governments are often the largest employers in a jurisdiction and operate large vehicle fleets. While it is recognized that the City of Merced has very limited resources with which it can play any meaningful role in supporting private sector energy conservation efforts, the City can pursue policies and programs which may have private sector applicability. In this respect, the City may take a leadership role in implementing employer-based trip reduction programs and fleet operator programs to reduce the City's emissions, demonstrate cost effective energy management techniques, and save public money. Options available to the City of Merced and other larger employers include:

Implementing Actions:

1.5.a Continue to support, encourage, and implement to the extent feasible innovative employer-based trip reduction programs for their employees.

Ensure that employment contracts negotiated with employee unions are flexible and allow workers to participate in programs that reduce commute trips, such as staggered work hours, incentives for using public transit, car pools, etc.

1.5.b Fleet vehicle operators should evaluate alternatives which include replacing or converting conventional fuel vehicles with clean fuel vehicles as rapidly as feasible within the financial constraints of the City.

Budget for clean fuel vehicles in long range capital expenditure plans.

1.5.c Support the use of teleconferencing and internet-based training opportunities in lieu of employee travel to conferences and meetings when feasible.

Work with the telephone company and interested public agencies to develop a multi-user teleconferencing center. Use commercial teleconferencing facilities as well as internet-based training if they are cost competitive considering travel costs and employee time savings.

1.5.d Make use of telecommuting programs as part of their trip reduction strategies.

Identify positions where telecommuting is feasible. Consider a pilot program with employee volunteers for the most promising positions.

1.5.e Encourage the development of state of the art communication infrastructure linked to the rest of the world.

Support changes to the State Building Code to encourage new homes and businesses to be wired with fiber-optic cables or to encourage wiring conduits with easy access and adequate capacity to allow for efficient retrofitting. Encourage the development of video-teleconferencing facilities and telecommuting centers. The City should study formation of public/private partnerships with major employers employing large numbers of long distance commuters. Telecommuting centers are generally compatible with mixed-use, pedestrian-oriented and transit-oriented neighborhood commercial areas.

Policy SD-1.6
To Reduce Emissions of PM_{10}, $PM_{2.5}$, and Other Particulates With Local Control Potential.

The levels of PM_{10} and $PM_{2.5}$ (particulate matter less than 10 and 2.5 microns in diameter) exceed state and federal health based standards. The San Joaquin Valley is classified as a serious non-attainment area for PM_{10} under the federal criteria. Because of this classification, the Air District is subject to a series of federal mandates aimed at achieving federal ambient air quality standards. Control efforts for sources under the jurisdiction of cities and counties can significantly reduce these emissions.

Implementing Actions:

1.6.a Work with the SJVAPCD to reduce to the maximum extent feasible particulate emissions from construction, grading, excavation, and demolition.

The City should include PM_{10} control measures as conditions of approval for subdivision maps, site plans, and grading permits. This will assist in implementing the District's PM_{10} regulation.

The City should inform developers of the requirements of the District's PM10 regulation when they apply for a grading permit.

Use strategies to minimize soil disturbances including:

- Minimize vegetation removal required for fire prevention to the extent compatible with public safety considerations. Utilize alternatives to disking, such as mowing, to the extent feasible. Where vegetation removal is required for aesthetic or property maintenance purposes, encourage or require alternatives to disking.
- Condition grading permits to require that graded areas be stabilized from the completion of grading to commencement of construction.

1.6.b Reduce PM_{10} and $PM_{2.5}$ emissions from City maintained roads to the maximum extent feasible.

Continue the City's street cleaning program aimed at removing heavy silt loadings from roadways which result from sources such as storm water runoff and construction sites.

1.6.c Require all access roads, driveways, and parking areas in new commercial and industrial development to be paved or constructed of other materials that minimize particulate emissions.

City standards currently require all parking areas and driveways to be paved (no gravel) and will continue to apply these standards.

Policy SD-1.7
Develop and Implement a Climate Action Plan for the City

Through recent changes in State and Federal law, local governments like the City of Merced have begun to pay more attention to what can be done regarding Climate Change and Greenhouse Gas reduction on the local level.

Implementing Actions:

1.7.a Complete the development and implementation of a Climate Action Plan for the City of Merced.

In 2009, City staff began preparation of a Climate Action Plan for the City, which is expected to be completed by no later than September 2012. The Climate Action Plan will include an evaluation of existing City and community programs aimed at reducing greenhouse gas emissions; an evaluation of other City programs, that although established for other purposes, also have greenhouse gas reduction benefits; an evaluation of greenhouse gas emissions efforts of other Cities in the State; a discussion of the legal framework, including State and Federal laws; an evaluation of possible available funding sources; a baseline greenhouse gas emission inventory for the City; the selection of an Emissions Reduction Target; and finally, recommended goals, policies, and actions to reach the selected Emissions Reduction Target. The development of the Climate Action Plan will involve a citizens committee and extensive involvement of elected officials.

1.7.b Once adopted, amend City policies and ordinances as needed to implement the goals, policies, and actions of the Climate Action Plan.

Within one year of adoption of the Climate Action Plan, the City should complete a review of its existing policies and ordinances in order to ensure implementation of the Climate Action Plan.

1.7.c As part of the development of the Climate Action Plan and in the spirit of AB 32, The Global Warming Solutions Act of 2006, a variety of suggested measures from the California Climate Action Team Strategies and the Department of Justice Attorney General will be considered and evaluated by the City for possible future implementation.

The following measures shall be considered although some of the items below have already been implemented by the City:

- When approving new development, require truck idling to be restricted during construction.
- Require new development to implement the following design features, where feasible:

1. Recycling:
    - Design locations for separate waste and recycling receptacles;
    - Reuse and recycle construction and demolition waste;
    - Recover by-product methane to generate electricity; and,
    - Provide education and publicity about reducing waste and available recycling services.
2. Promote pedestrian, bicycle and transit modes of travel through informational programs and provision of amenities such as transit shelters, secure bicycle parking and attractive pedestrian pathways.
3. Large canopy trees should be carefully selected and located to protect the building(s) from energy consuming environmental conditions, and to shade 50% of paved areas within 15 years. Trees near structures act as insulators from weather thereby decreasing energy requirements. Trees also store carbon.
4. Encourage mixed-use and high-density development to reduce vehicle trips, promote alternatives to vehicle travel and promote efficient delivery of services and goods.
5. Impose measures to address the "urban heat island" effect by, e.g. requiring light-colored and reflective roofing materials and paint; light-colored roads and parking lots; shade trees

in parking lots' and shade trees on the south and west sides of new or renovated buildings.

6. Transportation and motor vehicle emissions reduction:
   - Use low or zero-emission vehicles, including construction vehicles;
   - Create car sharing programs;
   - Create local "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems;
   - Provide shuttle service to public transit;
   - During construction, post signs that restrict truck idling;
   - Set specific limits on idling time for commercial vehicles, including delivery and construction vehicles;
   - Coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where signals are installed, require the use of Light Emitting Diode (LED) traffic lights; and,
   - Assess transportation impact fees on new development in order to facilitate and increase public transit service.
7. Water Use Efficiency:
   - Use of both potable and non-potable water to the maximum extent practicable; low flow appliances (i.e., toilets, dishwashers, shower heads, washing machines, etc.); automatic shut off valves for sinks in restrooms; drought resistant landscaping; "Save Water" signs near water faucets;
   - Create water efficient landscapes;
   - Use gray water. (Gray water is untreated household waste water from bathtubs, showers, bathroom wash facilities, and water from washing machines); and,
   - Provide education about water conservation and available programs and incentives.
8. Energy Efficiency:
   - Automated control system for heating/air conditioning and energy efficient appliances;
   - Utilize lighting controls and energy-efficient lighting in buildings;
   - Use light colored roof materials to reflect heat;
   - Take advantage of shade (save healthy existing trees when feasible), prevailing winds, landscaping and sun screens to reduce energy use;
   - Install solar panels on carports and over parking areas;
   - Increase building energy efficiency percent beyond Title 24 requirements. In addition implement other green building design ((i.e., natural daylighting and on-site renewable, electricity generation); and
   - Require that projects use efficient lighting.

1.7.d In addition to the measures described in SD-1.7.d, during the preparation of the City's Climate Action Plan, the City will evaluate and consider additional policies and measures for possible future implementation.

In addition to the measures suggested by the California Climate Action Team and the Attorney General, the City will consider during the preparation of the Climate Action Plan, the following policies for reducing greenhouse gas emissions (but other measures may also be considered):

A. In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take timely and necessary actions to achieve and maintain reductions in greenhouse gas emissions in order to limit and prevent potential human caused global climate change and the related potential detrimental affects upon public health and welfare of present and future residents of the City.

B. Establish and uphold planning criteria and environmental analysis protocols that evaluate potential greenhouse gas (GHG) emissions from public and private projects and provide useful reduction and mitigation strategies through implementation measures including the following:

   1. On an ongoing basis, as information becomes available and regulations are adopted by the City and by state and regional agencies, the City shall partner with air pollution control agencies to advise project applicants of greenhouse gas and air pollutant emission significance thresholds, mitigation requirements, and control regulations promulgated by federal, state, regional, and local agencies.
   2. On an ongoing basis the City shall utilize its code enforcement police power to ensure ongoing compliance with requirements for air quality and sustainability measures incorporated into projects design, conditions of approval, and mitigation measures.

C. Increase efforts to incorporate GHG emission reductions in land use decisions, facility design, and operational measures subject to City regulation through implementation measures such as the following:

   1. The City shall utilize guidance from the Institute for Local Government, California Attorney General's Office, California Air Pollution Control Officers Association, and other sources of technical guidance in determining appropriate and feasible mitigation measures which may be incorporated into land use plans, development projects and City operations to achieve GHG emission reductions.
   2. As information becomes available and regulations and policies are adopted by the City and by state and regional agencies, the City shall provide residents and project applicants with a "toolkit" of understandable feasible measures that can be used to reduce greenhouse gases and criteria pollutants, including educational materials on energy-efficient and "climate-friendly" products.
   3. On an ongoing basis, the City shall continue to evaluate its facility maintenance practices for opportunities to reduce GHGs, looking at facility cleaning and painting, parks maintenance, road maintenance, and utility system maintenance.
   4. As additional technical information becomes available, the City shall consider strengthening its standards for purchasing low polluting and climate friendly goods and services, requiring that emission reductions be achieved by vendors and contractors through City contracts and/or giving preference to those who demonstrate implementation of GHG and criteria air pollution emission reductions in their facilities and operations.

D. Maintain current levels of achievement for recycling and reuse of all types of waste material in the City, and further enhance waste and wastewater management practices to further achieve reductions in greenhouse gas emissions through implementation measures such as the following:

   1. The City shall continue to require provisions for recyclable material collection and storage areas to be incorporated into all residential development designs, and within one year from adoption of General Plan consider expanding this requirement to all industrial facilities, sizing the recycling area for industrial development according to the anticipated types and amounts of recyclable material generated.
   2. Within a reasonable period of time from adoption of General Plan, the City shall consider establishing incentives and a utility rate structure, as consistent with state law, to foster increased participation in residential recycling and green waste diversion.
   3. Within a reasonable period of time from adoption of General Plan, the City shall

consider instituting a program to evaluate major waste generators and to recommend recycling opportunities for their facilities and operations.

4. The City shall continue to partner with the California Integrated Waste Management Board to participate in waste diversion and recycling programs such as the tire collection and recycling program, and community recycling education.
5. Within a reasonable period of time from adoption of General Plan, the City shall consider instituting a restaurant and institutional food waste segregation and recycling program, to reduce the amount of organic material sent to landfills.

Policy SD-1.8
Implement Policies in Other General Plan Chapters to Address Air Quality and Greenhouse Gas Emissions Reduction Goals

The City's General Plan contains policies in various chapters that address air quality and greenhouse gas emissions reduction goals.

Implementing Actions:

1.8.a Continue implementation of land use, transportation, urban expansion, urban design, open space, and public facilities General Plan policies that address air quality goals.

State law now requires cities and counties in the San Joaquin Valley Air Basin to amend their General Plans to include goals, policies, and implementing strategies to improve air quality. The San Joaquin Valley Air Pollution Control District has issued *Air Quality Guidelines for General Plans* (June 2005), which contains suggested goals and policies for General Plans. When the *Merced Vision 2015 General Plan* was adopted in 1997, many of the suggested air quality policies were included in the General Plan and are still included in this Vision 2030 General Plan. Many of these policies are presented in the Sustainable Development Chapter, but many of these policies are spread throughout the General Plan in the Urban Expansion, Land Use, Transportation, Public Facilities & Services, Urban Design, Open Space, and other chapters.

Below is a list of topics addressed along with the General Plan policies found elsewhere in this document that relate to air quality goals:

- Sustainable Development-Air Quality Policies:
  - Environmental assessment of development (Policies SD-1.1)
  - Coordination with Air District (Policies SD-1.2 & SD-1.6)
  - Measures to reduce energy consumption (Policies SD-3.1, SD-3.2, SD-3.3)
  - Urban Expansion Policies:
  - Establishment of urban limit lines (Policies UE-1.1, UE-1.2, & UE-1.3)
  - Encouragement of Compact and In-fill Development (Policies U.E-1.2; Land Use L-2.8 & L-3.2: and Public Facilities P-1.2
- Land Use Policies:
  - Encouragement of Mixed-use Development (Policies L-1.1, L-1.2, L-1.7, L-2.7)
  - Increased residential densities (Policies L-1.2, L-1.7, L-3.1)
  - Encouragement of Transit-Oriented Development or the City's Village Concept (Policies L-3.1; Transportation T-1.5; Urban Design UD-1.1 through UD-1.5)

- Pedestrian-oriented or pedestrian-friendly developments (Policies L-2.7, L-3.1, L-3.3: Transportation T-2.7 & T-2.8)
- Locating services near employment centers (Policies L-1.1, L-1.2, L-1.7, L-2.1, L-2.4, L-2.6, and L-2.9)

- Transportation Policies:
  - Dedicated transit corridors or "Transitways" (Policies T-2.1, T-2.2, T-2.3)
  - An interconnected street system (Policies Land Use L-2.7 and L-3.3: Transportation T-1.2 and T-1.3
  - Trip reduction measures (Land Use L-2.9, Transportation T-2.9, Sustainable Development SD-1.5)
  - Encouragement of bicycles as a transportation option (Land Use L-3.3; Transportation T-2.4, T-2.5, T-2.6; Public Facilities P-5.2; Open Space OS-3.2)
  - Development of multi-modal (all forms of transportation) developments, including highway-oriented developments (Policies Transportation T-1.5, & T-3.5; Urban Expansion UE-1.1; and Land Use L-2.10)
  - Congestion management programs (Policies T-2.9)

1.8.b Continue implementation of land use, transportation, urban expansion, urban design, open space, and public facilities General Plan policies that address greenhouse gas emissions reduction goals.

The City has begun preparation of a Climate Action Plan (SD-1.7) which will address goals, policies, and actions relating to reducing greenhouse gas emissions. In the interim, staff was referred to recommendations from the California Air Pollution Control Officers Association (CAPCOA), entitled "Model Policies for Greenhouse Gases in General Plans" (June 2009). When the *Merced Vision 2015 General Plan* was adopted in 1997, many of the suggested greenhouse gas policies from the document above were already included in the General Plan and are still included in this *Merced Vision 2030 General Plan*. Many of these policies are presented in the Sustainable Development Chapter, but many of these policies are spread throughout the General Plan in the Urban Expansion, Land Use, Transportation, Public Facilities & Services, Urban Design, Open Space, and other chapters.

Below is a list of topics addressed along with the General Plan policies found elsewhere in this document that relate to greenhouse gas emission reduction goals:

- Urban Expansion Policies:
  - Establishment of urban limit lines (Policies UE-1.1, UE-1.2, & UE-1.3)
  - Encouragement of Compact and In-fill Development (Policies U.E-1.2; Land Use L-2.8 & L-3.2: and Public Facilities P-1.2

- Land Use Policies:
  - Encouragement of Mixed-use Development (Policies L-1.1, L-1.2, L-1.7, L-2.7)
  - Increased residential densities (Policies L-1.2, L-1.7, L-3.1)
  - Encouragement of Transit-Oriented Development or the City's Village Concept (Policies L-3.1; Transportation T-1.5; Urban Design UD-1.1 through UD-1.5)
  - Pedestrian-oriented or pedestrian-friendly developments (Policies L-2.7, L-3.1, L-3.3: Transportation T-2.7 & T-2.8)
  - Locating services near employment centers (Policies L-1.1, L-1.2, L-1.7, L-2.1, L-2.4, L-2.6, and L-2.9)

- Transportation Policies:
  - Dedicated transit corridors or "Transitways" and emphasis on public transit (Policies T-2.1, T-2.2, T-2.3)
  - An interconnected street system (Policies Land Use L-2.7 and L-3.3: Transportation T-1.2 and T-1.3
  - Trip reduction measures (Land Use L-2.9, Transportation T-2.9)
  - Encouragement of bicycles as a transportation option (Land Use L-3.3; Transportation T-2.4, T-2.5, T-2.6; Public Facilities P-5.2; Open Space OS-3.2)
- Public Facilities Policies:
  - Higher development fees based on distance from City center (Policies P-1.1 & P-1.3)
  - Solid waste diversion targets (Policies P-6.1 & P-6.2)
  - Hazardous materials management (Safety Policies S-7.1, S-7.2, & S-7.3)
  - Water conservation (Policies Public Facilities P-3.1; and Open Space OS-5.1)
  - Recycled water (Policies P-3.2, P-4.2)
- Open Space Policies:
  - Urban forest management & shade tree planting (Policies OS-1.4 and Transportation T-2.7)

Goal Area SD-2: Cultural Resources

GOALS:

- **A Diverse And Rich Historic and Cultural Resource Environment**
- **A Long-Term Community Historic Preservation/Improvement Program**

POLICIES:

SD-2.1 Identify and preserve the City's archaeological resources.

SD-2.2 Identify and preserve the City's historic and cultural resources.

SD-2.3 Develop and promote financial incentive programs for historic preservation efforts.

Policy SD-2.1
Identify and Preserve the City's Archaeological Resources.

It is thought that the San Joaquin Valley was inhabited in the late Pleistocene and early Holocene period, dating from perhaps as early as 12,000 years before the present (B.P.). Prior to Euro-American arrival, the San Joaquin Valley was occupied by Yokuts Indian populations. The Yokuts settlement system was characterized by principal villages on terraced areas adjacent to watercourses. Knowledge of these early inhabitants is limited. It is likely that the streams traversing the Merced Planning Area served as settlements for Yokuts and it is a State policy to preserve and protect the archaeological resources of the region.

Implementing Actions:

2.1.a Utilize the inventory of known archeological sites maintained by the Central California Information Center for the review of development proposals.

The Archaeological Inventory shall be used to identify areas within the Merced Planning Area subject to preservation practices. For large scale development projects proposed in close proximity to a natural water course, or in an area which exhibits potential for containing cultural resource material, preliminary cultural resource inventories should be conducted by a qualified archaeologist. Information from these site investigations shall be provided to the Central California Information Center for recordation.

2.1.b Utilize standard practices for preserving archeological materials that are unearthed during construction, as prescribed by the State Office of Historic Preservation.

Cultural resource discoveries are subject to the rules and regulations in State law. The City should work closely with the building trades industry to facilitate compliance with these laws and to assist where necessary in minimizing the adverse impacts of the implementation of these laws on the City's construction industry.

2.1.c If appropriate, consider reconstruction of archaeological sites in City parks, on school grounds, in open space areas, or other suitable locations where they can serve an educational purpose.

In order to increase the public's awareness to the cultural heritage of Merced, the City should support the efforts of Native American groups and individuals to develop cultural displays and exhibits in local public places.

Policy SD-2.2
Identify and Preserve the City's Historic and Cultural Resources.

The City of Merced contains many fine examples of its early development. Historic buildings, tree plantings, and other improvements serve to give the City a special character which is unique in the San Joaquin Valley. The City of Merced is dedicated to preserving, protecting and enhancing its historic and cultural resources.

Implementing Actions:

2.2.a Expand City cultural and historic information resources.

Establish and maintain an inventory of cultural, historic, and architecturally significant resources within the City and the planning area by expanding and improving the existing inventory of the downtown area. Consider a program or support other programs which designate historic landmarks and architecturally significant structures in the City.

2.2.b Support community groups and individuals working to preserve, protect and enhance the City's Historic and Cultural Resources.

In accordance with the City's Historic Preservation Ordinance (MMC 17.54) which outline procedures and criteria for historic designation, continue to support Historic Preservation Commission activities. Support, as feasible, both private and public efforts to preserve and rehabilitate historic structures in the City, including the need to protect a site from intrusion of surrounding land uses which are uncomplimentary or incompatible.

2.2.c Review and revise as necessary, the City's development/construction regulations to facilitate the preservation of historic structures.

Investigate and consider the possibility of using historic overlay zones in conjunction with the Historic Preservation Ordinance to control the use or modification of significant historic areas in the community, recognizing the limitations of Government Code Section 37361 as it applies to church facilities.

2.2.d Support, as feasible, efforts to promote the preservation of historically or architecturally significant structures in the City.

Support the preservation of the downtown's historically and architecturally significant structures. Encourage the design of new developments to be consistent with the design, character, and building bulk of the existing downtown. Encourage and support efforts to preserve historic structures in the Courthouse Square area, Downtown, Central Merced, and throughout the City. The restoration of the Merced Theater is one such current project.

2.2.e Support efforts to designate historic districts within the City.

The City should, as appropriate, be supportive of private efforts to establish historic districts with appropriate recognition and designation as National Registry Districts or by means of some other historic district recognition.

Policy SD-2.3
Develop and Promote Financial Incentive Programs for Historic Preservation Efforts.

Historic and cultural resources can be a financial liability to private citizens. In many instances, it is more economical to demolish and build new structures than to rehabilitate historic structures. The economics of maintaining and improving historic properties have resulted in many building and structures being lost or allowed to deteriorate to such a degree that preservation is impractical. The City will assist in the identification of financial resources that can be used by individuals and groups in the City to preserve, enhance and protect the historic and cultural resources of the City.

Implementing Actions:

2.3.a Work to identify financial resources which can be used for historic preservation efforts in Merced.

Utilize, where possible, Redevelopment funds to help finance restoration of historic buildings and structures in Merced. Identify other sources of historic preservation funds, such as Community Development Block Grants, Office of Historic Preservation Grant Funds, tax incentives, etc., to be used to finance historic renovation/restoration projects.

2.3.b Provide access to information on financial resources available to property owners to assist in historic preservation/restoration efforts.

Refer interested property owners to the State Office of Historic Preservation, for information regarding tax advantages of National Registry of historic properties, special building code standards applicable to historic buildings and structures, and loan and grant programs available to finance historic preservation/ renovation.

Goal Area SD-3: Energy Resources

GOAL

- **Sustainable Energy Resource Use in the City of Merced**

POLICIES

SD-3.1 Promote the use of solar energy technology and other alternative energy resources**.**

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

Policy SD-3.1
Promote the Use of Solar Energy Technology and Other Alternative Energy Resources.

Merced is located in an area that can benefit from the use of solar energy technology and other alternative energy resources to lower household heating and cooling costs.

Implementing Actions:

3.1.a Encourage the use of solar energy in design and management of all new construction in the City.

The City should work with members of the building and utility industries in identifying public policies and regulations which inhibit the construction of energy efficient development. The City should prepare guidelines and standards which can be used by members of the construction industry in the design of new building and development projects.

3.1.b Require all new subdivisions to maximize, to the extent feasible, proper orientation of lots with regard to solar utilization.

Proper solar orientation of lots often results in inefficient or poor circulation system designs. Good subdivision design attempts to maximize the benefits of lot orientation for solar access while maintaining the optimum circulation system design. The City planning staff may develop a library of subdivision design concepts that have proven effective in furthering energy conservation goals in other similarly situated communities and the City of Merced. This information should be made available to real estate developers and home builders.

3.1.c Encourage developers and builders to properly design all structures on each building lot in the City to take fullest advantage of solar use in heating and cooling.

The City planning staff might develop a library of building design concepts that have proven effective in furthering building energy conservation goals in other similarly situated communities. This information should be made available to real estate developers and home builders.

3.1.d Encourage developers and builders to maximize "passive" solar design, such as large south-facing windows for winter heat gains and overhangs and shading for summer heat protection.

The City should collect and make available to builders and homeowners design solutions to passive solar construction problems and support local the building industry's efforts to comply with State regulations on energy conservation design standards.

3.1.e Pursue further investigation of potential benefits utilizing building code revision, narrower streets, solar access rights, and other energy-saving techniques.

The City should continue to monitor policy developments at the state level and in other San Joaquin Valley communities to determine the most efficient and effective design policies which might be applied to new development in the City. Where appropriate, staff should recommend changes in policies and standards where it can be demonstrated that such changes will appreciably reduce energy consumption.

Policy SD-3.2
Encourage the Use of Energy Conservation Features, Low-Emission Equipment, and Alternative Energy Sources for All New Residential and Commercial Development.

Natural gas burning appliances used for space heating, water heating, and cooking are a sizable source of NOx emissions. Consumption of electricity causes pollutant emissions when the power plant is fueled by fossil fuels. Local efforts to reduce energy consumption can save consumers money and improve air quality.

Implementing Actions:

3.2.a Work with the local energy providers on voluntary incentive-based programs to encourage the use of energy efficient designs and equipment.

- Encourage the incorporation of energy conservation features in the design of all new construction and the installation of conservation devices in existing developments.
- Encourage energy audits of existing structures, identifying levels of existing energy use and potential conservation measures.
- Encourage the use of passive design concepts that make use of the natural climate to increase energy efficiency.
- Encourage new development not to preclude the use of solar energy systems by uses and buildings on adjacent properties.
- Incorporate the most energy-efficient design consistent with a reasonable rate of return and the recognition of the environmental benefits of energy conservation for all local government facilities and equipment.
- Perform an energy audit of existing public buildings and retrofit where cost-effective.
- Develop an energy management system for public buildings.

3.2.b Cooperate with the local building industry, utilities and the SJVAPCD to promote enhanced energy conservation standards for new construction.

Work with the California Energy Commission (CEC) and local utilities to identify areas of the existing state standards that can be enhanced most cost-effectively.

3.2.c Encourage new residential, commercial, and industrial development to reduce air quality impacts from area sources and from energy consumption.

- Support the use of weatherization programs for existing residential units and businesses.
- Encourage the installation of supplemental solar water heaters for new residential units.
- Support future SJVAPCD incentives and regulations to reduce emissions from swimming pool heaters.

- 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.
- Encourage the installation of energy efficient fireplaces and wood stoves in lieu of normal open hearth fireplaces.
- Establish standards for the provision of natural gas lines or electrical outlets to backyards to encourage the use of natural gas or electric barbecues, and electric gardening equipment.
- Support the use of electric vehicles, such as golf carts, where appropriate. Provide electric recharge facilities for electric vehicles.
- Encourage the installation of natural gas hook-ups for washers and dryers in housing units.

3.2.d Encourage builders to develop "green" and/or LEED-Certified buildings.

The City should consider developing incentives to encourage builders (residential, commercial, and industrial) to develop "green" or LEED-certified buildings. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for the environmentally sustainable design, construction and operation of buildings and neighborhoods. Since its inception in 1998, LEED has grown to encompass more than 14,000 projects in the United States and 30 countries.

3.2.e Investigate regulatory changes that will promote the use of wind energy technology.

The City should review and consider changes to its ordinances to make sure that there are no impediments to the use of wind energy technology.

Goal Area SD-4: Healthy Communities

GOALS

- **Healthy Lives for Community Residents**
- **A Healthy Environment for All Residents**

POLICIES

SD-4.1 Create a healthy built environment.

SD-4.2 Encourage increased physical activity of residents and healthier food choices.

Policy SD-4.1
Create a Healthy Built Environment

A growing concern is the obesity epidemic among American adults and children, and although personal responsibility plays a big part so can the built environment with our reliance on cars, limited availability of safe walking and bike paths, lack of open space and recreational opportunities, etc.

Implementing Actions:

4.1.a Promote compact, mixed use, and transit-oriented development.

Through the City's Village Concept, which calls for the development of compact, mixed-use, pedestrian- and transit-friendly developments, the City can help to build a healthier community.

Policies relating to the Village Concept can be found in the Land Use, Transportation, and Urban Design Elements.

4.1.b Plan neighborhoods with safe and attractive places for recreational exercise.

The City's Open Space Element (Chapter 7) has policies that promote neighborhood parks and bikeways. The Transportation Element (Chapter 4) has policies that promote the expansion of walking and biking facilities throughout the City.

4.1.c Create a balanced transportation system that provides for all modes of transportation.

The City's Transportation Element (Chapter 4) contains policies that promote a balanced transportation system that provides for all modes of transportation, including motorized vehicles, bicycles, transit, pedestrians, and air and rail transit.

4.1.d Continue to require tree planting and promote "green buildings."

The City's Open Space Element (Chapter 7) contains policies that promote tree planting along streets and in parking areas and the Sustainable Development Chapter contains policies to encourage "green buildings."

Policy SD-4.2
Encourage Increased Physical Activity of Residents and Healthier Food Choices

By providing increased opportunities for walking, biking, and recreation and by encouraging access to healthier foods, the City can help its residents become healthier.

Implementing Actions:

4.2.a Increase biking and walking through street design.

By designing "complete streets" that accommodate all modes of transportation, as required in the policies in the Transportation Element (Chapter 4), residents will have access to safe and convenient biking and walking facilities. The City's policy of planting of trees along streets between the curb and the sidewalk help create a feeling of safety for pedestrians and handicap-accessibility is emphasized. Bike lanes are provided along most streets.

4.2.b Encourage healthy food choices through the encouragement of farmers markets and community gardens.

The City will review its ordinances to make sure that there are no barriers to creating farmers markets and community gardens in the City. The City should also review its standards regarding agricultural activities within the City and determine if changes should be made to encourage residents to plant their own gardens, but still limiting the keeping of farm animals in the City limits, which create other issues. The City's policies regarding the preservation of agricultural land adjacent to the City also promote agricultural activities within the community.

8.5 TECHNICAL APPENDICES

8.5.1 Merced Area Soil Resources

The Merced Planning Area is situated within four physiographic land forms and five soil association groupings according to the Merced Area California Soil Survey. These physiographic groupings and associations are described as follows:

Soils of the Alluvial Fans and Flood Plains. Covering approximately 341 square miles in Merced County, this physiographic region is composed of about 92 square miles of recently deposited alluvial material, and 249 square miles of material that is geologically young but somewhat older than most recent deposits.

Recent alluvial fans and flood plains are mainly along the Merced River bottom lands which extend along the northern part of the Merced County. There are several occurrences of alluvial fans and flood plains near the City of Merced. Many small alluvial fans, flood plains, and stream ridges have been formed of material deposited by Burns Creek, Bear Creek, Owens Creek, Mariposa Creek, and several other minor streams. These areas receive little or no fresh alluvium deposits.

This physiographic grouping of soils contains six major soil associations, one of which is extensive in the urban setting of the study area. The area extends north of Black Rascal Creek to an area near the southern boundary of the planning area. This area is designated as the ***Wyman-Yokohl-Marguerite Association***.

The ***Wyman-Yokohl-Marguerite*** (WYM) **Association** consists of well-drained, medium textured and moderately fine textured soils that developed from alluvium derived from slate, schist, and metamorphosed sandstone.

These soils show various degrees of development. The ***Honcut*** and ***Yolo*** soils along the streams are uniform throughout their profile. Between the stream valleys, the ***Wyman*** soils have slightly more clay in the subsoil than in the surface soil, and the ***Ryer*** soils have a moderate accumulation of clay in the subsoil. Several areas of ***Yokohl*** soils have an indurated iron-silica hardpan. Most of the soils in this association are classified as “prime”.

Honcut soils lie along Bear, Burns, and Mariposa Creeks near Merced and along Dry Creek in the northern part of the County. They generally lie on low ridges parallel to the stream or on small, generally well-drained fans of smooth relief. The parent material was recently deposited alluvium derived from various sources, mostly basic igneous rocks.

Ryer soils are nearly level or gently sloping terraces along Dry Creek and Burns Creek in the area of Merced. These soils are well drained except in small depressions. The parent material was fine sandy or silty alluvium derived mostly from basic igneous rocks but include some material derived

from sedimentary rocks. The natural vegetation is mainly grass and a few widely scattered oaks.

Wyman soils formed in basic igneous alluvium that had received fresh material for a considerable time. These soils are very gently sloping to nearly level. They are well drained, except where an unconforming hardpan substratum blocks moisture penetration for part of the year. The cover is annual grass and a few scattered oaks.

Yokohl soils developed on nearly level to gently sloping terraces and alluvial fans. None of the Yokohl soils are considered prime.

Yolo soils are very deep and slightly stratified. They formed from alluvium on flood plains and small alluvial fans of minor streams that drain the low foothills. These soils are well drained and have good cover of annual grass and herbs and many large oaks. The Yolo soils show little or no change in profiles with increasing depth. Yolo soils are high fertile and readily penetrated by roots and water.

Soils of the Poorly Drained Saline-Alkali Basin. The southern portion of Merced County, extending northward into the southernmost portion of the planning area, is occupied by a broad, nearly level plain that has some low mound micro relief. There is also a small inclusion of this physiographic grouping found in the vicinity of Highway 59 north of the existing City boundaries. This physiographic region covers approximately 227 square miles in Merced County. Strong accumulations of salts and alkali and poor drainage are characteristic of the soils in the basin.

The soil association of this physiogrphic region which is found in the planning area is the ***Lewis-Landlow-Burchell*** (LLB) association. This association occupies an area extending from the southern portion of the Merced planning area, west from the Southern Pacific Railroad, to within 5 miles of the San Joaquin River. These soils developed from medium textured to moderately fine textured alluvium that was derived partly from granite and partly from metamorphosed sedimentary rocks. Surface runoff is slow. The water table is generally high in this soil association.

Burchell soils, the only "prime" soil in this association, occur in slight depressions or nearly flat basins south of the City of Merced. The parent material was alluvium derived mostly from basic igneous rocks but partly from slate and metasandstone. These soils are kept moist by their imperfect drainage and high water table. These soils are mildly alkaline to moderately alkaline with accumulations of lime present in the subsoil. Natural vegetation is a heavy growth of marsh grasses and rushes.

Soils of the Low Terraces. Covering approximately 186 square miles within Merced County, Soils of the Low Terraces physiographic grouping are found primarily within benches of several miles in width along the Merced River. They widen into an alluvial fan surrounding the Cities of Atwater and Winton and are found along the western boundary of the planning area north of the present city limits and the Atchison Topeka-Santa Fe Railroad line.

One of the three soil associations of this physiographic region, found in the planning area, is the ***San Joaquin-Madera Association.*** The topography of this association is gently undulating and has a

hog wallow micro relief. None of the soils in this association are considered "prime".

Soils of the High Terraces. This physiographic region covers approximately 188 square miles in Merced County and are found in a large portion of the planning area north of the existing City of Merced and the Lake Yosemite region. Of the three main areas found in this physiographic region, the largest is the lower gravely found in the planning area and Lake Yosemite. The other two regions are characterized as a sandy terrace along the northwestern boundary of Merced County and a gravely terrace south of the Merced River and east of the city of Winton.

At its eastern end, the area around Lake Yosemite is higher than the sandy terrace in the foothills north of the Merced River but slopes toward the west. Mound micro relief is characteristic of this area. There are almost no trees, but there is more grass than on the higher gravely terraces of this physiographic region.

Of the two soil associations comprising this physiogrphic region, the ***Redding-Pentz-Peters*** (RPP) ***Association*** is found in the planning area. The largest area of this association is located northeast of the City of Merced, and several smaller areas lie along the eastern boundary of Merced County. None of the soils in this association are considered "prime".

Soil Capability Groups

The capability classification is a grouping of soils that shows, in a general way, how suitable they are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all soils are grouped into three levels; 1) the capability class, 2) subclass and 3) unit. There are eight capability classes, designated by Roman Numerals I through VIII. Soils in capability class I have few limitations. Soils in capability class VIII are rough, shallow or otherwise limited in a manner that they do not produce worthwhile yields of crops, grazing or wood products.

The subclass indicates major kinds of limitations within the classes. They are represented by a small letter following the Roman Numeral (i.e. IIIe). Within the subclasses are the capability units which correspond to the nature of the limitation considered in placing the soil in a capability class and subclass.

The two "prime" capability classes are described as follows:

- **Class I Soils** that are very good for crops and have few limitations that restrict their use.
- **Class II Soils** that have some limitations that reduce the choice of plants or that make some conservation practices necessary.

Non-prime classes of soils include:

- **Class III Soils** that have severe limitations that reduce the choice of plants or that make special conservation practices necessary, or both.
- **Class IV Soils** that have very severe limitations that restrict the choice of plants, that make very careful management necessary, or both.
- **Class V Soils** that have little or no erosion hazard but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover. There are no Class V soils found in Merced County or the Merced City planning area.
- **Class VI Soils** that have severe limitations that make them generally unsuitable for cultivation and that limit their use chiefly to pasture, range, woodland, or wildlife food and cover.
- **Class VII Soils** that have very severe limitations that make them unsuitable for cultivation and that restrict their use chiefly to pasture, woodland, or wildlife shelter.
- **Class VIII Soils** and land forms that have limitations that preclude their use for commercial plants and that restrict their use to recreation, wildlife shelter, water supply, or scenery.

Storie Index Rating System

There are several factors that can be examined to determine the value of a specific parcel of land for agricultural purposes. They include factors found in the *Soil Survey of the Merced Area*. This publication places what is called a Storie Index rating on soil types, a rating based on the following four factors:

(A) The characteristics of the soil profile and the effective rooting depth;

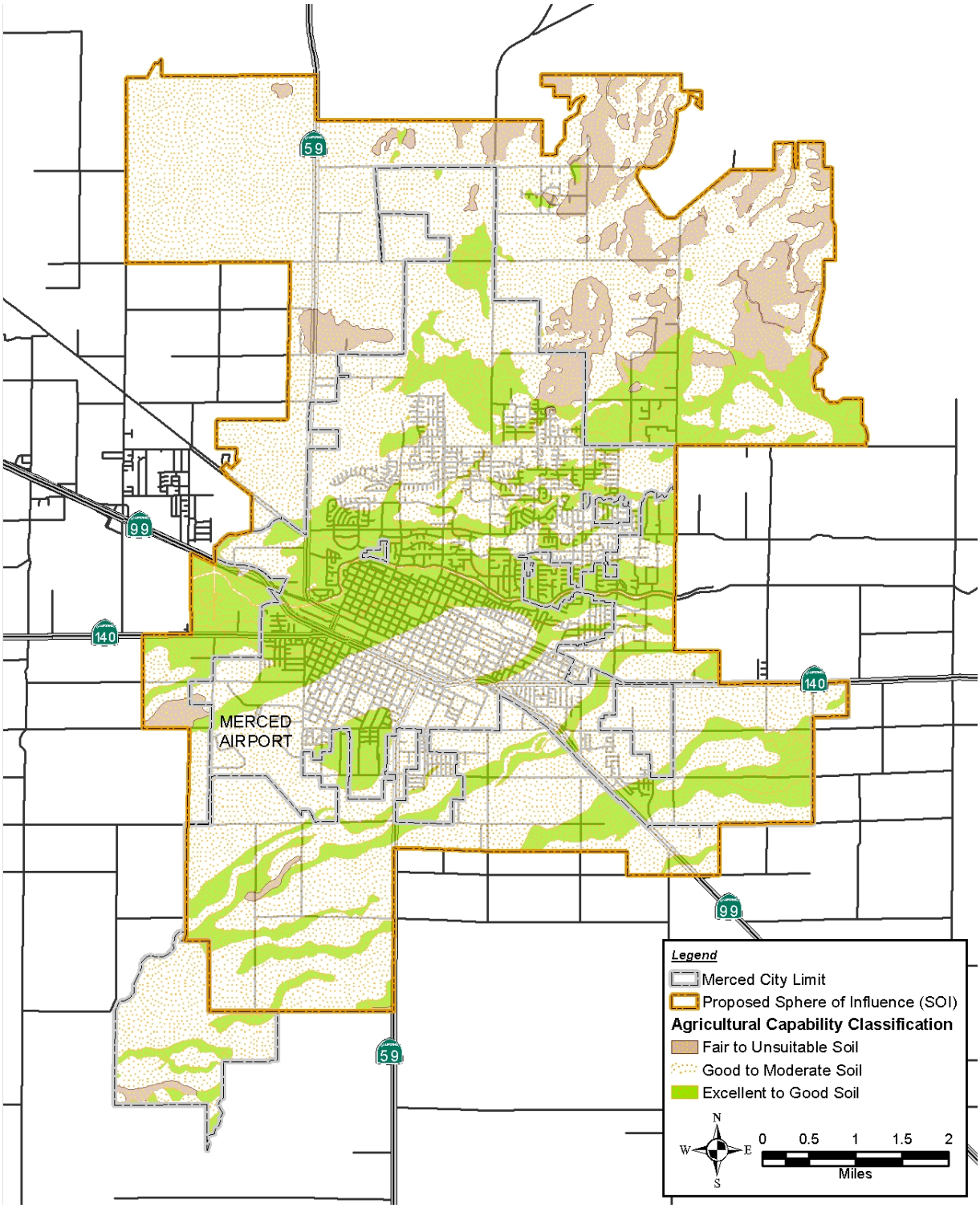
(B) The texture of the surface soil;

(C) Slope; and

(X) Other factors, such as drainage, salts, alkali, and erosion.

Each of these four general factors is evaluated on the basis of 100 percent. A rating of 100 percent expresses the most favorable, or ideal, condition for crop production, and lower ratings are given for conditions that are less favorable. The index rating for a soil is obtained by multiplying the four factors, A, B, C, and X, and any factor may dominate or control the final rating.

Figure 8.4 depicts the location of the various soil capability groups throughout the Merced Planning Area. ***Table 8.1*** describes the characteristics of those soil types considered to be "prime." ***Figure 8.5*** illustrates various soil associations located throughout the Merced area. ***Figure 8.6*** shows the ratings of farmland within the planning area in eight categories according to the 2008 Important Farmland Map for Merced County, prepared by the California Department of Conservation.



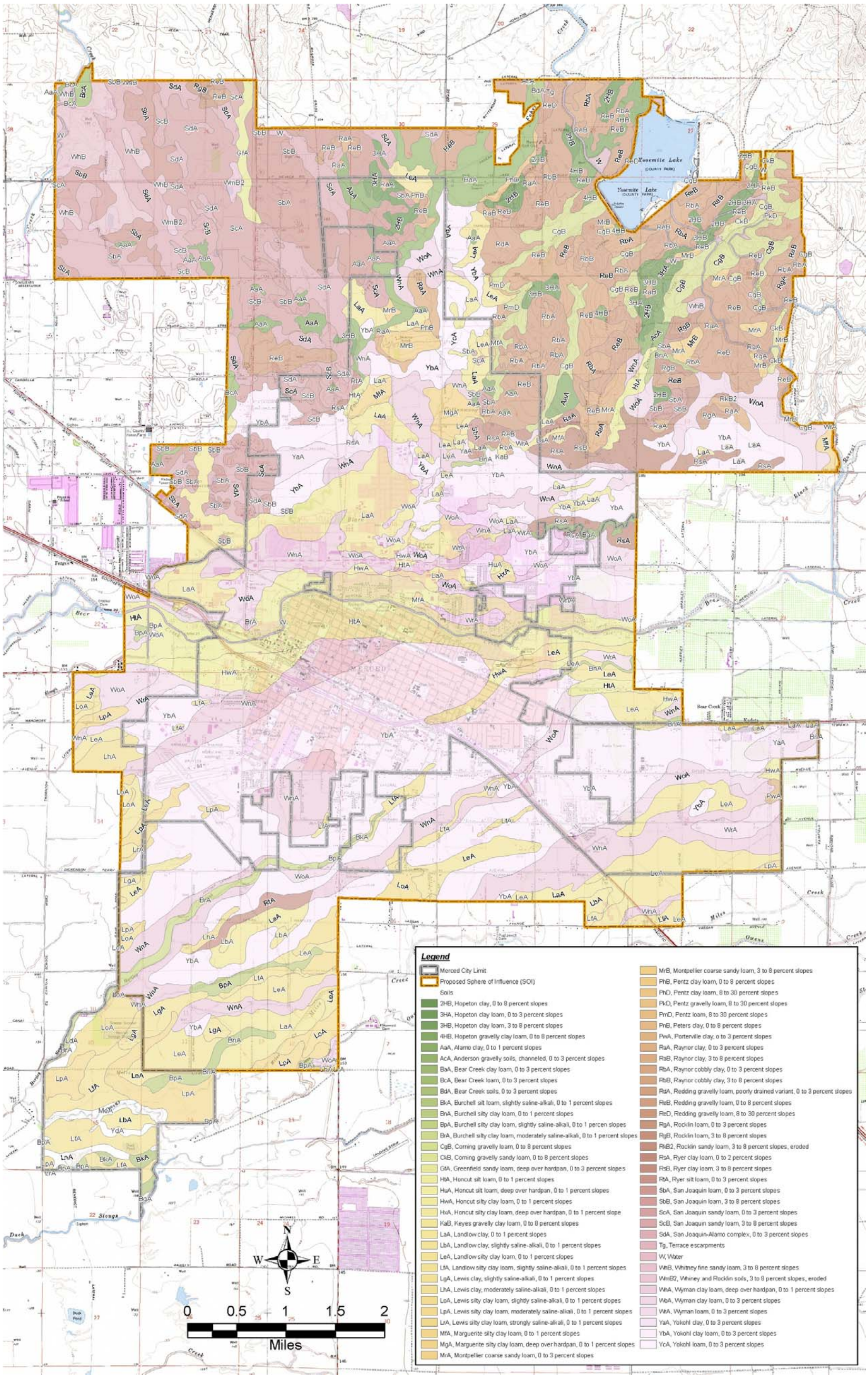
MERCED AREA SOIL CAPABILITY GROUPS

Figure 8.4

Table 8.1
Prime Soils Association Characteristics

Map Symbol	*Name of Soil*	*Capability Unit*	*Storie Index*	*Very Good & Good Crop Suitability*
		Honcut		
HtA	Honcut silt loam, 0 to 1 % slopes	I-1	100	Alfalfa, cotton, barley, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non-irrigated range.
HuA	Honcut silt loam, deep over hardpan, 0 to 1% slopes	IIs-3	80	Alfalfa, cotton, barley, truck crops, grapes, figs, almonds, peaches, rice, irrigated pasture, non- irrigated range.
HrA	Honcut fine sandy loam, 0 to 1% slopes	I-1	100	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non- irrigated range.
HsA	Honcut gravely sandy loam, 0 to 1% slopes	IIs-4	70	Alfalfa, cotton, barley, grapes, figs, almonds, peaches, irrigated pasture, non-irrigated range.
HwA	Honcut silty clay loam, 0 to 1% slopes	I-1	90	Alfalfa, cotton, barley, truck crops, figs, almonds, rice, irrigated pasture, non-irrigated range.
HxA	Honcut silty clay loam, deep over hardpan, 0 to 1% slopes	IIs-3	72	Alfalfa, cotton, barley, truck crops, figs, almonds, peaches, rice, irrigated pasture, non-irrigated range.
HzA	Honcut silty clay loam, channeled, 0 to 8% slopes	IIe-1	65	Alfalfa, cotton, barley, figs, almonds, irrigated pasture, non-irrigated range.
		Yolo		
YdA	Yolo loam, 0 to 1% slopes	I-1	100	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non- irrigated range.
YeA	Yolo loam, deep over hardpan, 0 to 1% slopes	IIs-3	80	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, rice, irrigated pasture, non-irrigated range.
		Wyman		
WrA	Wyman loam, 0 to 3% slopes	I-1	95	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non- irrigated range.
WtA	Wyman loam, moderately deep & deep over gravel, 0 to 3% slopes	IIs-3	85	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non- irrigated range.
WsA	Wyman loam, deep over hardpan, 0 to 3% slopes	IIs-3	85	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture.
WoA	Wyman clay loam, 0 to 3% slopes	I-1	81	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, rice, irrigated pasture, non- irrigated range.
WnA	Wyman clay loam, deep over hardpan, 0 to 1% slopes	IIs-3	72	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, rice, irrigated pasture, non- irrigated range.

Map Symbol	*Name of Soil*	*Capability Unit*	*Storie Index*	*Very Good & Good Crop Suitability*
Ryer				
RtA	Ryer silt loam, 0 to 3% slopes	IIs-7	85	Alfalfa, cotton, barley, sweet potatoes, truck crops, grapes, figs, almonds, peaches, irrigated pasture, non- irrigated range.
RsA	Ryer clay loam,. 0 to 3% slopes	IIs-7	77	Alfalfa, cotton, barley, truck crops, figs, almonds, irrigated pasture, non-irrigated range.
RsB	Ryer clay loam 3 to 8 % slopes	IIs-7	69	Barley, grapes, figs.
Burchell				
BgA	Burchell silt loam, 0 to 1% slope	IIw-2	67	Alfalfa, cotton, barley, truck crops, figs, rice, irrigated pasture, non- irrigated range.
BnA	Burchell silty clay loam, 0 to 1% slope	IIw-2	60	Alfalfa, cotton, barley, figs, rice, irrigated pasture, non-irrigated range.



MERCED AREA SOIL ASSOCIATION MAP

Figure 8.5

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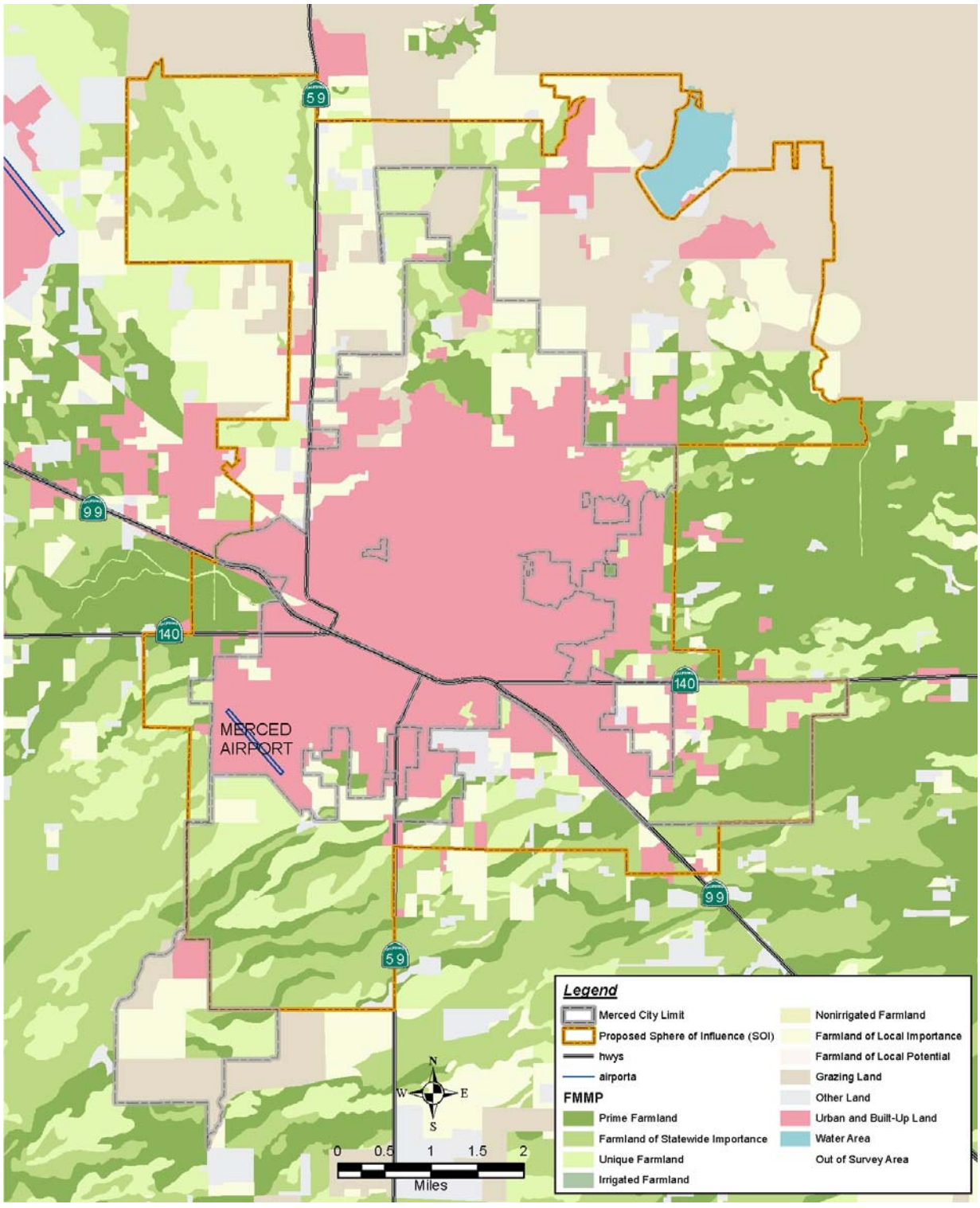

MERCED AREA
IMPORTANT FARMLAND MAP

Figure
8.6