7 Conservation and Open Space

The Conservation and Open Space Element is intended to establish policies and programs for the conservation, development, and use of open space and natural resources in Lemoore. Topics addressed include open space planning, land and agricultural resources, biological resources, hydrology and water quality, cultural resources, and air quality. Water supply and conservation as it pertains to water utilities is addressed in the Public Utilities Element.

7.1 OPEN SPACE

Lemoore's setting—in an agricultural county laced with creeks and waterways—includes natural resources that are important not only for aesthetic value, but also for environmental quality, habitat protection, and water resources. Preserving the general configuration and relationships of area wetlands, canals, and other natural features fosters a sense of place for the community while at the same time ensuring the functionality of the larger regional ecological system. The many roles of open space underscore the importance of careful land use planning.

CLASSIFICATION OF OPEN SPACE

State planning law (Government Code Section 65560) provides a structure for the preservation of open space by identifying open space categories. An additional category is included in this Plan to help define the urban development edge.

- *Open space for public health and safety* including, but not limited to: earthquake fault zones, unstable soil areas, floodplains, watersheds, areas presenting high fire risks, areas required for the protection of drinking water quality and water reservoirs, and areas required for the protection and enhancement of air quality.

- *Open space for the preservation of natural resources* including, but not limited to, areas required for the protection of plant and animal life, such as: habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, and creeks, lakeshores, banks of rivers and streams; and watershed lands.
- *Open space used for the managed production of resources* including, but not limited to, forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of ground water basins; marshes, rivers and streams that are important for the management of commercial fisheries; and areas containing major mineral deposits.
- *Open space for outdoor recreation* including, but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, such as access to lakeshores, beaches, rivers and streams; and areas that serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.
- *Open space in support of the mission of military installations* that comprises areas adjacent to military installations, military training routes, and underlying restricted airspace that can provide additional buffer zones to military activities and complement the resource values of the military lands.
- *Open space for the protection of Native American sites*, including, but not limited to, places, features and objects of historic, cultural, or sacred significance such as Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property (further defined in California Public Resources Code Sections 5097.9 and 5097.993). These sites are not mapped in this Plan as locations are suppressed for their protection.
- *Open space to shape and limit urban form* including, but not limited to, areas meeting other open space objectives, such as greenbelts and corridors established to implement community design goals or objectives.

Agricultural open space is an important land use around Lemoore and throughout the Central Valley.

The open space resources listed above and further illustrated in **Figure 7-1** are not intended to imply that the public interest would be best served by prohibiting development on all such lands. Rather, these open space resources likely signify one of three possible scenarios, depending upon the ecosystem fragility, location, hazard potential, regulatory constraints, and other pertinent factors. The three possible scenarios are:

- All development should be prohibited;
- Development should be permitted on part of the land and the balance preserved as open space—a clustering concept; or
- Development should be permitted subject to site plan review and the imposition of specific conditions to protect against hazards and preserve the integrity of the land and the environment.

General Plan policies and zoning requirements should be consulted on a case-by case basis to decide which scenario and what standards apply to specific areas of open space.

EXISTING OPEN SPACE

The City of Lemoore is surrounded primarily by agricultural open space and undeveloped lands in the unincorporated areas. Open space outside city boundaries are rarely visited by City residents and are preserved for ecological or agricultural reasons.

The policies listed in this section are designed to secure lands for general open space designation, ensure their protection, and improve management and access to these areas. Policies pertaining specifically to open space for the preservation of natural resources and the managed production of resources are provided in sections 7.2-7.4. Policies pertaining to open space for public health and safety are described in Section 7.4 as well as *Chapter 8: Safety and Noise*. Policies for recreational open space are provided in *Chapter 5: Parks, Schools, and Community Facilities*.

GUIDING POLICIES

COS-G-1 *Acquire, preserve, and maintain open space and natural resources for future generations.*

COS-G-2 *Use the open space system to meet multiple needs, including bike and trail linkages, storm water drainage and treatment, wildlife habitat, active and passive recreation, and greenbelt buffer to define the boundaries of the City.*

COS-G-3 *Design open spaces as sustainable systems with drought-tolerant plant materials.*

IMPLEMENTING POLICIES

COS-I-1 Protect lands designated for Agricultural/ Rural/ Conservation uses with appropriate zoning consistent with the General Plan.

COS-I-2 Identify a secure funding mechanism for the purchase of conservation easements to support farmland preservation and a green space buffer on County land surrounding the Lemoore Planning Area, with particular emphasis on land east of the City.

There are several ways to obtain funding for farmland conservation easements, including but not limited to, development impact fees, transfers of development rights (TDRs), tax allocations/appropriations, grants, donations or bonds. Each tool has strengths and weaknesses and the options must be evaluated to choose the best one for Lemoore. Implementation will necessitate cooperation with the County, usually in the form of a Memorandum of Understanding (MOU), and would also benefit from guidance through applicable land trust organizations, such as the American Farmland Trust or the California Council of Land Trusts.

COS-I-3 Work with the County to evaluate the need for and feasibility of creating a County Farmland Trust or Open Space District to negotiate open space transactions, hold easements, pursue local open space and farmland preservation policies.

A land trust or open space district would be a voter-established entity with authority to hold and manage lands for farmland preservation and conservation purposes. Donation of easements to a land trust or open space district may validate easements for tax purposes.

COS-I-4 Promote use of native vegetation, drought tolerant plants, recycled water irrigation and other water-saving devices in City open spaces for ease of maintenance and environmental sustainability.

[Insert Figure 7-1 Open Space Resources Map]

Back

7.2 AGRICULTURAL AND LAND RESOURCES

California State Law requires that a General Plan address agricultural resources from both soil conservation and open space perspectives.

SOILS

Soil properties have a significant bearing on land planning and development. Sixteen soil types have been mapped by the U.S. Department of Agriculture in the Lemoore area including urban land and water, and are illustrated on **Figure 7-2** and summarized in **Table 7.1**. Due to the range of soil types located in the Planning Area—with soil properties resulting in cutbanks caves[1], flooding, shrink-swells (expansive soils, described below), excess wetness, excess salt, excess sodium or droughty—various building site development restrictions exist in the Planning Area and affect land development costs. On average, Kimberlina and Nord soil types have the most favorable properties for development while Gepford, Goldberg, Pitco, and Vanguard soils have the least favorable properties. Soils with only slight or moderate soil restrictions comprise 8,900 acres or 73 percent of the Planning Area. These soils are concentrated on the eastern portion of the Planning Area. Much of the Westside contains soils with more severe building site development restrictions. None of the soils in the Planning Area comprise a significant direct health or safety hazard to residents. For more detail on building site development restrictions for soils located within the Planning Area refer to the *1986 Kings County Soil Survey*.

Erosion

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Soil erosion matters for agricultural land because it causes the fertile topsoil to wash away. Rates of erosion can vary depending on the soil material and structure, placement, and human activity. Soil containing high amounts of silt can be easily eroded, while sandy soils are less susceptible. In terms of building site restrictions, excessive soil erosion can eventually damage building foundations and roadways. Erosion is most likely to occur on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can be higher during the construction phase of development. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, or asphalt. In the case of agricultural or open space uses, erosion potential is reduced with vegetative coverage.

Soil erosion potential or susceptibility is identified by the soil's "K Factor". The "K-Factor" provides an indication of a soil's inherent susceptibility to erosion, absent slope and groundcover factors. Values of K range from 0.05 to 0.43. The higher the value, the more susceptible the soil is to sheet erosion by water. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have a moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having high silt content are the most susceptible to erosion of all soils. They are easily detached, tend to crust, and produce

[1] The walls of excavations tend to cave in or slough.

high rates of runoff. Values of K for these soils tend to be greater than .42. Soils with these very high K factor values should be conserved.[3]

Table 7.1 Soil Types by Average Building Site Development Restriction

Map No.	*Soil Name*	*Average Building Site Development Restriction, (K factor)*	*Total Acres*	*Percent of Planning Area*	*Acres in UGB*	*Percent of UGB*
103	Boggs Sandy Loam	Moderate (.37)	44	<1	42	1
104	Cajon Sandy Loam	Moderate (.15-.28)	465	4	443	6
112	Excelsior Sandy Loam	Moderate (.24-.43)	10	<1	9	<1
115	Gepford Clay	Severe (.28-.32)	127	1	0	0
118	Goldberg Loam	Severe (.32-.37)	1,526	13	891	12
119	Grangeville Sandy Loam	Moderate (.32)	2,535	21	1704	23
130	Kimberlina Fine Sandy Loam	Slight (.37)	652	5	505	7
134	Lakeside Loam	Moderate (.37)	2,312	19	616	8
137	Lemoore Sandy Loam	Moderate (.43)	1,602	13	1202	16
148	Nord Fine Sandy Loam	Slight (.37-.43)	1	<1	0	0
149	Nord Complex	Slight (.37-.43)	1,240	10	786	10
153	Pitco Clay	Severe (.37)	53	<1	33	<1
167	Urban Land	-	1,217	10	1,208	16
168	Vanguard Sandy Loam	Severe (.32-.37)	342	3	69	1
181	Water	-	73	1	47	1
179	Whitewolf Coarse Sandy Loam	Moderate (.20)	28	<1	17	<1
TOTAL			**12,227**	**100**	**7,572**	**100**

Source: US Department of Agriculture, Soil Survey of Kings County, 1986.

In the Lemoore Planning Area the majority of soils—10,909 acres or 89 percent—are moderately or highly susceptible to erosion, with K values greater than .25. Of those soils, the K values for many fall between .37 and .43. In the UGB, 66 percent of the soils are moderately or highly susceptible to erosion. The risk of erosion is further increased during grading and construction activities when soils are loosened and bare of vegetation.

[3] Institute of Water Research, Michigan State University, website: http://www.iwr.msu.edu/rusle/kfactor.htm. Viewed April 13, 2007.

MINERAL RESOURCES

The California Surface Mining and Reclamation Act (SMARA) of 1975 requires that all cities incorporate into their general plans mapped mineral resources designations approved by the State Mining and Geology Board. SMARA was enacted to limit new development in areas with significant mineral deposits. The State Geologist classifies land in California based on availability of mineral resources. The classification system is intended to ensure consideration of statewide or regionally significant mineral deposits by the City in planning and development administration. There are no mapped mineral resources in the Planning Area, and no regulated mine facilities as of July, 2007.[4]

FARMLAND

Agriculture is a dominant factor in the local economy and social character of Kings County and the City of Lemoore. In 2005 Kings County was ranked 9th among California counties in agricultural production. Trends in gross agricultural production value in Kings County are provided in **Table 7.2**. Common crops include cotton, tomatoes, alfalfa, and corn. Dairies are currently located in the southern portion of the Planning Area along Idaho Avenue and in the eastern portion of the Planning Area at State Route 198 and D Street interchange, as shown in **Figure 7-3**.

Farmland across the State is classified by the California Department of Conservation with respect to its potential for agricultural productivity. The State applies seven farmland categories:

- *Prime Farmland*. Land with the best combination of physical and chemical features able to sustain long-term agricultural production.
- *Farmland of Statewide Importance*. Similar to Prime Farmland but with minor shortcomings, such as greater slopes or decreased ability to store soil moisture.
- *Unique Farmland*. Land with lesser quality soils used for the production of the state's leading agricultural crops.

Row crops planted in the areas surrounding Lemoore

- *Farmland of Local Importance*. Land of importance to the local agricultural economy as determined by each county's board of supervisors and local advisory committee.
- *Grazing Land*. Land on which the existing vegetation is suited to the grazing of livestock.

[4] In April of 2007 there were still two mine facilities on the SMARA AB3098 list with addresses given for Lemoore, both owned by Stoney's Sand & Gravel, LLC. However, in the current list the only regulated facility in Kings County in located in Avenal. (http://www.consrv.ca.gov/OMR/ab_3098_list/current_list.htm)

- *Urban and Built-up Land.* Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel.
- *Other Land.* Low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres.

Table 7.2 Gross Agriculture Production for Kings County

Year	*Gross Value*	*Percent Change from Previous Year*
2000	$ 886,479,000	-
2001	$ 951,950,000	7.4
2002	$ 1,023,305,000	7.5
2003	$ 1,136,966,000	11.1
2004	$ 1,292,090,000	13.6
2005	$ 1,407,091,000	8.9
2006	$ 1,289,186,000	-8.4
Average	**$ 1,141,010,000**	**6.7**

Note: Includes totals without timber.

Source: California Agriculture Statistic Service, Kings County Agricultural Crop Reports, 2000-2006.

Figure 7-3 illustrates the distribution of these farmland categories within the Planning Area. As summarized in **Table 7.3**, Farmland of Statewide Importance comprises approximately 5,800 acres or 47 percent of land dispersed throughout the Planning Area. It is also almost 40 percent of the land within the UGB. Urban and Built-Up Land concentrated within existing City Limits comprising approximately 4,600 acres or 38 percent of the Planning Area (46 percent of the UGB). Prime Farmland comprises a small portion of the Planning Area and UGB (4 percent and 3 percent respectively), located to the northeast and northwest of the existing City Limits.

Table 7.3 Farmland in Lemoore Planning Area

Land Use Category	*Acreage*	*Percent of Planning Area*	*Acres in UGB*	*Percent of UGB*
Prime Farmland	519	4	251	3
Farmland of Statewide Importance	5,767	47	2,933	39
Farmland of Local Importance	68	1	152	2
Unique Farmland	27	<1	15	<1
Grazing Land	105	1	17	<1
Urban and Built-Up Land	4,634	38	3,508	46
Other Land	1,107	9	696	9
Total	**12,230**	**100**	**7,572**	**100**

Source: Department of Conservation: Division of Land Resource Protection, Dyett & Bhatia, 2007.

[Insert Figure 7-2 Soils Map]

back

[Insert Figure 7-3 Farmland Map]

Back

WILLIAMSON ACT

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, was enacted in 1965 to preserve agricultural and open space land in danger of premature conversion to urban uses. Its success has been based on the dual incentives of lowered property taxes for individual landowners and payments of subventions to counties for some of the losses of property tax revenues. Currently approximately 5,900 acres (48 percent) of the Planning Area is designated as Williamson Act land. A little over 2,000 acres—35 percent of Williamson Act land in the Planning Area, and 26 percent of all land in the UGB— are within the UGB.

AGRICULTURE PROTECTION ISSUES

Between the years 2000 and 2004 Kings County experienced the conversion of over 6,000 acres of agricultural land to urban uses, about 1 percent of all farmland in the county. While the county experienced farm productivity growth between 2000 and 2005, 2006 saw an 8.4 percent decrease in value of production, due to a combination of land conversion and product price fluctuations.

The City of Lemoore anticipates the future conversion of some County agricultural land to urban uses, however, multiple steps are taken in this General Plan to prevent excessive agricultural land conversion, such as directing growth away from areas of Prime Farmland (located primarily north of the existing City Limits), focusing on opportunities for infill development, and implementing buffers between active agricultural production and new residential uses in order to avoid conflict.

Table 7.4 Kings County Farmland Loss, 2000 - 2004

	2000		*2004*		*Farmland Acreage Change*
Land Type	*Acres*	*Percent*	*Acres*	*Percent*	
Prime Farmland	142,530	16	140,580	16	(1,950)
Farmland of Statewide Importance	429,170	48	429,770	48	600
Unique Farmland	24,490	3	28,520	3	4,030
Farmland of Local Importance	6,510	1	8,280	1	1,770
Grazing Land	244,180	27	233,490	26	(10,680)
All County Land *(farmland, urban, water, other)*	**890,790**	**100**	**890,780**	**100**	**(6,230)**

Source: Kings County 2001 through 2006 Agricultural Crop Reports; Dyett & Bhatia, 2007.

GUIDING POLICIES

COS-G-4 Reduce erosion to protect significant mineral resources, soil fertility and water quality simultaneously.

COS-G-5 Preserve Prime Farmland not needed to accommodate urban area growth.

IMPLEMENTING POLICIES

COS-I-5 Adopt soil conservation measures to reduce erosion caused by landscaping, construction of new roadways and paths, building construction, and off-road vehicles.

COS-I-6 Require erosion and sedimentation plans for new development activities, including:

- The location and description of existing soil features and characteristics;
- The location and description of proposed changes to the site; and
- A schedule for the installation of control measures for each phase of development.

COS-I-7 Work with Kings County to preserve State-designated Prime Farmland, retain agricultural use designations and encourage the continuation of farming activities outside the City.

See also farmland conservation policy recommendations under Open Space.

COS-I-8 Require developers to prepare detailed stormwater run-off analyses and mitigation plans for any new development adjoining existing Prime Farmland, grassland or wetlands.

COS-I-9 Require developers to inform subsequent buyers of potential continued agricultural production and the lawful use of agricultural chemicals, including pesticides and fertilizers adjacent to the new development site.

A "Right to Farm" acknowledgement will be required of all purchasers of lots adjacent to farmland.

7.3 BIOLOGICAL RESOURCES

FLORA

Agricultural

Almost 59 percent of the habitat in the Planning Area is agricultural. Croplands comprise the majority of the agricultural lands; vegetation includes a variety of sizes, shapes, and growing patters. Plants may either be annual (e.g. tomatoes) or perennial (e.g. alfalfa), and when grown in rows provide a varying amount of bare ground between rows. Annual crops are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops. Some agriculture fields are flooded, this flooding may be required by the type of crop produced (e.g. rice), or may be a management tool to meet other objectives. Orchards and vineyards typically are composed of a single species, and are evenly spaced in uniform rows. Crops are typically grown on the most fertile soils, and typically have lower habitat values than the native habitats they replaced.

Many species of rodents and birds have adapted to agricultural areas, with some considered agricultural pests. Agricultural practices can provide benefits to wildlife. Various raptors, such as Swainson's hawks (*Buteo swainsoni*), hunt in and around agricultural fields seasonally. Flooding of agricultural fields in the fall and winter may provide habitat and foraging opportunities for waterfowl, and open irrigation ditches and canals could potentially provide movement corridors and foraging habitat for many species. Agricultural habitats can provide food and water for many species, but do not generally provide long-term shelter due to the frequency of their disturbance. Vernal pools and wetland areas can be found within the cropland areas located within the western portion of the Planning Area, predominately within larger agricultural areas.

Valley Sink Scrub

Valley Sink Scrub is a low succulent scrubland dominated by alkali-tolerant species, especially iodine bush (*Allenrolfea occidentalis*). There is usually no understory, though sparse herbaceous cover of foxtail chess (*Bromus madritensis ssp. rubens*) sometimes develops. This community formerly surrounded the large San Joaquin Valley lakes (Kern, Buena Vista, Tulare, Goose) and along the San Joaquin Valley through Merced County to Solano and Glenn counties west of the Sacramento River. Valley Sink scrub has now been essentially extirpated by flood control, agricultural development, and ground water pumping (Holland, 1986).

Great Valley Cottonwood Riparian Forest

Great Valley cottonwood riparian forest is a dense, broad-leafed, winter deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii ssp. fremontii*) and Goodding's black willow (*Salix gooddingii*). The understory is usually dense, with abundant vegetative reproduction of canopy dominants and California wild grape is the most conspicuous vine. Scattered seedlings and saplings of shade-tolerant species such as box elder (*Acer negundo var. californica*) or Oregon ash (*Fraxinus latifolia*) may be found, but frequent flooding prevents their reaching into the canopy. This habitat type is usually found along the major low-gradient streams throughout the Great Valley[5], but is now reduced to scattered, isolated remnants or young stands because of flood control, water diversion, agricultural development, and urban expansion. This community is typically found below 1,000 ft in the northern valley and 300 feet in the south (Holland, 1986).

FAUNA

Special Status Species

Special-status species are those plants and animals that, because of their acknowledged rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by federal, State, or other agencies as deserving special consideration. According to records maintained by the California Natural Diversity Database (CNDDB), no sensitive status plant species occur within the Planning Area. The CNDDB does indicate that approximately 400 acres of land located in the northwest corner of the Planning Area is

[5] "The Great Valley" is an historic term referring to the Central Valley of California, and is used in the reference for this habitat description.

considered potential habitat for the San Joaquin kit fox, a Federally-listed Endangered and California Threatened species. The CNDDB also notes occurrences of Tipton kangaroo rat, a State and Federally endangered species, along the southern boundary of the Planning Area.

The Northern harrier is one of the many sensitive species found in the Planning Area.

The Planning Area is also within the activity area of the San Joaquin kit fox.

Other species potentially occurring in the Planning Area includes the Fully Protected blunt-nosed leopard lizard, the State Species of Special Concern western pond turtle, and the State Threatened Swainson's hawk. While the sandhill crane, a state-listed Threatened species, is not noted in the CNDDB database, it is common knowledge to biologists, birders, and residents of the Central Valley that they do indeed frequent Valley marshlands and may occur in the wetland complex in the western portion of the Planning Area. Other sensitive status species with documented occurrences in the Planning Area are northern harrier, white-tailed kite, ferruginous hawk, and tricolored blackbird. A large population of burrowing owl occurs throughout the property of the NAS Lemoore, and can be presumed to occur in the Planning Area as well. Provided below is a brief description of the special status species known to occur, or have a high likelihood to occur, in the Planning Area. Species with a medium or low likelihood to occur in the Planning Area are not described in the detail here, but are included in the list provided in Appendix B.

Blunt-nosed Leopard Lizard (*Gambelia sila*) is a Fully Protected species. The blunt-nosed leopard lizard occurs in open, sparsely vegetated, relatively flat areas on the valley floor and the surrounding foothills. Habitat types where this species is known to occur include alkali playas, alkali saltbush scrub, and also in chenopod scrub communities which are associated with non-alkaline, sandy soils. These burrows typically include abandoned ground squirrel tunnels and occupied or abandoned kangaroo rat tunnels (USFWS 2002).

Western pond turtle (*Clemmys marmorata marmorata*) is a California special concern species associated with permanent or nearly permanent water in a wide variety of habitats. It requires rocks, logs, or exposed soil for basking sites and may nest up to 0.3-mile (0.5-km) away from water (USFWS 2002). While the CNDDB does not indicate this species in the Planning Area, the potential for this species to occur in the Planning Area is high.

San Joaquin kit fox (*Vulpes macrotis mutica*) is a Federally-listed Endangered and California Threatened species. San Joaquin kit foxes inhabit grasslands and scrublands, many of which have been extensively modified by oil exploration and extraction, wind turbines, and agricultural mosaics of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands. Oak woodland, alkali-sink scrub, and vernal pool and alkali meadow communities

also provide habitat for the San Joaquin kit fox. Kit foxes construct their own dens, but they can also enlarge or modify burrows constructed by other animals, such as ground squirrels, badgers, and coyotes. They also den in human-made structures, such as culverts, abandoned pipes, and banks in roadbeds. Dens are usually scarce in areas with shallow soils due to the proximity to bedrock, high water tables, or impenetrable hardpan layers (Williams et al., 1997). The CNDDB contains a record of this species in the northwestern portion of the Planning Area, but outside of the UGB.

Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) is a Federal and State Endangered species. Tipton kangaroo rats inhabit arid-land with level or nearly level terrain located within the floor of the Tulare Basin in the southern San Joaquin Valley. Many of the presently inhabited areas have one or more species of woody shrubs, such as saltbush, iodine bush, goldenbush, and honey mesquite, and a ground cover dominated by introduced and native grasses and forbs. Burrows are commonly located in slightly elevated mounds, road berms, canal embankments, railroad beds, and bases of shrubs and fences. Soft soils, such as fine sands and sandy loams, and powdery soils of finer texture and of higher salinity generally support higher densities of Tipton kangaroo rats than other soil types. Terrain not subject to flooding is essential to sustain a population of Tipton kangaroo rats (Williams et al., 1997). The CNDDB notes occurrences along the southern boundary of the Planning Area, outside of the UGB.

Swainson's hawk (*Buteo swainsoni*) is listed as a Threatened species under the California Endangered Species Act and is also fully protected against take pursuant to Section 3503.5 of the Fish and Game Code of California and the Federal Migratory Bird Treaty Act. The Swainson's hawk is a relatively large bird-of-prey that typically nests in large trees in riparian corridors as well as in isolated trees remaining in or adjacent to agricultural fields in the Central Valley. Swainson's hawks require suitable nest trees adjacent to or in close proximity to large open agricultural fields, grasslands, and pastures that have an abundant prey base. Breeding occurs in late March to late August. This species forages in open grassland habitats and has adjusted to foraging in certain types of agricultural lands. These raptors typically forage within a 10-mile radius of nest sites but may range up to 18 miles from a nest site in search of suitable foraging habitat and available prey (Williams et al., 1997).

Ferruginous hawk (*Buteo regalis*) is a California Special Concern species. The wintering grounds for the ferruginous hawk consist of open grasslands. A previous occurrence of this species was noted in the wetland complex in the western portion of the Planning Area (Urban Futures 1997).

Northern harrier (*Circus cyaneus*) is a California Special Concern species that nests in wet meadows and tall grasslands, and forages in grasslands and marshes. A previous occurrence of this species was noted in the large wetland complex in the western Planning Area (Urban Futures 1997).

White-tailed kite (*Elanus leucurus*) is a Federal Species of Concern and a California Fully Protected species. The white-tailed kite forages in open plains, grasslands, and prairies; typically nests in trees. A previous occurrence of this species was noted in the wetland complex in the western Planning Area (Urban Futures 1997).

Sandhill crane (*Grus canadensis tabida*) is listed as a threatened species under the California Endangered Species Act. This species is known to breed on the plains east of the Cascade

Range and south to Sierra County and winters in the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve. The sandhill crane summers in open terrain near shallow lakes or freshwater marshes and winters in plains and valleys near bodies of fresh water (USFWS 2006).

Sandhill cranes are long legged, long necked, gray, heron-like birds with a patch of bald red skin on their heads.

Burrowing owl (*Athene cunicularia*) is a California Special Concern species that forages in open plains, grasslands, and prairies, and typically nests in abandoned small mammal burrows. The Planning Area contains potentially suitable habitat and is within the range of this species. A relatively large population of burrowing owls occurs at Naval Air Station Lemoore (Rosenberg et al, 1998).

Tricolored blackbird (*Agelaius tricolor*) is a California Special Concern species which is most numerous in the Central Valley and surrounding areas. This species requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony. The Tricolored blackbird nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water. Also nests in crops such as silage. A previous occurrence of this species was noted in the large wetland complex (Urban Futures 1997).

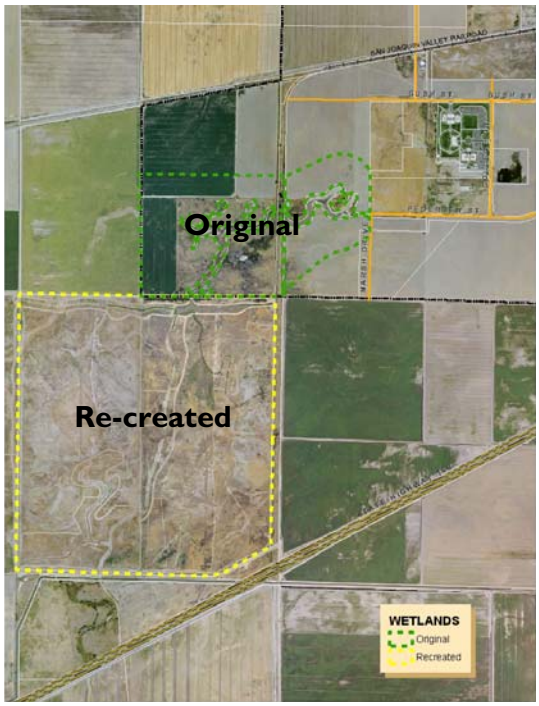
Wetlands

Within the Planning Area, water habitats can be composed of flooded agricultural fields, riverine and lacustrine habitat, or freshwater emergent wetlands (also referred to as "marsh"). These habitats provide roosting, foraging and cover opportunities for numerous species, including waterfowl, sandhill cranes (*Grus canadensis*) and western pond turtles (*Emys marmorata*).

The freshwater marsh in the western Planning Area within existing City limits is relatively undisturbed by farming, and appears to have been used only for light grazing in the recent past. This marsh provides habitat for wildlife, particularly water birds. The mix of emergent vegetation, open water, and drier sites covered by a low growth of saltgrass provides a mosaic of open areas and dense cover that are prime nesting areas for marsh birds, such as marsh wren and song sparrow. The marsh is very productive for insects, crustaceans, amphibians (particularly bullfrogs), and aquatic plant life, which serve as a food source for many of the birds. Wildlife use of the marsh changes with each season; migratory birds stop over in the fall and spring, while water birds such as ducks, geese, sandhill cranes, and migratory raptors winter in the marsh. Their presence is sometimes limited by seasonal hunting activities. These wetlands also provide an area where urban stormwater is treated by natural processes, and acts as a receiving area that reduces potential for flooding of adjacent agricultural properties.

The City of Lemoore has historically discharged much of its storm water runoff into irrigation canals. While ditch users typically desired an opportunity to use surplus drainage water in dry years, the downstream property owners complained of localized flooding during wet years. Farmers had also expressed concerns about the possible negative impacts to water quality

from potential pollutants that could be carried in urban runoff. In response to these problems, the City of Lemoore, working with property owners, ditch companies and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), cosponsored a project to convert approximately 871 acres of marginal farmland south and west of the original wetlands into re-created wetlands. Existing City storm water is currently diverted to the original wetlands. However, as development occurs on the Westside of SR-41, stormwater drainage will continue to be diverted towards the re-created wetlands and appropriate infrastructure shall be installed to allow for proper flow rates so that the entry point or points into the area will not be adversely affected by erosion. Pre-treatment will also ensure that wetlands are not adversely effected by pollution.



The City is working with property owners and other government agencies to re-create approximately 870 acres of wetlands west of the College.

Another large wetlands complex is located in the south just outside of the Planning Area (USFWS, 2007). Other small wetlands are located along SR-198, and in areas adjacent to the Lemoore Canal, which, while graded and devoid of riparian vegetation, does have a natural substrate and allows for infiltration. These small wetlands are likely supplied by groundwater and infiltration from the canal.

Wildlife Corridors

Open Space in the Planning Area provides movement corridors for regional wildlife. For the Planning Area, these corridors include the Kings River, which is just west of the Planning Area, Lemoore Canal, and other smaller watercourses. Larger agricultural and grassland areas may also serve as areas for regional wildlife movement, foraging, and dispersal corridors. Riparian vegetation associated with local watercourses and the freshwater marsh may also provide cover for migrating or non-migrating birds and mammals.


The Kings River is an important waterway and habitat for a range of wildlife and plantlife.

Figure 7-4 illustrates the potential habitat areas for special status species, vegetation, and habitats located within and just outside of the Planning Area.

GUIDING POLICIES

COS-G-6 *Protect wetlands as necessary components to the regional ecological system and as vital and unique habitats.*

COS-G-7 Protect rare and endangered species.

IMPLEMENTING POLICIES

COS-I-10 Require protection of sensitive habitat areas and "special status" species in new development in the following order: 1) avoidance; 2) onsite mitigation, and 3) offsite mitigation. Require assessments of biological resources prior to approval of any development within 300 feet of any creeks, sensitive habitat areas, or areas of potential sensitive status species.

The term "special status" species includes species classified as rare and endangered. These priorities are consistent with the California Department of Fish and Game guidelines. When habitat preservation on-site is not feasible (i.e., preserved parcels would be too small to be of any value), then off-site mitigation should occur.

COS-I-11 Periodically monitor existing and future stormwater drainage system pre-treatment and flows entering wetlands.

The City will impose monitoring requirements as part of development projects' mitigation monitoring and reporting requirements under CEQA where a project could have a potentially significant impact on wetlands.

COS-I-12 Require drainage basin buffers, maintenance of adequate water supply and reduced disturbance of the water table and wetlands systems.

COS-I-13 Establish a "no net loss" standard for sensitive habitat acreage, including wetlands and vernal pools potentially affected by development.

The City will required that assessments are conducted by a qualified biologist to determine the presence or absence of any sensitive resources, to assess the potential impacts, to identify measures for protecting the resource and surrounding buffer habitat and to ensure that the no net loss standard is achieved and maintained.

COS-I-14 Consult with trustee agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Environmental Protection Agency, and Regional Water Quality Control Board) during environmental review when special status species, sensitive natural communities, or wetlands or vernal pools may be adversely affected.

Applicants will be required to consult with all agencies with review authority for projects in areas supporting wetlands and special status species at the outset of project planning.

COS-I-15 Prohibit the use of invasive plant species, such as Pampas grass, adjacent to wetlands and other sensitive habitat, where such landscaping could adversely impact wildlife habitat.

[Insert Figure 7-4 Biological and Water Resources Map]

Back

7.4 WATER RESOURCES

The City of Lemoore is located in the San Joaquin Valley Groundwater Basin and the Tulare Lake Subbasin. The City relies exclusively on groundwater for its water supply, making the relationship between the City and the groundwater basins a critical one for future sustainable development.

GROUNDWATER BASINS

The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes. The Tulare Lake Subbasin is bounded on the south by the Kings-Kern county line, on the west by the California Aqueduct, the eastern boundary of Westside Groundwater Subbasin, and Tertiary marine sediments of the Kettleman Hills. It is bounded on the north by the southern boundary of the Kings Groundwater Subbasin, and on the east by the westerly boundaries of the Kaweah and Tule Groundwater Subbasins. The southern half of the Tulare Lake Subbasin consists of lands in the former Tulare Lake bed in Kings County. Average annual precipitation is seven inches throughout most of the subbasin and nine inches at the northern margin.

SURFACE HYDROLOGY

Major water features located within the Planning Area are portrayed in **Figure 7-4** along with biological resources. These features are primarily canals which provide important drainage resources for the City (some may be in pipes below ground). The Lemoore Canal, a prominent irrigation and drainage feature in the region, runs north-south, forming the eastern border of much of the Planning Area. The Lemoore Canal & Irrigation Company operates drainage ditch facilities within the Planning Area. The wetlands in the western portion of the Planning Area are another important surface water feature, particularly as concerns the maintenance of groundwater quality; they are discussed in more detail in the Biological Resources section.

Storm Drainage and Non-point Pollution Sources

During periods of wet weather, rain carries pollutants and sediments from all parts of a watershed into surface water bodies such as storm drains, streams, rivers, reservoirs, or marshes. In an urban setting, natural drainage patterns have been altered and storm water runoff, as well as non-storm discharge (irrigation water, accidental spills, washdown water, etc.), picks up sediments and contaminants from land surfaces, and transports these pollutants into surface and ground water. The diffused sources of pollutants range from: parking lots, bare earth at construction sites, agricultural sites, and a host of many other sources. Therefore, storm water discharged to surface waters may carry pollution from "nonpoint" sources. The total amount of pollutants entering aquatic systems from these diffused, non-point sources is now generally considered to be greater than that from any other source, such as pipe discharges (point source).

Groundwater Quality

Groundwater recharge occurs primarily from deep percolation of applied irrigation water and rainfall. The rate of recharge depends on the permeability of the surface and subsurface materials.

Water quality has been and may continue to be an issue due to the existence of hydrogen sulfide and colored water produced in various in-town wells. Additionally, arsenic in wells located in the north well field (wells number 2, 4, and 5) and in-town (well number 11) causes water quality issues.

Regulations Protecting Groundwater Quality

The major federal legislation governing the water quality is the Clean Water Act, as amended by the Water Quality Act of 1987. The objective of the act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The State of California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation in California. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the State, while the Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities.

GUIDING POLICIES

COS-G-8 *Preserve and improve the quality of the groundwater supply.*

COS-G-9 *Manage storm drainage to protect agricultural areas, habitats, and the ground water supply.*

COS-G-10 *Conserve water through system-wide efficiencies, techniques and community programs.*

IMPLEMENTING POLICIES

Groundwater

COS-I-16 Develop programs to monitor the quality of local groundwater and runoff that discharges directly into waterways to prevent pollution, in conjunction with federal, State, local agencies, and the private sector.

COS-I-17 Protect groundwater recharge areas by carefully regulating the type of development within and adjacent to these areas.

Conditions of approval may include the limitation of structural coverage and impervious surfaces and prohibition of uses with the potential to discharge harmful pollutants, increase erosion, or create other impacts degrading water quality.

Wastewater and Storm Drainage

COS-I-18 Update, monitor and implement the City's Storm Drainage Master Plan.

As part of the Master Plan, the City will update storm drain maps to identify locations where easements should be reserved for the eventual installation of pipes and structures to ensure appropriate system management.

COS-I-19 Establish and implement a storm drainage fee in conjunction with the recreation impact fee to acquire and develop combined pond basin/park sites and/or other drainage facilities to mitigate growth impacts.

COS-I-20 Require temporary on-site storm drainage basin in subdivisions and other development proposals, if needed, until storm drainage plans for that area are completed and formal connections are implemented. Design should take into consideration the properties of soils on the site.

COS-I-21 Require developers to construct and maintain permanent water control facilities (storm water basins or retention ponds) for new development in the Westside and other areas deemed necessary by the City Engineer, to control storm water and protect areas from flooding. Facilities shall incorporate the following:

- A fenced "low-flow" area to contain potential contaminants;
- Regularly-tilled top soil to maintain good percolation;
- When feasible, storm drainage facilities to channel water into the re-created wetlands which currently lack sufficient water to survive; and
- Other design features consistent with the Regional Water Quality Control Board's Best Management Practices.

Soils at the bottom of retention ponds will be periodically checked for concentrations of contaminants. Contaminated soil shall be disposed in an environmentally-friendly manner.

COS-I-22 Require on-site storm drainage to drain away from the streets in areas with no curbs and gutters.

COS-I-23 Continue to prohibit septic tanks and drain fields to prevent pollution of subsurface water resources.

Water Contaminants

COS-I-24 Control use of potential water contaminants through inventorying hazardous materials used in City operations, listing possible changes that can be made, educating City employees, and designing and implementing a re-placement/reduction program.

COS-I-25 Reduce the use of pesticides, insecticides, herbicides, or other toxic chemical substances by households and farmers by providing education and incentives for Integrated Pest Management (IPM) practices.

IPM is an approach to plant care that uses biological controls instead of, or in conjunction with, chemical controls. IPM does not necessarily eliminate the use of pesticides and other chemical controls, but it strives to use them as sparingly as possible. Utilize regional resources such as the UC Davis Extension for informational materials and technical support.

Water Conservation

COS-I-26 Establish water conservation guidelines and standards for new development and for municipal buildings and facilities.

The City also will develop and maintain a list of water conservation technologies, methods, and practices.

COS-I-27 Become a signatory to the California Urban Water Conservation Council and implement all Demand Management Measures as soon as they become feasible.

The California Urban Water Conservation Council is a non-profit organization whose goal is to integrate urban water conservation Best Management Practices (BMPs) into the planning and management of California's water resources. Since it's inception in 1991, 384 urban water agencies and environmental groups have pledged to develop and implement fourteen comprehensive conservation BMPs.

COS-I-28 Develop a schedule for the retrofitting of existing public buildings with water conservation features, and budget accordingly.

COS-I-29 Annually check for leaks throughout the City's main water supply and distribution system, and initiate repairs when necessary to reduce water waste.

COS-I-30 Consider establishing rebate and/or incentive programs for the replacement of leaking, aging and/or inefficient plumbing with more efficient, water saving plumbing and for the use of water efficient landscaping.

COS-I-31 Educate the general public about the importance of water conservation, water recycling and groundwater recharge through the following means:

- Making water production and treatment facilities available for tours by schools or organized groups;
- Encouraging educators to include water conservation in their curriculums;
- Providing tips to business groups on water conservation and recycling.

The City may solicit assistance from environmental groups, the Lemoore Elementary and High School Districts, and/or concerned citizens to provide education materials or staff time for these public outreach programs.

Water supply and conservation are addressed in *Chapter 6: Public Utilities*.

7.5 CULTURAL RESOURCES

In addition to a desire by the local community to protect historic resources, several State laws, most notably the California Environmental Quality Act, protect archaeological and historical resources. To preserve historic resources, the State has formed the State Historical Resources Committee that conducts the State Historic Resource Inventory and maintains the California Register of Historic Resources, which identifies historic landmarks and points of interest. The Committee also provides recommendations for the National Register of Historic Places.

Cultural resources are defined as prehistoric and historic sites, structures, and districts, or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason.

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric (before the introduction of writing in a particular area) or historic (after the introduction of writing). The majority of such places in this region are associated with either Native American or Euroamerican occupation of the area.

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the post-World War II period (1945-1955) are generally considered for protection if they are determined to be historically or architecturally significant. Sites dating after the post-World War II period may also be considered for protection if they could gain significance in the future. Historic resources are often associated with archaeological deposits of the same age.

Contemporary Native American resources, also called ethnographic resources, can include archaeological resources, rock art, and the prominent topographical areas, features, habitats, plants, animals, and minerals that contemporary Native Americans value and consider essential for the preservation of their traditional values.

PREHISTORIC CONTEXT

The San Joaquin Valley may have been inhabited by humans as early as 10,000 years ago; however, the evidence of early human use is mostly buried by alluvial deposits that have accumulated over the last several thousand years. The greatest exception to this has been the prolific discoveries at Tulare Lake[6], which has yielded evidence of the earliest occupation of California. Nonetheless, later periods are better understood because there is more representation in the archaeological record.

HISTORIC RESOURCES

According to the Southern San Joaquin Valley Archeological Information Center (SSJVAIC) at California State University Bakersfield (CSUB), there are currently no buildings or structures listed in the National Register of Historic Places or as California Historic Landmarks. However, there are 37 sites listed as having local historic significance. Many of

[6] An example of the pluvial lakes and marshes (now dry) that covered much of the California interior during the late-Pleistocene and early Holocene (or between about 1 million and 10,000 years ago).

these local historic sites are located within the downtown district, bounded by the railroad to the north, Lemoore Avenue to the east, "C" Street on the south and Hill Street to the west. These are summarized in **Table 7.5** and mapped in **Figure 7-5**.

Although there are no buildings or structures currently listed in the National Register of Historic Places or California Historic Landmarks, according to the SSJVAIC the Lemoore Canal is likely eligible for listing on the National Register of Historic Places. The Canal, previously know as the Lower Kings River Ditch, was the first irrigation system to be constructed in what is now Kings County (then Tulare County), and continues to play a critical role in the agricultural development of the county.

ARCHEOLOGICAL RESOURCES

According to CSUB, there are ten recorded archeological resource sites within the Planning Area. Of those, there are five habitation sites with human burials, two of which are completely destroyed, one is being systematically destroyed, and the other is destroyed on the surface only. There is one habitation site with no human burials but which contains many artifacts collected by the landowner.

The Lucerne Hotel in Downtown was recently re-habilitated successfully.

The Byron House is single-story home designed in a turn-of-the-century architectural style.

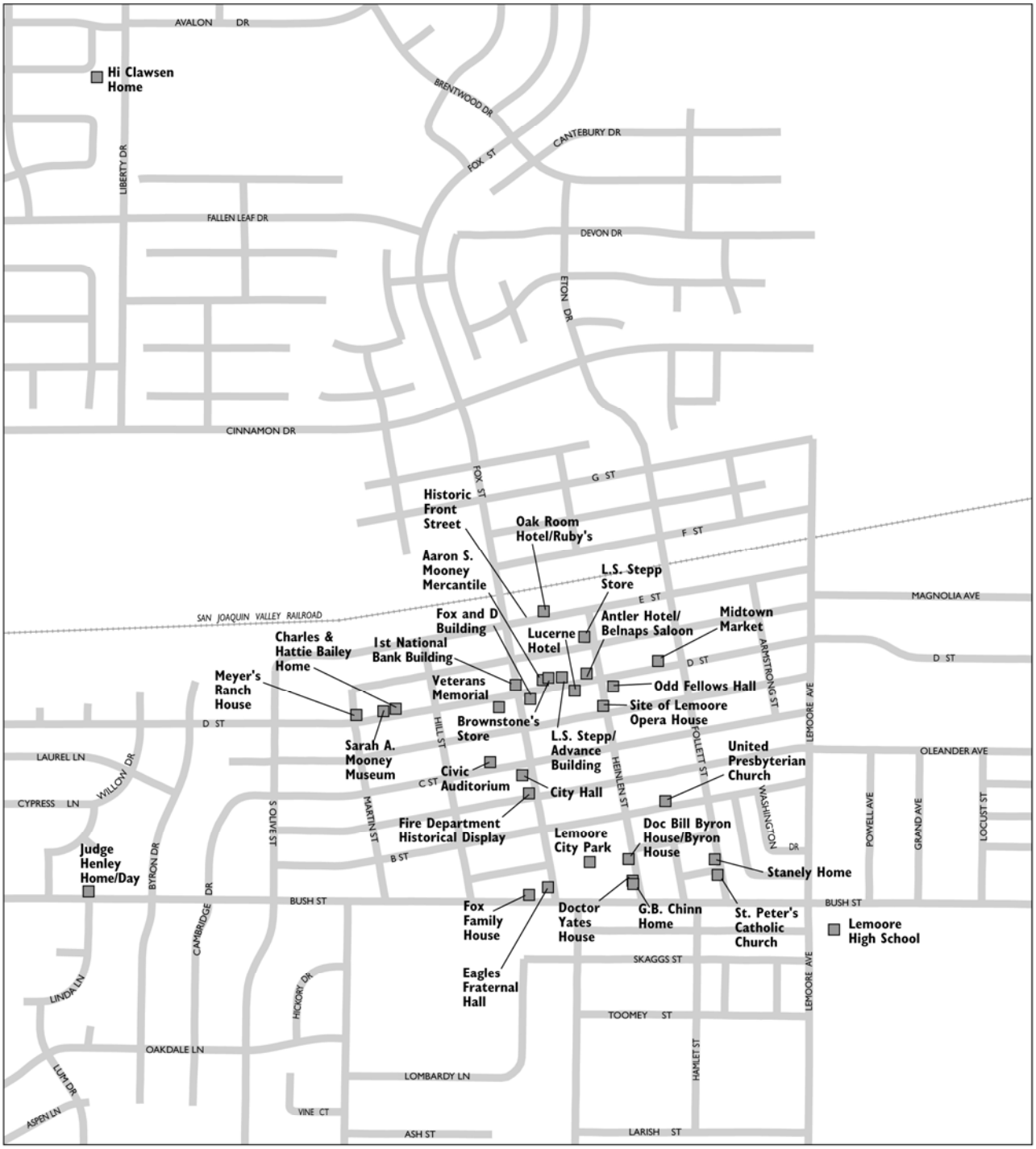
The Lemoore City Hall on Fox Street, constructed in 1924, is one of the most notable historic buildings in the City.

Originally constructed in 1898, the Meyer's Ranch House is currently used as a transitional home for girls who have "aged out" of foster care.

Table 7.5 Locally Designated Buildings of Historic Significance

Map No.	*Name*	*Year Built*
1	1st National Bank Building	1914
2	3-span Wood Bridge	1910
3	4-span Wood Bridge - Lemoore canal	1940
4	Aaron S. Mooney Mercantile	1910
5	Antler Hotel/ Belnaps Saloon	1908
6	Brownstone's Store	-
7	Byron House	1905
8	City Hall	1924
9	Civic Auditorium	1943
10	Day	1904
11	Doc Bill Byron House	1910
12	Doctor Yates House	1912
13	Eagles Fraternal Hall	1920
14	Fire Department Historical Display (Model T Ford)	1917
15	Fox and "D" Building	-
16	Fox Family House	1938
17	Hi Clawsen Home	1916
18	Historic Front Street ("E" Street)	-
19	G.B. Chinn Home	1916
20	Judge Henley Home	1904
21	L.S. Stepp Store	1920
22	L.S. Stepp/ Advance Building	1920
23	Lemoore City Park	-
24	Lemoore High School	1924
25	Lucerne Hotel	1895
26	Charles (Lemoore's first Mayor) and Hattie Bailey Home	1923
27	Meyer's Ranch House (Transitional Home)	1898
28	Midtown Market	1960s
29	Mrs. Fox/ Machado	1938
30	Oak Rooms Hotel/ Ruby's	1894
31	Odd Fellows Hall	1904
32	Sarah A. Mooney Museum	1893
33	Site of Lemoore Opera House	1889
34	St. Peter's Catholic Church	1912
35	Stanley Home	1915
36	United Presbyterian Church	1932
37	Veterans Memorial	1919

Source: Southern San Joaquin Valley Archeological Information Center, 2006; City of Lemoore, 2006.



Note: Wooden railroad bridges east and west of downtown not shown on map.

Figure 7-5

Cultural and Historic Resources

Source: City of Lemoore, 2006.

GUIDING POLICIES

COS-G-11 Identify and preserve the archaeological and historic resources that are found within the Lemoore Planning Area.

IMPLEMENTING POLICIES

COS-I-32 Establish an inventory of historical buildings in Lemoore, including schools, churches, commercial buildings, public buildings, and residential buildings.

A historic preservation checklist is the primary planning tool used to identify, record, and evaluate historic properties within a community, neighborhood, project area, or region. The checklist may include items to determine a building's architectural significance, age, historic importance, structural integrity, cost of restoration and other attributes. The inventories generated from these survey activities form an important component in local preservation programs, and ultimately contribute to local knowledge of historical resources.

COS-I-33 Require that new development analyze and avoid potential impacts to archaeological, paleontological, and historic resources by:

- Requiring a records review for development proposed in areas that are considered archaeologically or paleontologically sensitive;
- Determining the potential effects of development and construction on archeological or paleontological resources (as required by CEQA);
- Requiring pre-construction surveys and monitoring during any ground disturbance for all development in areas of historical and archaeological sensitivity; and
- Implementing appropriate measures to avoid the identified impacts, as conditions of project approval.

In the event that historical, archaeological, or paleontological resources are accidentally discovered during construction, grading activity in the immediate area shall cease and materials and their surroundings shall not be altered or collected. A qualified archaeologist or paleontologist must make an immediate evaluation and avoidance measures or appropriate mitigation should be completed, according to CEQA Guidelines. The State Office of Historic Preservation has issued recommendations for the preparation of Archeological Resource Management Reports that will be used as guidelines.

COS-I-34 If, prior to grading or construction activity, an area is determined to be sensitive for paleontological resources, retain a qualified paleontologist to recommend appropriate actions. Appropriate action may include avoidance, preservation in place, excavation, documentation, and/or data recovery, and shall always include preparation of a written report documenting the find and describing steps taken to evaluate and protect significant resources.

COS-I-35 Provide technical assistance with the registration of historic sites, buildings, and structures in the National Register of Historic Places, and inclusion in the California Inventory of Historic Resources.

COS-I-36 Adopt a Landmarks and Historic Preservation District Overlay Zone or Ordinance to preserve all City-, State-, and federally-designated historic sites and structures to the maximum extent feasible.

COS-I-37 Establish an interim design review process for proposed demolitions and exterior alterations and additions to non-residential buildings that are more than 75 years old. The Planning Commission will be the review authority, with their decisions subject to appeal to the City Council. Criteria to be considered in approving or conditionally approving the proposed change will include:

- For proposed alterations and additions: The project design is compatible with Secretary of the Interior Standards for the Treatment of Historic Properties and with the Downtown Revitalization Plan; and
- For proposed demolitions: The applicant has demonstrated that the existing use can not generate a reasonable rate of return; the existing building constitutes a hazard to public safety and is economically infeasible to rehabilitate, the design quality of the replacement building will be superior to the existing building and will be compatible with adjacent buildings and the character of Downtown Lemoore, or the proposed demolition or removal is necessary to allow a project that will have public benefits outweighing the public benefits of retaining the existing building.

This process will be in place until the inventory of potential landmarks and historic buildings is completed and zoning for Landmarks and Historic Districts is adopted.

7.6 AIR QUALITY

The U.S. EPA, pursuant to the Federal Clean Air Act of 1967 (Amended 1990) sets national ambient air quality standards (NAAQS) for several pollutants and oversees their implementation by State air quality agencies. The California Air Resources Board (CARB) is the corresponding State agency. CARB is responsible for establishing emission standards for on-road motor vehicles sold in California and overseeing the activities of regional/county air districts. It also establishes air quality standards and is empowered under the California Clean Air Act to enforce compliance.

Lemoore is located within the San Joaquin Valley Air Basin (SJVAB), considered one of the most polluted air basins in California due to its unique topography and weather patterns (**Figure 7-6**). Air quality in the basin is monitored by the San Joaquin Valley Air Pollution Control District (SJVAPCD), which operates a network of monitoring stations throughout the Valley to determine if emissions and air pollutant levels meet health and safety standards.

The SJVAPCD is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern. The SJVAPCD is governed by an eleven member Governing Board consisting of representatives from the Board of Supervisors of all eight counties and three Valley city representatives.

SJVAPCD has permit authority over stationary sources such as factories, acts as the primary reviewing agency for environmental documents and develops regulations consistent with State and federal air quality agencies.

The Kings County Association of Governments also has a role in air quality planning by ensuring its transportation plans, programs, and projects conform to the most recent air quality requirements; and by coordinating effectively between government agencies.

DEFINITIONS

Air quality is affected by three general types of pollutants – criteria air pollutants, toxic air contaminants, and odors and nuisances. Criteria air pollutants and toxic air contaminants (as described below) are under the purview of the SJVAPCD. The City has a more direct role in regulating odors and nuisances, and the release of particulate matter at construction sites.

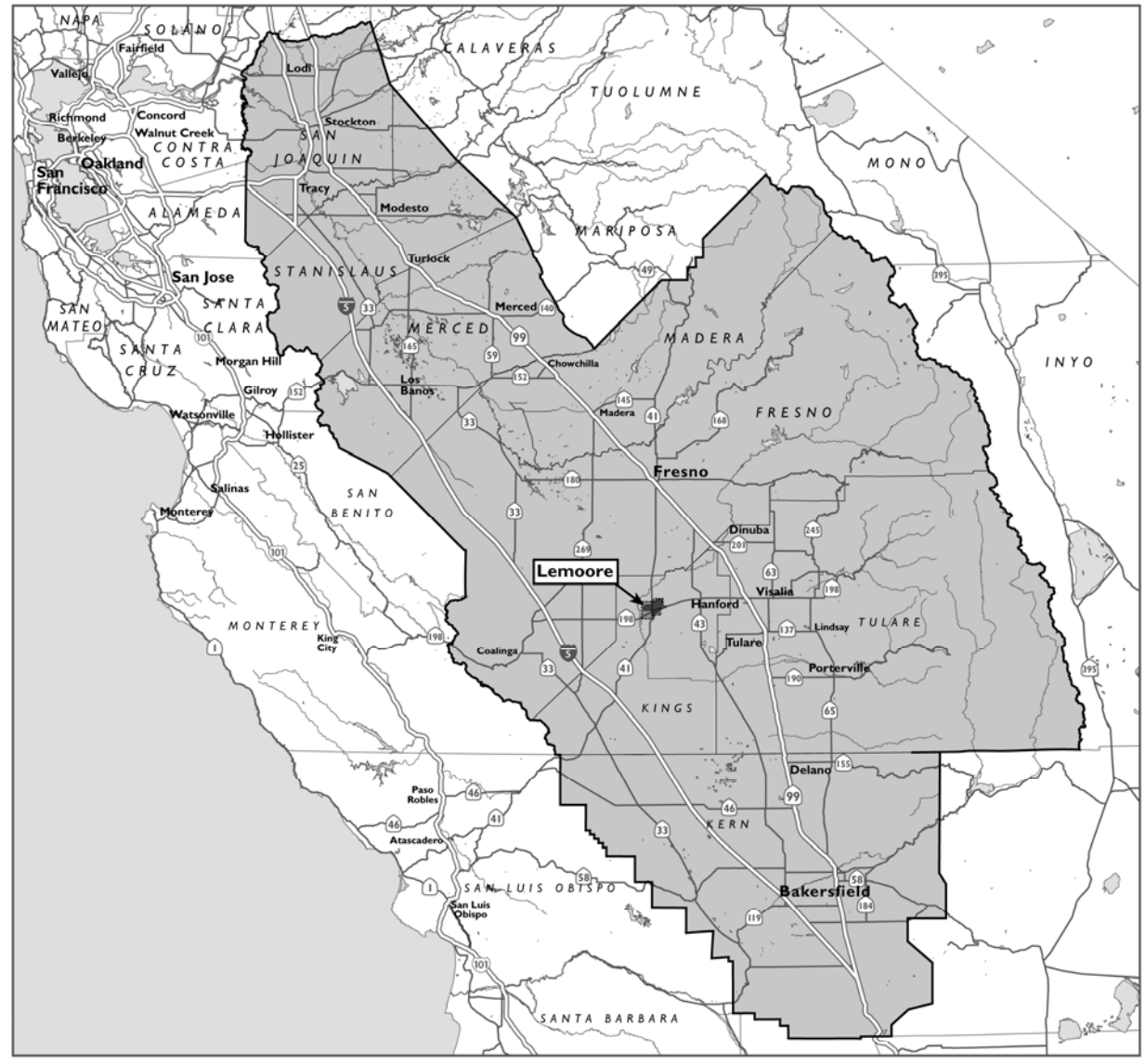
Criteria Air Pollutants

Criteria air pollutants are most pervasive in urban air environments and include pollutants such as Carbon Monoxide (CO), Ozone (O_3), and particulate matter, including Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), PM10, PM2.5 and Lead (Pb). State and federal ambient air quality standards have been established to monitor their levels.

Under the California Clean Air Act and amendments to the Federal Clean Air Act, the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board are required to classify Air Basins as either "attainment" or "non-attainment" for each criterion of air pollutants, based on whether or not the national and State standards have been met. **Table 7.6** shows minimum standards for criteria air pollutants, their effects on health, and potential sources. The Valley meets federal standards for all air pollutants except PM10 and 8-hour ozone, which remain in the "serious non-attainment" category. The quality index for PM2.5 in San Joaquin Valley is still in the federal "non-attainment" category but has been improving in the last 3 years.[7]

Vehicle and industry activity plays a large role in the emission of particulates and ozone in the Valley, particularly north-south goods movement on I-5 and Highway 99. Emissions are also generated through commercial operations and building energy use. Lemoore's primary role in achieving and maintaining regional air quality standards is through land use decision-making to reduce vehicular use in the city, and in cooperation with State agencies such as SJVAPCD and California Air Resources Board (CARB) to implement emissions control plans.

[7] 'Strategic Action Proposal, Air Quality Workgroup' by California Partnership for the San Joaquin Valley, October 2006; and U.S. EPA Press Release "EPA Reclassify Valley Air to Extreme" 8 April 2004.



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MILES

Figure 7-6
San Joaquin Valley Air Basin

Table 7.6 State and National Criteria Air Pollutant Standards, Effects and Sources

Pollutant	*Averaging Time*	*California Standard*	*National Primary Standard*	*Major Pollutant Sources*	*Pollutant Health and Atmospheric Effects*
Ozone	1 hour	0.09 ppm	---	On-road motor vehicles, other mobile sources, solvent extraction, combustion, industrial and commercial processes.	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.
	8 hours	0.07 ppm	0.08 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide	1 hour	0.18 ppm	---	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.	Irritating to eyes and respiratory tract. Colors atmosphere reddish brown.
	Annual Average	---	0.053 ppm		
Sulfur Dioxide	1 hour	0.25 ppm	---	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.	Irritates upper respiratory tract, injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron and steel. Limits visibility and reduces sunlight.
	24 hours	0.04 ppm	0.14 ppm		
	Annual Avg.	---	0.03 ppm		
Respirable Particulate Matter (PM10)	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).	May irritate eyes and respiratory tract, decreases lung capacity and increases risk of cancer and mortality. Produces haze and limit visibility.
	Annual Average	20 $\mu g/m^3$	---		
Fine Particulate Matter (PM2.5)	24 hours	---	35 μg/m3	Fuel combustion in motor vehicles, equipment and industrial sources; residential and agricultural burning. Also formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	Increases respiratory disease, lung damage, cancer and premature death. Reduces visibility and results in surface soiling.
	Annual Average	12 μg/m3	15 μg/m3		
Lead	Monthly Average	1.5 μg/m3	---	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction.
	Quarterly	---	1.5 μg/m3		

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

Source: California Air Resource Board, Available at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, updated February, 2007.

Toxic Air Contaminants

Toxic air contaminants (TACs) are typically pollutants that occur at relatively low concentrations and are associated with carcinogenic (cancer causing) or other adverse health effects. Carcinogens, mutagens, or reproductive toxins are some examples. They are typically emitted from mobile sources such as cars and trucks, as well as stationary sources, such as factories, gas stations, hospital operations, and other businesses. Some examples of sources of TACs: most paradichlorobenzene in the environment comes from its use in moth repellent products and in toilet deodorizer blocks; perchloroethylene is the main solvent used in the dry-cleaning process, and also used in metal degreasing, and in some adhesives, aerosols, paints, and coatings; benzene and formaldehyde are emitted by mobile sources.

Unlike criteria air pollutants, there are no ambient air quality standards established for TACs. Regulation of TACs is achieved through federal and State controls on individual sources. The SJVAPCD implements a State law known as the Air Toxics "Hot Spots" Information and Assessment Act to control emissions. This law requires each district to compile an inventory of toxic emissions from polluting facilities. TACs from mobile sources such as benzene and formaldehyde have traditionally been regulated through emissions standards for on-road motor vehicles and specifications for gasoline and diesel fuel. The City can reduce public exposure to toxic air contaminants by ensuring sufficient buffer zones are provided around stationary sources. The Air Resources Board maintains an inventory of toxic air contaminants concentrations and their health risks. **Table 7.7** describes total emissions in the years 1995 to 2005 from stationary sources of toxic air contaminants in the San Joaquin Valley.

Odors and Nuisances

Odors and nuisances are emissions or occurrences with little or no adverse health effects but which have the potential to generate citizen complaints. Controlling odors from livestock and some industrial sites is a challenge, as well as complaints of dust from construction sites. Lemoore can address these nuisances through land use regulations such as buffering incompatible uses and local controls at construction sites.

Since 2000, the City has implemented a General Plan Amendment designed to protect the viability of the three industrial parks in the City. Resolution 2000-01 promotes the location of industry in areas where prevailing winds would not increase the impact of odors on adjacent property, while also requiring all residential uses developed within a mile of industrial zones to record noise and odor easements acknowledging the presence of nearby industries.

AIR QUALITY CONDITIONS AND TRENDS

The SJVAPCD operates a network of air pollution monitoring stations in San Joaquin Valley to provide information on ambient concentrations of critical air pollutants and toxic air contaminants. Since air quality is rarely localized and typically of a regional character, data recorded nearby can be taken to approximate air quality standards in Lemoore. **Table 7.8** summarizes recent data collected from Kings County (Ozone, Nitrogen Dioxide, Carbon Monoxide, PM10 and PM2.5).

Table 7.7 Annual Average Concentrations and Health Risks for Toxic Air Contaminants in the San Joaquin Valley Air Basin (1995-2005)

TAC	*Conc.*/ Risk***	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Acetaldehyde	Annual Avg	0.54	1.28	1.19	1.3	1.56	1.09	1.15	1.24	1.34	1.14	1.42
	Health Risk	*3*	*6*	*6*	*6*	*8*	*5*	*6*	*6*	*7*	*6*	*7*
Benzene	Annual Avg	1.16	0.73	0.71	0.76	0.69	0.63	0.538	0.552	0.463	0.372	0.374
	Health Risk	*107*	*68*	*66*	*71*	*64*	*58*	*50*	*51*	*43*	*34*	*35*
1,3-Butadiene	Annual Avg	0.264	0.222	0.195	0.233	0.177	0.158	0.15	0.146	0.095	0.08	0.082
	Health Risk	*99*	*83*	*73*	*88*	*67*	*59*	*56*	*55*	*36*	*30*	*31*
Carbon Tetrachloride	Annual Avg	0.098	0.077		0.114		0.096	0.086	0.091	0.097		
	Health Risk	*26*	*20*		*30*		*25*	*23*	*24*	*26*		
Chromium, Hexavalent	Annual Avg	0.28	0.13	0.11	0.1	0.1	0.12		0.086	0.078	0.083	0.076
	Health Risk	*42*	*20*	*16*	*15*	*15*	*18*		*13*	*12*	*13*	*11*
para-Dichloroben-	Annual Avg	0.11	0.1	0.13			0.11	0.13	0.15	0.15	0.15	0.15
	Health Risk	*8*	*7*	*9*			*7*	*9*	*10*	*10*	*10*	*10*
Formaldehyde	Annual Avg	2.1	2.96	2.77	2.86	3.44	2.61	3.08	3.13	3.02	2.27	2.52
	Health Risk	*15*	*22*	*20*	*21*	*25*	*19*	*23*	*23*	*22*	*17*	*19*
Methylene Chloride	Annual Avg	0.61	0.54	0.53	0.52	0.5	0.53	0.27	0.16	0.14	0.11	0.12
	Health Risk	*2*	*2*	*2*	*2*	*2*	*2*	*<1*	*<1*	*<1*	*<1*	*<1*
Perchloroe-thylene	Annual Avg	0.068	0.068	0.056	0.039		0.076	0.052	0.039	0.033	0.027	0.032
	Health Risk	*3*	*3*	*2*	*2*		*3*	*2*	*2*	*1*	*1*	*1*
Diesel PM***	Annual Avg	(1.7)					(1.3)					
	Health Risk	*(510)*					*(390)*					
Average Basin Health Risk	*Without Diesel PM*	*305*	*231*	*194*	*235*	*181*	*196*	*169*	*184*	*157*	*111*	*114*
	With Diesel PM	*(815)*					*(586)*					

* Concentrations for Hexavalent Chromium are expressed as ng/m3, and concentrations for Diesel PM are expressed as ug/m3. Concentrations for all other TACs are expressed as ppb.

** Health Risk represents the number of excess cancer cases per million people based on a lifetime (70-year) exposure to the annual average concentration. Total Health Risk represents only those compounds listed in this table and only those with data for that year. There may be other significant compounds for which monitoring and/or health risk information are not available.

*** The Diesel PM concentrations are estimates based on receptor modeling. Because data are not available for all years, Diesel PM is not included in the Average Basin Health Risk number.

Source: California Air Resources Board 2007 Almanac, Appendix C

Table 7.8 Ozone, Nitrogen, Carbon Monoxide and Particulate Matter Air Pollution for Kings County (1999 - 2005)

OZONE (ppm)	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Peak 1-Hour Indicator	0.109	0.115	0.113	0.114	0.107	0.106	0.1
Peak 8-Hour Indicator	0.099	0.102	0.098	0.099	0.095	0.093	0.088
4th High 1-Hr. in 3 Yrs	0.123	0.127	0.124	0.126	0.12	0.119	0.112
Avg. of 4th High 8-Hr. in 3 Yrs	0.128	0.128	0.124	0.124	0.121	0.121	0.113
Maximum 1-Hr. Concentration	0.111	0.11	0.107	0.105	0.1	0.094	0.098
Max. 8-Hr. Concentration	0.14	0.124	0.127	0.125	0.12	0.121	0.12
Days Above State Standard	95	112	64	86	71	55	38
Days Above Nat. 1-Hr. Std.	25	51	18	27	15	9	4
Days Above Nat. 8-Hr. Std.	28	48	21	29	19	7	6
NITROGEN DIOXIDE (ppm)							
Peak 1-Hr. Indicator	0.084	0.073	0.068	0.073	0.073	0.072	0.071
Max. 1-Hr. Concentration	0.086	0.072	0.096	0.067	0.076	0.069	0.072
Max. Annual Average		0.014		0.014	0.013	0.012	0.012
*CARBON MONOXIDE (ppm)**							
Peak 8-Hr. Indicator	8.5	8.4	6.4	5.3	4.8	4.2	3.7
Max. 1-Hr. Concentration	11.9	10.1	8.4	6.1	5.8	4.6	4.3
Max. 8-Hr. Concentration	7.8	6.6	6	4.5	4.1	3	3
Days Above State 8-Hr. Std.	0	0	0	0	0	0	0
Days Above Nat. 8-Hr. Std.	0	0	0	0	0	0	0
PM-10 (ug/m3)							
Max. 24-Hr. Concentration (State)	185	137	221	174	150	219	137
Max. 24-Hr. Concentration (Nat)	174	128	185	168	150	217	131
Annual Average (State)	53.1	51.3		55.4	47.5	43.6	42.6
Annual Average (Nat)	52.2	50.2	57.4	53.5	46.7	47.9	40.3
Calc Days Above State 24-Hr Std	135	132		172	149	100	126
Calc Days Above Nat 24-Hr Std	6	0	14	6	0	7	0
PM-2.5 (ug/m3)							
Max. 24-Hr. Concentration (State)	53	76	123.2	90.7	55.1	61	92.5
Max. 24-Hr. Concentration (Nat)	53	76	123.2	90.7	55.1	61	92.5
98th Percentile of 24-Hr Conc.			89.5	65.1	42.2	49.4	74.5
Annual Average (State)					16.2		17.5
Avg. of Quarterly Means (Nat)		16.4	19.2	21.5	16.3	17.5	17.5

*Data for Carbon Monoxide are for the San Joaquin Valley Air Basin overall.

Source: California Air Resources Board Almanac 2007 - Appendix A and Chapter 4.

Ozone

Ground level ozone is a major component of smog (it should not be confused with 'stratospheric' ozone, which protects us from the sun's harmful ultraviolet rays). Ground level ozone is not directly emitted to the atmosphere, but is a secondary air pollutant produced by complex chemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight. Between 1999 and 2004, the number of days Ozone exceeded State standards ranged from 48 as the high in 2000 to 7 as the low in 2004. For "peak hour" Kings County remains in the Severe/non-attainment category, though conditions have improved since 2000.

Carbon Monoxide

Carbon monoxide is an odorless, invisible gas produced by incomplete combustion or emitted from organic substances. Carbon monoxide levels are not monitored in Lemoore or Kings County, but overall figures for Madera, Merced and Kings counties place it in the 'Attainment' category.[8] Readings at the nearest stations at Fresno and Modesto also indicate general attainment of federal standards. Since the introduction of oxygenated fuels in 1992, background carbon monoxide concentrations have been dramatically reduced. Future concentrations are expected to decline further as older, heavily polluting vehicles are gradually replaced by newer, cleaner-running models.

Suspended Particulate Matter

Particulate matter is the general term used for a mixture of solid particles and liquid droplets in the air. They include aerosols, smoke, fumes, dust, ash, and pollen. Fine particulate matter is classified as PM10 for matters 10 microns or less in diameter and PM2.5 for matters 2.5 microns or less in diameter. Fine particulate matter is known to cause adverse health problems such as decreased lung capacity, respiratory disease, lung damage, and cancer, as this particulate can penetrate deep into the respiratory system.

Both PM2.5 and PM10 emissions are expected to increase in the future with an overall increase in vehicle ownership and miles traveled. As part of its effort to protect the environment, the City will encourage residents to use alternatives modes of transportation or switch to clean-energy vehicles.

[8] Source: SJVAPCD Air Quality Attainment Data at http://www.valleyair.org/aqinfo/attainment.htm

Table 7.9 Attainment Status of the San Joaquin Valley Air Basin for State and National Ambient Air Quality Standards

	Designation/Classification	
Pollutant	*Federal Standards*[1]	*State Standards*[2]
Ozone - One hour	*No Federal Standard*	Non-attainment/Severe
Ozone - Eight hour	Non-attainment/Serious[5]	Non-attainment
PM10	Non-attainment/Serious[3]	Non-attainment
PM2.5	Non-attainment[4]	Non-attainment
CO - Fresno Urbanized Area	Attainment	Non-attainment/Moderate
CO - Remainder of Fresno County	Unclassified/Attainment	Attainment
CO - Merced, Madera and Kings Counties	Unclassified/Attainment	Unclassified
CO - Kern (SJVAB portion), Tulare, Stanislaus, San Joaquin	Unclassified/Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide - Kern County (SJVAB portion)	Attainment	Attainment
Sulfur Dioxide - All Other Counties	Unclassified	Attainment
Lead (Particulate)	*No Designation*	Attainment
Hydrogen Sulfide	*No Federal Standard*	Unclassified
Sulfates	*No Federal Standard*	Attainment
Visibility Reducing Particles	*No Federal Standard*	Unclassified

[1] See 40 CFR Part 81.
[2] See CCR Title 17 Sections 60200-60210.
[3] Although EPA has determined that the San Joaquin Valley Air Basin has attained the federal PM 10 standards, their determination does not constitute a re-designation to attainment per section 107(d)(3) of the Federal Clean Air Act. The Valley will continue to be designated non-attainment until all of the Section 107(d)(3) requirements are met.
[4] The Valley is designated non-attainment for the 1997 PM 2.5 federal standards. EPA designations for the 2006 PM 2.5 standards will be finalized in December 2009. The District has determined, as of the 2004-06 PM 2.5 data, that the Valley has attained the 1997 24-Hour PM 2.5 standard.

[5] On April 30, 2007 the governing board of the San Joaquin Valley Air Pollution Control District voted to request EPA to reclassify the San Joaquin Valley Air Basin as extreme non-attainment for the federal 8-hour ozone standard. On June 14, 2007, the California Air Resources Board approved the request. This request must be forwarded to the EPA by the CARB and would become effective upon EPA final rulemaking after a notice and comment process; it is not yet in effect.

Source: San Joaquin Valley Air Pollution Control District, Ambient Air Quality Standards & Valley Attainment Status.

SENSITIVE RECEPTORS

Some people are more sensitive than others to the effects of air pollutants. Chronic asthma or bronchitis suffers, young children or the elderly, for example, may experience more discomfort compared to other residents. Aside from age and health problems, heightened sensitivity may also be caused by prolonged exposure to air pollutants and proximity to an emissions source. Therefore, hospitals, schools, convalescent facilities, residential areas, and other sensitive receptors should not be located close to pollution sources. Potentially incompatible uses can be separated by land use zoning or other regulations.

In addition to the policies listed in this section, land use policies in Chapter 2 and circulation policies in Chapter 4 promote alternative modes of transportation and land use concepts that are intended to reduce overall vehicle emissions.

GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE

Global climate change (GCC) is currently one of the most important and widely debated scientific, economic, and political issues in the United States. GCC is a change in the average weather of the earth that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. Of particular concern is the gradual increase in average temperatures and associated changes in environmental conditions. In California these may include, but are not limited to: decreased air quality; more severe heat; increased wildfires; shifting vegetation; declining forest productivity; decreased spring snowpack; water shortages; a potential reduction in hydropower; a loss of winter recreational opportunities; agricultural damage from heat, pests, pathogens, and weeds; and rising sea levels resulting in shrinking beaches; disruptions in estuarine habitats and fresh water supply, and increased coastal flooding.

Although GCC is a widely accepted concept, the extent of the change or the exact contribution from human activity remains in debate. In addition, the connection between local land use decisions and global climate change is not well understood and, therefore, is not reflected in climate modeling. The United Nations Intergovernmental Panel on Climate Change (IPCC) has predicted that the range of global mean temperature change from 1990 to 2100, given six scenarios, could range from 2.0° Celsius (C) or 3.6 °F to 4.5°C or 8.1 °F (IPCC, 2001). Regardless of analytical methodology, global average temperature and sea level are expected to rise under all scenarios (IPCC, 2001).

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHG). These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that enters our atmosphere from space is absorbed by the Earth's surface. The Earth's surface emits radiation back toward space in the form of infrared radiation, and GHGs absorb some of that radiation. Some radiation that otherwise would have escaped back into space is thus retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect.

The accumulation in the atmosphere of GHGs regulates the earth's temperature. Without naturally-occurring GHGs, the Earth's surface would be about 61°F cooler (CCAT, 2006). However, many scientists believe that emissions from human activities, such as electricity

production and vehicles, have elevated the concentration of these gases in the atmosphere beyond naturally-occurring concentrations.

Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. GHG have varying global warming potential (GWP) and atmospheric lifetimes. Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The GWP is the potential of a gas or aerosol to trap heat in the atmosphere.

Expressing GHGs emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride). GHG emissions with a higher GWP have a greater global warming effect on a molecule per molecule basis. For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. (California Climate Action Registry, *General Reporting Protocol*, Appendix C (2006).

Automobiles are estimated to contribute about 41 percent of all GHG emissions in California.

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, residential, transportation, and agricultural sectors (California Energy Commission 2006). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (California Energy Commission 2006). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (California Energy Commission 2006). California is the second largest GHG emitter in the United States (trailing only Texas) and the 12th largest emitter in the world, producing 492 million gross metric tons of carbon dioxide equivalents in 2004 (California Energy Commission 2006).

In September 2006, Governor Arnold Schwarzenegger signed the California Climate Solutions Act of 2006. This Act requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, the Act directs the California Air Resources Board (CARB) to develop and implement regulations to reduce statewide GHG emissions from stationary sources. The Act also requires the State to develop regulations to address GHG emissions from vehicles.

Though the Attorney General's office has filed multiple lawsuits to force local agencies (mostly large and populous counties) to take action on GHGs, to-date the State has not imposed any specific requirements on local agencies to help achieve the requisite emissions reductions. The Attorney General has announced the intent to continue filing lawsuits in the

absence of implementing regulations. The State has, however, adopted several so-called early action GHG reduction measures that will help to reduce GHG emissions from local land use decisions that may generate additional vehicle traffic. These actions include: a low-carbon fuel standard that reduces carbon intensity in California fuels; reduction of refrigerant losses during motor vehicle air conditioning system maintenance by restricting the sale of "do-it-yourself" automotive refrigerants; and requiring broader use of state-of-the-art methane capture technologies to increase methane capture from landfills. CARB has also adopted a requirement, effective in 2009, that requires every new car sold in California to bear a sticker showing the vehicle's smog and greenhouse gas emission characteristics. The label will allow consumers to consider and compare a vehicle's environmental impacts. (California Environmental Protection Agency, 2007)

Because generation of GHGs is, for the most part, related to growth, short of stopping growth in its tracks, policies that reduce energy consumption and fuel usage can also have a positive effect. In addition to promoting development patterns that will reduce the vehicles miles traveled per capita, there are a variety of other actions that cities and counties can take to reduce energy consumption even as they grow. The City is in the process of purchasing electric and hybrid vehicles, as well as analyzing the possibilities for energy retrofits and adding solar power to City buildings and facilities.

Table 7.10 provides a summary of policies provided in the General Plan that address global warming, GHG emissions, and other sustainability goals outlined as eight global warming mitigation opportunities.

Table 7.10 Summary of GHG Emissions Reduction and Sustainability Policies

Global Warming Mitigation Opportunities	*General Plan Policies Provided*
(1) Prepare a Greenhouse Gas Reduction Plan and associated programs to quantify, monitor, and reduce emissions.	COS-I-38, COS-I-39, COS-I-40, COS-I-47, COS-I-48
(2) Require all new buildings or major renovations to incorporate green building design principles.	CD-I-58, CD-I-60, CD-I-61, CD-I-62, COS-I-48
(3) Require all new development to incorporate sustainable site design, landscaping design, and maintenance.	CD-I-11, CD-I-59, CD-I-60 PU-I-9, PU-I-11, COS-I-26, COS-I-27, COS-I-28 (existing public buildings), COS-I-29 (water system overall efficiency), COS-I-30, COS-I-31 (public education on water conservation) COS-I-45, SN-I-8, SN-I-9, SN-I-10, SN-I-11, SN-I-14, SN-I-15, SN-I-16, SN-I-17
(4) Require site designs for all new development to minimize energy use.	CD-I-58 (site and building), CD-I-62 (reducing energy inputs related to construction and site development), CD-I-65 (outdoor light) C-I-31, C-I-32, C-I-33, C-I-34 (minimize energy associated with navigating/traveling through site)
(5) Require developer designs to accommodate and facilitate the installation of self-generation of energy (solar, etc.) in all new homes and buildings.	CD-I-60, CD-I-61
(6) Require all construction projects to use all feasible measures to recycle unused construction materials and demolition projects to reuse building materials.	CD-I-62
(7) Require City fleets to use low emission vehicles.	C-I-26, as well as policies to reduce driving including C-I-24, C-I-25, C-I-27, COS-I-48
(8) Require all new residential and non-residential development to use Energy Star appliances, energy efficient water heaters and air conditioners, and energy efficient lighting.	CD-I-60, CD-I-61, CD-I-63 (outdoor lighting, bullets 3, 4, 5)

Source: Dyett & Bhatia, 2007.

GUIDING POLICIES

COS-G-12 Make air quality a priority in land use planning by implementing emissions reduction efforts targeting mobile sources, stationary sources and construction-related sources.

COS-G-13 Minimize exposure to toxic air pollutant emissions and noxious odors from industrial, manufacturing and processing facilities.

COS-G-14 Utilize diverse and creative mitigation approaches to manage remaining levels of air pollution that cannot be reduced or avoided.

IMPLEMENTING POLICIES

COS-I-38 Compile and update an inventory of greenhouse gas emissions from City operations and track related solid waste, energy, economic, and environmental data.

COS-I-39 Support State efforts to reduce greenhouse gases and emissions through local action that will reduce motor vehicle use, support alternative forms of transportation, require energy conservation in new construction, and energy management in public buildings.

By proposing compact development, mixed use centers, walkable neighborhoods, green building technology, and jobs-housing balance, the City will be helping to implement many of the strategies and programs in the San Joaquin Valley 2007 Ozone Plan.

COS-I-40 Prepare a Greenhouse Gas Emissions Reduction Plan, focusing on feasible actions the City can take to minimize the adverse impacts of Plan implementation on climate change and air quality. The Plan will include but will not be limited to:

- An inventory of all known, or reasonably discoverable, sources of greenhouse gases (GHGs) that currently exist in the City and sources that existed in 1990. In determining what is a source of GHG emissions, the City may rely on the definition of "greenhouse gas emissions source" or "source" as defined in Section 38505 of the California Global Warming Solutions Act ("AB 32") or its governing regulations. The inventory may include estimates of emissions drawing on available information from to state and regional air quality boards, supplemented by information obtained by the City.
- A projected inventory of the new GHGs that can reasonably be expected to be emitted in the year 2030 due to the City's discretionary land use decisions pursuant to the 2030 General Plan Update, as well as new GHGs emitted by the City's internal government operations. The projected inventories will include estimates, supported by substantial evidence, of future emissions from planned land use and information from state and regional air quality boards and agencies.
- A target for the reduction of those sources of future emissions reasonably attributable to the City's discretionary land use decisions under the 2030 General Plan and the City's internal government operations, and feasible GHG emission reduction measures whose purpose shall be to meet this reduction target by regulating those sources of GHG emissions reasonably attributable to the City's discretionary land use decisions and the City's internal government operations.

*The General Plan includes a comprehensive set of policies that will support the GHG Emission Reduction Plan. See **Table 7.10** for a cross-reference of these policies.*

COS-I-41 Amend the Zoning Ordinance to prohibit locating new "sensitive receptor" uses—hospitals, residential care facilities and child care facilities—within:

- 500 feet of a freeway, urban roads carrying 100,000 vehicles per day, or rural roads carrying 50,000 vehicles per day.
- 1,000 feet of a distribution center (that accommodates more than 100 trucks a day, more than 40 trucks with operating transport refrigeration units (TRUs) a day, or where TRU operation exceeds 300 hours per week).
- 300 feet of any dry cleaning operation that uses toxic chemicals. For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult your local air district.
- 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons or more per year).

COS-I-42 Conforming to the SJVAPCD Fugitive Dust Rule, require developers to use best management practices (BMPs) to reduce particulate emission as a condition of approval for subdivision maps, site plans and all grading permits. BMPs include:

- During clearing, grading, earth-moving or excavation operations, fugitive dust emissions shall be controlled by regular watering, paving of construction roads, or other dust-preventive measures;
- All materials excavated or graded shall be either sufficiently watered or covered by canvas or plastic sheeting to prevent excessive amounts of dust;
- All materials transported off-site shall be either sufficiently watered or covered by canvas or plastic sheeting to prevent excessive amounts of dust;
- All motorized vehicles shall have their tires watered before exiting a construction site;
- The area disturbed by demolition, clearing, grading, earth-moving, or excavation shall be minimized at all times; and
- All construction-related equipment shall be maintained in good working order to reduce exhaust.

COS-I-43 Enact a wood-burning ordinance compliant with District Rule 4901 that:

- Regulates the installation of EPA-certified wood heaters or approved wood-burning appliances in new developments or replacements;
- Lists permitted and prohibited fuels; and
- Describes a "No Burn" policy on days when the air quality is poor.

COS-I-44 Seek grant funding for a "change-out" program to help homeowners replace old word-burning fireplaces with EPA-certified wood-burning appliances.

Smoke released from fireplaces and wood stoves contains carbon monoxide, nitrogen dioxide, volatile organic compounds, and inhalable particulate matter (PM-10). The changeout programs have been successful in areas of the State where emissions from wood-burning fireplaces cause significant air pollution. Many grant programs offer cash rebates to encourage replacement of old wood-burning appliances with more efficient ones.

COS-I-45 Utilize more plants and trees in public area landscaping, focusing on those that are documented as more efficient pollutant absorbers.

COS-I-46 Establish a Clean Air Awards Program to acknowledge outstanding effort and to educate the public about the linkages between land use, transportation and air quality.

COS-I-47 Coordinate air quality planning efforts and CEQA review of discretionary projects with potential for causing adverse air quality impacts with other local, regional and State agencies.

The City will work with the San Joaquin Valley Air Pollution Control District on parallel initiatives for air quality, so programs are complementary and uniform wherever possible.

COS-I-48 Educate employees and department managers about sustainability with a focus on specific operational changes that can be made to reduce greenhouse gas emissions, such as fuel efficient driving and reducing energy use at work.

COS-I-49 Require tenants of all new development within one mile of industrial land uses to record odor easements attesting to the presence of nearby industry and acknowledging the right of said industry to emit odors that are not a threat to human health.

For vehicle trip reduction policies please see *Chapter 4: Circulation*.

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