Tulare County General Plan Update

Background Report

Tulare County General Plan















February 2010

Addendum

Housing Element

Correction to All General Plan 2030 Update Documents

The Housing Element is subject to specific State statutory requirements for periodic updates. To meet mandated State timelines, the Tulare County Housing Element was prepared and adopted on a separate schedule. A new Tulare County Housing Element was formally adopted by the Board of Supervisors on March 23, 2010. All references in the February 2010 proposed General Plan 2030 Update, Notice of Availability, Recirculated Draft Environmental Impact Report and Background Report to the Tulare County Housing Element or the 2003 Tulare County Housing Element shall by this notice be deemed to refer to the 2010 Tulare County Housing Element, adopted March 23, 2010. A copy is available from the Tulare County Resources Management Agency and is available on the Internet at http://generalplan.co.tulare.ca.us/.

TULARE COUNTY GENERAL PLAN 2030 UPDATE

2010 Background Report

Prepared for

February 2010

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1. INTRODUCTION

1.1 What is a General Plan?

Every city and county in California is required by California Government Code Sections 65100 through 65763 to prepare and maintain a planning document called a general plan. A general plan is designed to serve as the jurisdiction's "constitution" or "blueprint", and guides elected and appointed officials in land use, public infrastructure and services, and resource conservation decisions. All specific plans, subdivisions, public works projects, and zoning decisions must be consistent with the general plan.

The Tulare County General Plan Update and the update process serve several important purposes:

- Create opportunities for meaningful public participation in the planning and decision-making process.
- Describe current conditions and trends impacting the county.
- Identify planning issues, opportunities, and challenges that should be addressed through the General Plan.
- Explore and evaluate the implications of land use and policy alternatives.
- Ensure that the General Plan is current, internally consistent, and easy to use.
- Provide guidance in the planning and evaluation of future land and resource decisions.
- Serve as a vision and framework for the coordinated future growth in Tulare County.

A general plan typically has three defining features:

General. As the name implies, the general plan provides broad, flexible guidance that will be used to make informed future land use and resource decisions in Tulare County.

Comprehensive. A general plan addresses a wide range of social, economic, infrastructure, and natural resource issues. These include land use, housing, circulation, utilities, public services, recreation, agriculture, biological resources, and many other interrelated topics. The topic areas addressed in the Tulare County General Plan area are listed under Section 1.5.

Long-Range. General plans provide guidance to reach an envisioned future. To successfully achieve its vision, the general plan must include policies and actions that address immediate, mid- and long-term needs.

1.2 Project Overview

The proposed Tulare County General Plan 2030 Update establishes a planning framework and policies for the planning period to 2030 and is considered a comprehensive update of the County of Tulare's (County) current General Plan. The General Plan Update will provide for the continuation of many existing policies, modifications of others, and the addition of new policies. The General Plan Update project documents consist of the General Plan Update document (consisting of three parts: Part I: the Goals & Policies Report, Part II: the Area Plans, and Part III: the Community and other Plans [the plans in Part III will not be changed as part of this update, except for Dinuba (revised by this update to include the Dinuba Golf Course) and Pixley (revised by this update to include Harmon Field)]), the Environmental Impact Report, and the General Plan 2010 Background Report.

1.3 Regional Setting

Tulare County (Figure 1-1, Regional Location) is located in a geographically diverse region with the majestic peaks of the Sierra Nevada framing its eastern region, while its western portion includes the San Joaquin valley floor, which is very fertile and extensively cultivated. Tulare County is the second-leading agricultural-producing county in the U.S. Fresno County is currently (2004) the top producer. In addition to its agricultural production, the county's economic base also includes agricultural packing and shipping operations. Small and medium size manufacturing plants are located in the western part of the county and are increasing in number. Tulare County contains portions of Sequoia National Forest, Sequoia National Monument, Inyo National Forest, and Kings Canyon National Park. Sequoia National Park is entirely contained within the county.

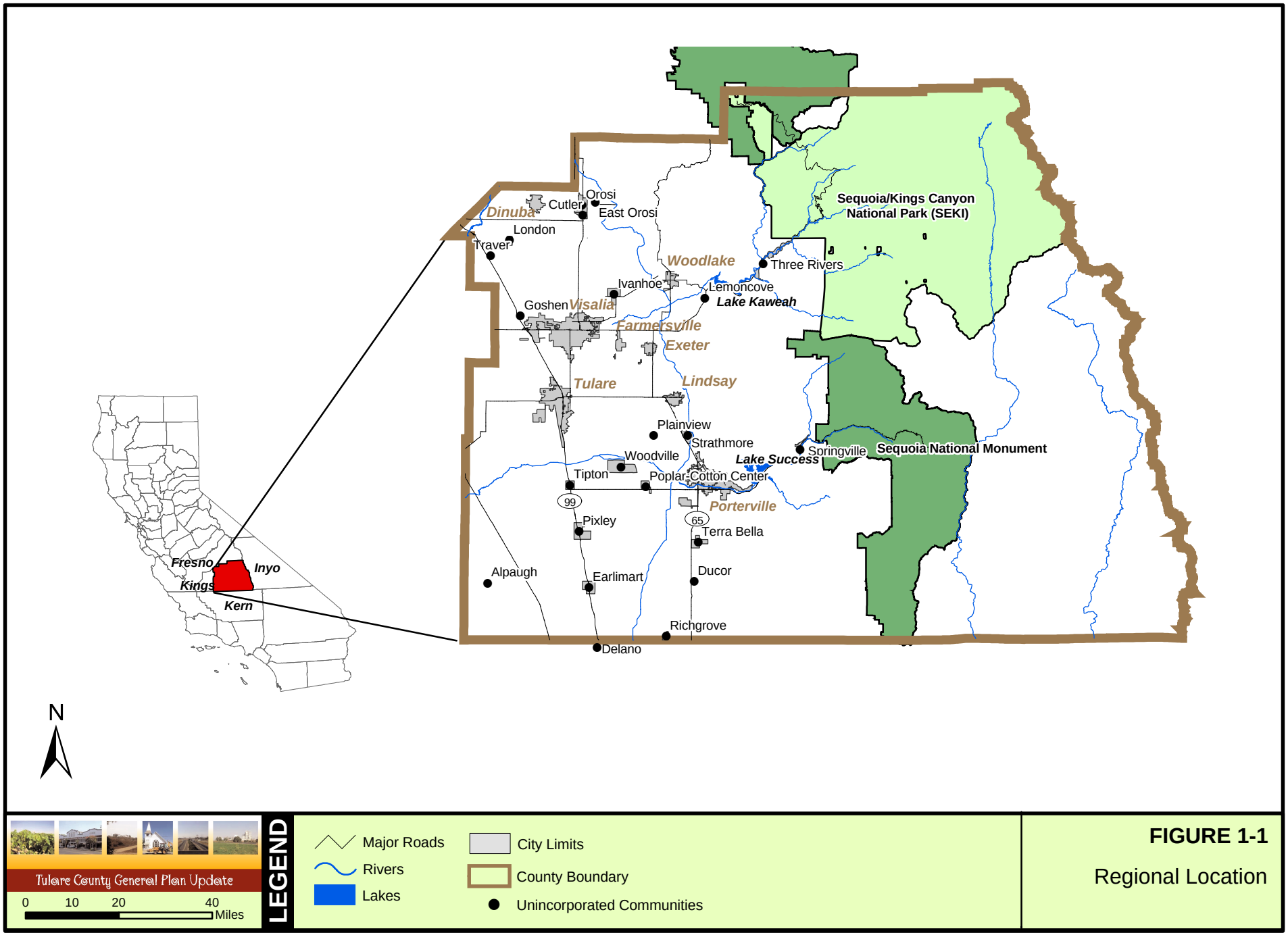


FIGURE 1-1

Regional Location

Tulare County contains more than 4,840 square miles (3,097,600 acres) within its' borders and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and a mountain region just east of the foothills. The eastern half of the county is generally comprised of public lands, which include not only the parks listed above, but also the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. The county also contains one state park and one wildlife refuge. Colonel Allensworth State Park, located in the southwestern corner of the county, provides picnic and camping areas. The Pixley National Wildlife Refuge provides habitat for the endangered blunt-nosed leopard lizard, the San Joaquin kit fox, the Tipton Kangaroo rat, as well as a wintering area for migratory waterfowl.

The main transportation network in the county includes State Route 99, which is the main north-south highway in the county, and State Routes 63, 65, 190, and 198, which connect the major cities and public lands in the county. The major cities of Tulare County include Visalia (pop. 96,750), Tulare (pop. 41,811), Porterville (pop. 37,619), Dinuba (pop. 15,678), and Lindsay (pop. 9,054). The county also contains the Tule River Indian Reservation (California Department of Finance, 2003).

1.4 County Boundaries

The County of Tulare is neighbored by Fresno County to the north and Kern County to the south. Kings County is located on the west side of Tulare County while Inyo County borders the county to the east. The crest of the Sierras forms the boundary with Inyo County. The northern border of Tulare County is an irregular line that passes just south of the City of Reedley and State Route 180. The southern border is a consistent east-west trending line, comprising the south standard parallel south of Mount Diablo, located north of the City of Delano. The western border generally trends north-south in a straight-line north and south just east of Corcoran. Along the eastern border is Inyo County.

1.5 Organization and Purpose of the Background Report

This report is organized into twelve chapters, as follows:

Chapter 1., Introduction. This chapter provides an overview of the Background Report with a description of how to use the General Plan documents and a brief overview of Tulare County's regional setting**.**

Chapter 2., Market Conditions and Demographics. This chapter addresses countywide market trends and current demographic characteristics.

- Countywide Trends (Section 2.2);
- Economic Character of Unincorporated Areas (Section 2.3);
- Trends in Industry Growth and Concentration (Section 2.4); and
- Demographic Characteristics (Section 2.5).

Chapter 3., Land Use and Population. This chapter addresses land use and population and how these two components affect Tulare County.

- Summary of Existing Plans (Section 3.2);
- Redevelopment Plans (Section 3.3);
- Existing Land Use (Section 3.4);
- Existing Zoning Summary (Section 3.5);
- City General Plans (Section 3.6);
- Spheres of Influence (Section 3.7);
- Surrounding County and City General Plans (Section 3.8);
- Regional Plans and Policies (Section 3.9); and
- Federal and State Plans and Policies (Section 3.10).

Chapter 4., Agriculture, Recreation, and Open Space. This chapter focuses on recreation and agricultural lands with in the study area and identifies open space areas.

- Recreation and Open Space (Section 4.2); and
- Agricultural Resources (Section 4.3).

Chapter 5., Transportation and Circulation. Included in this chapter is a discussion of existing circulation conditions and regulations. This chapter includes discussions on streets and highways, public transportation, bicycles and pedestrian systems, and freight transportation systems.

- Streets and Highways (Section 5.2);
- Funding (Section 5.3);
- Capital Road Improvements (Section 5.4);

- Road System Condition (Section 5.5);
- Air Quality (Section 5.6);
- Transportation System Management/Transportation Demand Management (Section 5.7);
- Rail Transportation (Section 5.8);
- Aviation System (Section 5.9);
- Goods Movement (Section 5.10);
- Public Transportation (Section 5.11);
- Non-Motorized Systems (Section 5.12);
- Commute Modes of Transportation (Section 5.13); and
- Major Trip Attractors (Section 5.14).

Chapter 6., Air Quality and Climate Change. Discussed in this chapter are the existing air quality conditions, state and federal regulations, documented sources of pollutants and a review of control measures.

- Air Quality (Section 6.2); and
- Climate Change (Section 6.3).

Chapter 7., Public Services and Utilities. This chapter presents the county's existing utilities, public facilities and public services as well as future needs in these areas.

- Domestic Water Supply (Section 7.2);
- Wastewater (Section 7.3);
- Stormwater Drainage (Domestic Water and Sanitary Sewer) (Section 7.4);
- Solid and Hazardous Waste (Section 7.5);
- Natural Gas and Electric Service (Section 7.6);
- Law Enforcement (Section 7.7);
- Fire Protection (Section 7.8);
- Schools (Section 7.9);
- Communications (Section 7.10);
- Court Services (Section 7.11);
- Library Services (Section 7.12);

- Hospital and Ambulance Services (Section 7.13); and
- Social Services (Section 7.14).

Chapter 8., Safety. This chapter addresses natural and human made hazards in Tulare County.

- Geologic and Seismic Hazards (Section 8.2);
- Flood Hazards (Section 8.3);
- Fire Hazards (Section 8.4);
- Human-Made Hazards (Section 8.5);
- Noise (Section 8.6); and
- Climate Change (Section 8.7).

Chapter 9., Biological, Archaeological and Historical Resources. This chapter identifies biological, archaeological, and historical resources in the study area.

- Biological Resources (Section 9.2); and
- Archaeological and Historical Resources (Section 9.3).

Chapter 10., Natural Resources. This chapter covers water supply and mineral resources in Tulare County.

- Water Resources (Section 10.2);
- Mineral and Petroleum Resources (Section 10.3);
- Oil and Gas Resources (Section 10.4); and
- Timber Resources (Section 10.5).

Chapter 11., Scenic Landscapes. This chapter identifies major visual areas and provides descriptions and photographs.

- Organizing Features (Section 11.2);
- Scenic Corridors and Places (Section 11.3);
- Urban Structure (Section 11.4); and
- Visual Implications of Environmental Issues (Section 11.5).

Chapter 12., Bibliography. This chapter contains key references and personal communications used to prepare this document.

- References (Section 12.2); and
- Personal Communications (Section 12.3).

2. MARKET CONDITIONS AND DEMOGRAPHICS

2.1 Introduction

This chapter analyzes trends affecting the economic base and local support industries in Tulare County. It also highlights the key economic characteristics of each of the major unincorporated communities, analyzes industry trends, and provides an overview of county demographics.

This chapter is divided into the following four sections.

- Countywide Trends (Section 2.2);
- Economic Character of the Unincorporated Areas (Section 2.3);
- Trends in Industry Growth and Concentration (Section 2.4); and
- Demographic Characteristics (Section 2.5).

2.2 Countywide Trends

Introduction

Economic base industries are the drivers of local and regional economies. Industries in the economic base draw income into a local economy by selling products or services outside of the local economy, much like the export industries of a national economy. Accrued earnings then circulate throughout the local area in the forms of: wages and salaries; investments; purchase of fixed assets; and goods and services. In turn, these earnings generate more jobs and wealth. For Tulare County, the economic base consists of agriculture and agricultural-related manufacturing.

In addition to the economic base industries, there are also local support industries, such as retail, the progress of which is a function of the economic base and demographic changes. In the same way that retail, services, and transportation support and depend on economic base industries, major industry divisions that comprise the base likewise depend on each other. For example, milk collected from cows on farms within the agricultural division, is processed and packaged by dairy products food processors within the manufacturing division, such as milk pasteurizers, makers of cheese, ice cream, and yogurt.

Economic opportunities in the unincorporated area of the County are affected by overall industry growth and decline throughout the County. This chapter highlights recent job growth trends by major industry category, providing a framework for evaluation of more detailed business development opportunities.

Methods

This chapter relies on employment trend data published by the State of California Employment Development Department Labor Market Information Division (EDD-LMID). This data measures jobs reported by employers to the state Unemployment Insurance Program. The job counts include most wage and salary employment but may not include the proprietors themselves or other self employed individuals. Also, the data published by EDD is provided at a general level of industry detail. Some of the tables use more detailed data supplied by the Minnesota IMPLAN Group, which receives employment data directly from the Federal Department of Labor.

Key Terms

- **Economic Base.** The portion of the local economy that primarily sells its goods and services to customers outside the county or local region. These industries draw income into the county that is then recirculated in local-serving ("Non-Basic") businesses such as retail and service establishments.
- **Labor Force.** Persons that are either employed or are actively seeking work.

Regulatory Setting

There is no applicable regulatory setting for this section.

Existing Conditions

Agriculture comprises the majority of Tulare County's economic base. As Tables 2-1 and 2-2 show, 29 percent of all jobs in the county are in agriculture, compared to 21 percent of the three-county region consisting of Tulare, Kings, and Kern counties. Three percent of all jobs in the state and 29 percent of jobs in Tulare County were related to agriculture in 2002, as Table 2-2 (Employment by Sector, Tulare County, Region and California 2000 – 2002) shows. In absolute terms, the number of agriculture jobs in Tulare County increased by 0.4 percent per year between 1995 and 2000 (see Table 2-1). In the region and state, agricultural jobs decreased by one percent per year over the same time period.

Agriculture continues to be the sector with the greatest number of workers in Tulare County. In 2002, 29 percent of all jobs were in this sector, as Table 2-2 shows. Since 2000, employment in agriculture had increased by two percent per year in Tulare County. Given the significance of the dairy industry in Tulare County, countywide employment growth in agriculture as a whole is possibly linked to increased marketing by the Milk Advisory Board, whose advertising campaigns have promoted Tulare and other California counties' dairy industries through award-winning advertisements touting "Got Milk" and "Happy Cows." In the region and state, agriculture declined by two percent and one percent per year, respectively.

Manufacturing is another important sector in the county. This sector employed 11,700 workers or eight percent of the total jobs in 2002 as Table 2-2 shows. At the state level, manufacturing accounts for a larger share of total jobs, at 12 percent, whereas for the three county comparison region, manufacturing jobs captured only six percent of all jobs in the year 2002.

While agriculture and manufacturing, particularly food processing, are vital to Tulare County's economy, economic sectors whose fortunes are intimately tied to population growth experienced the most rapid growth. Industries in these sectors are known as "local support industries." As Table 2-2 shows, fastest growing sectors since 2000 have been finance-insurance-real estate, construction, and government. These industries in Tulare County grew annually by 7 percent, 5 percent, and 3 percent respectively between 2000 and 2002. As population increases in the Central Valley, "local support industries" such as real estate sell more homes, spurring more jobs in other population-dependent industries such as construction. Government is another "local support sector" and, as Table 2-2 shows, employment in this sector increased by three percent per year between 2000 and 2002, a rate of growth that was slightly less than the four percent annual rate of growth between 1995 and 2000.

Not all "local support industries" grew as fast as finance-insurance-real estate, construction or government. Service and retail are other sectors that are also referred to as "local-support industries," and these sectors grew annually by two percent and one percent between 2000 and 2002, as Table 2-2 shows.

As a proportion of total employment in 2002, the service sector comprised of 14 percent of all jobs in the county. This sector is evenly distributed between business services, health services, and social services-membership organizations, which comprise 25 percent, 24 percent and 20 percent of the service sector. In addition to these service industries, there is "other services," which is a catch-all term employed

by the California EDD for a wide variety of service industries with small employment numbers. Twenty-four percent of all service sector jobs in Tulare County in 2002 are in "other services." The remaining service industries comprise of amusement-recreation and hotel-lodgings, which comprised of four percent and three percent of all service sector jobs in the county. In term of employment growth between 2000 and 2002, social services-membership organization and amusement-recreation grew the fastest, growing annually by eight and seven percent respectively. Employment in health services increased by three percent per year, while hotel-lodgings experienced zero growth. Employment in business services industries declined by two percent per year between 2000 and 2002, going from 5,200 to 5,000 jobs.

Table 2-3 identifies key industries within the agricultural sector. Forty-five percent of all agricultural jobs in Tulare County, or 18,166 workers, were in crop-producing industries in the year 2000. Employment in agricultural production increased by two percent annually between 1995 and 2000. In contrast, employment in crop and livestock production industries declined in the Region and State, by 0.2 percent per year and three percent per year respectively.

Table 2-4 shows that between 2000 and 2002, agricultural production related jobs continued to increase in the County, growing by seven percent per year between 2000 and 2002. Agricultural service related jobs in the County decreased significantly at three percent annually. The Region experienced a significant increase (six percent per year) in agricultural production jobs, although employment in service jobs increased slightly by one percent per year in the short period between 2000 and 2002.

One noteworthy agricultural industry in Tulare County was timber. In the year 2002, timber production in the county amounted to 7,225 million board feet (MBF) of timber, the aggregate value of which was $1.1 million, according the California's State Board of Equalization. During 2002, timber production increased by 15 percent per year, whereas in the state as a whole, timber production declined by seven percent per year during 2002. From the vantage point of 1995, timber production in Tulare County actually decreased by five percent annually, going from 10,572 MBF in 1995 to 7,225 MBF in 2002. In the state, timber production declined by four percent per year over that period. In terms of employment, the forestry industry within the agricultural sector employed approximately 81 workers in 2002, an increase of 11 workers over the year 2000 figure of 70 workers. In 1995, this industry employed 119 workers.

Table 2-1. Employment By Sector, Tulare County, Region and California 1995 – 2000

	Tulare County				Region				California			
	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00
Construction and Mining	3,700	5,000	4%	6%	24,010	25,980	6%	2%	515,400	750,400	5%	8%
Government	23,600	28,300	20%	4%	79,720	92,320	23%	3%	2,107,000	2,318,100	4%	2%
Transportation	3,100	3,600	3%	3%	9,520	12,250	3%	5%	400,100	469,900	3%	3%
Services	17,100	19,600	14%	3%	61,960	73,820	18%	4%	3,728,500	4,612,900	31%	4%
Finance Insurance and Real Estate	3,400	3,700	3%	2%	9,940	11,730	3%	3%	731,900	819,900	5%	2%
Wholesale	4,400	4,700	3%	1%	12,990	13,620	3%	1%	724,500	818,200	5%	2%
Retail	19,200	20,000	14%	1%	58,250	61,970	15%	1%	2,190,600	2,477,400	16%	2%
Agriculture (est.)	39,814	40,641	29%	0.4%	93,915	87,715	21%	-1%	562,825	540,816	4%	-1%
Manufacturing	12,200	12,300	9%	0.2%	25,030	26,200	6%	1%	1,794,200	1,947,800	13%	2%
Communication and Public Utilities	1,100	1,100	1%	0%	4,730	4,560	1%	-1%	230,100	273,700	2%	4%
Total	**127,614**	**138,941**	**100%**	**2%**	**380,065**	**410,165**	**100%**	**2%**	**12,985,125**	**15,029,116**	**89%**	**3%**

Source: Applied Development Economics, based on California EDD/Agricultural employment estimates: Applied Development Economics, based on US Agricultural Census, 1992, 1997 and 2002.

Table 2-2. Employment By Sector, Tulare County, Region and California 2000 - 2002

	Tulare County				Region				California			
	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02
Finance Insurance and Real Estate	3,700	4,200	3%	7%	11,730	12,630	3%	4%	819,900	850,700	6%	2%
Construction and Mining	5,000	5,500	4%	5%	25,980	27,660	7%	3%	750,400	770,100	5%	1%
Government	28,300	30,300	21%	3%	92,320	102,540	24%	5%	2,318,100	2,499,000	16%	4%
Agriculture (est.)	40,641	42,190	29%	2%	87,715	83,980	20%	-2%	540,816	535,256	3%	-1%
Services	19,600	20,300	14%	2%	73,820	77,350	18%	2%	4,612,900	4,687,100	31%	1%
Retail	20,000	20,400	14%	1%	61,970	64,900	15%	2%	2,477,400	2,653,200	17%	3%
Wholesale	4,700	4,700	3%	0%	13,620	13,660	3%	0.1%	818,200	806,500	5%	-1%
Communication and Public Utilities	1,100	1,100	1%	0%	4,560	4,530	1%	-0.3%	273,700	270,500	2%	-1%
Manufacturing	12,200	11,700	8%	-2%	26,110	26,160	6%	0.1%	1,947,800	1,779,000	12%	-4%
Transportation	3,600	3,400	2%	-3%	12,250	11,520	3%	-3%	469,900	441,700	3%	-3%
Total	**138,841**	**143,790**	**100%**	**2%**	**410,075**	**424,930**	**100%**	**1.8%**	**15,029,116**	**15,293,056**	**100%**	**1%**

Source: Applied Development Economics, based on California EDD/Agricultural employment estimates: Applied Development Economics, based on US Agricultural Census, 1992, 1997 and 2002

Table 2-3. Employment in Agriculture, Tulare County, Region and California 1995 - 2000

	Tulare County				Region				California			
	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00
Agriculture (est.)	39,814	40,641	100%	0.4%	93,915	87,715	100%	-1%	562,825	540,816	100%	-1%
Production (est.)	16,569	18,166	45%	2%	38,170	37,720	43%	-0.2%	344,174	302,645	56%	-3%
Services (est.)	23,246	22,475	55%	-1%	54,832	49,995	57%	-2%	218,650	238,171	44%	2%

Source: Applied Development Economics, based on California EDD

Note: Agricultural Services sector encompasses a wide array of services sold to farm-oriented enterprises and to non-farm final consumers. These farm-oriented services are essentially intermediate activities, providing inputs for agricultural production.

Table 2-4. Employment in Agriculture, Tulare County, Region and California 2000 – 2002

	Tulare County				Region				California			
	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02
Agriculture (est.)	40,641	42,190	100%	2%	87,715	83,980	100%	-2%	540,816	535,256	100%	-1%
Production (est.)	18,166	20,941	45%	7%	37,720	33,480	43%	-6%	302,645	305,013	56%	0.4%
Services (est.)	22,475	21,249	55%	-3%	49,995	50,500	57%	1%	238,171	230,243	44%	-2%

Source: Applied Development Economics, based on California EDD

Table 2-5 distributes manufacturing employment by a select number of industries at the two-digit SIC level categories. Of the 12,194 manufacturing jobs in the year 2000, 34 percent were in food processing (SIC 20). Similar to Tulare County, food-processing industries are equally important to the three-county region encompassing 29 percent of all manufacturing jobs. However, the food processing industry experienced a loss of jobs between 1995 and 2000, declining by one percent per year in Tulare County. In the Region, employment in food processing declined by 0.1 percent per year between 1995 and 2000. As discussed later in this section of the report (see Table 2-7), food processing as a whole declined in Tulare County largely because of the declining fortune of the meat products manufacturers (SIC 201), bakery products manufacturers (SIC 205), beverage manufacturers (SIC 208) and miscellaneous manufacturers (SIC 209). Any number of reasons could possibly explain the decline of these food processing industries, from changing diets, to increased productivity through greater reliance on labor-saving technology, and to global competition, in which local food processing manufacturers must compete in domestic and foreign markets with cheaper products from abroad.

Table 2-5 also ranks industries by employment growth, with industries experiencing the greatest growth between 1995 and 2000 at the top of the list. Rubber and miscellaneous plastics (SIC 30) experienced the greatest annual growth in the late 1990s, growing by 15 percent per year between 1995 and 2000. After rubber and miscellaneous plastics, fabricated metal products (SIC 34) and instruments and related Products (SIC 38) grew the next fastest in Tulare County, by eight and six percent per year.

In addition to analyzing trends in food processing (SIC 20), it is worth noting trends in the sub-sector of manufacturing industries called durable goods producers. Employment in durable good manufacturing increased by only 0.5 percent per year in Tulare County during the late 1990s, a growth rate that lagged behind that of the region and the state, as shown in Table 2-5. Typically, durable goods producers require high skills, pay the highest wages, and provide higher quality benefits. More importantly, they maintain a wide network of relations with various buyers and suppliers, the transactions of which allow money to be recirculated in the county and region through numerous transactions. Thus, durable goods production is an indication of the maturity of the manufacturing sector.

Between 2000 and 2002, employment in durable goods manufacturing declined by six percent per year, as shown in Table 2-6. Table 2-6 also shows that the other important component to manufacturing – food processing – declined annually by two percent between 2000 and 2002.

Table 2-7 identifies a select mix of food processing industries. Thirty-four percent of all manufacturing jobs are in food processing, which is by far the largest industry within the manufacturing sector. Because food processing is a main economic engine of Tulare County, it is important to understand the products that are produced. Seventy-one percent of Tulare County's food processing is comprised of dairy products (SIC 202) and preserved fruits and vegetables (SIC 203) manufacturing. In other words, of the 4,138 jobs in food processing, 1,390 are in dairy products manufacturing and 1,522 are in preserved fruits and vegetables. Overall, employment in food processing declined by one percent per year between 1995 and 2000. Grain mills (SIC 204) experienced substantial increases in employment while preserved fruits and vegetables grew marginally in the late 1990s. For the three-county region, the bulk of food processing is in preserved fruits (SIC 203) and dairy products (SIC 202) sectors, which increased significantly in the late 1990s.

Tulare County has significant tourism and visitor-serving business opportunities, with gateways to the Sequoia and Kings Canyon National Parks, as well as other destinations in the southern Sierra region. Tables 2-8 and 2-9 below identify trends in the county's tourism and visitor-serving industries. Since 2000, employment in these industries has increased by four percent per year, a rate of growth that is significantly better than that of the State as a whole. As shown in Tables 2-8 and 2-9, Tulare County consistently captured the bulk of employment in tourism and visitor-serving industries in the three-county region from 1995 through 2002.

Table 2-5. Manufacturing Employment By Sector, Tulare County, Region and California, 1995 - 2000

	Tulare County				Region				California			
	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00
Manufacturing	12,200	12,300	100%	0.2%	25,030	26,200	100%	1%	1,794,200	1,947,800	100%	2%
Durable	4,400	4,500	37%	0.5%	9,820	10,530	40%	1%	1,089,600	1,222,600	63%	2%
Non-Durable	7,800	7,800	63%	0.0%	15,210	15,670	60%	1%	704,600	725,200	37%	1%
Other non-durable manufacturing	3,506	3,700	30%	1%	7,543	8,035	31%	1%	532,214	538,887	28%	0.2%
Food and kindred products	4,294	4,100	33%	-1%	7,667	7,635	29%	0%	172,386	186,313	10%	2%
Select Manufacturing Industries												
30 Rubber and misc. plastics products	263	535	4%	15%	1,534	1,968	8%	5%	71,987	74,092	4%	1%
34 Fabricated metal products	589	871	7%	8%	1,223	1,693	6%	7%	115,277	130,935	7%	3%
38 Instruments and related products	168	220	2%	6%	504	771	3%	9%	166,853	177,420	9%	1%
26 Paper and allied products	607	736	6%	4%	805	900	3%	2%	39,272	38,380	2%	-0.5%
36 Electronic & other electric equipment	495	555	5%	2%	590	695	3%	3%	223,336	274,807	14%	4%
35 Industrial machinery and equipment	985	1,055	9%	1%	2,168	2,545	10%	3%	195,578	228,341	12%	3%
32 Stone, clay, and glass products	277	275	2%	-0.1%	1,541	1,672	6%	2%	44,350	49,815	3%	2%
20 Food and kindred products	4,294	4,100	34%	-1%	7,667	7,635	29%	-0.1%	172,386	186,313	10%	2%
24 Lumber and wood products	936	893	7%	-1%	1,261	1,165	4%	-2%	50,000	61,622	3%	4%
27 Printing and publishing	1,959	1,807	15%	-2%	2,921	2,659	10%	-2%	148,271	149,023	8%	0.1%
28 Chemicals and allied products	141	118	1%	-3%	612	246	1%	-17%	69,671	81,935	4%	3%
37 Transportation equipment	203	164	1%	-4%	1,494	1,498	6%	0.1%	164,263	152,105	8%	-2%
33 Primary metal industries	678	509	4%	-6%	727	563	2%	-5%	33,190	35,843	2%	2%
23 Apparel and other textile products	351	190	2%	-12%	458	212	1%	-14%	149,181	138,166	7%	-2%

Source: Applied Development Economics, based on California EDD and IMPLAN

Table 2-6. Manufacturing Employment By Sector, Tulare County, Region and California, 2000 - 2002

	Tulare County				Region				California			
	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02
Manufacturing	12,300	11,700	100%	-2%	26,200	26,160	100%	-0.1%	1,947,800	1,779,000	100%	-4%
Non-Durable	7,800	7,700	63%	-1%	15,670	15,880	60%	1%	725,200	676,300	37%	-3%
Other non-durable manufacturing	3,700	3,800	30%	1%	7,220	6,930	28%	-2%	539,700	500,800	28%	-4%
Food and kindred products	4,100	3,900	33%	-2%	8,450	8,950	32%	3%	185,500	175,500	10%	-3%
Durable	4,500	4,000	37%	-6%	10,530	10,280	40%	-1%	1,222,600	1,102,700	63%	-5%

Source: Applied Development Economics, based on California EDD and IMPLAN

Table 2-7. Manufacturing Employment By Sector, Tulare County, Region and California, 1995 - 2000

		Tulare County				Region				California			
		Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00
Manufacturing		12,200	12,300	100%	0.2%	25,030	26,200	100%	1%	1,794,200	1,947,800	100%	2%
Select Food Processing Industries													
20	Food and kindred products	4,294	4,138	34%	-1%	7,667	7,635	29%	-0.1%	172,386	186,313	10%	2%
204	Grain mill products	124	298	2%	19%	297	607	2%	15%	8,315	9,273	0.5%	2%
203	Preserved fruits and vegetables	1,313	1,522	12%	3%	2,051	2,555	10%	4%	47,133	42,699	2%	-2%
206	Sugar and confectionery products	324	356	3%	2%	418	452	2%	2%	11,239	11,263	1%	0%
202	Dairy products	1,505	1,390	11%	-2%	2,295	2,165	8%	-1%	14,455	16,138	1%	2%
209	Misc. food and kindred products	613	429	3%	-7%	1,262	1,020	4%	-4%	21,312	23,539	1%	2%
205	Bakery products	115	78	1%	-7%	214	161	1%	-6%	21,407	24,689	1%	3%

Source: Applied Development Economics, based on California EDD and IMPLAN

Table 2-8. Tourism and Visitor Serving Industries, Tulare County, Region and California, 1995 - 2000

	Tulare County				Region				California			
	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00	Employment 1995	Employment 2000	Distribution 2000	Annual Change 95 - 00
Tourism and Visitor-Serving Industries	1,400	1,300	100%	-1%	1,500	1,420	100%	-1%	359,600	408,100	100%	3%
Hotels & Other Lodging Places	700	600	46%	-3%	800	720	51%	-2%	178,700	197,200	48%	2%
Amusement & Recreation Serv.	700	700	54%	0%	700	700	49%	0%	180,900	210,900	52%	3%

Source: Applied Development Economics, based on California EDD

Table 2-9. Tourism and Visitor Serving Industries, Tulare County, Region and California, 2000 - 2002

	Tulare County				Region				California			
	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02	Employment 2000	Employment 2002	Distribution 2002	Annual Change 00 - 02
Tourism and Visitor-Serving Industries	1,300	1,400	100%	4%	1,420	1,550	100%	4%	408,100	406,600	100%	-0.2%
Hotels & Other Lodging Places	600	600	43%	0%	720	750	48%	2%	197,200	191,700	47%	-1%
Amusement & Recreation Serv.	700	800	57%	7%	700	800	52%	7%	210,900	214,900	53%	1%

Source: Applied Development Economics, based on California EDD

2.3 Economic Character Of The Unincorporated Areas

Introduction

This section describes key features of selected unincorporated communities in Tulare County. It is intended to provide a context for future consideration of appropriate economic development opportunities in each area.

Methods

The information in this section is based on site visits and discussions with County staff.

Key Terms

- **Comprehensive Economic Development Strategy (CEDS).** This document is prepared for the entire county including the cities and the unincorporated area for purposes of outlining the economic development plans of each jurisdiction and identifying major infrastructure projects that are needed to stimulate or support economic development. The U.S. Economic Development Administration views the CEDS as a statement of local priorities when considering applications for funding for the identified projects.

- **Redevelopment Project Area (RDA).** Under state law, the county may identify and establish areas deemed to be "blighted" and in need of economic assistance. Within these areas, a portion of the property tax growth (Tax Increment Financing) each year may be retained to fund projects that benefit the area, including infrastructure projects, affordable housing and other forms of economic incentives to development.

Regulatory Setting

There is no regulatory setting for this section.

Existing Conditions

The unincorporated valley floor supports most of the agricultural production in the county. Additionally, significant tourism and recreation opportunities exist in the foothills and higher elevations of the Sierra Nevada Mountains. TCAG lists 21 unincorporated communities in its 2003 Tulare County Data Book. Many of the communities located on the valley floor feature a major processing plant that serves surrounding food and fiber growing areas. Several communities in the foothills offer recreation attractions, lodging and other visitor-serving businesses.

The southern and western parts of Tulare County are dominated by alfalfa, cotton, dairy production operations and milk processing facilities. The northern and eastern portions of the county, located below the elevated foothills, are better suited for grapes and orchards (citrus, olives) production. The Friant Kern Canal transports irrigation water, supporting much of the valley agriculture in Tulare County.

The county has designated eight Redevelopment Project Areas, including Richgrove, Earlimart, Pixley, Goshen, Traver, Cutler-Orosi, Ivanhoe and Poplar-Cotton Center. Additional RDA project areas are under consideration for Terra Bella/Ducor, Strathmore, and Tipton. The County's Comprehensive Economic Development Strategy (CEDS) lists infrastructure improvements planned to support economic development for many of the County's redevelopment project areas. An excerpt from the CEDS can be found in Appendix A. A brief discussion of the current economic highlights of the larger unincorporated communities is provided below.

In addition, there are several small unincorporated valley communities in the county such as Strathmore, Woodville, and Alpaugh as well as a number of Foothill and Sierra communities such as California Hot Springs, Posey, and Camp Nelson. The populations of these communities range from a dozen or so to over 700 people (Alpaugh). These communities typically consist of a few square blocks of housing and one to a dozen retail establishments. Lemon Cove is discussed further below because it is currently affected by gravel mining operations nearby.

- **Cutler/Orosi.** Combined, Cutler and Orosi are the largest unincorporated communities, with a combined population of more than 12,000. These communities are located on State Route 63 and Avenue 416, in northern Tulare County. The county has sponsored efforts to plan

for more commercial development in these communities, which also features a designated industrial park.

- **Goshen and Traver.** Goshen and Traver are the two most visible communities for travelers along State Route 99 (SR 99) north of Visalia. Foster Farms chicken and cattle feed operation dominate the community of Traver, while Goshen has a more diverse employment base as Visalia continues to develop its industrial area west toward the community. Goshen's commercial district is divided along both sides of SR 99. Of all the redevelopment project areas, Goshen has the highest dollar volume of RDA projects underway, as outlined in the county's CEDS. Planning projects or issues that affect the community include the existing Visalia Airport land use plan, a proposed auto mall at the southwest corner of State Routes 99 and 198, Visalia's industrial park specific plan, the realignment of Betty Drive and its intersection for improved access to the Visalia industrial area, and residential growth on the west side of the town.

A 25 million gallon-per-day ethanol plant has been constructed (see the ethanol discussion under Pixley).

- **Lemon Cove.** This small roadside community is at the junction of State Routes 198 and 216, near the confluence of the Kaweah and St. John's Rivers. It is at the edge of Tulare County's heaviest sand and/gravel mining areas, operated by RMC Pacific Materials, Kaweah River Rock and Lemon Cove Granite. RMC pacific recently received approval to begin mining on a new property near SR 245 and Dry Creek Road. Kaweah River Rock and Lemon Cove Granite both have proposed expansions in the permitting stages.

- **Pixley.** In the last few years, there have been a number of proposals for ethanol plants in agricultural areas throughout California to take advantage of expected future demand for ethanol as a gasoline additive. Ethanol fermentation is also a good way to use large amounts of agricultural waste/ biomass such as corn and agriculture process wastewater while at the same time generating byproducts such as electricity and carbon dioxide that might be used by nearby operations. Ethanol plants

typically locate near large biomass sources and require significant rail and truck access.

One such plant has been permitted in Pixley at the Avenue 120 interchange of SR 99 (SW frontage road), an area that is not in the current RDA project area. Other plants have been constructed in Visalia and Goshen.

- **Springville.** Located on SR 190, a less-traveled southern access to the Sierras, Springville is an attractive community in the Lake Success recreation area. The Tule Indian Tribe is proposing to build a casino and hotel resort nearby on SR 190. The county is considering designating SR 190 as a scenic highway, and the U.S. Forest Service (USFS) has completed a marketing plan to enhance outdoor visitation to this portion of the Sierras. In 2004, the Sequoia Regional Visitors Council completed a draft marketing plan for visitation to this part of the Sierras. The marketing plan was funded by a grant that was received from the USFS.

- **Terra Bella.** Terra Bella has a log deck and sawmill owned by Sequoia Forest Industries, from which it receives its supply of lumber from the nearby Sierras. While the company has shut down operations elsewhere (including Soledad), this mill is planned to stay open indefinitely.

- **Three Rivers.** Three Rivers, located northwest of Lake Kaweah, serves as the gateway to Sequoia and Kings Canyon National Parks. The USFS has a marketing plan for visitation to these national parks. The same visitation marketing plan includes Three Rivers. Some businesses in this area have been negatively affected by recent roadwork. The USFS recently completed extensive roadway construction. Some visitor-serving businesses in this area have (and in some cases continue) been negatively affected by the rebuilding of SR 198 and have not yet recovered their diminished revenue caused by roadway construction and closure.

- **Tipton.** Located on State Route 99 and served by the Union Pacific Railroad (UPRR) line, Tipton features a long strip of undeveloped land along the tracks that is suitable for development by all types of industry. Sunkist

has a plant at the Avenue 144 interchange at the south end of town, and has discussed constructing a cogeneration plant as well. A community plan is under development as well as a proposed new redevelopment project area to be located downtown along the railroad tracks.

2.4 Trends in Industry Growth and Concentration

Introduction

The first part of the chapter identified sectors and industries that make up the economic base of the county. It identified rates of growth for base and local support industries. This section examines data in the context of developments in the county and the state to determine whether growth industries are growing as fast as, or in excess of, similar industries in the region or California. It analyzes whether particular growing industries are concentrated more in Tulare County than elsewhere. The analysis of discrete growth rates, relative growth rates, and levels of concentration, determines those industries in which the region maintains a comparative advantage, as well as those industries that are emerging or declining.

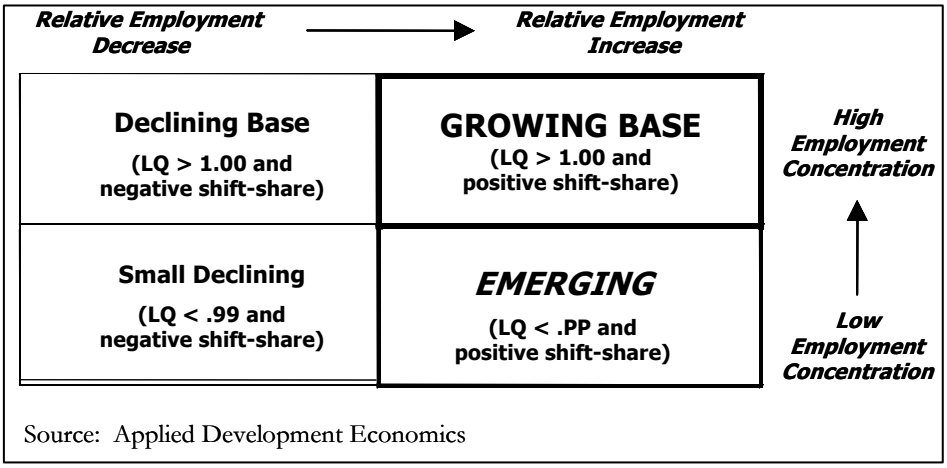
Methods

An important approach for determining employment concentration is called location quotient analysis. The location quotient for a specific industry is the ratio of the number of jobs in a specific industry in a specific place versus all jobs in the same place, compared with the number of jobs in the same specific industry for a larger area (such as the State of California) versus all jobs in the larger area. A location quotient of one ("1.0") means that an industry is distributed within the economy of an area in the same way that it is distributed in the comparison area's economy. Location quotients are also used as indicators of export and import activity. Differences in productivity at the level of establishment, regional labor needs, regional consumption patterns, and quality of products and services are factors that also influence whether an industry exports products and services. As a general rule of thumb, if the location quotient is between 0.80 and 1.25, it cannot be said for certain that an area is a net exporter or importer.

Determining whether specific growth industries are expanding as fast as or even more so than similar industries at higher geographic levels (such as the State of California) is another element to understanding an area's comparative advantage. An important approach for determining the

relative growth in employment is called the shift-share analysis.[1] The four-quadrant analysis combines findings from the shift-share and location quotient analyses for specific industries and, in doing so, is an important tool in identifying g*rowing base*, *declining base*, *emerging*, and *small declining* industries. Figure 2-1 provides a schematic of the four-quadrant analysis.

FIGURE 2-1
Four-Quadrant Analysis Schematic



Source: Applied Development Economics

The growing economic base includes those industries that generate positive growth rates and whose respective local concentration is greater than 1.00. Industries within this category merit the attention of policy makers and planners, as they are the source of regional wealth-creation and jobs. Moreover, growing economic base industries are those in which a county maintains a comparative economic advantage vis-à-vis other counties, regions or California. To be sure, comparative economic advantage results from a variety of local conditions including availability of specialized marketing organization, easy access to credit, transport facilities, a trained labor force, and the existence of complementary industries.

The emerging industry sectors are those that are growing in employment but whose local concentration is small compared to the share of the same industry sector in the regional or state economy. Industries within this category are often referred to as "infant industries." Those merit special attention given their potential to attract other complementary industries and businesses, create regional wealth, and expand the number of jobs.

[1] It is possible that specific product lines can report absolute positive growth between two points in time yet, at the same time, experience a negative shift-share. Textile mills (SIC 22) in a part of the Central Valley region - Kings County - increased by 36 percent, from 162 jobs in 1991 to 220 in 1999. At the same time, in the comparison area - the State of California - textile mills grew even faster, by 76 percent. Thus, Kings County's textile job growth lagged behind that for the region and, as a result, that county experienced a negative shift-share for SIC 22.

The declining economic base includes industries that have a high local concentration but have negative growth rates. These industries are somewhat concentrated in an area but, overall, they are not growing at comparable rates of similar industries in other places. It is possible that the unfavorable trend is due to industry-wide restructuring that eventually will strengthen the competitiveness of the affected firms and result in future growth. In any event, identifying the leading causes to negative growth rates is important.

The fourth category includes businesses that capture a small share in the local economy (location quotient less than one) and are declining in employment. This category is not the subject of an in-depth analysis because the types of businesses that comprise this category lack the necessary fundamentals for long-term viability and growth. Industry sectors in this category would normally be considered targets only as part of a strategy to increase the local creation of products or services now being imported to strengthen a local industry cluster.

Key Terms

- **Location Quotient (LQ).** A ratio that compares the percentage that an industry represents of total employment in the county to its percent statewide. A location quotient of one ("1.0") means that an industry exhibits the same concentration locally that exists statewide. If the LQ is more than 1.0, that industry is more prominent in the county than it is statewide. If the LQ is less than one, the reverse is true.
- **Shift Share.** Compares the rate of industry growth in the county to the rate of growth for the same industry statewide. If industries are growing more rapidly in the county than they are statewide, they are considered to have a competitive advantage locally.
- **Emerging Industries.** Industries that currently exhibit a low concentration in the county but are growing rapidly.

Regulatory Setting

Agriculture and other industries in Tulare County are affected by a wide set of local, regional, state, and international regulations governing trade and the flow of commodities. Internationally, commercial accords such as the North American Free Trade Agreement (NAFTA) and the proposed Free Trade Area of the Americas promise to expand the markets for California food products while, at the same time, opening

up US markets to commodities produced by NAFTA members, such as Mexico and Canada. Stakeholders from various Central Valley industries have voiced concerns about the impact of NAFTA with respect to over-supply of certain commodities, which, in turn could depress market prices received by industries such as growers of farm produce.

In California, Central Valley industries are also affected by state and regional regulations governing air quality, due to a confluence of circumstances ranging from the topography of the region, to the concentrated presence of diesel trucks along Highway 99 and Interstate 5, to agricultural practices that emit particulates into the air in quantities large enough to affect vision and health. For example, industries in the region are subject to the Federal Clean Air Act (1970 and amended twice thereafter), which established the framework for modern air pollution control.

The Clean Air Act directs the Environmental Protection Agency (EPA) to establish ambient air standards for various pollutants. In recent years, the federal EPA declared that the San Joaquin Valley region does not meet ambient air quality standards. Thus, local and regional officials, in partnership with private industry and the San Joaquin Valley Unified Air Pollution Control Board, are working with state officials in implementing what is known as a "state implementation plan" (SIP), which demonstrates how the region will meet federal air standards. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants.

In addition to meeting federal air quality standards, local and regional officials are also working to meet state regulations per the California Clean Air Act. The California Clean Air Act (CCAA) of 1988 establishes an air quality management process that generally parallels the federal process. The CCAA, however, focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

Another regulatory regime that affects the regional economy includes the California Air Resources Board (ARB). The ARB regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level.

Refer to Chapter 6.0, Air Quality and Climate Change for more detailed discussion on air quality regulations.

In addition to air quality regulations, the local and regional economies are affected by state regulations governing water quality, as well as by local regulations that can also influence economic development. The water quality impact of wastewater in the groundwater has received increased attention over the last several years. Municipal wastewater treatment systems, animal confinement facilities and other types of waste disposal are being modified to address the "No Net Degradation" policy for the groundwater basin established by the Regional Water Quality Control Board (RWQCB) has caused the development of stricter regulations for animal confinement facilities (dairies, poultry and beef feedlots, etc.). New regulations have been developed to reduce the level of restrictions and salts from such activities to attain the RWQCB policy. Additional examples of local regulations include policies on agricultural and other commercial industrial land uses, as well as open space areas, which can be found in city and county governments' respective general plans. Local regulations also include zoning, which stipulate rules regarding allowable and encouraged uses within specified areas.

Existing Conditions

Growing Base Findings

As discussed earlier, agriculture and food processing are critical to the three-county region. These industries comprise the economic base and, not surprisingly, are fixtures in the growing base quadrant of the four-quadrant analysis. Of the ten industries that employ the most people, five are in agriculture. Crop services (SIC 072), dairy farms (SIC 024), general farms (SIC 019), preserved fruits and vegetables (SIC 203) and horticultural services (SIC 018) employed 13,347 workers, or approximately 40 percent of all workers in industries that exhibited "growing base" characteristics in the late 1990s.[2]

Altogether, a total of 33,539 jobs were in industries that exhibited the characteristics of growing base industries in the year 2000. The number

[2] In performing the "four quadrant analysis," ADE relied on data obtained from the Minnesota IMPLAN Group (MIG). The MIG obtains its data from the US Bureau of Labor Statistics, which, in turn, obtains employment data from states via unemployment insurance reports submitted by all employers to state agencies in charge of tracking employment trends. This dataset is known as "ES202." MIG arranges its ES202 employment data by standard industrial classification (SIC) codes, the finest detail of which is available at the "four digit" SIC level. For the purposes of this report, ADE analyzed employment trends via the "four quadrant analysis" using MIG employment figures organized at the "three digit" SIC level.

of jobs that comprised the growing economic base increased by 16 percent, up from 25,860 in 1995. Agriculture and food processing industries comprise 46.5 percent of all jobs in the growing base in 2000, which underscores the earlier analysis on the prominence of these industries in the economic base. In 1995, economic base industries comprised 47 percent of all growing base jobs, underscoring the importance of these industries throughout the late 1990s.

Table 2-10 ranks the growing base industries in terms of change in employment between 1995 and 2000. If it is generally true that industries with location quotients greater than 1.25 are net exporters of goods and services, then the industries in Table 2-8 represent what are arguably those industries whose export and regional wealth creating potential are the greatest. In 2000, there were 33,539 jobs in 47 growing base industries. Of these jobs, 12,691 were in agriculture (38 percent), 2,912 in food processing (9 percent) and 1,829 in other economic base industries. In other words, 52 percent of all jobs in the growing base were in economic base industries. By the same token, 48 percent of all jobs in the growing base were in local support industries.

Table 2-11 ranks growing base industries by their respective location quotients, or by the extent to which they are concentrated in Tulare County relative to the state. As expected, dairy farms (SIC 024) are the most concentrated industry in the group of industries in the growing base, with a location quotient of 23.6. It also led all categories with an increase of 1,019 jobs or 47 percent.

Table 2-12 ranks growing base industries with the greatest relative growth rates, or shift-share ratios. Interestingly, of these industries, only four recorded shift shares in excess of 1.00, meaning that only four industries grew at rates similar to, or greater than, similar industries elsewhere. Thus, the vast bulk of growing base industries did not grow as fast as comparable industries statewide during the 1995-2000 economic boom. The long-term implications of this finding are, at this point, unclear.

Table 2-10. Growing Base Industries: 1995 – 2000 Tulare County

SIC	Description	Employment Tulare County 1995	Employment Tulare County 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995-2000	Percentage Change in Study Area Employment 1995-2000
349	Misc. fabricated metal products	44	247	0.338	1.782	203	461%
355	Special industry machinery	67	241	0.421	1.433	174	260%
724	Barber shops	4	12	0.422	2.364	8	200%
655	Sub dividers and developers	78	231	0.630	1.605	153	196%
021	Livestock, except dairy and poultry	234	628	5.547	15.372	394	168%
018	Horticultural specialties	334	887	1.159	2.827	553	166%
517	Petroleum and petroleum products	98	247	1.064	2.688	149	152%
204	Grain mill products	124	298	1.662	3.849	174	140%
549	Miscellaneous food stores	62	142	0.451	1.152	80	129%
308	Miscellaneous plastics products, nec	263	535	0.509	1.023	272	103%
497	Irrigation systems	22	44	5.675	9.616	22	100%
415	School buses	93	181	1.119	2.570	88	95%
569	Misc. apparel & accessory stores	41	76	0.390	1.080	35	85%
029	General farms, primarily livestock and animal specialties	66	116	14.651	21.374	50	76%
519	Misc. nondurable goods	453	772	0.730	1.226	319	70%
836	Residential care	535	849	0.916	1.192	314	59%
544	Candy, nut, and confectionery stores	22	35	0.576	1.084	13	59%
162	Heavy construction, except highway	341	537	0.887	1.389	196	57%
732	Credit reporting and collection	81	127	0.747	1.099	46	57%
557	Motorcycle dealers	31	48	0.994	1.164	17	55%
805	Nursing and personal care facilities	937	1,442	0.861	1.373	505	54%
784	Video tape rental	112	172	0.823	1.067	60	54%
631	Life insurance	486	739	2.287	3.750	253	52%
523	Paint, glass, and wallpaper stores	48	72	0.874	1.283	24	50%
024	Dairy farms	2,174	3,193	17.745	23.644	1,019	47%
593	Used merchandise stores	96	141	0.970	1.185	45	47%
011	Cash grains	22	31	0.987	1.450	9	41%
722	Photographic studios, portrait	66	93	0.831	1.367	27	41%
352	Farm and garden machinery	263	369	9.878	13.937	106	40%
411	Local and suburban transportation	173	240	0.927	1.070	67	39%
515	Farm-product raw materials	84	117	2.782	5.519	33	39%
265	Paperboard containers and boxes	304	405	1.746	2.621	101	33%
762	Electrical repair shops	82	108	0.706	1.204	26	32%
833	Job training and related services	374	490	1.346	1.623	116	31%
801	Offices & clinics of medical doctors	1,466	1,888	0.822	1.008	422	29%
019	General farms, primarily crop	2,263	2,829	8.679	12.865	566	25%
726	Funeral service and crematories	81	100	1.383	1.813	19	23%
071	Soil preparation services	74	91	6.524	8.263	17	23%
203	Preserved fruits and vegetables	1,313	1,522	3.104	4.269	209	16%
508	Machinery, equipment, and supplies	736	847	1.290	1.433	111	15%
276	Manifold business forms	382	437	12.111	17.325	55	14%
531	Department stores	3,719	4,193	1.857	2.253	474	13%
206	Sugar and confectionery products	324	356	3.213	3.786	32	10%
267	Misc. converted paper products	304	331	2.281	2.548	27	9%
072	Crop services	4,731	4,916	11.095	12.273	185	4%
793	Bowling centers	58	56	0.871	1.105	-2	-3%
421	Trucking & courier services, except air	2,195	2,108	1.561	1.717	-87	-4%
	GROWING BASE TOTAL	**25,860**	**33,539**			**7,679**	**30%**
	Economic Base Industries	13,286	17,432	52.0%		4,146	31%
	Agriculture	9,898	12,691	37.8%		2,793	28%
	Agricultural manufacturing	2,369	2,912	8.7%		543	23%
	Other Basic Industries	1,019	1,829	5.5%		810	79%
	Local Support	12,574	16,107	48.0%		3,533	28%

Source: Applied Development Economics, based on IMPLAN

Table 2-11. Top Twenty Most Concentrated Growing Base Industries in Tulare County

SIC	Description	Location Quotient 2000
024	Dairy farms	23.644
029	General farms, primarily livestock and animal specialties	21.374
276	Manifold business forms	17.325
021	Livestock, except dairy and poultry	15.372
352	Farm and garden machinery	13.937
019	General farms, primarily crop	12.865
072	Crop services	12.273
497	Irrigation systems	9.616
071	Soil preparation services	8.263
515	Farm-product raw materials	5.519
203	Preserved fruits and vegetables	4.269
204	Grain mill products	3.849
206	Sugar and confectionery products	3.786
631	Life insurance	3.750
018	Horticultural specialties	2.827
517	Petroleum and petroleum products	2.688
265	Paperboard containers and boxes	2.621
415	School buses	2.570
267	Misc. converted paper products	2.548

Source: Applied Development Economics, based on IMPLAN

Table 2-12. Top Twenty Relative Growth Rate Growing Base Industries in Tulare County

SIC	Description	Shift-Share
349	Misc. fabricated metal products	4.468
355	Special industry machinery	2.461
724	Barber shops	2.424
655	Subdivisions and development	1.712
021	Livestock, except dairy and poultry	1.643
018	Horticultural specialties	1.486
517	Petroleum and petroleum products	1.449
549	Miscellaneous food stores	1.327
204	Grain mill products	1.288
569	Misc. apparel & accessory stores	1.134
415	School buses	1.035
308	Miscellaneous plastics products, nec	0.946
497	Irrigation systems	0.731
544	Candy, nut, and confectionery stores	0.681
515	Farm-product raw materials	0.638
519	Misc. non-durable goods	0.613
631	Life insurance	0.524
805	Nursing and personal care facilities	0.502
162	Heavy construction, except highway	0.494

Source: Applied Development Economics, based on IMPLAN

Emerging Base Findings

In addition to the growing base, there are also emerging base industries. These industries are not concentrated in Tulare County at comparative levels to the growing base industries, but they merit attention by virtue of their positive shift-share, meaning that, for one reason or another, these industries are growing as fast as, if not faster, than similar industries elsewhere. Altogether, there were approximately 75 emerging base industries consisting of 14,959 jobs in 2000 (see Table 2-13). Interestingly, only nine percent of all emerging base jobs are in economic base industries of agriculture or food processing, with vast bulk of jobs in local support industries. Thus, unlike the situation in the growing base, agriculture or food processing are not significant elements to the region's emerging base.

Declining Base Findings

In contrast to the emerging base quadrant, a different picture emerges in the declining base quadrant. Industries in this quadrant have a positive location quotient and a negative shift-share, meaning that they are concentrated in the county but are declining. The declining base quadrant consists of 38,006 jobs, as shown in Table 2-14. These 38,006 jobs are not at immediate risk of elimination but have experienced relative decline during the 1995-2000 period when compared to similar industries outside of the county. Of these jobs, 22,339 (or 59 percent) are in agricultural economic base industries.

Table 2-13. Emerging Base Industries: 1995 – 2000, Tulare County

SIC	Description	Employment Tulare 1995	Employment Tulare 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995 - 2000	Percentage Change in Study Area Employment 1995 - 2000	Shift-share
451	Air transportation, scheduled	36	387	0.053	0.382	351	975%	9.152
399	Miscellaneous manufactures	6	50	0.055	0.333	44	733%	6.865
239	Misc. fabricated textile products	4	21	0.019	0.093	17	425%	4.113
628	Security and commodity services	3	18	0.026	0.087	15	500%	4.082
283	Drugs	2	10	0.008	0.030	8	400%	3.527
737	Computer and data processing services	52	270	0.037	0.087	218	419%	2.845
366	Communications equipment	1	4	0.003	0.011	3	300%	2.698
016	Vegetables	24	87	0.080	0.319	63	263%	2.642
829	Schools & educational services, nec	53	195	0.242	0.732	142	268%	2.370
249	Miscellaneous wood products	19	61	0.293	0.983	42	221%	2.183
637	Pension, health, and welfare funds	11	41	0.234	0.595	30	273%	2.153
241	Logging	1	18	0.028	0.613	17	1700%	17.105
131	Crude petroleum and natural gas	5	13	0.046	0.204	8	160%	1.968
505	Metals and minerals, except petroleum	1	3	0.009	0.025	2	200%	1.850

Table 2-13. Emerging Base Industries: 1995 – 2000, Tulare County (Continued)

SIC	Description	Employment Tulare 1995	Employment Tulare 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995 - 2000	Percentage Change in Study Area Employment 1995 - 2000	Shift-share
284	Soap, cleaners, and toilet goods	6	15	0.050	0.127	9	150%	1.453
295	Asphalt paving and roofing materials	1	2	0.056	0.135	1	100%	1.103
362	Electrical industrial apparatus	29	60	0.417	0.924	31	107%	1.066
361	Electric distribution equipment	1	2	0.017	0.039	1	100%	1.061
509	Miscellaneous durable goods	144	295	0.317	0.666	151	105%	1.003
651	Real estate operators and leasers	155	285	0.267	0.542	130	84%	0.866
783	Motion picture theaters	68	125	0.412	0.782	57	84%	0.797
881	Private households	339	759	0.406	0.647	420	124%	0.730
542	Meat and fish markets	22	36	0.445	0.823	14	64%	0.684
731	Advertising	15	31	0.056	0.086	16	107%	0.624
342	Cutlery, hand tools, and hardware	35	49	0.312	0.600	14	40%	0.617
154	General building contractors—nonresidential buildings	233	447	0.619	0.950	214	92%	0.575
565	Family clothing stores	134	264	0.302	0.449	130	97%	0.545
799	Misc. amusement, recreation services	492	848	0.401	0.607	356	72%	0.500
866	Religious organizations	123	186	0.622	0.954	63	51%	0.453
821	Elementary and secondary schools	103	183	0.280	0.403	80	78%	0.450
372	Aircraft and parts	9	12	0.012	0.019	3	33%	0.450
563	Women's accessory & specialty stores	16	25	0.284	0.428	9	56%	0.449
226	Textile finishing, except wool	11	20	0.252	0.355	9	82%	0.432
346	Metal forgings and stampings	76	102	0.601	0.932	26	34%	0.412
274	Miscellaneous publishing	17	26	0.212	0.304	9	53%	0.382
251	Household furniture	16	27	0.070	0.097	11	69%	0.376
864	Civic and social associations	192	266	0.513	0.754	74	39%	0.372
794	Commercial sports	21	36	0.193	0.260	15	71%	0.351
384	Medical instruments and supplies	22	36	0.062	0.085	14	64%	0.349
382	Measuring and controlling devices	124	183	0.229	0.321	59	48%	0.344
871	Engineering & architectural services	247	386	0.271	0.373	139	56%	0.343
359	Industrial machinery, nec	97	155	0.296	0.399	58	60%	0.327
513	Apparel, piece goods, and notions	6	8	0.018	0.025	2	33%	0.325
507	Hardware, plumbing & heating equipment	98	146	0.402	0.547	48	49%	0.315
502	Furniture and home furnishings	9	14	0.044	0.060	5	56%	0.311
285	Paints and allied products	30	32	0.539	0.804	2	7%	0.297
735	Misc. equipment rental & leasing	158	228	0.583	0.781	70	44%	0.286
736	Personnel supply services	1,736	3,388	0.648	0.807	1,652	95%	0.268
862	Professional organizations	9	13	0.256	0.334	4	44%	0.254
561	Men's & boys' clothing stores	34	40	0.502	0.671	6	18%	0.230
723	Beauty shops	123	163	0.403	0.520	40	33%	0.221
621	Security brokers and dealers	68	115	0.230	0.281	47	69%	0.203
254	Partitions and fixtures	15	19	0.214	0.267	4	27%	0.174
734	Services to buildings	488	648	0.604	0.715	160	33%	0.122
592	Liquor stores	67	60	0.586	0.727	-7	-10%	0.120
603	Savings institutions	78	74	0.200	0.246	-4	-5%	0.119
289	Miscellaneous chemical products	7	9	0.119	0.140	2	29%	0.115
161	Highway and street construction, except elevated highways	130	197	0.861	0.999	67	52%	0.112

Table 2-13. Emerging Base Industries: 1995 – 2000, Tulare County (Continued)

SIC	Description	Employment Tulare 1995	Employment Tulare 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995 - 2000	Percentage Change in Study Area Employment 1995 - 2000	Shift-share
562	Women's clothing stores	132	138	0.464	0.557	6	5%	0.110
452	Air transportation, nonscheduled	7	8	0.185	0.220	1	14%	0.110
271	Newspapers	272	280	0.664	0.761	8	3%	0.064
566	Shoe stores	102	108	0.546	0.622	6	6%	0.059
803	Offices of osteopathic physicians	1	1	0.101	0.114	0	0%	0.048
483	Radio and TV broadcasting	157	194	0.702	0.782	37	24%	0.042
841	Museums and art galleries	4	6	0.085	0.094	2	50%	0.041
602	Commercial banks	911	805	0.707	0.792	-106	-12%	0.037
179	Misc. special trade contractors	323	510	0.727	0.799	187	58%	0.035
641	Insurance agents, brokers, and service	449	493	0.637	0.702	44	10%	0.028
751	Automotive rentals, no drivers	51	62	0.263	0.288	11	22%	0.023
571	Furniture and home furnishings stores	373	497	0.861	0.937	124	33%	0.017
616	Mortgage bankers and brokers	79	134	0.268	0.291	55	70%	0.016
729	Miscellaneous personal services	84	110	0.542	0.589	26	31%	0.014
863	Labor organizations	17	19	0.160	0.173	2	12%	0.008
347	Metal services, nec	5	6	0.030	0.032	1	20%	0.005
781	Motion picture production & services	3	4	0.003	0.003	1	33%	0.005
872	Accounting, auditing, & bookkeeping	369	3	0.496	0.534	22	6%	0.001
	EMERGING BASE TOTAL	**9,361**	**14,959**			**5,598**	60%	
	Economic Base Industries	830	1,286	8.6%		456	55%	
	Agriculture	24	87	0.6%		63	263%	
	Agricultural manufacturing							
	Other Basic Industries	806	1,199	8.0%		393	49%	
	Local Support	8,531	13,673	91.4%		5,142	60%	

Source: Applied Development Economics, based on IMPLAN

Table 2-14. Declining Base Industries: 1995 – 2000, Tulare County

SIC	Description	Employment Tulare 1995	Employment Tulare 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995 to 2000	Percentage Change in Study Area Employment 1995 - 2000	Shift-share
027	Animal specialties	88	108	5.35	5.73	20	23%	-0.004
572	Household appliance stores	123	120	1.16	1.24	-3	-2%	-0.011
492	Gas production and distribution	148	131	1.65	1.74	-17	-11%	-0.017
335	Nonferrous rolling and drawing	259	292	2.69	2.82	33	13%	-0.031
017	Fruits and tree nuts	6,829	6,770	8.71	9.07	-59	-1%	-0.032
491	Electric services	322	258	1.83	1.89	-64	-20%	-0.035
501	Motor vehicles, parts, and supplies	468	507	1.02	1.06	39	8%	-0.040
356	General industrial machinery	168	176	1.18	1.21	8	5%	-0.047
553	Auto and home supply stores	530	550	1.38	1.42	20	4%	-0.049
076	Farm labor and management services	13,427	14,461	13.39	13.66	1,034	8%	-0.057
554	Gasoline service stations	518	439	1.03	1.02	-79	-15%	-0.073
243	Millwork, plywood & structural members	238	338	1.42	1.44	100	42%	-0.090
273	Books	558	571	7.94	7.83	13	2%	-0.092
769	Miscellaneous repair shops	296	244	1.15	1.11	-52	-18%	-0.101
518	Beer, wine, and distilled beverages	172	161	1.15	1.11	-11	-6%	-0.105
525	Hardware stores	211	235	1.93	1.88	24	11%	-0.115
013	Field crops, except cash grains	995	738	8.83	8.15	-257	-26%	-0.122
494	Water supply	42	51	1.27	1.22	9	21%	-0.141
541	Grocery stores	2,918	2,679	1.29	1.19	-239	-8%	-0.150
598	Fuel dealers	81	69	3.42	3.12	-12	-15%	-0.152
025	Poultry and eggs	292	260	7.40	6.78	-32	-11%	-0.153
591	Drug stores and proprietary stores	724	666	1.23	1.11	-58	-8%	-0.177
202	Dairy products	1,505	1,390	11.60	10.32	-115	-8%	-0.193
556	Recreational vehicle dealers	59	69	1.97	1.81	10	17%	-0.197
636	Title insurance	151	149	1.30	1.16	-2	-1%	-0.201
171	Plumbing, heating, air-conditioning	554	707	1.14	1.05	153	28%	-0.209
422	Public warehousing and storage	277	341	1.63	1.47	64	23%	-0.241
075	Animal services, except veterinary	87	80	1.76	1.50	-7	-8%	-0.244
344	Fabricated structural metal products	425	464	1.53	1.28	39	9%	-0.313
327	Concrete, gypsum, and plaster products	272	274	1.83	1.49	2	1%	-0.318
514	Groceries and related products	1,539	1,145	1.56	1.18	-394	-26%	-0.320
275	Commercial printing	730	493	1.43	1.02	-237	-32%	-0.344
552	Used car dealers	81	90	2.21	1.80	9	11%	-0.362
085	Forestry services	80	70	6.49	4.93	-10	-13%	-0.365
332	Iron and steel foundries	297	192	5.98	4.01	-105	-35%	-0.391
092	Fish hatcheries and preserves	5	1	4.04	1.46	-4	-80%	-0.394
209	Misc. food and kindred products	613	429	3.21	2.18	-184	-30%	-0.405
242	Sawmills and planning mills	360	192	3.37	2.02	-168	-47%	-0.422
245	Wood buildings and mobile homes	183	199	5.60	4.28	16	9%	-0.439
287	Agricultural chemicals	95	40	2.99	1.57	-55	-58%	-0.439
521	Lumber and other building materials	626	558	1.42	1.02	-68	-11%	-0.440
824	Vocational schools	199	110	1.77	1.02	-89	-45%	-0.478
232	Men's and boys' furnishings	289	141	2.74	1.48	-148	-51%	-0.481
244	Wood containers	135	85	3.21	1.81	-50	-37%	-0.573
703	Camps and recreational vehicle parks	65	40	2.20	1.15	-25	-38%	-0.654

Table 2-14. Declining Base Industries: 1995 – 2000, Tulare County (Continued)

SIC	Description	Employment Tulare 1995	Employment Tulare 2000	LQ 1995	LQ 2000	Change in Study Area Employment 1995 to 2000	Percentage Change in Study Area Employment 1995 - 2000	Shift-share
097	Hunting and trapping, and game propagation	3	1	3.63	1.30	-2	-67%	-0.667
353	Construction and related machinery	210	74	3.48	1.22	-136	-65%	-0.727
417	Bus terminal and service facilities	5	5	5.63	3.38	0	0%	-0.788
832	Individual and family services	1,523	766	2.96	1.18	-757	-50%	-0.857
414	Bus charter service	92	77	2.90	1.46	-15	-16%	-0.942
	EMERGING BASE TOTAL	**39,867**	**38,006**			**-1,861**	**-5%**	
	Economic Base	27,833	27,644	72.7%		-189	-1%	
	Agriculture	21,639	22,339	58.8%		700	3%	
	Agricultural manufacturing	613	429	1.1%		-184	-30%	
	Other Basic Industries	5,581	4,876	12.8%		-705	-13%	
	Local Support	12,034	10,362	27.3%		-1,672	-14%	

Source: Applied Development Economics, based on IMPLAN

2.5 Demographic Characteristics

Introduction

This section provides for the assessment of the current and projected population in Tulare County.

Methods

Information in this section is provided by the U.S. Census Bureau, California Department of Finance (DOF), and Tulare County Association of Governments (TCAG). Compound average growth rates for historic and projected growth rates were based on population data provided by DOF.

Key Terms

- **Census.** The 10-year period count for population.
- **Estimate.** The approximate calculation of a given record.
- **Projection.** A prediction of future setting based on extrapolations from past observations.

Regulatory Setting

There is no regulatory setting for this section.

Existing Conditions

The California Department of Finance (DOF) provides population estimates for cities and counties throughout California. The Tulare County Association of Governments (TCAG) and Tulare County utilizes these population estimates and projections for use in traffic modeling and other planning purposes in Tulare County. According to DOF population estimates, between 1990 and 2000, Tulare County grew by about 18 percent, from 311,920 to 368,020 persons. During this period, the population growth averaged about 1.7 percent per year. Since 2000, the county experienced an average yearly population growth of 2.2 percent, for a total current (2007) population of 429,010 (DOF, 2007; TCAG, 2008).

Table 2-15 shows the county's historic and projected annual growth rates. These rates represent the compound annual growth rate for each of the cities within the county as well as the unincorporated areas of the county. The compound annual growth rates seen in this table are essentially the average annual growth rate that occurred between 1990 and 2007 and the projected average annual growth rate for 2007 through 2030. The annual growth rate for the entire county is expected to increase from 1.9 percent to 2.4 percent through 2030. Annual growth for most cities and the unincorporated areas are expected to increase over historic growth rates. Porterville, Tulare, and Visalia are expected to have declining or stable growth rates through 2030 over their historic rates.

Table 2-15. Tulare County Historic and Projected Annual Growth Rates

	Historic Growth Rates 1990-2007	Projected Growth Rates 2007-2030
Dinuba	2.7%	3.4%
Exeter	2.3%	3.1%
Farmersville	3.1%	3.9%
Lindsay	1.7%	2.8%
Porterville	3.3%	3.2%
Tulare	3.1%	3.0%
Visalia	2.6%	2.6%
Woodlake	1.6%	2.3%
Incorporated	2.8%	2.9%
Unincorporated	0.46%	1.3%
County Total	1.9%	2.4%

Source: DOF, 2007; TCAG, 2008.

Population Projections

The DOF prepares population projections for all counties in California. The DOF uses a baseline cohort-component method to project population. A baseline projection assumes people have the right to migrate where they choose and no major natural catastrophes or war will occur. A cohort-component method traces people born in a given year through their lives. As each year passes, cohorts change due to the mortality and migration assumptions. New cohorts are formed by applying the fertility assumptions to the women of childbearing age.

Life tables were developed using deaths from the California Department of Health Services by gender, race/ethnicity, and age for the period 1970 to 1990. Age-specific, general, and period fertility rates were developed by race/ethnicity and county annually for the period 1970 to 1990. Births to women under 15 and over 44 were added to the births of the youngest and the oldest age groups when computing the fertility rates.

TCAG has utilized DOF population projections to project growth for the county. Table 2-16 shows TCAG's growth projections through 2030. The percentage of the county's population living in incorporated cities is expected to increase by 2030. The percentage of the county's population living in unincorporated areas in the county will decrease by 2030. The TCAG expects an additional 313,970 people to be living in incorporated and unincorporated Tulare County by 2030 for a total population of about 742,970.

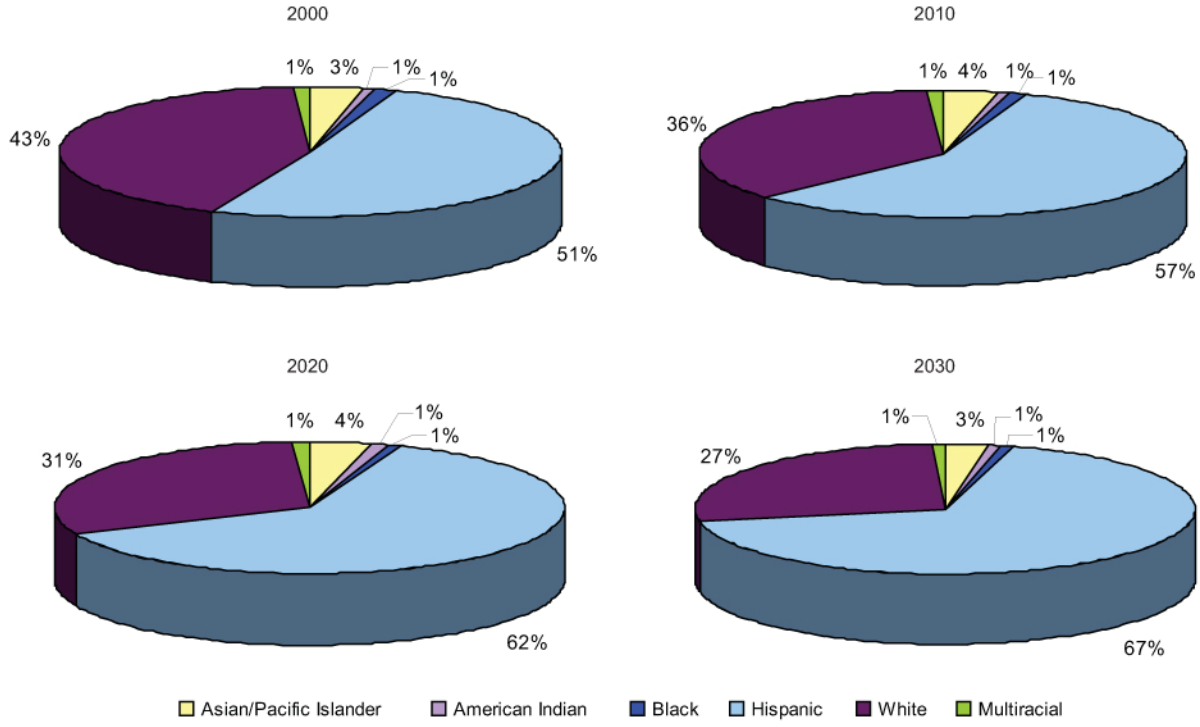
Table 2-16. Tulare County Population Growth Projections, 2007–2030

	2007 (% of total)	2010 (% of total)	2020 (% of total)	2030 (% of total)
Dinuba	20,000 (4.7%)	22,940 (4.9%)	32,310 (5.4%)	43,620 (5.9%)
Exeter	10,730 (2.5%)	12,060 (2.6%)	16,640 (2.8%)	21,420 (2.9%)
Farmersville	10,470 (2.4%)	12,270 (2.6%)	18,000 (3.0%)	25,120 (3.4%)
Lindsay	11,170 (2.6%)	12,640 (2.7%)	16,630 (2.8%)	21,130 (2.8%)
Porterville	51,470 (12.0%)	54,650 (11.7%)	77,480 (12.9%)	105,210 (14.2%)
Tulare	55,940 (13.0%)	59,890 (12.8%)	83,340 (13.91%)	111,400 (15.0%)
Visalia	117,740 (27.5%)	124,590 (26.7%)	165,050 (27.5%)	211,110 (28.0%)
Woodlake	7,390 (1.7%)	8,110 (1.7%)	10,200 (1.7%)	12,400 (1.7%)
Incorporated Subtotal	*284,910 (66.4%)*	*307,150 (65.8%)*	*419,650 (70.0%)*	*551,410 (74.2%)*
Unincorporated Subtotal	*144,090 (33.6%)*	*159,750 (34.2%)*	*179,740 (30.0%)*	*191,560 (25.8%)*
County Total	**429,000**	**466,900**	**599,390**	**742,970**

Source: TCAG, 2008.

Figure 2-2 shows the county's projected population growth by distribution of ethnic groups from 2000 through 2030. The Hispanic population is expected to grow the most with an increase from 51 percent of the county's population in 2000 to 67 percent of the population in 2030. Other groups, such as Asian/Pacific Islander, American Indian, Black, White, and Multiracial groups are expected to have minimal growth. While the White population group is expected to have some growth, its share of the county's total population will decrease from 43 percent in 2000 to 27 percent in 2030 (DOF, 2007).

Figure 2-2. Department of Finance Population Growth Projections by Race, Tulare County, 2000-2030



SOURCE: DOF, 2007

Population Characteristics

The following tables describe the population characteristics of Tulare County, including the distribution of population by age group, gender, ethnicity, income, and educational attainment.

Age

Table 2-17 shows the distribution of age groups and compares them between the incorporated and unincorporated areas of the county, and to the total population in Tulare County. The table suggests that the age distribution within cities and towns is relatively the same. Tulare

County has a significant portion (56.5 percent) of its population between the ages of 18 and 64. The incorporated cities have a slightly higher percentage of the population in this age group (at 57.3 percent) than the unincorporated area, which has 55.2 percent between 18 and 64.

Table 2-17. Population by Age, Tulare County, Census 2000

Age Group	Incorporated Cities		Unincorporated Areas		Tulare County Total	
0 – 4 Years	19,892	8.9%	12,934	9.0%	32,826	8.9%
5 – 17 Years	53,888	24.1%	37,538	26.0%	91,426	24.8%
18 – 64 Years	128,220	57.3%	79,632	55.2%	207,852	56.5%
65 and Older	21,858	9.8%	14,059	9.8%	35,917	9.8%
Total	**223,858**	**100%**	**144,163**	**100%**	**368,021**	**100%**

Source: U.S. Census Bureau, 2000a.

Table 2-18 provides the distribution of children among each of the incorporated cities and unincorporated communities with community plans. For a few areas, over 35 percent of the population is under the age of 18 (Dinuba, Earlimart, Farmersville, Lindsay, Poplar/Cotton Center, Pixley, Richgrove, Strathmore, and Woodlake). The unincorporated area of the county has a slightly higher percentage of children (34 percent) than the incorporated area average (33.6 percent). Children make up just over one third of the total county population.

Table 2-18. Children (0 – 17 Years), Tulare County, Census 2000

Location	Children (0-17 Years)	Total Population	Percent Children
Cities			
Dinuba	6,023	16,844	35.8%
Exeter	3,093	9,168	33.7%
Farmersville	3,354	8,737	38.4%
Lindsay	3,912	10,297	38.0%
Porterville	13,570	39,615	34.3%
Tulare	15,213	43,994	34.6%
Visalia	28,615	91,565	31.3%
Woodlake	2,513	6,651	37.8%
Incorporated Subtotal	***76,293***	***226,871***	***33.6%***
Unincorporated Communities			
Cutler-Orosi	4,301	11,809	36.4%
Earlimart	2,782	6,583	42.3%
Goshen	896	2,394	37.4%
Ivanhoe	1,693	4,474	37.8%
Poplar/Cotton Center	605	1,496	40.4%
Pixley	1,031	2,586	39.9%
Richgrove	1,184	2,723	43.5%
Springville	240	1,109	21.6%
Three Rivers	470	2,248	20.9%
Strathmore	996	2,584	38.5%
Other Areas	33,761	103,144	32.7%
Unincorporated Subtotal	***47,959***	***141,150***	***34.0%***
Total County	**124,252**	**368,021**	**33.8%**

Source: U.S. Census Bureau, 2000a and 2000b.

Table 2-19 compares the elderly population in each incorporated city and unincorporated community (with a community plan) to the total county population. The two cities with the largest proportion of elderly persons are Exeter (11.1 percent) and Visalia (10.9 percent), while the unincorporated communities of Springville and Three Rivers showed the highest senior populations with 23.4 percent and 22.1 percent, respectively. This high rate for Springville and Three Rivers is likely due to their appeal as communities for retirement. In total, about 47,404 (12.9 percent) of Tulare County residents are over the age of 65.

Table 2-19. Senior Population, Tulare County, Census 2000

Location	65 and Older	Population	Percent Elderly
Cities			
Dinuba	1,527	16,844	9.1%
Exeter	1,019	9,168	11.1%
Farmersville	553	8,737	6.3%
Lindsay	936	10,297	9.1%
Porterville	3,738	39,615	9.4%
Tulare	4,119	43,994	9.4%
Visalia	9,966	91,565	10.9%
Woodlake	500	6,651	7.5%
Incorporated Subtotal	***22,358***	***226,871***	***9.9%***
Unincorporated Communities			
Cutler-Orosi	811	11,809	6.9%
Earlimart	393	6,583	6.0%
Goshen	143	2,394	6.0%
Ivanhoe	257	4,474	5.7%
Poplar/Cotton Center	114	1,496	7.6%
Pixley	188	2,586	7.3%
Richgrove	119	2,723	4.4%
Springville	259	1,109	23.4%
Three Rivers	497	2,248	22.1%
Strathmore	179	2,584	6.9%
Other Areas	2,960	103,144	2.9%
Unincorporated Subtotal	***18,393***	***141,150***	***13.0%***
Total County	**47,404**	**368,021**	**12.9%**

Source: U.S. Census Bureau, 2000a and 2000b.

Gender

As shown in Table 2-20, the number of males and females in the county is about equal, with 50.3 percent male and 49.7 percent female. This is true of both the incorporated and unincorporated areas. The proportion of males to females in cities and unincorporated communities reverses with cities having 51.1 percent female and 48.9 percent male, and unincorporated communities having 47.8 percent female and 52.2 percent male. In one area of the county, Cutler-Orosi, the male

population stands out from the other cities and communities with 54 percent. This reflects the presence of large numbers of recently immigrated Hispanic men drawn by agricultural employment.

Table 2-20. Population by Gender, Tulare County, Census 2000

Location	Male	Percent	Female	Percent
Cities				
Dinuba	8,554	50.8%	8,290	49.2%
Exeter	4,416	48.2%	4,752	51.8%
Farmersville	4,428	50.7%	4,309	49.3%
Lindsay	5,215	50.6%	5,082	49.4%
Porterville	19,444	49.1%	20,171	50.9%
Tulare	21,364	48.6%	22,630	51.4%
Visalia	44,167	48.2%	47,398	51.8%
Woodlake	3,425	51.5%	3,226	48.5%
Incorporated Subtotal	***111,013***	***48.9%***	***115,858***	***51.1%***
Unincorporated Communities				
Cutler-Orosi	6,371	54.0%	5,438	46.0%
Earlimart	3,413	51.8%	3,170	48.2%
Goshen	1,182	49.4%	1,212	50.6%
Ivanhoe	2,367	52.9%	2,107	47.1%
Poplar/Cotton Center	779	52.1%	717	47.9%
Pixley	1,375	53.2%	1,211	46.8%
Richgrove	1,439	52.8%	1,284	47.2%
Springville	526	47.4%	583	52.6%
Three Rivers	1,090	48.5%	1,158	51.5%
Strathmore	1305	50.5%	1,279	49.5%
Traver	375	51.2%	357	48.8%
Unincorporated Subtotal	***20,222***	***52.2%***	***18,516***	***47.8%***
Other Unincorporated	***53,775***	***52.5%***	***48,637***	***47.5%***
Total County	**185,010**	**50.3%**	**183,011**	**49.7%**

Source: U.S. Census Bureau, 2000a and 2000b.

Teen pregnancy is more prevalent in Tulare County than most other counties in California. From 2000 to 2005, Tulare County consistently ranked in the top three counties for highest teen birth rates in California. Information used to calculate teen pregnancy is not readily available, however, teen birth rate information is gathered by the California Department of Health Services. This information provides the birth rates for teens 15 to 19 years of age by teen births per 1,000 teen females. While Tulare County has seen an overall drop in its teen pregnancy rate from 2000 to 2006 (77.7 per 1,000 to 60.7 per 1,000), it consistently has a much higher teen birth rate than the teen birth rate for California. This issue is not isolated in Tulare County either. In 2006, the neighboring counties of Kings and Kern were the top two counties, respectively, for highest teen birth rates in California. Another neighboring county,

Fresno, was seventh in the state for highest teen birth rates in California (California Department of Public Health, 2007).

Table 2-21. Teen Pregnancy Rate, State of California, 2000-2006

Race/Ethnicity	Teen Birth Rates (Females Age 15-19 per 1,000)						
	2000	2001	2002	2003	2004	2005	2006
Hispanic	97.7	96.3	90.1	87.4	88.9	78.4	76.7
White	45.6	39.6	37.9	32.5	33.7	31.5	30.2
Black	103.8	76.6	43.1	85.0	72.6	47.4	66.1
Native American	63.4	23.1	95.6	76.4	67.6	38.2	75,1
Asian/Pacific Islander	65.0	53.7	49.2	50.5	63.9	52.1	40.4
2 or More Races	39.6	25.2	37.0	56.8	17.4	25.3	33.6
County Total	**77.7**	**73.1**	**69.3**	**67.6**	**68.8**	**61.4**	**60.7**
California	**46.7**	**43.7**	**40.7**	**39.1**	**38.2**	**37.2**	**37.8**

Source: California Health and Human Services Department, April 2003.

Ethnicity

According to the 2000 U.S. Census, Hispanic or Latino (50.8 percent), and White (41.8 percent) are the largest ethnic groups in Tulare County. The remaining six ethnic group categories represent 7.4 percent of the total population of the county, with the Black population at 1.4 percent, Asians/Pacific Islanders at 3.16 percent, and Native Americans at .8 percent as shown on Table 2-21.

Table 2-22. Total Population by Ethnicity, Tulare County, Census 2000

Ethnicity	Persons	Percent
Hispanic or Latino	186,846	50.80
White	153,916	41.80
Asian/Native Hawaiian and Other Pacific Islander	11,714	3.16
Black	5,122	1.40
Native American	3,011	0.80
Some Other Race	444	0.10
Two or More Races	6,968	1.90
Total	**368,021**	**100.00**

Source: U.S. Census Bureau, 2000a and 2000b.

Tulare County is similar to other central valley counties in that it has a high Hispanic population. This is primarily based on the intense agricultural activities that employ predominantly Hispanic people throughout California. When compared to the state of California (percent Hispanic), Tulare County has a much higher percentage of

Hispanic population at 50.8 percent. The average Hispanic population in the incorporated cities is lower than the unincorporated areas of the county at 47.7 and 55.6 percent, respectively. However, there are four incorporated cities that are over 70 percent Hispanic: Woodlake (83.8 percent); Lindsay (78 percent); Dinuba (75.1 percent); and Farmersville (72 percent). Table 2-22 shows the distribution of Hispanic people in the county and compares it to the county's total population. Most cities and unincorporated communities have significantly higher proportions of Hispanics than other ethnic groups.

Table 2-23. Hispanic Population, Tulare County, Census 2000

Location	Hispanic Population	Total Population	Percent Hispanic
Cities			
Dinuba	12,647	16,844	75.1%
Exeter	3,507	9,168	38.3%
Farmersville	6,292	8,737	72.0%
Lindsay	8,029	10,297	78.0%
Porterville	19,589	39,615	49.4%
Tulare	20,058	43,994	45.6%
Visalia	32,619	91,565	35.6%
Woodlake	5,575	6,651	83.8%
Incorporated Subtotal	***108,316***	***226,871***	***47.7%***
Unincorporated Communities			
Cutler-Orosi	10,322	11,800	87.5%
Earlimart	5,760	6,583	87.5%
Goshen	1,751	2,394	73.1%
Ivanhoe	3,407	4,474	76.2%
Poplar/Cotton Center	893	1,496	59.7%
Pixley	1,763	2,586	68.2%
Richgrove	2,493	2,723	91.6%
Springville	62	1,109	5.6%
Three Rivers	148	2,248	6.6%
Strathmore	1,771	2,584	68.5%
Traver	552	732	75.4%
Unincorporated Communities Subtotal	***28,922***	***38,729***	***74.7%***
Other Unincorporated	49,608	102,421	48.4%
Total Unincorporated	78,530	141,150	55.6%
Total County	**186,846**	**368,021**	**50.8%**

Source: U.S. Census Bureau, 2000a

Foreign Born Population

Migration proportions were developed for the two decades between 1970 and 1990 by a survived population method. The 1970 population was aged forward in time to 1980 by adding recorded births to form new cohorts and subtracting deaths to form existing cohorts. The survived population was compared to the 1980 population and differences were

assumed to be migration. The ten-year migration was annualized and divided by the total to derive a proportion. The same process was used for the period 1980 to 1990. The migration proportions for the two decades were then averaged and smoothed using a none-cohort average.

Tulare County has seen a 50.3 percent increase in foreign born population over the past ten years. According to the U.S. Census in 1990 there were 51,457 foreign born people residing in Tulare County. By 2000 that number had increased to 83,124, an increase of 31,667. Of the total year 2000 foreign born population, it is estimated that only 21,567 were naturalized citizens, leaving a remainder of 61,557 as temporary or illegal residents. Tulare County's foreign born population is small when compared with all of California (8,864,255 foreign born residents) making up only 0.94 percent of the state total.

Table 2-24 shows the country of origin for the foreign born population in Tulare County and the state of California. As the table shows, a majority of Tulare County's immigrants (84.6 percent) come from Latin American countries and another 10.0 percent from Asian countries. The remaining 5.4 percent are from Europe (4.0 percent), Africa (0.2 percent), Oceania (0.1 percent), and North America (0.7 percent). While the general hierarchy of immigration origins is the same for California, the state as a whole has much more immigration from Asia and Europe and less from Latin America when compared to Tulare County. This is likely due to many Asian and European immigrants settling in coastal regions and the high number of Latin American immigrants coming to the agricultural areas of the state, in such areas as Tulare County, to find farm-related jobs.

Table 2-24. Foreign Born Population by Region of Origin, Tulare County, 2000

	Tulare County		California	
Region of Origin	Foreign Born Population	Percentage	Foreign Born Population	Percentage
Latin America	70,330	84.6%	4,926,803	55.6%
Asia	8,586	10.3%	2,918,642	32.9%
Europe	3,347	4.0%	696,578	7.9%
Africa	189	0.2%	113,255	1.3%
North America	86	0.1%	141,779	1.6%
Oceania	586	0.7%	67,131	0.8%
Total	**83,124**	**100.0%**	**8,864,255**	**100.0%**

Source: U.S. Census Bureau, 2000b.

Educational Attainment

The educational profile of Tulare County is indicative of a largely "working class" community, with just 12.4 percent of residents ages 25 and older having a bachelor's degree or higher. Over 20 percent of residents have less than a 9th grade education, and the remaining residents fall somewhere in the middle. Overall, the level of educational attainment among Tulare County residents remained fairly constant from 1990 to 2000, which is indicative of an economy that did not change significantly in terms of its workforce needs (see Table 2-25).

Table 2-25. Educational Attainment of Persons 25 and Older, Tulare County, 1990-2006

Educational Attainment	1990	2000	2006
Less than 9th grade	41,293	47,161	50,271
9th to 12th grade, no diploma	29,421	31,351	26,504
High school graduate (includes equivalency)	40,873	47,004	63,812
Some college, no degree	32,784	42,886	51,918
Associate degree	12,319	12,926	16,337
Bachelor's degree	14,687	15,956	20,729
Graduate or professional degree	6,278	7,604	8,941
Total population over 25 years	**177,655**	**204,888**	**238,512**

Source: U.S. Census Bureau, 1990, 2000b, and 2006

Household Income

Table 2-26 shows the distribution of 1999 household incomes, as reported in the 2000 Census, for Tulare County and the State of California. Generally, household incomes in the county are lower than incomes in the State of California. For example, the percentage of Tulare County households earning less than $25,000 was approximately 36 percent, compared to 25 percent of California households. Households earning $100,000 or more comprised less than eight percent of all county households, but accounted for approximately 17 percent of all California households.

Table 2-26. Income Distribution, Tulare County and California, 1999

	Tulare County		State of California	
Income	Number	Percent	Number	Percent
Under $25,000	40,381	36.6%	2,934,115	25.5%
$25,000 to $34,999	16,182	14.7%	1,315,085	11.4%
$35,000 to $49,999	18,809	17.0%	1,745,961	15.2%
$50,000 to $74,999	18,512	16.8%	2,202,873	19.1%
$75,000 to $99,999	8,045	7.3%	1,326,569	11.5%
$100,000 and over	8,427	7.7%	1,987,417	17.3%
Total Households	110,356	100.0%	11,512,020	100.0%

Source: U.S. Census Bureau, 2000c.

3. LAND USE AND POPULATION

3.1 Introduction

This chapter presents the context for land use planning in Tulare County. It describes how land in the unincorporated areas of the county is used currently, and estimates the potential for additional development under existing planning policies.

This chapter is divided into the following sections:

- Summary of Existing County Plans (Section 3.2);
- Redevelopment Plans (Section 3.3);
- Existing Land Use (Section 3.4);
- Existing Zoning Summary (Section 3.5);
- City General Plans (Section 3.6);
- Spheres of Influence (Section 3.7);
- Surrounding County and City General Plans (Section 3.8);
- Regional Plans and Policies (Section 3.9); and
- Federal and State Plans and Policies (Section 3.10).

The discussion of existing land uses and land use policies and regulations is based upon both a detailed land use inventory (using information furnished by the Tulare County geographic information system (GIS) and the Tulare County Assessor's database), and a review of current planning documents, including the current Tulare County General Plan and Zoning Ordinance, the general plans of each of the incorporated cities in the county, and the plans of other levels of government covering land in Tulare County, such as state, federal, and regional agencies.

3.2 Summary of Existing County Plans

Introduction

The following discussion is an overview of the various official county planning documents and their policies that affect land use. The section includes summary reviews and evaluations of four different levels of plans: topical elements of the existing *General Plan* that address

countywide issues; elements of the three area plans; the various community plans; and the specific plans. The purpose is to provide a summary of existing county land use plans and policies and to determine the implications of each plan on growth and development in the unincorporated areas. Other sections of this chapter evaluate the implications of the general plans of each of the incorporated cities, countywide functional plans and the policies of regional governmental agencies that may affect growth in Tulare County.

Methods

The Tulare County Long Range Planning Division provided the information in this section.

Key Terms

- **Buildout.** Development of land to its full potential or theoretical capacity as permitted under current or proposed General Plan or community plan land use designations.
- **County Service Area.** A geographic subarea of the county used for the planning and delivery of parks, recreation, and other human services based on an assessment of the service needs of the population in that subarea.
- **Density, Residential.** The number of permanent residential dwelling units per gross acre of land.
- **Dwelling Unit.** A room or group of rooms (including sleeping, eating, cooking, and sanitation facilities, but not more than one kitchen), which constitutes an independent housing unit, occupied or intended for occupancy by one household.
- **General Plan.** A compilation of a city's or a county's policies regarding its long-term development in the form of diagrams and accompanying text. The general plan is a legal document required of each local agency by the State of California Government Code Section 65301. In California, the general plan has seven mandatory elements (land use, circulation, conservation, open space, noise, housing, and safety) and may include any number of optional elements (such as economic development or community design). Cities and Counties located in the San Joaquin Valley are required to include an air quality element or air quality goals and

policies in other elements to comply with Government Code Section 65302.1

- **Goal.** A general, overall, and ultimate purpose, aim, or end toward which the county will direct effort.
- **Growth Management.** The use of a wide range of techniques by a county or city to determine the amount, type, and rate of development desired by the community and to channel that growth into designated areas. Growth management policies can be implemented through zoning, capital improvement programs, public facilities plans or ordinances, urban growth boundaries, standards for levels of service, and other programs.
- **Infill Development.** Development of vacant land (usually individual lots or left-over properties) within areas, which are already largely developed. Infill development can also be redevelopment, rehabilitation, and/or retrofits to existing development.
- **Infrastructure.** Public or private facilities, such as sewage-disposal systems, water-supply systems, other utility systems, and roads.
- **Objective.** A specific statement of a desired future condition toward which the county will expend effort in the context of striving to achieve a broader goal. An objective should be achievable and, where possible, should be measurable and time-specific. The State Government Code (Section 65302) requires that general plans spell out the "objectives," principles, standards, and proposals of the General Plan.
- **Planning Area.** The planning area is the land area addressed by the General Plan. For the Tulare County General Plan, the planning area consists of all unincorporated areas within the county, including areas under federal or state ownership.
- **Policy.** A specific statement of principle or of guiding actions, which implies clear commitment but is not mandatory. A general direction that a governmental agency sets to follow, in order to meet its goals and objectives before undertaking an action program. (See "Program.")
- **Program.** An action, activity, or strategy carried out in response to adopted policy to achieve a specific goal or objective. Policies and programs establish the "who," "how"

and "when" for carrying out the "what" and "where" of goals and objectives.

- **Specific Plan.** Under Article 8 of the Government Code (Section 65450 *et seq*), a legal tool for detailed design and implementation of a defined portion of the area covered by a General Plan. A specific plan may include all detailed regulations, conditions, programs, and/or proposed legislation which may be necessary or convenient for the systematic implementation of any General Plan element(s).
- **Vacant.** Land outside of agricultural uses with a structural value of zero.

Regulatory Setting

California Government Code §65301 requires the following:

> (a) The general plan shall be so prepared that all or individual elements of it may be adopted by the legislative body, and so that it may be adopted by the legislative body for all or part of the territory of the county or city and any other territory outside its boundaries that in its judgment bears relation to its planning.
>
> The general plan may be adopted in any format deemed appropriate or convenient by the legislative body, including the combining of elements. The legislative body may adopt all or part of a plan of another public agency in satisfaction of all or part of the requirements of Section 65302 if the plan of the other public agency is sufficiently detailed and its contents are appropriate, as determined by the legislative body, for the adopting city or county.
>
> (b) The general plan may be adopted as a single document or as a group of documents relating to subjects or geographic segments of the planning area.
>
> (c) The general plan shall address each of the elements specified in Section 65302 to the extent that the subject of the element exists in the planning area. The degree of specificity and level of detail of the discussion of each element shall reflect local conditions and circumstances. However, this section shall not affect the requirements of subdivision (c) of Section 65302, nor be construed to expand or limit the authority of the Department of

Housing and Community Development to review housing elements pursuant to Section 65585 of this code or Section 50459 of the Health and Safety Code. The requirements of this section shall apply to charter cities.

Existing Conditions

Overview

The existing General Plan consists of countywide elements and regionally specific elements. The countywide General Plan includes the following elements:

- Land Use (1964);
- Transportation/Circulation (1964);
- Environmental Resource Management (1972);
- Open Space/Recreation/Conservation (1972);
- Library Master Plan (1973);
- Seismic Safety (1975);
- Civic Center Master Plan (1975);
- Safety Element (1975);
- Scenic Highways (1975);
- Water and Liquid Waste Management (1981);
- Public Buildings Plan (1981);
- Urban Boundaries (1983);
- Aviation and Airport Systems (1985);
- Noise (1988); and
- Housing (2003).

The individual General Plan elements include goals, policies, and programs that apply throughout the unincorporated county.

Area and Sub Area Plans

Area and sub area plans have been designated to guide planning for all areas outside incorporated cities and unincorporated communities as defined in the Urban Boundaries Element. The plan boundaries are shown in Figure 3-1. The following list identifies areas with area or sub area plans:

- Mountain Framework (Area Plan) (unadopted);
- Rural Valley Lands Plan (RVLP) (Area Plan) (1975);
- Kings River Plan (Sub Area Plan) (1982);
- Foothill Growth Management Plan (Area Plan) (1981);
- Great Western Divide North Half Plan (Sub Area Plan) (1990);
- Kennedy Meadows Plan (Sub Area Plan) (1986);
- Redwood Mountain Plan (Sub Area Plan) (unadopted);
- South Sierra Plan (Sub Area Plan) (unadopted);
- Upper Balch Park Plan (Sub Area Plan) (unadopted);
- Great Western Divide South Half Plan (Sub Area Plan) (unadopted); and
- Posey Plan (Sub Area Plan) (unadopted).

Of the area and sub area plans listed, only the Rural Valley Lands Plan, Kings River Plan, Foothill Growth Management Plan, Great Western Divide North Half Plan, and Kennedy Meadows Plan have been adopted. The remaining areas for which plans have not been adopted are all located in the eastern half of the county, and consist mainly of federally-owned land.

Tulare County has identified land for urbanization according to four categories: 1) lands in and around incorporated cities, 2) lands in and around unincorporated communities, 3) lands in foothill development corridors, and 4) lands that qualify under the RVLP. The county is legally responsible for the planning and regulation of all lands that fall outside incorporated city limits, even though cities adopt their own general plans for the incorporated area and a portion of surrounding unincorporated area.

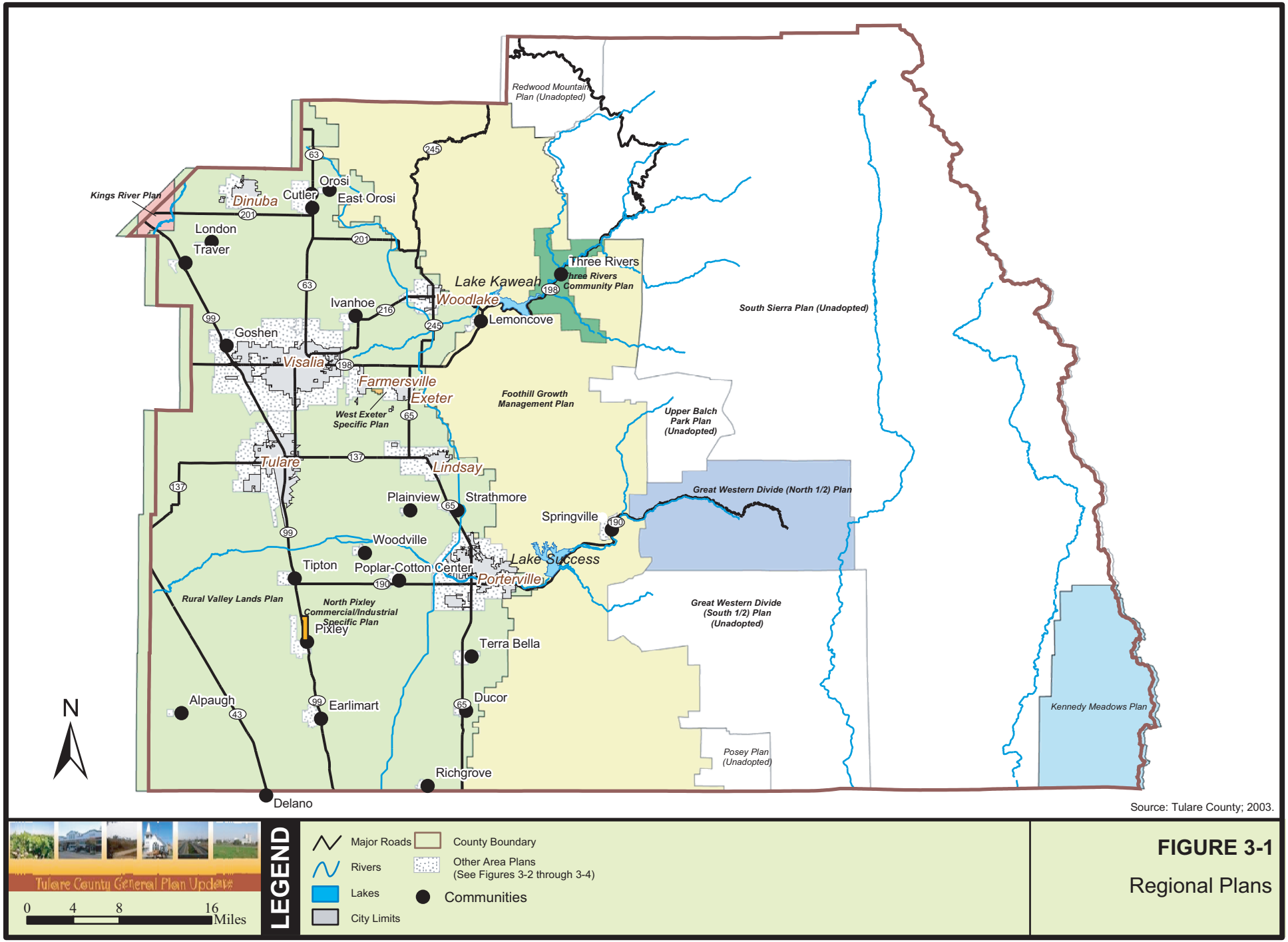


FIGURE 3-1

Regional Plans

Tulare County uses three key planning tools to guide urban development in all unincorporated areas of the county. The first is the Urban Boundaries Element; the second are the area and sub area Plans; the third are the General Plans for identified incorporated cities and community plans for unincorporated communities. Land use outside the established Urban Development Boundaries is guided by the area and sub area Plans.

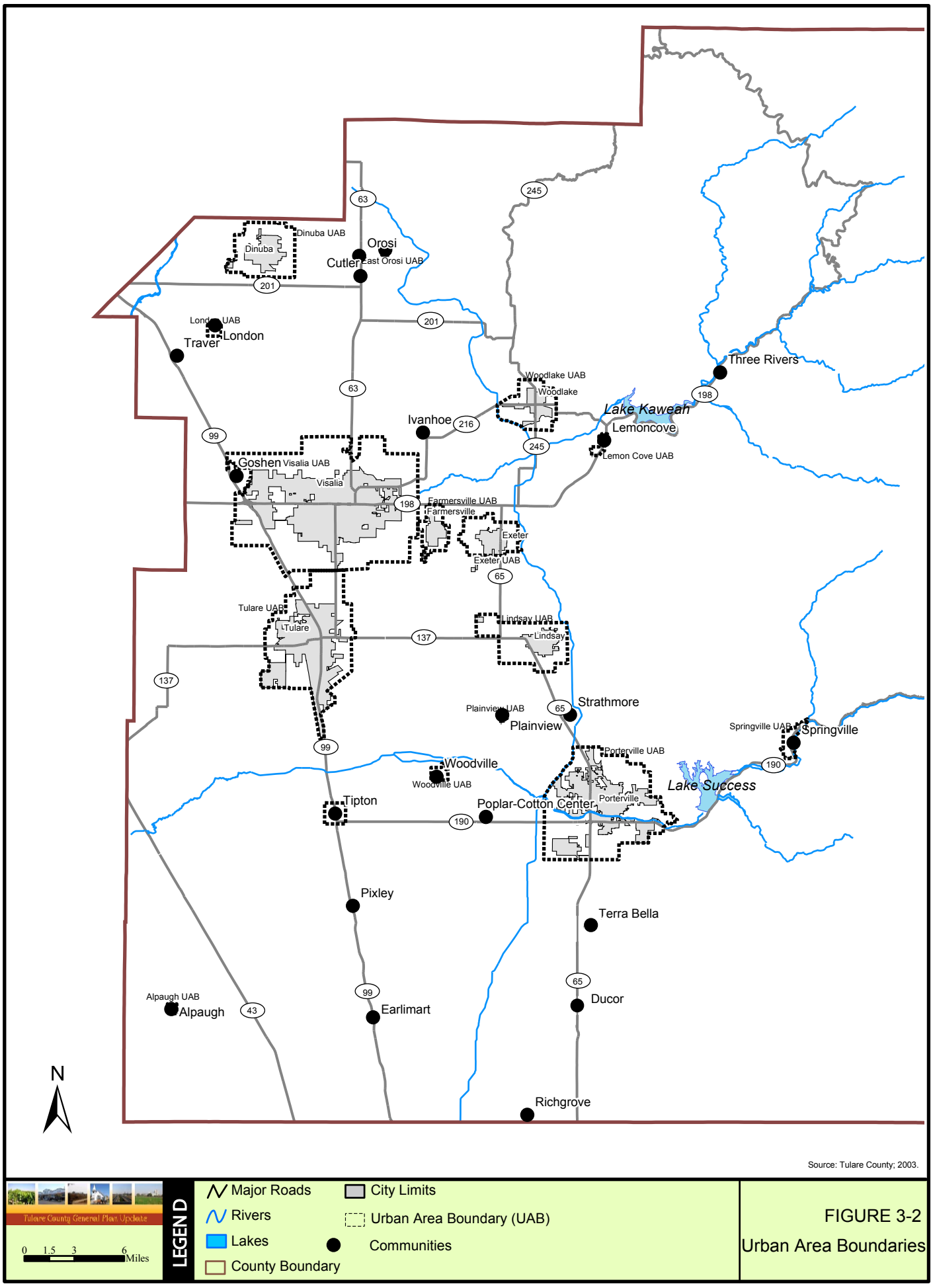
The General Plan Urban Boundaries Element establishes boundaries for land use policies in the unincorporated areas surrounding all eight incorporated cities and 18 unincorporated urban areas in the county.

Urban Boundaries

The Urban Boundaries Element, adopted in 1974, identifies two types of boundaries: Urban Area Boundaries (UAB) and Urban Improvement Area (UIA). At the time of the Urban Boundaries Element adoption (1974), the UIA was defined as the twenty-year growth boundary and the UAB was defined as the ultimate growth boundary for each city or community. In 1983, the Urban Boundaries Element was amended to replace the UIA model with the Urban Development Boundary (UDB), and to modify the UAB model to a "comment" area around incorporated cities and having the UAB as the next logical area of expansion beyond the UDB. UABs are no longer established around unincorporated communities, though existing UABs and UIAs are still used.

The UDB establishes a twenty-year growth boundary for unincorporated communities for which services will likely be extended to allow growth. The county uses population, existing county policies, and development suitability analysis when determining the location and size of the UDB.

Just as the UDB defines the area where growth will occur, it is also intended to serve as the community plan area boundary. While the 1983 amendment to the Urban Boundaries Element replaced the UIA with the UDB, some communities continue to have UIAs, but the guidelines of these UIAs are the same as the UDB. The Urban Boundaries Element directs that community plans be adopted for 18 unincorporated communities to guide future development within their community boundaries. Of the 18 communities identified by the element, 12 had adopted community plans by mid-2004. Figures 3-2, 3-3, and 3-4 show all boundaries (UAB, UDB, and UIA) as identified by the Tulare County GIS database.


Dinuba UAB
Dinuba
Orosi
Cutler
East Orosi UAB
London UAB
London
Traver
Woodlake UAB
Woodlake
Three Rivers
Lake Kaweah
Lemoncove
Lemon Cove UAB
Ivanhoe
Goshen
Visalia UAB
Visalia
Farmersville UAB
Farmersville
Exeter
Exeter UAB
Tulare UAB
Tulare
Lindsay UAB
Lindsay
Plainview UAB
Plainview
Strathmore
Springville UAB
Springville
Porterville UAB
Porterville
Woodville
Woodville UAB
Lake Success
Tipton
Poplar-Cotton Center
Pixley
Terra Bella
Alpaugh UAB
Alpaugh
Earlimart
Ducor
Richgrove
63
245
201
99
216
198
65
137
190
43
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
LEGEND
Major Roads
Rivers
Lakes
County Boundary
City Limits
Urban Area Boundary (UAB)
Communities
FIGURE 3-2
Urban Area Boundaries

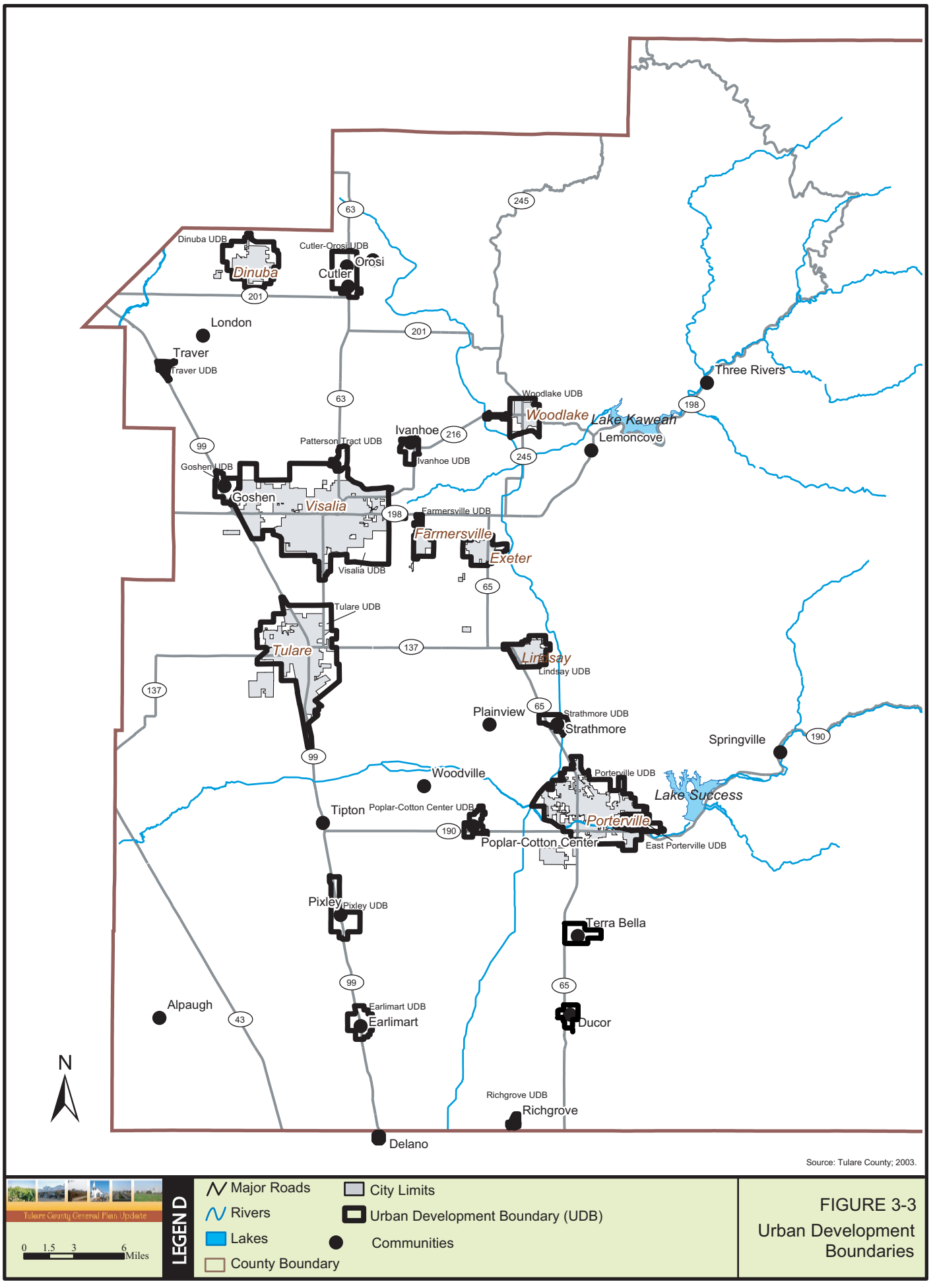
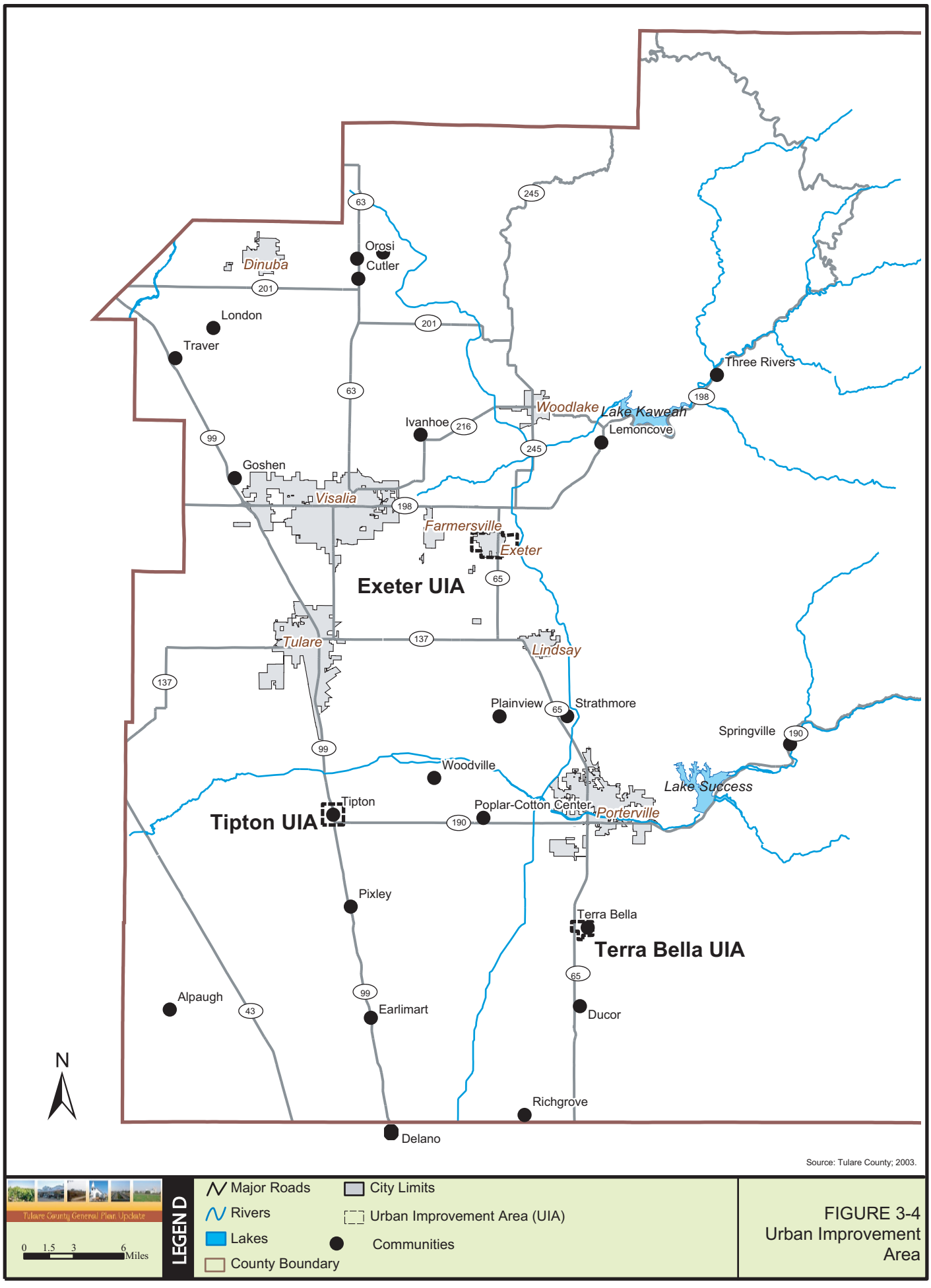


FIGURE 3-3
Urban Development Boundaries


Orosi
Cutler
Dinuba
London
Traver
Three Rivers
Woodlake
Lake Kaweah
Lemoncove
Ivanhoe
Goshen
Visalia
Farmersville
Exeter
Exeter UIA
Tulare
Lindsay
Plainview
Strathmore
Springville
Woodville
Lake Success
Tipton
Tipton UIA
Poplar-Cotton Center
Porterville
Pixley
Terra Bella
Terra Bella UIA
Alpaugh
Earlimart
Ducor
Richgrove
Delano
63
245
201
99
216
198
65
137
190
43
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
LEGEND
Major Roads
Rivers
Lakes
County Boundary
City Limits
Urban Improvement Area (UIA)
Communities
FIGURE 3-4
Urban Improvement Area

The 12 unincorporated communities with community plans (CP) are listed below. In addition, the county has adopted the General Plans of all eight incorporated cities to guide land use outside the city limits by within the UDB. Community plans supplement the county-wide General Plan policies. These plans have their own land use diagrams with land use designations and development standards to guide area growth. Communities with plans are as follows:

- Cutler-Orosi (1988);
- Earlimart (1988);
- Goshen (1978);
- Ivanhoe (1990);
- Pixley (1997);
- Poplar-Cotton Center (1996);
- Richgrove (1986);
- Springville (1985);
- Strathmore (1989);
- Terra Bella/Ducor (2004);
- Three Rivers (1980); and
- Traver (1989).

Cities with general plans include: Dinuba, Exeter, Farmerville, Lindsay, Porterville, Tulare, Visalia, and the City of Woodlake. According to county staff, community plans are being developed and/or updated for the communities of Three Rivers and Tipton. Figures 3-2, 3-3, and 3-4 show each boundary (UAB, UDB, and UIA) as identified by the Tulare County GIS database.

Specific Plans

The County has adopted two specific plans: the West Exeter Specific Plan (1989) and the North Pixely Commercial/Industrial Specific Plan (1999). The West Exeter Specific Plan supersedes portions of the 1964 Land Use and Circulation Element by establishing new land use controls and circulation patterns for the land within its boundaries. The North Pixley Commercial/Industrial Specific Plan is designed to implement both the Tulare County General Plan and Pixley Community Plan.

Summary

Area and sub area, community, and specific plans form a framework that governs land use for the unincorporated areas of Tulare County. Each of these planning categories and plans is discussed in greater detail below.

Area Plans

Area plans have been prepared for two of the three major geographic regions of the county: the San Joaquin rural valley floor and the foothills. No plan has been adopted for the whole mountain region.

Rural Valley Lands Plan

The Rural Valley Lands Plan (RVLP) (GPA 94-008) was adopted in 1975, and has had two subsequent amendments that strengthen its agricultural-protective provisions. The RVLP applies to about 773,500 acres of the valley portion of the County, outside the planned Urban Development Boundaries (UDB) and generally below the 600-foot elevation contour line along the foothills of the Sierra Nevada Mountain Range. The Kings River Plan, West Exeter, and Sequoia Field Public Building Element also lie within the RVLP.

The purpose of the RVLP is to protect and maintain the agricultural viability of rural valley areas by establishing requirements for exclusive agricultural zoning (containing minimum parcel sizes) appropriate to sustain agriculture and implementing a policy that utilizes resource information to determine the suitability of rural lands for non-agricultural uses. The goal of the RVLP is to "sustain the viability of Tulare County agriculture by restraining division and use of land which is harmful to continued agricultural use."

The RVLP utilizes five exclusive agriculture (AE) zones, each requiring a different minimum parcel size (ranging from five to eighty acres). These zones are as follows: AE, AE-10, AE-20, AE-40, and AE-80. The number designation on each zone generally reflects the minimum acres of land needed to productively farm a certain crop at a commercial level. Further analysis of Tulare County's zoning ordinance and specific zone requirements are discussed in Section 3.5.

Table 3-1 shows the zoning categories used in the RVLP. The table also shows total acreage in the RVLP area. The majority of the land located in this region is dedicated to agricultural uses. As Table 3-1 shows, the majority of land in the RVLP area is zoned AE-40 (495,180 acres) and AE-20 (196,630 acres). The RVLP area contains approximately 769,108 acres of land with about 2,140 acres utilized by non-designated land types, such as roads and waterways.

In order to grant an exception for the use of the AE zone on properties that have minimal or no agricultural value, a point system is used to evaluate property suitability. Points are awarded for various factors such as parcel size, available public services, and surrounding land uses. Parcels determined to be more suitable for nonagricultural uses may be zoned (discretionary review required) for urban/suburban uses. Parcels that do not meet the requirements for rezoning are not allowed to rezone and must remain agriculturally zoned. A detailed description of the point system is shown below.

The RVLP point system issued to determine whether a site is suitable to rezone from an agricultural zone on the Valley floor to an urban zone. The county shall not allow re-zoning of parcels that accumulate 17 or more points according to the RVLP Development Criteria. If the number of points accumulated is 11 or less, the parcel may be considered for nonagricultural zoning. A parcel receiving 12 to 16 points shall be determined to have fallen within a "gray" area in which no clear cut decision is readily apparent. In such instances, the Planning Commission and Board of Supervisors shall make a decision based on the unique circumstances pertaining to the particular parcel of land, including factors not covered by this system. The following list of determinants used in the system shows the categories and points established by the RVLP:

Table 3-1. Rural Valley Lands Plan Zoning Designations, Tulare County, 2008

Zone 1	Acres
Agricultural (A-1)	1,640
Exclusive Agriculture (AE)	3,090
Exclusive Agriculture (AE-10)	26,080
Exclusive Agriculture (AE-20)	196,630
Exclusive Agriculture (AE-40)	495,180
Exclusive Agriculture (AE-80)	39,610
Foothill Agriculture (AF)	1,800
Neighborhood Comm. (C-1)	20
General Commercial (C-2)	50
Service Commercial (C-3)	50
Light Manufacturing (M-1)	400
Heavy Manufacturing (M-2)	110
Recreation (O)	170
Prof. Admn. Office (P-O)	4
Single Family Residential (R-1)	120
Two-family Residential (R-2)	4
Multiple Family Residential (R-3)	10
Rural Residential (R-A)	2,000
Subtotal	***766,968***
Other/Non-zoned[2]	2,140
Total	**769,108**

1 All overlay zones (e.g., F, SC, M) are deferred to the base zone with which they are combined.

2 Includes lands zoned for floodways and other non-zoned areas such as right-of-ways and bodies of water.

Source: Rural Valley Lands Plan, 1975; Tulare County Assessor's Database, 2008a.

RLVP Plan Criteria and Evaluation Matrix

A. RESTRICTED TO AGRICULTURE VALUES

1. Agricultural Preserve Status

   a. Definition
   Determine if the site is within an agricultural preserve.

   b. Justification
   To prevent conflict between agricultural preserve rules and regulations and use of the land.

   c. Weighting Criteria

      1) Restricted to Agriculture - site is within an agricultural preserve.

         a) Importance - the Board of Supervisors has determined that these lands should be maintained in commercial agricultural production.

      2) Not Restricted to Agriculture - site is not within an agricultural preserve.

         a) Importance - these lands have other land use alternatives available to them.

2. Limitations for Individual Waste Disposal Facilities

   a. Definition
   Determine by conferring with the Tulare County Health Department if individual waste disposal facilities can be permitted on the parcel under review.

   b. Justification
   The Tulare County Health Department may determine that employing an individual waste disposal facility for the disposal of liquid waste will be in violation of County ordinances and/or State and federal laws or regulations.

   c. Weighting Criteria

      1) Restricted to Agriculture - employing an individual waste disposal facility is prohibited by law or regulation.

         a) Importance - prevent the contamination of the ground water table.

      2) Not Restricted to Agriculture - employing an individual waste disposal facility is not prohibited by law.

a) Importance - to direct nonagricultural development into areas where employing an individual waste disposal system will not result in the contamination of the groundwater table.

B. VARIABLE POINT VALUE

1. Land Capability

a. Definition
Determine the predominant land capability of the site for agricultural purposes.

b. Justification
To preserve prime agricultural lands for agricultural production.

c. Weighting Criteria

1) Highest Relative Suitability - lands which are of a Class I, II, III, or IV land capability. Their point values are as follows:

Class I, II, or III – 4 point value

Class IV – 2 point value

a) Importance - to preserve lands with agricultural capability by discouraging nonagricultural development.

2) Lowest Relative Suitability - lands which are not of Class I, II, III, or IV capability.

a) Importance - direct nonagricultural development into areas that are not suited for agricultural purposes.

C. FOUR POINT VALUES

1. Existing Parcel Size

a. Definition
Determine the parcel size of the applicant's entire contiguous ownership.

b. Justification
To provide for development of nonagricultural uses on those parcels which are less than five acres (gross) in size. This will prevent the division of lands into smaller parcels.

c. Weighting Criteria

1) Highest Relative Suitability - the site is five acres (gross) or larger in size.

a) Importance - to prevent further division of large agricultural parcels into smaller parcels, thus limiting their value for agricultural purposes.

2) Lowest Relative Suitability - the site is less than five acres (gross) in size.

a) Importance - to allow development of nonagricultural uses to occur on those parcels where most agricultural uses would be economically infeasible.

2. Existing Land Use/Suitability for Cultivation

a. Definition
Determine present use of the site and its suitability for the commercial cultivation, growing and harvesting of field crops, fruit and nut trees, vines, vegetables, and horticultural specialties.

b. Justification
To identify and protect existing and potential agricultural lands, while also allowing nonagricultural uses to locate on those lands not suitable for agriculture.

c. Weighting Criteria

1) Highest Relative Suitability - the land is in agricultural use or has the potential for cultivation. Things to be considered are as follows: Is the site presently being used for commercial agriculture? What is the land's cropping history? Is the site suitable for cultivation? Have adjacent properties been successfully farmed? (For factors to consider in judging suitability see lowest relative suitability.)

a) Importance - to preserve land in agricultural use and to discourage nonagricultural use of land with the potential for cultivation.

2) Lowest Relative Suitability - the land is not in agricultural use and is not suitable for cultivation as determined by a professional agronomist. Examples of conditions to take into consideration in determining that the site is not suitable for cultivation are as follows: cold

spots in thermal areas, sand streaks covering a majority of the site, high concentration of salts or alkali, and areas of extremely rocky soil. The opinion of the appropriate professional, such as testing by a soil scientist, may be required as proof of the existence of any impeding condition.

a) Importance - to encourage nonagricultural development to occur on lands which are not in agricultural use or are less suitable for cultivation.

D. THREE POINT VALUE CATEGORY

1. Surrounding Parcel Size (Do not evaluate if the site received "0" points for "Existing Land Use/Suitability for Cultivation". Enter a "0" for this factor in such cases.)

   a. Definition
   Determine the percentage of final subdivision lots in the area devoted to parcels less than five acres (gross) in size within one-quarter mile (1,320 feet) of the perimeter of the subject site.

   b. Justification
   To provide for development of nonagricultural uses in areas where there is already a high percentage of parcels that are less than five acres (gross) and to protect large-parcel areas from further breakdown.

   c. Weighting Criteria

      1) Highest Relative Suitability - within one-quarter mile (1,320 feet) of the perimeter of the site, 35 percent or less of the area is devoted to parcels smaller than five acres (gross) in size.

         a) Importance - to discourage nonagricultural land uses in areas where land is essentially in agriculture.

      2) Lowest Relative Suitability - within one-quarter mile (1,320 feet) of the perimeter of the site, more than 35 percent of the area is devoted to parcels smaller than five acres (gross) in size.

         a) Importance - allow nonagricultural development on the site, if within the surrounding area a high percentage of the area is devoted to parcels of less than five acres.

2. Surrounding Land Use

   a. Definition
   Determine the various land uses that are abutting and within one-quarter mile (1,320 feet) of the site. In determining land use, nonagricultural uses shall include schools and farm labor camps. Rights of way, including irrigation canals, rivers, roads and transmission lines, should not be included in the calculations described below. Agricultural uses include land that is fallow and has been under cultivation and shall also include uses that are compatible in agricultural areas, such vacant lands (improved or unimproved) and open space lands (including parks and golf courses). Tentative subdivision or parcel map approval shall not be considered a nonagricultural use until the final map has been recorded.

   b. Justification
   To prevent the close association of agricultural uses and nonagricultural uses, which may have the potential to adversely affect each other and discourage the establishment of nonagricultural uses in agricultural areas.

   c. Weighting Criteria

      1) Highest Relative Suitability - none of the standards that have been set for nonagricultural value have been met. However, for proposed heavy industrial zone changes, the lowest relative suitability criterion set forth below shall not consider residential uses to be nonagricultural uses.

         a) Importance - to eliminate conflicts with adjacent land uses and protects agricultural land uses (and residential land uses, in the case of proposed heavy industrial zone changes) from intrusion of inharmonious uses.

      2) Lowest Relative Suitability

         2.1) The site is not abutted by nonagricultural uses, but within one-quarter mile (1,320 feet) of the perimeter of the site, at least 35 percent of the area is devoted to nonagricultural uses.

         2.2) The site is abutted on one side with nonagricultural uses and within one-quarter mile (1,320 feet) of the perimeter of the site; at

least 25 percent of the area is devoted to nonagricultural uses.

2.3) The site is abutted on two sides with nonagricultural uses and within one-quarter mile (1,320 feet) of the perimeter of the site; at least 20 percent of the area is devoted to nonagricultural uses.

2.4) The site is abutted on three sides with nonagricultural uses and within one-quarter mile (1,320 feet) of the perimeter of the site; at least 15 percent of the area is devoted to nonagricultural uses.

2.5) The site is abutted on four sides with nonagricultural uses.

2.6) Importance - to allow nonagricultural development in those areas where such development has already occurred.

3. Proximity to Inharmonious Uses

a. Definition
Determine if any dairies, feed lots, concentrated animal raising operations, sand and gravel operations, waste disposal sites, airports and/or agricultural chemical research stations are located within one-half mile (2,640 feet) of the site.

b. Justification
To prevent the establishment of inharmonious uses that may jeopardize the continued operation or future expansion of these activities, and to discourage nonagricultural uses in areas where dust, flies, odors, noise, and hazardous chemicals may be a problem.

c. Weighting Criteria

1) Highest Relative Suitability - the site is within one-half mile (2,640 feet) of any of the above types of uses.

a) Importance - to prevent uses which may be inharmonious with the above-mentioned activities.

2) Lowest Relative Suitability - the site is more than one-half mile (2,640 feet) from any of the uses mentioned above.

3) Flexible Point Value - for proposed commercial or industrial zone changes, the following formula may be used in place of the criteria contained in (1) and (2) above:

3 points - If any of the above types of operations are located adjacent to the site.

2 points - If any of the above types of operations are located within one-eighth mile (660 feet) of the site.

1 point - If any of the above types of operations are located within one-quarter mile (1,320 feet) of the site.

0 points - If none of the above types of operations is located within one-quarter mile (1,320 feet) of the site.

a) Importance - to recognize that, while residential uses may be inharmonious with the activities mentioned above, commercial and industrial uses might not be inharmonious.

4. Proximity to Lands Within Agricultural Preserves

a. Definition
Determine the amount of area within one-quarter mile (1,320 feet) of the perimeter of the site that is in agricultural preserves.

b. Justification
To protect those areas which have been set aside by official action of the County for commercial agricultural use from adjacent conflicting land uses.

c. Weighting Criteria
(If the site meets any of the criteria listed under the highest relative suitability, award this factor 3 points. If the site does not meet any of the highest relative suitability criteria, award the factor "0" points.)

1) Highest Relative Suitability

1.1) The site is not abutting an agricultural preserve, but within one-quarter mile (1,320 feet) of the perimeter of the site at least 64 percent of the area is land that is in agricultural preserves.

1.2) The site is abutted on one side with an agricultural preserve, and within one-quarter mile (1,320 feet) of the perimeter of the subject site at least 50 percent of the area is land that is in agricultural preserves.

1.3) The site is abutted on two sides with agricultural preserves, and within one-quarter mile (1,320 feet) of the perimeter of the site at least 35 percent of the area is land that is in agricultural preserves.

1.4) The site is abutted on three sides with agricultural preserves, and within one-quarter mile (1,320 feet) of the perimeter of the site at least 20 percent of the area is land that is in agricultural preserves.

1.5) The site is abutted on four sides with agricultural preserves.

a) Importance - to eliminate conflicts with adjacent land uses and to protect agricultural land uses from intrusion of inharmonious uses.

2) Lowest Relative Suitability - none of the above criteria have been met.

a) Importance - to encourage nonagricultural uses to develop in those areas where such uses will not conflict with lands committed to long-term agricultural uses.

E. TWO POINT VALUE CATEGORY

1. Level of Groundwater and Soil Permeability

a. Definition

Determine the groundwater level and the soil permeability rating for the site. Highly permeable is defined as a percolation rate greater than five inches per hour. Groundwater shall be the highest recorded groundwater level in unrestricted aquifers as shown on the U.S.D.I. Bureau of Reclamation "Lines of Equal Depth to Ground Water" map or the California Department of Water Resources "Lines of Equal Depth to Water in Wells" or "Lines of Equal Elevation of Water in Wells" maps, provided that the groundwater maps to be used are based on data that is not more than 25 years old.

b. Justification
To preserve in agriculture or open space those areas characterized by a high groundwater table and highly permeable soil.

c. Weighting Criteria

1) Highest Relative Suitability - site has highly permeable soil and a groundwater table within twenty (20) feet of the ground surface.

a) Importance - those lands that have highly permeable soil and a water table higher than twenty feet should be maintained in agriculture or open space because such lands are not suitable for the installation of domestic, commercial, and industrial waste disposal systems.

2) Lowest Relative Suitability - site has a water table lower than twenty (20) feet from the ground surface, and does not have highly permeable soil.

a) Importance - such lands are more suitable for installation of domestic, commercial and industrial waste disposal systems.

F. ONE POINT VALUE CATEGORY

1. Proximity to Fire Protection Facilities

a. Definition
Determine the distance to the nearest fire protection facilities from the site.

b. Justification
To enable fire protection facilities to provide adequate services for all nonagricultural land uses in the County within the requirements of established Fire Code Standards and to protect the County's Insurance Services Office (I.S.O.) ratings.

c. Weighting Criteria

1) Highest Relative Suitability - site is not within a five-mile response distance from fire protection facilities. For proposed industrial or commercial zone changes, three (3) points shall be awarded for highest relative suitability.

a) Importance - this land should be maintained in agriculture in order to conform to fire safety standards.

2) Lowest Relative Suitability - site is within a five-mile response distance from fire protection facilities.

a) Importance - land which has accessibility to fire protection facilities is more suitable for nonagricultural uses.

2. Access to a Paved County and/or State Maintained Road

a. Definition
Determine if the site has access to a paved County and/or State maintained road.

b. Justification
Protect agriculture from problems of dust and pollution created by increased vehicular traffic on unpaved minor roads, and to discourage the creation of new roads that may have to be maintained by the County or State.

c. Weighting Criteria

1) Highest Relative Suitability - the site does not have direct access to a paved road.

a) Importance - those areas that do not have accessibility to paved roads may be better suited for agricultural uses.

2) Lowest Relative Suitability - the site has access to a paved road.

a) Importance - those areas that have accessibility to a paved road may be better suited for nonagricultural uses than areas that do not have such access.

3. Historical, Archaeological, Wildlife Habitat, and Unique Natural Features

a. Definition
Determine if within the boundaries of the subject site there are any historical, archaeological, wildlife habitat, and/or unique natural features (as defined in ERME) which should be preserved.

b. Justification
To preserve and protect historical and archaeological sites, wildlife habitats, and unique natural features.

c. Weighting Criteria

1) Highest Relative Suitability - located on the site is a historical or archaeological site, wildlife habitat, and/or unique natural feature.

a) Importance - to discourage encroachment of nonagricultural development, which could seriously damage or alter historical or archaeological sites, wildlife habitats, and/or unique natural features.

2) Lowest Relative Suitability - no historical or archaeological site, wildlife habitat, and/or unique natural features exist on the site.

a) Importance - to direct nonagricultural uses into those areas in which there exists no historical or archaeological sites, wildlife habitats, and/or unique natural features, which may be destroyed by such activity.

4. Flood Prone Areas

a. Definition
Determine if the site is subject to 100-year frequency floods.

b. Justification
To preserve in open space or agricultural use those areas subject to flooding.

c. Weighting Criteria

1) Highest Relative Suitability - site is subject to 100-year frequency floods.

a) Importance - to prevent nonagricultural uses from establishing in areas where severe flooding presents a hazard to public health, safety or welfare.

2) Lowest Relative Suitability - site is not subject to 100-year frequency floods.

a) Importance - to direct nonagricultural uses into areas where flooding is not a problem.

5. Availability of Community Domestic Water

a. Definition
For residential zone changes, determine if community domestic water can be obtained. In the case of proposed industrial or commercial zone changes, determine instead if

the requirements of the Tulare County Fire Flow Ordinance can be met.

b. Justification
To consolidate nonagricultural development where water services are already available in order to maximize use of existing systems and prevent proliferation of new systems in rural areas.

c. Weighting Criteria

1) Highest Relative Suitability - for residential zone changes, site does not have accessibility to community domestic water. In the case of proposed industrial or commercial zone changes, the requirements of the Tulare County Fire Flow Ordinance cannot be met.

a) Importance - to discourage the creation of additional community domestic water systems in agricultural areas and assure that the requirements of the Tulare County Fire Flow Ordinance are met.

2) Lowest Relative Suitability - for residential zone changes, site has access to community domestic water. In the case of proposed industrial or commercial zone changes, the requirements of the Tulare County Fire Flow Ordinance can be met.

a) Importance - to encourage nonagricultural uses to locate in areas where community domestic water systems have already been established and assure that the requirements of the Tulare County Fire Flow Ordinance are met.

6. Surface Water Irrigated Lands

a. Definition
Determine if the site has rights to surface irrigation water.

b. Justification
To preserve in agriculture those lands irrigated by surface water sources.

c. Weighting Criteria

1) Highest Relative Suitability - site has rights to surface irrigation water.

a) Importance - to maintain in-agriculture those lands that can be irrigated by surface water sources and are not totally dependent on groundwater for irrigation.

2) Lowest Relative Suitability - site does not have rights to surface irrigation water.

a) Importance - such lands are less suitable for agricultural use since their only source of irrigation water would be groundwater.

7. Groundwater Recharge Potential (Do not evaluate if the site received "0" points for "Surface Water Irrigated Lands". Enter a "0" for this factor in such cases.)

a. Definition

Determine the soil permeability rating for the site. For highest groundwater recharge potential, the site should be irrigated by surface water sources and onsite soils should be in a permeability class that is rated at least moderately slow (have a projected vertical conductivity/percolation rate of at least 0.20 inch of water per hour) and must lack a restrictive layer (a soil or rock layer that inhibits the movement of water and/or roots through the soil) so as to provide continuity to groundwater. Groundwater shall be the highest recorded groundwater level in unrestricted aquifers as shown on the U.S.D.I. Bureau of Reclamation "Lines of Equal Depth to Ground Water" map or the California Department of Water Resources "Lines of Equal Depth to Water in Wells" or "Lines of Equal Elevation of Water in Wells" maps, provided that the groundwater maps to be used are based on data that is not more than 25 years old.

b. Justification

To preserve in agriculture (or open space) those lands with the highest potential for groundwater recharge.

c. Weighting Criteria

1) Highest Relative Suitability - site has soils that are of at least moderately slow permeability (percolation rate of at least 0.20 inch per hour) and lack a restrictive layer (a soil or rock layer that inhibits the movement of water and/or roots through the soil).

a) Importance - to maintain in agriculture those lands irrigated by surface water sources and containing permeable soils, as they account for significant

amounts of groundwater recharge from irrigation water that percolates below the crop root zone and into the unconfined aquifer.

2) Lowest Relative Suitability - site does not contain permeable soils or contains an impediment to recharge, such as a restrictive layer that would inhibit the movement of water and/or roots through the soil (the latter factor to be determined by the opinion of the appropriate professional, such as a soil scientist, engineer, or geologist).

    a) Importance - such lands are less suitable for groundwater recharge.

Kings River Plan

The Kings River Plan (KRP) is a sub area plan adopted in 1982 as an amendment to the Land Use and Circulation Element and supersedes the Rural Valley Lands Plan. The plan area encompasses approximately 6,641 acres located in the northwestern corner of the county where the Kings River crosses into Tulare County. The planning area, which is used predominantly for intensive agriculture, contains one of the few remaining well-preserved riparian habitats in the southern San Joaquin Valley. Because of the aesthetic setting and the recreation opportunities provided by the Kings River, the KRP provides policies that mitigate conflicts between increasing urbanization and the existing agricultural use and natural resource preservation.

The KRP specifies goals and policies to balance residential development with existing uses, provide recreation opportunities, provide balanced circulation, assure that water and sewer facilities are environmentally safe, minimize the damage of flooding, and preserve existing habitat. Land use within the plan area is split between Sub-Area "A" (an 85-acre county-owned parcel) and the remaining plan area. The land use plan designates land outside Sub-Area "A" for agriculture, residential, floodways, commercial-recreation, public, golf courses, private recreation, and general commercial uses.

Sub-Area "A" is comprised of an 85-acre county owned parcel on the Kings River. Due to its ownership and proximity to the river, additional detail has been provided.

Table 3-2 shows the land use designations and the total acreage in the Kings River Plan area. A majority of the land in the KRP area is

comprised of Agriculture lands (3,456 acres) followed by land located in Rural Residential/Recreation Opportunity (1,717 acres). Lands designated for development are located mainly along the Kings River.

Table 3-2. Kings River Plan Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Agriculture	**3,456**
Residential	**177**
Rural Residential/Recreation Opportunity	**1,717**
Private Recreation	**34**
Commercial Recreation	**59**
Neighborhood Commercial	**0**
Kings River Golf Course & Country Club	**116**
Public	**11**
Floodway	**238**
Subtotal	**5,808**
Other (Non-designated)	**833**
Total	**6,641**

Source: Kings River Plan, 1982; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Foothill Growth Management Plan

The Foothill Growth Management Plan (FGMP) was adopted in 1981. The FGMP includes a comprehensive statement of the development policies and standards that prescribe land use and circulation patterns for the foothill region of Tulare County. The plan encompasses 675,641 acres of land generally at a 600-foot elevation to the west and bounded on the east by the federally owned parks in the Sierra Nevada Mountains and some privately owned lands on the San Joaquin Valley floor. The plan's policies set guidelines for community identity, new development, recreation/open space, agriculture, environmental protection, scenic corridors protection, history/archaeology, infrastructure facilities, and public services. The community plans for both Springville and Three Rivers are within in the FGMP boundaries.

The FGMP utilizes four land use designations that are geographically limited to two areas outside the communities of Three Rivers and Springville. These designations are Development Corridor, Extensive Agriculture, Foothill Extension, and Valley Agriculture Extension.

Table 3-3 shows the land use designations along with total acreage in the FGMP area. Nearly 85 percent of the land within this region is dedicated to agricultural uses. The lands that are developable are located mainly along transportation corridors where geographic and geological characteristics are conducive to development. In total, approximately 675,641 acres of land are designated in the FGMP area.

Table 3-3. Foothill Growth Management Plan Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Extensive Agriculture	537,175
Development Corridor	86,138
Foothill Extension	16,933
Valley Agricultural Extension	35,345
Total	**675,641**

Source: Foothill Growth Management Plan, 1981; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Mountain Planning Region

The Mountain Planning Region includes all land located east of the Foothill Growth Management Plan, which generally coincides with the westerly boundary of federal lands. This includes lands under the jurisdiction of the National Park Service (Sequoia National Park), the U.S. Forest Service (Sequoia National Forest and Giant Sequoia National Monument), and the Bureau of Land Management (BLM). The private lands in this region amount to about 40,000 acres. The following are seven separate geographical locations or "sub-areas" within the Mountain Planning Region:

- Kennedy Meadows (1986);
- Great Western Divide - North ½ (1990);
- Great Western Divide - South ½ (unadopted);
- Redwood Mountain (unadopted);
- Posey (unadopted);
- Upper Balch Park (unadopted); and
- South Sierra (unadopted).

Of the seven sub-areas identified above, only the Kennedy Meadows and Great Western Divide (North ½) sub-areas have adopted plans. For areas without adopted plans, the 1964 Land Use Element and any federal or state land use management plans guide development and/or land management. These two plans use unique land use designations that provide for the future growth of each sub-area. These two plans collectively cover 50 percent of the private land in the Mountain Planning Region.

Kennedy Meadows Plan. The Kennedy Meadows Plan includes an area of about 93,000 acres in the southeastern corner of the county.

Table 3-4 shows the land use designations along with total acreage in the Kennedy Meadows Plan area. Over 80 percent of the land within this plan area is federal or state-owned. The lands that are privately owned include small enclaves scattered throughout the plan area. The county has designated all private holdings with a land use classification. Land designated as Mountain Commercial has not been guaranteed because the land use diagram for the Kennedy Meadows Plan depicts this designation as geographic "nodes" rather than defined geographic bound areas. Over 40 percent of the land in the Kennedy Meadows Plan area is comprised of Resource Management and Resource Conservation Management (6,408 acres) followed by land designated as in Mountain Residential-40 (6,013 acres). In total, there are approximately 15,500 acres of designated lands in the Kennedy Meadows Plan area. In addition, 77,393 acres of land is not designated since they are federal or state-owned lands, right-of-ways, waterways, and other uses.

Great Western Divide (North ½) Plan (GWDN ½ Plan). The GWDN ½ Plan includes over 106,000 total acres and is located on the eastern edge of the Foothill Growth Management Plan area along State Route 190, east of Porterville.

Table 3-4. Kennedy Meadows Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Mountain Residential – 40	6,013
Mountain Residential – 5	3,078
Resource Conservation Management	6,408
Mountain Commercial[1]	-
Subtotal Designated	**15,499**
Government-owned and Other (Non-designated)	77,393
Total	**92,892**

1 The Land Use Diagram for Kennedy Meadows does not identify boundaries of land use for Mountain Commercial; rather, circular "nodes" for general locations are depicted.

Source: Kennedy Meadows Plan, 1986; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Table 3-5 shows the land use designations in the plan along with the total acreage in the Great Western Divide (North ½) Plan area. Over 95 percent of the land located in the plan area is federally or state-owned. The lands that are privately owned include small enclaves scattered throughout the plan area, each with its own neighborhood name. The

county has designated all private holdings with specific land use types. As Table 3-5 shows, the two largest designated land areas in the Great Western Divide (North ½) Plan area are Resource Management and Conservation, followed by land designated as Mountain Residential (20,000 square foot minimum).

Table 3-5. Great Western Divide (North ½) Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Resource Management & Conservation	3,078
Mountain Residential – 5 Acre Minimum	5,607
Mountain Residential – 20,000 sq./ft. Minimum	1,168
Multiple Family Residential	5
Neighborhood Commercial	1
General Commercial	46
Quasi-Public	51
Subtotal Designated	**9,956**
Other (Non-designated) & Federal & State Lands	101,272
Total	**106,181**

Source: Great Western Divide (North ½) Plan, 1990; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Community Plans

The Tulare County General Plan establishes a broad policy framework that guides land use decisions in the unincorporated areas of the county. Because of the diverse geography and land uses within the county (ranging from highly urbanized areas to the intensive agricultural uses on the San Joaquin Valley floor, to the natural open spaces of the Sierra Nevada Mountains), 12 individual community plans have been prepared within the framework of the overall General Plan to address the unique values and issues in each. The community plans supplement the General Plan, and address land use, circulation, housing, public services, and other issues in much the same way that the General Plan of an incorporated city addresses such issues. The plans also contain specific goals, policies, and programs tailored to each particular community.

Table 3-6 provides a summary of key information for each plan: adoption date, timeframe, revision, acreage, vacant land, land need, existing population, and projected population.

Table 3-6. Summary of Community Plans, Tulare County, 2006

Community Plan	Adoption (Year)	Most Revision (Recent)	Target Year/Time-Frame	Total Plan Area (Acres)	Vacant Land (Acres)	Projected Planning Period Land Need (Acres)	Existing Plan Population	Projected Population (Target Year)
Cutler - Orosi	1988	1988	2010	2,282	1,393	1,043	9,400	20,500
Earlimart	1988	1988	2010	1,406	593	499	5,592	10,792
Goshen	1978	1978	2000	1,058	659	435	1,945	3,625
Ivanhoe	1990	1993	2010	809	346	263	3,450	5,335
Pixley	1997	1997	2015	2,176	930	880	2,457(1992)	4,438
Poplar/Cotton Center	1996	1996	2015	907	418	244	2,299	4,941
Richgrove	1986	1986	2005	230	50	NA	1,629	2,653
Springville	1985	1985	2005	949	758	NA	1,017	2,020
Strathmore	1989	1989	2010	790	272	526	2,100	3,250
Terra Bella (Ducor)	2004	2004	2020	1,407 (367)	822 (277)	804 (222)	3,466 (504)	5,550 (1,125)
Three Rivers	1980	1980	2000	20,085	19,039	3,125	1,645	3,445
Traver	1989	1989	2010	405	111	123	612	1,148

Source: Cutler Orosi Community Plan, 1988; Earlimart Community Plan, 1988; Goshen Community Plan, 1978; Ivanhoe Community Plan, 1990; Pixley Community Plan, 1997; Poplar/Cotton Center Community Plan, 1996; Richgrove Community Plan, 1986; Springville Community Plan, 1985; Strathmore Community Plan, 1980; Terra Bella-Ducor, 2004; Three Rivers Community Plan, 1980; Traver Community Plan, 1989.

For each community in the sections below a table is provided which shows land use designations total acreage.

Cutler-Orosi Community Plan

Cutler and Orosi are two unincorporated towns located in northern Tulare County, approximately 16 miles east of State Route 99 and 15 miles north of Visalia. The two towns are located about one mile from each other, are predominantly rural-agriculture service centers within a 2,280-acre urban boundary, and have a combined population of 11,809 (TCAG, 2003). The community plan was adopted in 1988. The plan defines an urban boundary that guides development for the two towns. The policies of the plan establish guidelines for controlling sprawl, extending existing development, preserving prime agricultural land, and promoting infill development.

Table 3-7 shows that the largest designated land area in the Cutler-Orosi Community Plan area is Medium Density Residential.

Table 3-7. Cutler-Orosi Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Low Density Residential	138
Medium Density Residential	821
High Density Residential	76
Residential Reserve	434
Office	24
Neighborhood Commercial	0
General Commercial	141
Service Commercial	0
Industry	137
Industrial Reserve	106
Public Facilities	198
Parks/Open Space	69
Subtotal Designated	**2,144**
Other (Non-designated)	138
Total	**2,282**

Source: Cutler-Orosi Community Plan, 1988; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

The Cutler-Orosi Community Plan assigns land use designations to 2,144 acres of land. An additional 138 acres of land is undesignated, dedicated rights-of-way, waterways, and other similar uses.

Earlimart Community Plan

The Earlimart Community Plan guides development for the town of Earlimart, located approximately 25 miles south of Visalia in southern Tulare County on State Route 99. The plan was adopted in 1988 to guide growth and development over a 20-year period through 2010. The community is primarily a rural, agricultural service center with a population of 6,583 (TCAG, 2003). The community plan includes policies for the redevelopment of existing housing, commercial development, industrial development, agricultural preservation, and continued local services. The planning area boundary encompasses approximately 1,406 acres.

Table 3-8 indicates that 72 percent of the designated land in the Earlimart Community Plan area is designated for Low Density Residential. In total, there are 1,133 acres of designated lands in the Earlimart Community Plan area. An additional 273 acres within the plan area is not designated, used for rights-of-way, waterways, and other similar uses.

Table 3-8. Earlimart Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Low Density Residential	816
High Density Residential	26
General Commercial	67
Service Commercial	1
Highway Commercial	36
Industrial	13
Quasi-Public	37
Subtotal Designated	**1,133**
Other (Non-designated)	273
Total	**1,406**

Source: Earlimart Community Plan, 1988; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Goshen Community Plan

The Goshen Community Plan was adopted in 1978 with a planning horizon of 2000. Goshen is located approximately 1½ miles north of the Visalia Municipal Airport on State Route 99 and has a population of 2,394 (TCAG, 2003). The Goshen Community Plan was adopted to guide future development in the 1,058-acre area. The policies of the plan establish guidelines for minimizing airport conflicts with community uses, fostering a cohesive community with access to services and facilities, planning according to surrounding uses and available services, working with surrounding communities, providing housing, and developing the economy.

Table 3-9 shows that more than 45 percent of the land in the Goshen Community Plan area is comprised of Residential use, followed by 19 percent of the land designated as Low Intensity Commercial and Industrial (116 acres). In total, there is about 851 acres of designated lands in the Goshen Community Plan area. In addition, 207 acres of undesignated land is rights-of-way, waterways, and other similar uses.

Table 3-9. Goshen Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Residential	350
Mobile Homes[1]	76
Residential Reserve	47
Community Commercial	24
Highway Commercial	51
Service Commercial	13
Private Recreation	24
Industrial	116
Low Intensity Commercial & Industrial	150
Parks & Schools	0

Table 3-9. Goshen Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Subtotal Designated	**851**
Other (Non-designated)	207
Total	**1,058**

1 The Mobile Homes designation is an overlay and is not factored into subtotal or total acreages.

Source: Goshen Community Plan, 1978; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

Ivanhoe Community Plan

Ivanhoe is an unincorporated community located in north central Tulare County, approximately 4.5 miles northeast of the City of Visalia. The community is predominantly a rural, agricultural service center within an 809-acre urban boundary and a population of 4,474 (TCAG, 2003). The community plan was adopted in 1990 with the planning period lasting through 2010. The policies of the plan establish guidelines for redevelopment, balanced land use, expanding the economic base, developing consistently with services, environmental preservation, and housing.

Table 3-10 shows that nearly 38 percent of the designated land in the Ivanhoe Community Plan area is designated Low Density Residential.

Table 3-10. Ivanhoe Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Residential Reserve	219
Low Density Residential	258
Medium Density Residential	38
High Density Residential	7
Commercial	69
Neighborhood Commercial	0
Industrial	39
Industrial Reserve	42
Public	17
Subtotal Designated	**689**
Other (Non-designated)	120
Total	**809**

Source: Ivanhoe Community Plan, 1990; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

689 acres of designated lands are within the Ivanhoe Community Plan area. An additional 120 acres within the plan area consist of rights-of-way, waterways, and other similar uses.

Pixley Community Plan

The Pixley Community Plan was adopted in 1997 for a planning horizon through the year 2015. Pixley is located approximately 12 to 15 miles south of Tulare on State Route 99 and has a population of 2,586 (TCAG, 2003). The Pixley Community Plan was adopted to guide future development in the 2,176-acre, Pixley urban planning boundary. The policies of the plan establish guidelines for redevelopment of housing, commercial, and circulation facilities; commercial development; industrial development; agricultural preservation; public service improvements; and compact urbanization.

In addition to the Pixley Community Plan, a specific plan has been adopted to guide growth in Pixley. This specific plan guides growth for the community's industrial commercial corridor. Please see North Pixley Industrial/Commercial Specific Plan under Specific Plans in this chapter.

Table 3-11 shows that the majority of land in the Pixley Community Plan area is designated Commercial/Industrial. A large amount of designated acreage is in active agriculture uses.

Table 3-11. Pixley Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Residential Reserve	560
Low Density Residential	349
Medium Residential	41
High Residential	14
Commercial	62
Commercial Reserve	0
Industrial	31
Industrial Reserve	67
Planned Commercial/ Industrial	693
Public	65
Subtotal Designated	**1,882**
Other (Non-designated)	294
Total	**2,176**

Source: Pixley Community Plan, 1997; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

In total, 1,882 acres of designated lands exists in the Pixley Community Plan Area. In addition, 294 acres within the plan area are non-designated rights-of-way, waterways, and other similar uses.

Poplar/Cotton Center Community Plan

Poplar and Cotton Center are two unincorporated communities located in south central Tulare County, approximately 20 miles southeast of Visalia. The two communities are predominantly rural, agricultural service centers with a combined population of 1,496 (TCAG, 2003). The community plan was adopted in 1996 with a planning horizon through the year 2015. The plan defines an urban boundary that guides development for the two towns. The goals and policies of the plan prescribe guidelines for redeveloping housing, commercial, and circulation facilities, housing, commercial and industrial development, agricultural preservation, and public service improvements.

Table 3-12 shows that the largest designated area in the Poplar/Cotton Center Community Plan area is Residential Reserve (216 acres) followed by land allocated for Medium Density Residential use (155 acres).

Table 3-12. Poplar/Cotton Center Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Residential Reserve	216
Low Density Residential	41
Medium Density Residential	155
High Density Residential	10
Commercial	111
Commercial Reserve	55
Industrial	69
Industrial Reserve	63
Public/Quasi-Public	125
Subtotal Designed	**845**
Other (Non-designated)	62
Total	**907**

Source: Poplar/Cotton Center Community Plan, 1996; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

There is a total of 845 acres of designated lands in the Poplar/Cotton Center Community Plan Area. In addition, 62 acres within the plan area is non-designated, used for rights-of-way, waterways, and other similar uses.

Richgrove Community Plan

Richgrove is an unincorporated community located in southern Tulare County, southwest of the city of Porterville. The community is a predominantly rural, agricultural service center within a 148-acre urban boundary and a population of 2,723 (TCAG, 2003). The community plan

was adopted in 1986 for a planning horizon through the year 2005. The plan defines an urban boundary that guides development for the town. The goals and policies of the plan establish guidelines for balanced land use, consistent development and services, preservation of quality of life, and increased housing opportunities.

Table 3-14 shows that the designation with the most land in the Richgrove Community Plan area is comprised of Residential designated land (97 acres), followed by Industrial land use (46 acres).

Table 3-14. Richgrove Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Residential	97
Public/Quasi-Public	28
Commercial	13
Industrial	46
Subtotal Designated	**184**
Other (Non-designated)	46
Total	**230**

Source: Richgrove Community Plan, 1986; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

In total, there are about 184 acres of designated lands in the Richgrove Community Plan area. In addition, 46 acres within the plan area are non-designated lands used for rights-of-way, waterways, and other similar uses.

Springville Community Plan

The Springville Community Plan guides the development of the town of Springville, located in the lower Sierra Nevada foothills, approximately 15 miles northeast of Porterville. The plan was adopted in 1985 to guide growth and development through the year 2005. The community is primarily a rural, commercial-tourist area with a planning area boundary encompassing approximately 948 acres and a population of 1,109 (TCAG, 2003). The community plan contains policies to balance land use, preserve natural and historical heritage, strengthen tourism services, provide open space, ensure adequate services, facilitate efficient emergency services, and protect scenic qualities.

Table 3-15 shows that more than half of the designated land in the Springville Community Plan area is comprised of Low Density Residential use (457 acres).

Table 3-15. Springville Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Low Density Residential	457
Medium Density Residential	98
Planned High Density Residential	107
Planned Community Commercial	23
Planned Recreation Commercial	168
Public/Quasi Public	30
Designated Floodway Overlay	29
Subtotal Designated	**912**
Other (Non-Designated)	37
Total	**949**

Source: Springville Community Plan, 1985; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

In total, 912 acres of designated lands exist in the Springville Community Plan. In addition, 37 acres within the plan area are non-designated, and used for rights-of-way, waterways, and other similar uses.

Strathmore Community Plan

The Strathmore Community Plan was adopted in 1989 for a planning horizon through 2010. Strathmore is located approximately 5 miles north of Porterville on State Route 65 and has a population of 2,584 (TCAG, 2003). The Strathmore Community Plan was adopted to guide future development in the approximately 790-acre Strathmore urban planning boundary. The policies of the plan establish guidelines for the redevelopment of housing, commercial uses, circulation, facilities, commercial development, industrial development, agricultural preservation, public service improvements, and compact urbanization.

Table 3-16 shows that the designation with the most land in the Strathmore Community Plan area is Low Density Residential use (177 acres) followed by Medium Density Residential (137 acres).

Table 3-16. Strathmore Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Low Density Residential	177
Medium Density Residential	137
High Density Residential	35
Residential Reserve	0
Highway Commercial	36
Service Commercial	21
General Commercial	15
Commercial Reserve	0
Industrial	109
Industrial Reserve	96
Public	40
Subtotal Designated	**666**
Other (Non-designated)	124
Total	**790**

Source: Strathmore Community Plan, 1989; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

There are 666 acres of designated lands in the Strathmore Community Plan area. In addition, 124 acres within the plan area are non-designated, used for rights-of-way, waterways, and other similar uses.

Terra Bella - Ducor Community Plan

Terra Bella and Ducor are two unincorporated communities located in south-central Tulare County. Terra Bella is approximately 7. miles south of Porterville and 26 miles southeast of Visalia, the County seat and largest city of the County. Ducor is located approximately 4 miles south of Terra Bella. Both communities are situated adjacent to State Highway 65. Road 236 is a north/south roadway that bisects both communities with Terra Bella at the intersection of Avenue 95 and Ducor at the intersection of Avenue 56. The Union Pacific railroad runs north-south through both communities and the Atchison/Topeka and Santa Fe railroad, just north of Ducor.

The two communities are predominately rural, agriculturally-related service centers. In addition to including various agriculturally-oriented businesses (i.e., packing houses, cold storage facilities), the communities also support various residential areas where many of the local farm workers reside.

Three Rivers Community Plan

The Three Rivers Community Plan guides the development of the Three Rivers planning area, located in the lower Sierra Nevada foothills,

approximately 30 miles northeast of the City of Visalia. The plan was adopted in 1980 to guide growth and development through the year 2000. The community is primarily a rural, commercial-tourist area with a population of 2,248 (TCAG, 2003). The community plan establishes policies to balance land use, match services with growth, protect low intensity land uses, develop a diverse economy, provide housing, and preserve the environment. The planning area boundary encompasses approximately 20,085 acres.

Table 3-17 shows that the designation in the most land in the Three Rivers Community Plan area is in Agricultural designation (10,334 acres) followed by Medium Density Residential (4,480 acres) and Low Density Residential (3,552 acres).

Table 3-17. Three Rivers Land Use, Tulare County, 2006

Designation	Total Acreage
Low Density Residential	3,552
Medium Density Residential	4,400
High Density Residential	258
Multiple Family Residential	80
Mobile Homes	16
Community Commercial	95
Commercial Recreation	406
Light Industrial	32
Agricultural	10,334
Parks & Recreation	83
Subtotal Designated	**19,256**
Other (Non-designated)	829
Total	**20,085**

Source: Three Rivers Community Plan, 1980; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

There are 19,256 acres of designated lands in the Three Rivers Community Plan Area and, 829 acres within the plan area are non-designated, used for rights-of-way, waterways, and other similar uses.

Traver Community Plan

Traver is an unincorporated community, with a population of 732 (TCAG, 2003), located in north-central Tulare County, approximately 10 miles northwest of the City of Visalia. The planning area boundary encompasses 405 acres. The Traver Community Plan was adopted in 1989. The goals and policies of the plan prescribe guidelines for compact land use and growth, industrial development, matching public services with growth, environmental concerns, and redevelopment.

As Table 3-18 shows that a majority of the land in the Traver Community Plan area is designated Residential Reserve (64 acres) and the Medium Density Residential (54 acres) lands.

Table 3-18. Traver Land Use Designations, Tulare County, 2006

Designation	Total Acreage
Medium Density Residential	54
Residential Reserve	64
Commercial	50
Industrial	43
Industrial Reserve	9
Quasi-Public	0
School	16
Park	8
Subtotal Designated	**244**
Other (Non-designated)	161
Total	**405**

Source: Traver Community Plan, 1989; Tulare County GIS, 2006; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

In total, there is about 405 acres of designated lands in the Traver Community Plan Area. 161 acres within the plan area is dedicated to rights-of-way, waterways, and other uses.

Specific Plans

Specific plans have been prepared for two areas near Exeter and Pixley where more precise development guidance is required to address unique physical constraints and developmental pressures. The specific plans address the requirements of Government Code Section 65450.

The plans contain elements that correspond to those in the overall Tulare County General Plan; and include a separate element relating to public services and facilities. Each specific plan element contains policies that guide development and preservation of resources within the planning area that "supersede", but are consistent with, the General Plan. Specific plan areas are shown on Figure 3-5.

North Pixley Commercial/Industrial Specific Plan

The North Pixley Commercial/Industrial Specific Plan consists of 733 acres in the northern portion of the Pixley Community Plan area. The Specific Plan was adopted in 1999. This plan guides both commercial and industrial land development through land use designations with the objective of providing compatible and complementary development with the Pixley Community Plan. The County determined the plan was needed to insure that Pixley's Commercial/Industrial potential would be focused in the best location for the community and surrounding area.

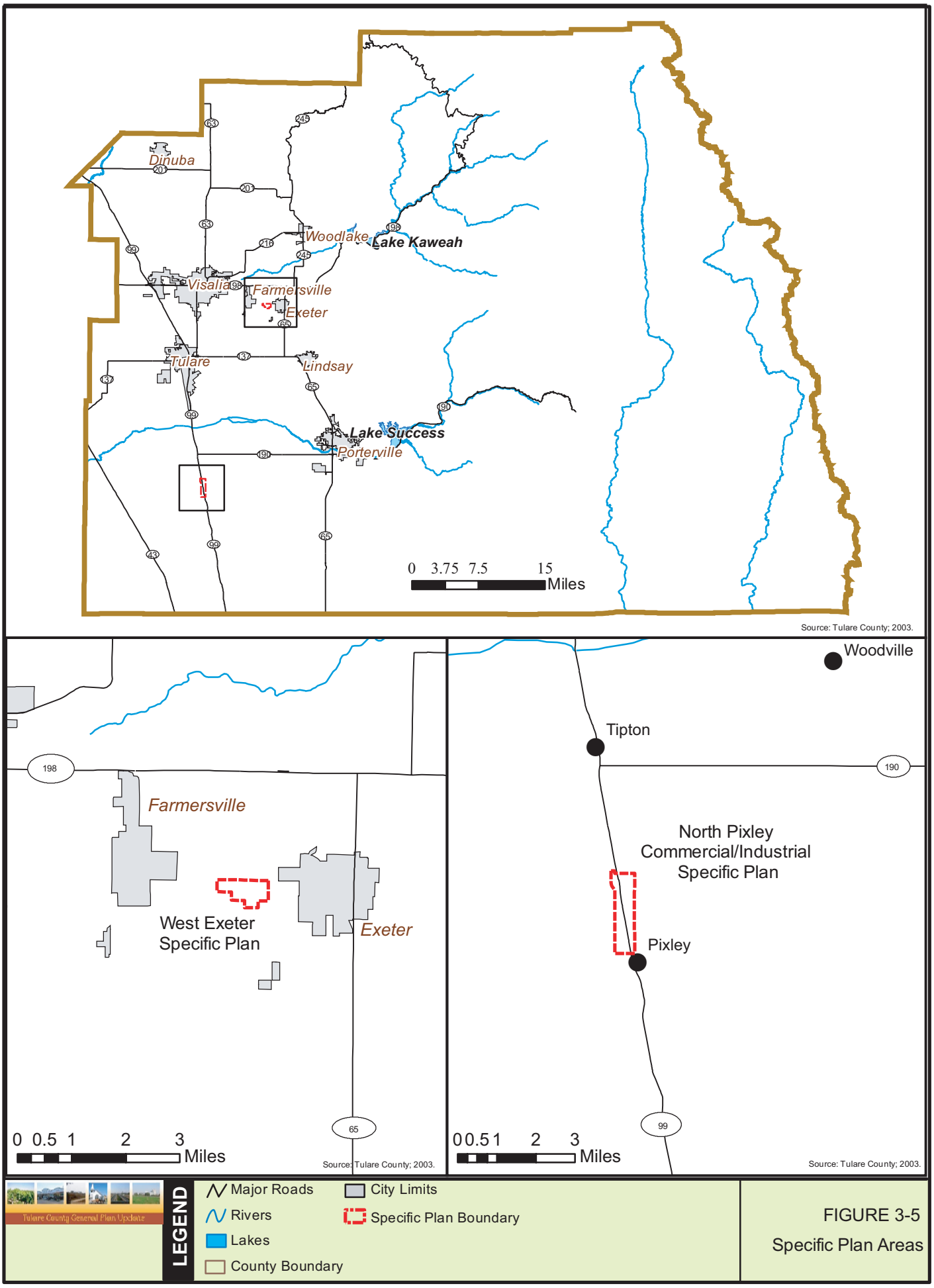


FIGURE 3-5
Specific Plan Areas

Table 3-19 shows the zoning districts that guide the plan along with the total acreage. A majority of the land in the North Pixley Commercial/Industrial Specific Plan area is comprised of the Planned Development Light Industrial (PD-M-1) District with 682 total acres. In total, 718 zoned acres exist in the North Pixley Commercial/Industrial Specific Plan area. A total of 15 acres of non-designated land is used for rights-of-way.

Table 3-19. North Pixley Commercial/Industrial Specific Plan Zoning Designations, Tulare County, 2004

Zoning Districts	Total Acreage
PD-M-1 (Light Industrial)	683
PD-M-2 (General Industrial)	35
Subtotal Designated	**718**
Other (Non-designated)	15
Total	**733**

Source: North Pixley Commercial/Industrial Specific Plan, 1999; Tulare County GIS, 2003; Tulare County Assessors Database, 2003; Mintier & Associates, 2004.

West Exeter Specific Plan

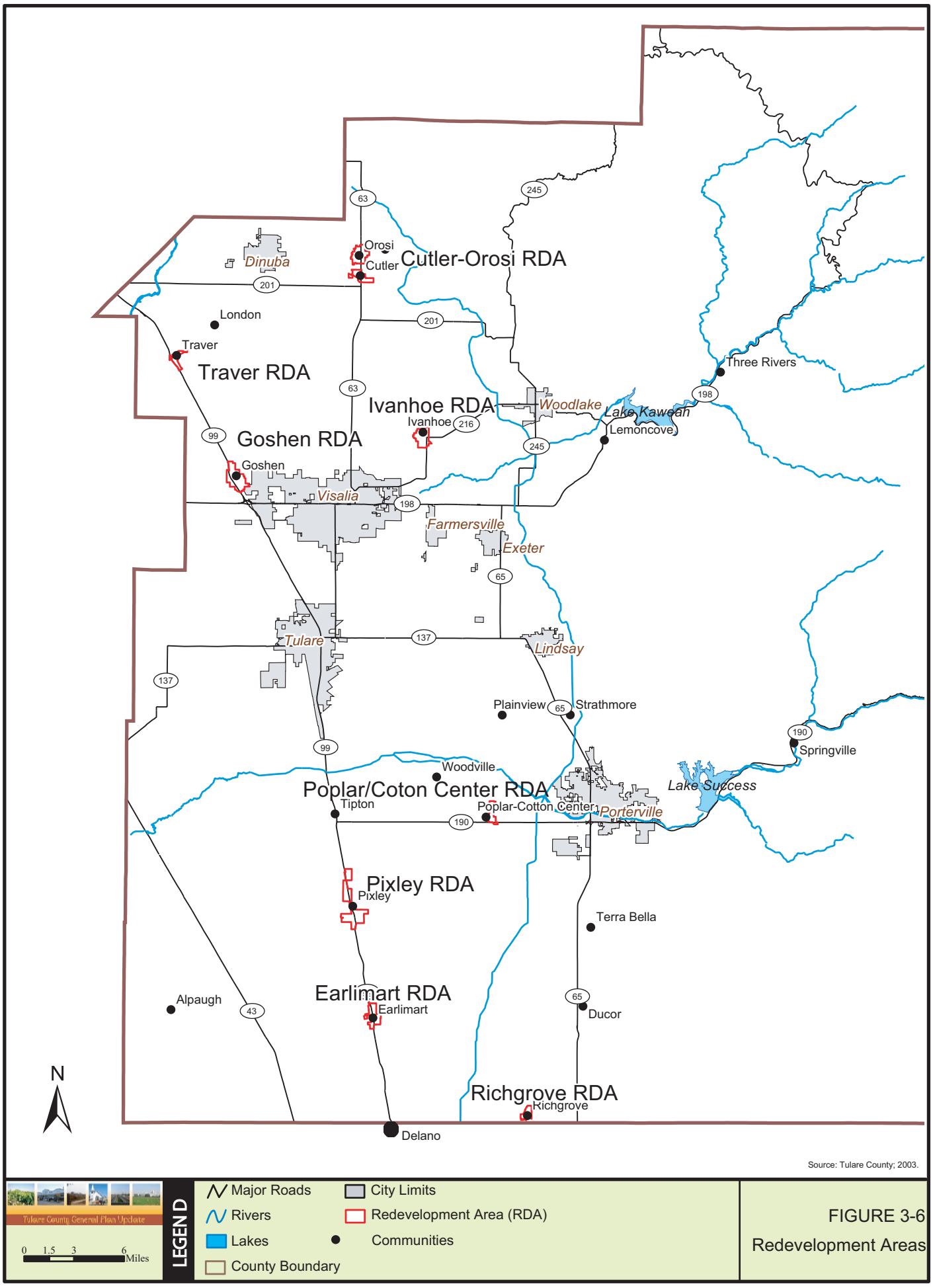
The West Exeter Specific Plan consists of approximately 250 acres on the south side of Avenue 280, north of Avenue 276, east of Road 176, and west of Road 184. The plan was adopted in 1989 to maintain the existing quality of life and provide for future rural residential development of the West Exeter Area that, according to the Rural Valley Lands Plan, has been determined to be suitable for non-agricultural use. The plan details an overall circulation system and assesses the feasibility of providing other infrastructure appropriate to serve rural residential densities in the plan area.

All land within the boundaries of the West Exeter Specific Plan Area are zoned Rural Residential (R-A-43). This zoning designation allows for single-family residential uses and agricultural uses. The policies and guidelines of the plan emphasize the residential aspect of this zoning category and support its use in conjunction with the Rural Valley Lands Plan.

3.3 Redevelopment Plans

Introduction

There are eight redevelopment project areas in Tulare County. These projects are all located within the boundaries of existing Community Plan areas (see Figure 3-6, Redevelopment Areas). A general description of each redevelopment plan including the general size and goals for each project area is presented below.


Cutler-Orosi RDA
Traver RDA
Ivanhoe RDA
Goshen RDA
Poplar/Coton Center RDA
Pixley RDA
Earlimart RDA
Richgrove RDA
Orosi
Cutler
Dinuba
London
Traver
Ivanhoe
Goshen
Visalia
Farmersville
Exeter
Tulare
Lindsay
Plainview
Strathmore
Woodville
Tipton
Poplar-Cotton Center
Porterville
Pixley
Terra Bella
Alpaugh
Earlimart
Ducor
Richgrove
Delano
Woodlake
Lemoncove
Three Rivers
Lake Kaweah
Springville
Lake Success
63
245
201
99
216
198
65
137
190
43
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
LEGEND
Major Roads
Rivers
Lakes
County Boundary
City Limits
Redevelopment Area (RDA)
Communities
FIGURE 3-6
Redevelopment Areas

Methods

Information in this section was provided by the Tulare County Redevelopment Agency.

Key Terms

There are no key terms for this section.

Regulatory Setting

In accordance with the State of California's Community Redevelopment Law, redevelopment plans set the stage for the general activities and implementation procedures used by the redevelopment agency over a time frame of 30 years. These include steps the agency may undertake in pursuing the redevelopment process in a community. The plans also include a description of activities which the redevelopment agency is required to undertake. These are required in the redevelopment process to conform to Community Redevelopment Law.

Redevelopment plans are structured to provide the redevelopment agency with the maximum legal flexibility to implement redevelopment activities in a community's project area. The redevelopment agency not only sets forth objectives for the plan area at the time of adoption, but also for the projected future redevelopment needs of the community.

Existing Conditions

Cutler-Orosi Redevelopment Plan

The Cutler-Orosi Redevelopment Plan was adopted in 1989. The plan includes a description of the planning area boundaries, which are entirely within the Cutler-Orosi Community Plan Area.

The overall goal of the Cutler-Orosi Redevelopment Plan is to eliminate conditions of blight by encouraging rehabilitation; facilitating land assembly and development for housing, employment, and an expanded tax base; and promoting development in accordance with the General Plan.

In addition to the goals, policies, and procedures outlined in the plan, a list of financing methods and infrastructure projects are detailed for the 920-acre project area. The plan also proposes to complete public improvements on sewer lines, water systems, industrial park improvements, drainage, construction of a new community center, public housing improvements, lighting, and street beautification.

Earlimart Redevelopment Plan

The 1989 Earlimart Redevelopment Plan encompasses a 478.1-acre area within the Earlimart Community Plan boundary. The plan boundaries include virtually all of the urbanized areas of Earlimart, as well as the undeveloped land at the extreme northerly and southwesterly ends of the community. In addition to the goals, policies, and procedures the plan lists needed public improvements.

The goals of the Earlimart Redevelopment Plan are supported by a wide array of objectives to mitigate and eliminate various forms of blight. The plan identifies industrial development as a principle strategy to expand and diversify the community's economy and job base. Retail and commercial service sectors are expected to expand through the enhancement of population and income generated demand. Highway 99 is identified as a central artery to improve the overall image of the community, as well as enhance commercial trade and industrial growth. The existing housing stock is slated for rehabilitation and housing replacement programs. Infrastructure improvements in all areas of public services (i.e., water, sewer, streets, drainage) are expected to remove impediments to economic growth and development. Finally, the Plan calls for the enhancement of active and passive recreational opportunities and facilities for residents within and around the project area.

Goshen Redevelopment Plan

The 1987 Goshen Redevelopment Plan encompasses most of the Goshen Community Plan area along SR 99.

The overall goal of the Ivanhoe Redevelopment Plan is to eliminate conditions of blight through strengthening the agricultural/industrial and highway commercial economic base, enhancing access at freeway interchanges; improving the quality/availability of housing; substantial infrastructure improvements; strengthening the aesthetic image of the entire community; and, the elimination/mitigation of all blighted conditions/influences in the plan area.

In addition to the goals of the plan, the following public improvements are also proposed: street improvements for agricultural/ industrial and highway commercial uses; development of a community wastewater treatment system; upgrade selected segments of the water system; development of a storm drainage system; and substantial improvements to freeway interchanges.

Ivanhoe Redevelopment Plan

The 1997 Ivanhoe Redevelopment Plan covers 563 acres within the Ivanhoe Community Plan area.

The overall goal of the Ivanhoe Redevelopment Plan is to eliminate conditions of blight through the assembly of irregular lots for industrial use; augmentation of the economy to stimulate investment in industrial/commercial uses; opportunities for individual revitalization projects; expansion of employment opportunities; installation of new/improved public improvements; low income housing improvements; and opportunities for recreational activities.

In addition to the goals of the plan, the following public improvements are also proposed: community/recreation center development; park system development; sheriff sub-station development; storm drain improvements; lighting/landscaping improvements; master storm drain plan; fire station improvements; upgrade of water/sewer systems; and the general elimination/mitigation of blighted public utilities.

Pixley Redevelopment Plan

The Pixley Redevelopment Plan was adopted in 1997 to implement redevelopment goals in its 1,258-acre project area. The plan boundary lies entirely within the Pixley Community Plan area within urbanized areas along SR 99.

The plan focuses the efforts and resources of the Redevelopment Agency in the following aspects of the community: elimination or minimization of blight; assembly of lots and parcels for industrial use; augmentation of the area's economic base through commercial and industrial investment; expansion and diversification of employment opportunities; installation or repair of public improvements; improvement and expansion of low and moderate income housing; and creation and enhancement of recreational facilities for the Pixley community.

In addition to the goals of the plan, the following redevelopment projects are also proposed for the project area: construction or expansion of the existing medical center; development of an industrial park; fire station improvements; general elimination/mitigation of blighted public utilities; creation of a storm drainage master plan; improved lighting; and construction of a park.

Poplar-Cotton Redevelopment Plan

The 1997 Poplar-Cotton Redevelopment Plan is located in the Poplar-Cotton Community Plan area. The plan encompasses portions of the community plan area along State Route 99.

The overall goal of the Poplar-Cotton Redevelopment Plan is to eliminate conditions of blight through the assembly of small or irregular shaped lots for industrial uses; stimulate the economic base through new industrial and commercial development; allow opportunities for owners and business tenants to revitalize their properties; expand employment opportunities; install and improve public utilities; improve and expand low income housing opportunities; and create and enhance recreational opportunities and facilities.

In addition to the goals of the plan, the following public improvements are also proposed: development of a community/ recreation center; construction of storm drainage improvements; lighting and landscaping improvements; development of a master drainage plan; development and construction of a fire station; upgraded water/sewer systems; development of commercial buildings for community facilities; development and construction of a child care center; placement of an in-ground ditch; improved street extension between the Towns of Poplar and Cotton Center; and the general elimination/mitigation of blighted public utilities.

Richgrove Redevelopment Plan

The Richgrove Redevelopment Plan was adopted in 1987 to implement redevelopment goals in its project area. The plan boundary lies within the Richgrove Community Plan area around the central urbanized portion of the community.

The plan focuses the efforts and resources of the Redevelopment Agency in the following aspects of the community: improvement in the quality and type of housing opportunities; substantial infrastructure improvements; strengthened aesthetic image; and, the elimination/mitigation of other blighted conditions or influences in the plan area.

In addition to the goals of the plan, the following public improvement projects are also proposed for the project area: street resurfacing and improvement of curbs, gutters, and drainage systems; and parcel assembly for an outdoor recreation facility.

Traver Redevelopment Plan

The Traver Redevelopment Plan was adopted in 1989 to implement redevelopment goals in its project area. The plan boundary lies within the Traver Community Plan area around the urbanized area of the community; primarily along and to the east of SR 99.

The plan focuses the efforts and resources of the Redevelopment Agency in the following aspects of the community: facilitating the creation of local employment/economic opportunities through agriculture; strengthening the aesthetic image of the SR 99 corridor; expanding community level shopping opportunities; increasing the capture of SR 99 commercial trade; improving the existing housing stock; improving infrastructure systems; enhancing recreation opportunities/facilities; and eliminating/mitigating all blighted conditions/influences in the plan area.

In addition to the goals of the plan, the following public improvement projects are also proposed for the project area: construction of a storm drainage system; installation of curbs and gutters; minor pavement improvements; other general street repairs; and improvement/ expansion of the park site owned by the school district.

3.4 Existing Land Use

Introduction

This section analyzes and describes existing land uses, the pattern and types of development throughout the unincorporated county.

Method

The Tulare County Long Range Planning Branch, Tulare County GIS, and the Tulare County Assessor's Database provided the information for this section. Existing land use data was derived from land use codes and improvement values used by the Tulare County Assessor for property tax assessment purposes. In addition, limited field site checks were conducted by county staff.

Key Terms

- **Agricultural Use.** Land that is used for the production of agricultural products including crops, livestock, orchards, vineyards, and related services.

- **Commercial**. A land use classification which permits facilities for the buying and selling of commodities and services.
- **Developable Land**. Land which is suitable as a location for structures.
- **Development**. The physical extension and/or construction of urban land uses. Development activities include: subdivision of land; construction or alteration of structures, roads, utilities, and other facilities; installation of septic systems; grading; deposit of refuse, debris, or fill materials; and clearing of natural vegetative cover (with the exception of agricultural activities). Routine repair and maintenance activities are exempted.
- **Habitat**. The physical location or type of environment in which an organism or biological population lives or occurs.
- **Industrial**. The manufacture, production, and processing of consumer goods. Industrial is often divided into "heavy industrial" uses, such as construction yards, quarrying, and factories, and "light industrial" uses, such as research and development and less intensive warehousing and assembly.
- **Land Use Classification**. A system for classifying and designating the appropriate use of properties.
- **Mixed Use**. Properties on which various uses, such as office, commercial, institutional, and residential, are combined in a single building or on a single site. These projects have significant functional interrelationships and a coherent physical design. A "single site" may include contiguous properties.
- **Office Use**. The use of land by general business offices, medical and professional offices, administrative or headquarters offices and research and development.
- **Open Space Land**. Any parcel or area of land or water which is essentially unimproved and devoted to an open space use.
- **Residential**. Land designated in the Tulare County General Plan and Zoning Ordinance for buildings consisting only of dwelling units. May be vacant or unimproved.

Regulatory Setting

There is no regulatory setting for this section.

Existing Conditions

Assessed land uses have been organized into generalized categories that are summarized on Table 3-20. Classified lands total 3,930 square miles of or approximately 81 percent of Tulare County. Open space, which includes wilderness, national forests, monuments and parks, and county parks, encompasses 25 percent of the county. Agricultural uses total over 2,150 square miles or about 44 percent of the entire county. Incorporated cities in Tulare County capture less than three percent of the entire county.

Table 3-20. Summary of Assessed Land by Generalized Land Use Categories, Tulare County, 2008

Generalized Land Use Category	Square Miles	Percentage[1]
Residential	110	2.0
Commercial	10	Less than 1%
Industrial	10	Less than 1%
Agriculture	2,150	44.0
Public (including airport, church, schools)	420	9.0
Open Space (including national forests and parks, timber preserves)	1,230	25.0
Classified Subtotal	**3,930**	**81**
Unclassified (includes streets and highways, rivers, canals, etc.)	780	16.0
Unincorporated County Subtotal	**4,710**	**97**
Incorporated Cities	130	3.0
Total County	**4,840**	**100**

1 Percents reflect those estimated for the total land area of the County and may not equal 100 due to rounding.
Source: Tulare County Assessor's Database, 2008a

Figure 3-7 shows the distribution of assessed uses as of 2008. The open space areas comprise the eastern half of the county, while the other classified uses are clustered within the unincorporated towns and adjacent to incorporated cities and major highway corridors.

Residential Land

The types of residential uses analyzed in this Background Report include: detached single-family homes; multi-family housing including duplexes, apartments, and all structures containing two or more housing units (either individually owned or rented); planned unit developments and condominiums; and mobile homes. Many of the zoning districts established by the Tulare County Zoning Ordinance allow a residence use, by right or special use permit.

Residential lot counts are summarized in Table 3-21 by acreage in the unincorporated county.

Table 3-21. Residential Land Use, Tulare County, 2008

General Description	Lot Count	Acres
Residential (non classified)	226	2,490
Residential (0-1 DU/A)	9,338	46,030
Residential (1-4 DU/A)	7,019	3,800
Residential (4<-8 DU/A)	7,979	1,490
Residential (8<-12 DU/A)	763	110
Residential (12<-More DUA)	259	30
Mobile Home Park	42	380
Mountain Cabin[1]	3,345	11,460
Employee Housing	1	2
Mobile Home on Lot	2,214	6,140
Total	**31,186**	**71,932**

1 Mountain Cabin includes existing land uses listed as Mountain Cabins/Lodge/Camp and Mountain Home (seasonal) in the County's databases.

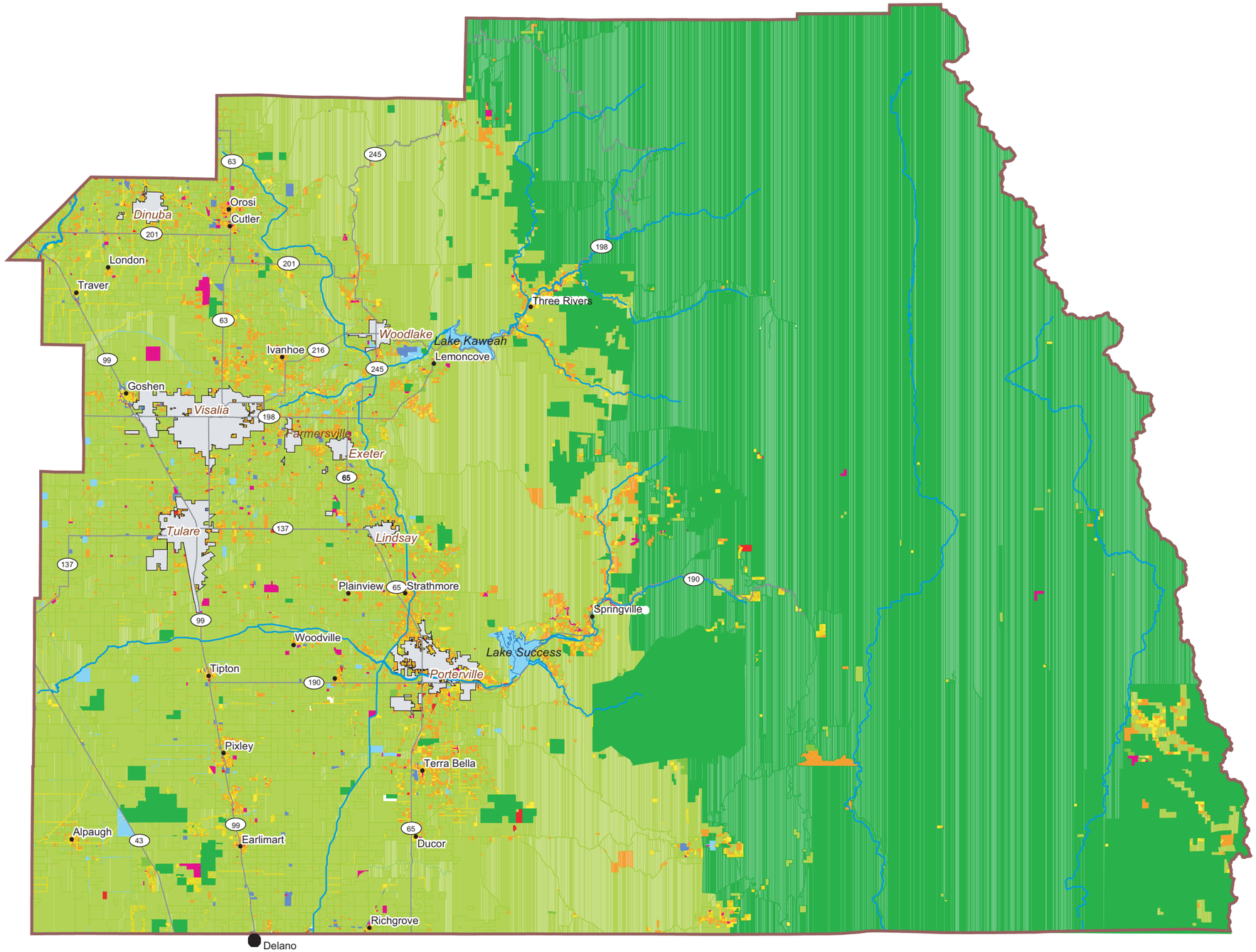
Source:Tulare County Assessor's Database, 2008a

Assessed residential land in unincorporated Tulare County total approximately 71,932 acres on a total of 31,186 parcels. Nearly all of this development exists in the flat valley region with higher lot concentrations located along major highways and around existing cities. Limited residential uses exist in the foothill and mountain regions along highways and in the unincorporated communities of Three Rivers and Springville. These mountain areas also have the largest acreage per residential unit.

Commercial and Industrial Land

For purposes of this analysis, commercial uses include offices, retail establishments, and outdoor storage/sales uses such as car sales, lumber yards, and plant nurseries. Industrial uses include light industrial establishments such as warehouses and mini-storage businesses, and heavy industrial uses involved in the manufacture of large items and/or the use of large manufacturing equipment. Assessor land use codes representative of commercial and industrial land uses are summarized on Table 3-22, with the corresponding acreage in each category.

As Table 3-22 shows, Tulare County contains a wide range of commercial and industrial uses in the unincorporated areas of the county.



Source: Tulare County; 2003.



Tulare County General Plan Update

LEGEND

- Major Roads
- Rivers
- Lakes
- County Boundary
- City Limits
- Communities
- Agriculture
- Commercial
- Industrial
- Residential
- Parks/Recreation
- Public/Institutional
- Open Space/Wilderness
- Vacant
- Water

N

0 5 10 20 Miles

FIGURE 3-7

Existing Land Use

Table 3-22. Commercial and Industrial Land Uses, Tulare County, 2008

General Description	Lot Count	Acreage
Commercial		
Auto Repair, Parts, Sales	72	170
Banks; S&L; Credit Unions	3	2
Broadcasting (TV/Radio/Cable)	8	80
Commercial	295	970
Hotel/Motel	34	450
Mortuary	2	1
Professional Offices	82	170
Recreation	40	910
Restaurants; Fast Food	121	120
Retail Store	83	110
Sales Lot	27	200
Service Shops	175	470
Shopping Center	1	2
Small Store	245	300
Supermarket	5	4
Warehouse/Lumber Yard	106	430
TOTAL COMMERCIAL	**1,345**	**4,430**
Industrial		
Batch Plant/Sand, Gravel	30	960
Canneries, Wineries	26	1,130
Cotton Gins	24	450
Dehydrating Plant	15	200
Heavy Manufacturing	1	30
Industrial	99	570
Light Manufacturing	102	840
Mineral Rights	7	400
Packing House/Cold Storage	158	1,570
Public Utilities	72	530
Total Industrial	**530**	**6,680**

Source: Tulare County Assessor's Database, 2008a

Commercial and industrial uses in the unincorporated county are located primarily along major highways. Limited commercial land uses are also located within the small, rural communities throughout the county.

Agricultural Land

Lands that are assessed as agriculture, dairies, forestry, or other activities involving the preservation, use, extraction, or processing of natural resources can be broken into specific categories. For example, the general category of agriculture includes such activities as irrigated row crop or permanent crop (orchards and/or vineyards) production, dry land farming, dairies, and grazing or concentrated raising of livestock. Each activity is important and distinct because they have different characteristics of operation and resource consumption. Permanent type crops (orchards and vineyards), row crop production, and dairies

consume more water than dry land farming, which may affect the existing and future capacity of area water supplies and urban land uses. Agricultural use of fertilizer/pest control applications, and/or hours of operation also may cause conflicts with other uses.

Selected Assessor's codes (representative of cultivated and semi-agricultural uses in Tulare County) are summarized on Table 3-23. According to Table 3-23, the county has 646,990 acres of cultivated agricultural land, 729,230 acres of semi-agricultural land, and 190 acres of non-classified agricultural land. It should be noted that Assessor data represents the best currently available data and may not reflect the agricultural use in 2008 since crop patterns change in response to market demands and some of the land use data compiled by the Assessor may not be current. The data provides a 'snapshot' of crop patterns that are representative of Tulare County.

Table 3-23. Agricultural-Related Land Uses, Tulare County, 2008

General Description	No. of Lots	Acres
Cultivated Agriculture Land		
Citrus	4939	137,740
Deciduous Fruit and Nut Trees	3,018	137,490
Field Crops; Row Crops	4,414	298,480
Vineyards	1,172	73,280
Cultivated Agriculture Land Subtotal	**13,543**	**646,990**
Semi-Agricultural Land		
Ag Equipment Sheds/Shops	59	500
Ag Services	24	1,180
Dairies	380	46,830
Dry Pasture	4,911	668,400
Equine Stables	30	1,010
Exotic Animals; Bees	48	1,070
Feedlots	50	3,750
Poultry Operations	29	1,690
Wet Pasture	217	4,800
Semi-Agricultural Land Subtotal	**5,748**	**729,230**
Agriculture (No Detail)	45	190
Total	**19,336**	**1,376,410**

Source: Tulare County Assessor's Database, 2008a

Agricultural use is the principal land use in the western two-thirds of the county.

Public/Quasi-Public Land

For purposes of this analysis, public/quasi-public uses will include airports, cemeteries, churches, healthcare, landfills, schools, and utilities. In addition, a category, identified by the County Assessor, for miscellaneous public uses is included. Selected public/quasi-public land uses are summarized on Table 3-24.

Public/quasi-public land uses are primarily located in the unincorporated communities.

Table 3-24. Public Land Uses, Tulare County, 2008

General Description	No. of Lots	Acres
Airport (private)	5	120
Charitable Organization	11	160
Church	219	580
Fraternal Organization	13	50
Government Owner	479	262,540
Hospitals; Rest Homes; etc.	6	10
Institutional	9	170
Rehab Facilities	8	2070
Schools	106	1,250
Total	**860**	**267,370**

Source: Tulare County Assessor's Database, 2008a

Open Space Land

The largest category of existing uses in Tulare County is open space. This is primarily associated with federally managed lands, such as Sequoia and Kings Canyon National Parks (SEKI) and Sequoia National Forest and Monument. Other uses in the open space category include parks and recreation, golf courses, timberlands, wildlife preserves, and campgrounds.

The acreage of open space lands is shown on Table 3-25. This land is located primarily in the eastern half of the county on large, federally owned parcels. Federal and state-owned lands (Sequoia National Forest, Giant Sequoia National Monument, SEKI, and Bureau of Land Management) make up a large portion of the land in the open space category. Smaller parcels of parks, golf courses, wildlife preserves, and recreation areas are distributed throughout the valley and foothill regions.

Table 3-25. Open Space Land Uses, Tulare County, 2008

General Description	No. of Lots	Acreage
Cemetery	33	300
Golf Courses	7	260
Recreation (Gov Owner)	151	777,680
Timberlands	29	7,460
Total	**220**	**785,700**

Source: Tulare County Assessor's Database, 2008a

Unclassified Land

Unclassified land includes areas that are unavailable for development or do not have an assessed use code classified as one of the others. Water related uses and water infrastructure are included in the county's unclassified land.

The acreage of unclassified land is summarized on Table 3-26.

Table 3-26. Unclassified Land Uses, Tulare County, 2008

General Description	No. of Lots	Acreages
Irrigation Systems	47	20
Water Storage/Ditch	414	12,190
Water Systems	207	1,670
Miscellaneous[1]	5,041	488,110
Total	**5,709**	**501,990**

1 Miscellaneous includes lands designated as 'Miscellaneous', 'Unknown', or 'x' in the Assessor's Database.

Source: Tulare County Assessor's Database, 2008a

3.5 Existing Zoning Summary

Introduction

The purpose of this section is to summarize existing information regarding the Tulare County Zoning Ordinance.

Methods

The Tulare County RMA Long Range Planning Branch provided the information in this section.

Key Terms

- **Ordinance**. A law or regulation set forth and adopted by a governmental authority, usually a city or county.
- **Zoning**. The division of a city or county by legislative regulations into areas, or zones, which specify allowable uses for real property and size restrictions for buildings within these areas; a program that implements policies of the General Plan.
- **Zoning District**. A designated section of the county for which prescribed land use requirements and building and development standards are uniform.

Regulatory Setting

State law requires that zoning ordinances be consistent with the General Plan pursuant to Government Code Section 65860.

Existing Conditions

Tulare County's first zoning ordinance was adopted in 1947 as Ordinance 352. The Zoning Ordinance was adopted as a separate ordinance from the County Code. The Zoning Ordinance has been amended numerous times since but has never undergone a comprehensive update.

A major difference between the General Plan and zoning is the level of detail. The General Plan provides broad guidance on the location, type, density, and timing of new growth and development over the long-term. Zoning determines the specific type of use and provides detailed standards for development. Both the land use designations of the General Plan and the development standards of the zoning ordinance determine the holding capacity and build-out potential of the county. The holding capacity and build-out potential are measures of the ultimate population size and extent of development that could be allowed by the County based on current policies and regulations.

The Zoning Ordinance establishes six residential districts, four commercial, two industrial zones, and thirteen other zones that are related to agriculture, timber, and other resource-related land uses. These zones translate the broad land use categories established by the Tulare County General Plan into more detailed land use classifications.

The text of the Zoning Ordinance contains regulations that govern development and land use in the zoning districts shown on the zoning maps. The ordinance includes three main components: detailed descriptions of each zoning district in terms of the type of land uses that are allowed in each zone; standards for the development of new land uses within each zone (building height limits, setback requirements, off-street parking and sign requirements, minimum parcel size, etc.); and procedural requirements for processing land use permit applications and administration of the ordinance itself.

Table 3-27 lists each zoning district, together with its minimum allowable lot area for new subdivisions of land, and the acreage of land in the unincorporated areas to which each zone is applied. The minimum lot area requirements are expressed in acreage or square footage, and represent the smallest lot size that could be approved in a

new subdivision in the applicable zone. In addition, there are seven overlay zones that combine with other zones to provide development requirements of the underlying zoning district.

The zoning acreage data was developed through the use of a geographic information system (GIS). The polygons (rectangles and other multi-sided geometric forms representing areas of specific zoning on the county's zoning maps) were digitized (converted from lines on paper to digital information that can be understood by a computer). This includes all acreage of the county including that within the unincorporated communities and those areas outside of the incorporated cities. The GIS was used to calculate the area of each zone within Tulare County.

3.6 City General Plans

Introduction

Like Tulare County, each city has an adopted general plan to guide land use decisions within its jurisdiction. This section summarizes key aspects of each county adopted city general plan within Tulare County. It describes the geographical area covered by each general plan, local constraints on future development, and the policies in each plan that respond to city growth, annexation, and population related issues.

Method

Each of the incorporated cities in the county was contacted for current information. A copy of each county adopted city's General Plan was obtained and reviewed for the following section.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides an overview of the incorporated city general plans in the county. Tulare County has adopted these plans as land use and circulation plans for the areas surrounding cities within the Urban Development Boundaries.

Table 3-27. Zoning District Data, Tulare County, 2008

Section of Zoning Ordinance	District Name	Zoning Map Code	Principal of District	Characteristic Uses Permitted in District	Dwelling Units Permitted Per Lot	Minimum Parcel Size	Acres Zoned
4	Rural Residential	R-A	Single family residential units and agricultural production	Single family dwellings and farming uses	1	6,000 Sq./Ft.	59,170
4.5	Mountain Residential	M-R	Single family residential units, agricultural production and open space protection	Single family dwellings, farming and open space	1 unit + 1 additional unit for each 40 Acres	20,000 Sq./Ft.	11,880
5	Single Family Estate Residential	R-O	Single family residential units and agricultural production	Single family dwellings and farming	1	12,500 Sq./Ft.	850
6	Single Family Residential	R-1	Single family residential units	Single family dwellings	1	6,000 Sq./Ft.	3,930
7	Two-Family Residential	R-2	Single family and two-family residential units	Single family and duplex dwellings	2	6,000 Sq./Ft.	790
8	Multiple-Family Residential	R-3	Single family, two-family, and multifamily residential units	Single family, duplex, and multifamily dwellings	4 (more than 4 units requires Site Plan Review)	6,000 Sq./Ft.	510
8.05	Recreation	O	Agriculture, residential, commercial uses.	Those in the R-3 zone, farms, hotels, resorts, grocers, retail stores, restaurants.	4 (more than 4 units requires Site Plan Review)	10,000 Sq./Ft.	1,050
8.07	Commercial Recreation	CO	Commercial uses in the foothill and mountain regions	Commercial/retail oriented toward recreation, tourists, and/or highway travelers	1 per 1,500 Sq./Ft.	12,500 Sq./Ft.	390
8.10	Professional and Administrative Office	P-O	Provide locations for office uses.	Offices, administrative services, multifamily dwellings	As provided in the R-3 zone.	10,000 Sq./Ft (6,000 Sq/Ft. for residential uses)	30
9	Automobile Parking Zone	P-1	Provide open parking lots and structures	Parking Lots, single family, duplex, and multifamily dwellings	As provided in the R-3 zone.	6,000 Sq./Ft.	10
9.5	Exclusive Agricultural	AE	Intensive agriculture	Farming and farm related structures	1 unit + 1 per 2.5 acres	5 Acres	3,570
9.55	Exclusive Agricultural	AE-10	Intensive agriculture on 10 acre minimum parcels	Farming and farm related structures	1 unit + 1 per 10 Acres	10 Acres	34,260
9.6	Exclusive Agricultural	AE-20	Intensive agriculture on 20 acre minimum parcels	Farming and farm related structures	1 unit + 1 per 20 Acres	20 Acres	243,370
9.7	Exclusive Agricultural	AE-40	Intensive agriculture on 40 acre minimum parcels	Farming and farm related structures	1 unit + 1 per 20 Acres	40 Acres	530,660

Table 3-27. Zoning District Data, Tulare County, 2008

Section of Zoning Ordinance	District Name	Zoning Map Code	Principal of District	Characteristic Uses Permitted in District	Dwelling Units Permitted Per Lot	Minimum Parcel Size	Acres Zoned
9.8	Exclusive Agricultural	AE-80	Intensive agriculture on 80 acre minimum parcels	Farming and farm related structures	1 unit + 1 per 20 Acres	80 Acres	53,720
10	Agricultural	A-1	Agricultural production	Farming and farm related structures	1	5 Acres	1,497,170
10.3	Foothill Agricultural	AF	Agricultural and open space protection	Farming and farm related structures	1 unit + 1 per 40 Acres	160 Acres	488,090
10.5	Timber Preserve	TPZ	Timber production and management	Forestry and timber related activities	N/A	160 Acres	9,200
10.7	Resource Conservation	RC	Protect natural resources from urbanization	Open Space, single family dwellings, farming and related activities	1 unit + 1 per 40 Acres	160 Acres	10,320
11	Neighborhood Commercial	C-1	Residential, commercial, retail, service uses	Those in the R-3 zone, retail stores, and services	As provided in the R-3 zone.	10,000 Sq./Ft.	70
12	General Commercial	C-2	Non-manufacturing retail stores	Those in the C-1 zone, retail stores, businesses, and services	As provided in the C-1 zone.	10,000 Sq./Ft.	970
12.5	Service Commercial	C-3	Wholesale and repair services	Those in the C-2 zone, repair shops, services, warehousing	As provided in the C-2 zone.	10,000 Sq./Ft.	360
13	Light Manufacturing	M-1	Manufacturing and processing of non-obnoxious products and services	Those in the C-3 zone, assembly, manufacturing, fabrication, etc	N/A	10,000 Sq./Ft.	2,300
14	Heavy Manufacturing	M-2	Manufacturing and processing of obnoxious products and services	Those in the M-1 zone, gas, boiler works, ovens, mills, canning, plastics, machining, quarry, wood processing, etc	N/A	10,000 Sq./Ft.	570
14.1	Airport Impact	AP	Provide service, commercial, industrial, and agriculture near airports	Farming, Sales, warehousing, and manufacturing	N/A	12,500 Sq./Ft.	20
14.3	Special Mobile Home	M	Provide for mobile home use in communities where such housing is desirable.	Mobile Homes (excluding mobile home parks)	1-2	As provided in the underlying zone	52,510
14.4	Scenic Corridor Combining	SC	Combine with other zones to protect the visual quality of roads	Open space, farming, billboard regulations	As provided in the underlying zone	As provided in the underlying zone	N/A
14.5	Special Combining	-	Combine with other zones to allow for development below minimum lot requirements	Uses allowed in underlying zone	As provided in the underlying zone	Open	N/A

Table 3-27. Zoning District Data, Tulare County, 2008

Section of Zoning Ordinance	District Name	Zoning Map Code	Principal of District	Characteristic Uses Permitted in District	Dwelling Units Permitted Per Lot	Minimum Parcel Size	Acres Zoned
14.7	Primary Flood Plain Combining	F-1	Protect property in high risk flood areas	Open space, farming, public utilities, parking	As provided in the underlying zone	As provided in the underlying zone	1,440
14.8	Secondary Flood Plain Combining	F-2	Combine with other zones to protect of property in areas with high risk of flooding	Those in the F-1 zone and single family dwellings	As provided in the underlying zone	As provided in the underlying zone	N/A
16.4	Site Plan Review Combining	SR	Combine with other zones in special areas to require site plan review	Uses allowed in underlying zone and single family dwellings and farming	1	As provided in the underlying zone.	N/A
18.6	Planned Development	PD	Combine with other zones to reduce development restrictions and provide for harmonious uses	Uses allowed in underlying zone	As provided in the underlying zone	As provided in the underlying zone	N/A
Total							**3,007,210**

Source: Tulare County Zoning Ordinance Maps, 2008b.

Existing Conditions

The eight incorporated cities in Tulare County contain approximately 284,910 residents (66 percent of the total county population) according to 2007 Department of Finance (DOF) data. Most of these cities are small, farming-service communities surrounded by active agricultural operations. Consequently, one of the biggest issues facing the expansion of such cities is the conversion of prime agricultural land to support additional housing, businesses, and other urban land uses, and the inevitable tension that arises at the interface of daily agricultural operations and suburban uses.

Each of the eight incorporated cities has an adopted general plan outlining growth within their city limits. Tulare County has adopted eight city general plans that help coordinate planning efforts with the cities for the areas outside of each city limit but within the county adopted boundaries. The summary land use table for each county adopted general plan shows the amount of land is within each land use category for the city's plan boundary and the amount that is in the adopted County's Urban Development Boundary.

City of Dinuba General Plan

The City of Dinuba is located in northwestern Tulare County, 14 miles north of Visalia and twelve miles east of SR 99. The Dinuba General Plan is made up of nine elements: Land Use, Circulation, Open Space/Conservation/Recreation, Urban Boundaries, Community Design, Noise, Public Services and Facilities, Safety, and Housing. The General Plan was last updated in 1997 and establishes a planning boundary larger than the County-established Urban Development Boundary; however, all lands outside the Urban Development Boundary within the City's Planning Area are indicated as "Green Belt" areas where development is not expected to occur (except the Wastewater Golf Course and Residences Project).

According to the background material contained in the plan Dinuba is expected to have a population growth rate between four and five percent with a population of 27,387 by 2020. With a population of 16,844 (TCAG, 2003), this is over 10,000 additional residents over 20 years.

Because of Dinuba's location it shares a small regional economy with two other cities located in Fresno County; Kingsburg and Reedley. This "triad" of cities, has a unique existence as each city share residents, employees and growth demands across county lines.

City of Exeter General Plan

The City of Exeter is located just south of the intersection of SR 65 and SR 198, seven miles east of Visalia, two and one half miles east of Farmersville, and eight miles north of Lindsay. According to the U.S. Census the population of Exeter in 2000 was 9,168. The Exeter General Plan was updated in 2004, and is comprised of seven elements: Land Use and Circulation, Housing, Open Space and Conservation, Safety, and Noise. The Land Use and Circulation Elements establish two planning boundaries concurrent with County adopted Urban Development Boundaries (2,180 acres) and Urban Area Boundary (4,480 acres).

Exeter's Land Use element contains seven sections related to future growth: land use and population, population and land use projections, land use designations and population densities, planning issues and land use goals, land use policies and actions, land use designations/zoning district matrix, and a land use map. Through these sections the future growth of Exeter and its surroundings are planned through 2020. In total, the plan anticipates two acreage needs, low and high, based on low and high population expectations in 2010 and 2020. The low land acreage needs for all land use types is 192 acres by 2010 and 421 acres by 2020. The high land acreage needs for all land use types is 320 to 330 acres by 2010 and 716 to 726 acres by 2020.

City of Farmersville General Plan

The City of Farmersville is located about five miles east of the City of Visalia.

The Farmersville General Plan was updated in November 2002 with a timeframe extending 23 years, through 2025. The plan projects two rates of growth during the plan period, with a high build out population estimate of about 20,155 residents and a low build out population estimate of about 17,854. The plan estimates a total land need of approximately 290 acres through the planning period to accommodate expected growth. This land can be provided within the available land in the urban development boundary. Much of the land within the city's planning area outside the current (2007) city limits is rural residential and productive agriculture land.

The General Plan policies foresee future growth and development occurring in designated areas within the city limits and urban development boundary. City staff noted in the plan that Farmersville has underdeveloped commercial and industrial areas in comparison with

surrounding Tulare County cities. Constraints to continued development of the city might include: water supply; sewer capacity; air quality; competition for commercial and industrial development with other urban areas; local and regional efforts to preserve prime agricultural land; and traffic congestion.

City of Lindsay General Plan

Lindsay is located approximately 10 miles north of Porterville on State Route 65. This roadway provides the primary link between Lindsay and Porterville.

The 1989 General Plan projects a moderate rate of growth during the planning period that extends to 2010. The 2010 population of the city is projected at 18,240 residents, which translates into an average annual population increase of about 5 percent, well above the annual historic population increase of 2.4 percent that occurred between 1980 and 1988.

The planning area boundary is also the city's sphere of influence, adopted by the Tulare County Local Agency Formation Commission Organization (LAFCO) in 1985. The General Plan concentrates the expansion of the city to areas that lie within the existing urban service boundary. In addition, emphasis is placed on preserving lands identified by the city as reserve, until the city's growth merits its use.

The General Plan policies direct city growth through the planned use of reserved lands. The plan emphasizes the supply of adequate residential lands at densities that meet the needs of all income groups. Further importance is placed on the central business district as a source of economic growth and stability for the city. Factors that could constrain continued development of Lindsay include: overcrowded housing; water supply; air quality; and competition for jobs and housing from other urban areas.

City of Porterville General Plan

Porterville is located about 25 miles southeast of Tulare and is located at the intersection of Highways 65 and 190, at the base of the Sierra Nevada Mountains. The city's General Plan boundary encompasses approximately 45 square miles. Population at the time of adoption of Porterville's General Plan (2008) was 45,220 within the city limits, with projections of 107,300 residents by 2030. The City is also in the process of updating its Sphere of Influence (SOI) boundary.

The General Plan policies guide future growth through focused development in currently designated areas within the city limits and urban development boundaries. Such growth includes expanding shopping and retail centers, office space, and industrial land to provide a sustainable economy, and residential growth to meet all groups living in Porterville.

In addition to allocating land uses, the goals and policies of the land use element address issues including: citywide growth; residential development; commercial/retail development; commercial and industrial employment development; public services; downtown retail and professional service development; conservation; and community identity/design. Factors that could constrain continued development of the city include: air quality; competition for commercial and industrial development from other urban areas (mainly Visalia and Tulare); and local and regional efforts to preserve prime agricultural land and open space.

City of Tulare General Plan

Tulare is the second most populous city in Tulare County (after Visalia) and an employment center. The city is located south of Visalia, along Highway 99.

The City of Tulare completed an update to its General Plan in April 2008. The current Tulare General Plan policies guide future growth to designated areas within the city limits and urban development boundary. The plan's goal is to ensure a self sufficient, full service city where its citizens live, work and play. Such growth includes well planned shopping areas, commercial services, and office space to reduce the out bound/in bound flow of city commuters to surrounding communities.

The goals and policies of the land use element address issues including: citywide growth; residential development; commercial development; office/business park development; industrial development; agricultural preservation; park and recreation facilities; municipal services; and community character. Factors that could constrain continued development of Tulare include: air quality; competition for commercial and industrial development from other urban areas (mainly Visalia); local and regional efforts to preserve prime agricultural land; and traffic congestion.

City of Visalia General Plan

Visalia is the most populous city in Tulare County and is the county's main center for employment. The city is located ten miles north of Tulare on State Route 63 which provides the primary link between the Tulare and the Visalia urban areas.

The Visalia General Plan was last revised in 1990 and updated in 1996 and has a planning horizon through 2020. The plan projects an average annual population increase of 2.75 percent with a projected population of approximately 165,000 residents by 2020. The plan directs the expansion of the city to areas northeast of its existing incorporated boundaries. Much of the land within the city's 90-square mile planning area but outside the current (2007) city limits is rural residential and productive agriculture land.

The General Plan policies guide future growth of the city through managed contiguous and concentric growth from the city's core area. The plan also emphasizes policies to limit urban sprawl. Special issue areas addressed by the plan include: the College of the Sequoias; transportation; the Visalia Municipal Airport; and the city's three redevelopment project areas.

In 1996, Tulare County revised the land use designations and development standards provided in the 1996 Visalia General Plan for the area outside the City limits but within the Urban Development Boundary.

City of Woodlake General Plan

The City of Woodlake is a small, rural city located 20 miles north of Exeter at the intersection of Highways 245 and 216. The city covers approximately two square miles with a population of 6,925 (2007). The most recent update of the Woodlake General Plan Land Use Element occurred in 1978 and established a 1995 planning horizon. The plan encompasses approximate 21,145 acres. The City is currently updating their General Plan.

The plan promotes growth that will continue the city's small town, rural character.

*Note: The cities of Delano and Kingsburg plan on developing general plans which may become two additional County Adopted City General Plans. Delano and Kingsburg have established Urban Development Boundaries and the Plans will become components of the general plan when adopted.

3.7 Spheres of Influence

Introduction

This section discusses the spheres of influence adopted by LAFCo for the cities and other special districts in Tulare County. A "sphere of influence" is a boundary surrounding cities and special service districts that is intended to represent the area into which the city or district will probably expand and extend public services over a twenty year horizon. Spheres of influence and changes to existing sphere boundaries must be approved by the Tulare County Local Agency Formation Commission (LAFCo). LAFCo is a state-mandated regulatory body that oversees changes in jurisdictional boundaries that may include annexations, detachments, formations, dissolutions, consolidations, mergers, incorporations and dis-incorporations. LAFCo is directed by state law (the Cortese-Knox–Hertzberg Local Government Reorganization Act of 2000) to establish and periodically review the spheres of influence for each agency within its jurisdiction.

Methodology

The Tulare County RMA Long Range Planning Branch, Tulare County GIS, and Tulare County LAFCo provided the information in this section.

Key Terms

- **Annex.** To incorporate a land area into an existing district or municipality, with a resulting increase in the boundaries of the annexing jurisdiction.

- **Level of Service (LOS).** Some communities in California are also developing level of service standards relating to municipal functions such as police, fire, and library service.

- **Local Agency Formation Commission (LAFCo)**. A five-member commission established by state law within each county that reviews and evaluates all proposals for the formation of special districts, incorporation of cities, annexation to cities or special districts, consolidation of districts, and merger of districts with cities. Each county's LAFCo is empowered to approve, disapprove, or conditionally approve such proposals. The five LAFCo members generally include two county supervisors, two city council members, and one member representing the

general public. Some LAFCos include members who are directors of special districts.

Regulatory Setting

The Tulare County LAFCo has drafted a policy manual to regulate changes in local government boundaries and spheres of influence to implement the requirements of State law.

Existing Conditions

The policies of LAFCo require a plan for the extension of services to be submitted with every application for a boundary change. Other policies discourage the annexation of farmlands when significant areas of non-prime farmland are available, and encourage infill development of vacant areas within cities before the annexation and development of fringe areas.

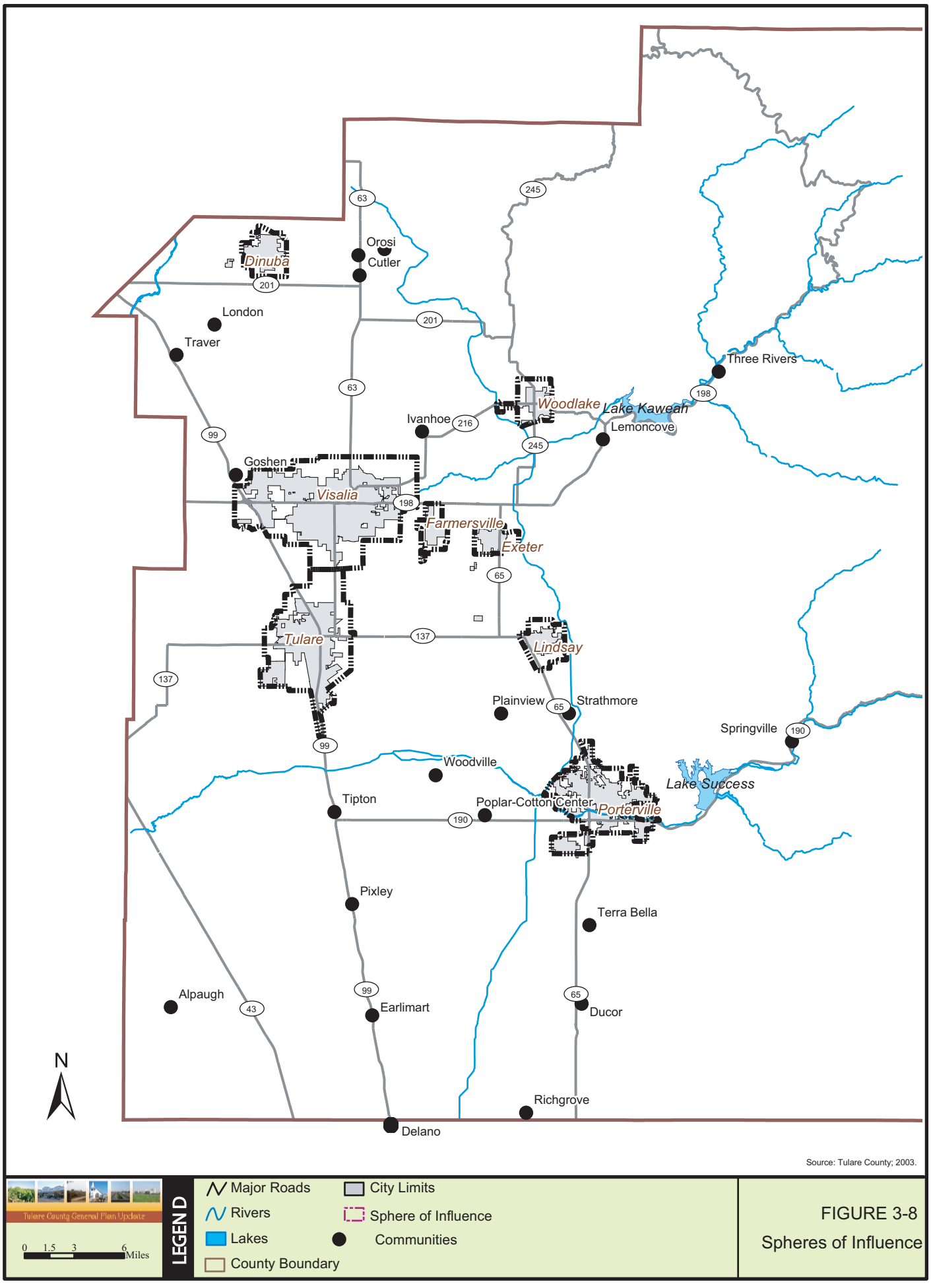
Spheres of Influence

Table 3-28 shows the amount of land that is located within spheres of influence (SOI) for each of the cities in Tulare County. The pattern and distribution of these lands is illustrated in Figure 3-8. In total, the SOIs include approximately 83,000 acres, which is almost twice as much land than is currently located within incorporated city limits. All of the cities contain at least 40 percent more land outside their city limits, but within their SOI boundary. The city with the largest amount of land remaining in its SOI is Porterville (61.5 percent). This situation is likely due to the high number of unincorporated county "islands" contained within the city of Porterville.

Table 3-28. Spheres of Influence, Tulare County, 2007

City	Incorporated Area Acreage	Sphere of Influence Acreage	Percent of SOI outside of Incorporated Lands
Dinuba	3,970	4,980	80%
Exeter	1,460	2,220	66%
Farmersville	1,390	2,520	55%
Lindsay	1,660	3,930	42%
Porterville	10,310	14,600	71%
Tulare	12,140	19,900	61%
Visalia	22,630	34,140	66%
Woodlake	1,750	3,710	47%
Total	**55,310**	**83,000**	**67%**

Source: Tulare County LAFCO, 2007.


Orosi
Cutler
Dinuba
London
Traver
Three Rivers
Woodlake
Lake Kaweah
Ivanhoe
Lemoncove
Goshen
Visalia
Farmersville
Exeter
Tulare
Lindsay
Plainview
Strathmore
Springville
Woodville
Lake Success
Tipton
Poplar-Cotton Center
Porterville
Pixley
Terra Bella
Alpaugh
Earlimart
Ducor
Richgrove
Delano
63
245
201
99
216
198
65
137
190
43
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
LEGEND
Major Roads
Rivers
Lakes
County Boundary
City Limits
Sphere of Influence
Communities
FIGURE 3-8
Spheres of Influence

In comparison with the entire county (3,098,257 acres, including cities), the amount of land contained in SOI boundaries is not significant – 2.7 percent. However, when compared to the total land on the valley floor (933,648.9 total acres, including cities), being those lands below 600 feet elevation and which are most conducive to development, the SOI lands account for approximately 8.9 percent of valley lands.

In 2000, Assembly Bill (AB) 2838 (Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 as amended) was signed into law to reform local government reorganization law. Highlights of these revisions include, but are not limited to, streamlining and clarifying LAFCo policies and procedures; making LAFCos neutral, independent, and balanced in their representation of counties, cities, and special districts; strengthening LAFCo powers to prevent sprawl and ensure the orderly extension of government services; enhancement of communication, coordination, and procedures of LAFCos and local governments; and enhancing opportunities for public involvement, active participation, and information regarding government decision making.

Service reviews were also added to the LAFCo mandate with the passage of AB 2838. A service review is a comprehensive study designed to enhance communications among LAFCo, local agencies, the county, and communities regarding the provision of municipal services. Service reviews attempt to capture and analyze information about the governance structures and efficiencies of service providers, and to identify opportunities for greater coordination and cooperation between providers. The service review is a prerequisite to mandated SOI reviews and updates and may also lead LAFCo to take other actions under its authority.

The Tulare County LAFCo Policy and Procedural Manual implements the Cortese-Knox-Hertzberg Act as mandated: encouraging orderly growth and development and in balancing that development with sometimes competing state interests of discouraging urban sprawl: preserving open space and prime agricultural lands; efficiently extending government services; and providing housing for persons and families of all incomes. The LAFCo Policy C-1 requires that, "As a guideline for determining conformance with Section 56377, an analysis shall be prepared and considered of the amount of land within the existing city limits for the same land use classification as the land use within the annexation proposal, relative to a 10 year supply for residential and 20 year supply for commercial or industrial." The County refers to this as the 10 Year Rule, which mandates LAFCo to monitor the

amount of vacant land within the city limits, to avoid leapfrog development and encourage more compact development patterns.

City/County Memoranda of Understanding

Tulare County has entered into memoranda of understanding (MOU) with all eight of its cities regarding land use and tax sharing for the development and annexation of lands within each city's adopted SOI. In addition, a special Island Annexation Tax Sharing Agreement has been entered into with the City of Visalia. In general, the MOU's are Master Tax Sharing Agreements. These MOU's state that the county and cities will reallocate taxes and revenues that are a part of the annexation are between the two agencies. Based on factors such as service providers and various tax revenue generators (e.g., sales, property, and services).

3.8 Surrounding County and City General Plans

Introduction

Tulare County borders four other counties: Fresno to the north; Kings to the west; Inyo to the east; and Kern to the south. In addition, there are four cities that abut Tulare County: Kingsburg (Fresno County) and Reedley (Fresno County) to the north and Delano (Kern County) to the south

Methodology

The existing general plans for the four bordering counties and three neighboring cities provided the information for this section.

Key Terms

There are no key terms for this section.

Regulatory Setting

There is no regulatory setting for this section.

Existing Conditions

Although the land use decisions made in adjacent counties are beyond Tulare County's direct control, interjurisdictional coordination should occur through the General Plan update process. Coordination can assist in facilitating consistency in both land use designation and policy creation along common borders. Examples of interjurisdictional issues

between Tulare County and its neighboring counties, include, but are not limited to, corridor planning, air and water quality, and scenic issues. The following summarizes the County General Plans of Fresno, Inyo, Kern, and Kings County.

County Plans

Fresno County General Plan

Fresno County is located to the north of Tulare County. This county is currently the leading agricultural producing county in the nation with about 2,911 square miles of agricultural land. Fresno County is experiencing huge gains in population and development, especially in its 15 incorporated cities. A comprehensive revision to the General Plan was recently adopted (October 2000), which assumes doubling of its population by the year 2020. The plan identifies the county as a protector of its agricultural land through policies that direct urban growth primarily to existing incorporated cities. Significant growth is not proposed adjacent to the border of Tulare and Fresno Counties.

The Fresno County General Plan comprises the following seven elements: Economic Development; Agriculture and Land Use; Transportation and Circulation; Public Facilities and Services; Open Space and Conservation; Health and Safety; and Housing.

Kern County General Plan

Kern County is located along Tulare County's southern border. The county consists of valley floor, mountains, foothills, and desert regions. The Kern County General Plan was updated in 2007. Approximately one million acres of land in the county are outside its direct planning jurisdiction due to the presence of federal agencies and incorporated cities. The policies and proposals in the Kern County General Plan do not appear to be in conflict with forecasted Tulare County growth along their common border.

Inyo County General Plan

Inyo County is located east of Tulare County. Inyo County is mainly a rural county, consisting primarily of public lands managed by the U.S. Forest Service, Bureau of Land Management, and the National Parks Service. Its western border (shared with Tulare County) is in a remote portion of the Sierra Nevada Mountains and consists largely of public lands, such as the Inyo and Sequoia National Forest. The General Plan for Inyo County adopted in 2001 reflects the public ownership and rural,

open space nature of the lands within the jurisdiction. Over 80 percent of land within Inyo County is designated as open space. Due to the interface with public lands, the potential for conflict between the two counties is minimal. One ongoing issue for both counties is the need for coordination between the counties and the U.S. Forest Service and National Park Service.

The Inyo County General Plan comprises the following seven elements: Government; Land Use; Economic Development; Housing; Circulation; Conservation/Open Space; and Public Safety.

Kings County General Plan

Kings County borders Tulare County to the west. The county consists almost entirely of prime agricultural land outside of its four incorporated cities and four unincorporated communities. Updated in 1993, the Kings County General Plan projects modest growth in the unincorporated areas through its 20-year planning horizon. The plan encourages urban development within cities and existing urban areas and maintains large (40 acres or more) parcel sizes outside city expansion areas. There does not appear to be any new or expanded developments proposed along its common boundary that could adversely affect the Tulare County General Plan.

City Plans

Just as land use decisions in neighboring counties are out of Tulare County's control, land use decisions made by the cities that abut Tulare County are also beyond Tulare County control. However, coordination with these jurisdictions can assist in ensuring consistent growth patterns and adequate services for both the cities' and county's residents along the common borders. The following summarizes the city general plans of Delano, Kingsburg, and Reedley.

City of Delano General Plan

The City of Delano is located in Kern County just south of Tulare County on SR 99. Comprised of 38,824 (U.S. Census Bureau, 2000a) residents, Delano's primary industry provides support services to surrounding agriculture and manufacturing. Delano is unique in its relationship to Tulare County in that it has grown directly to the edge of the county. Because Tulare County does not provide services to its residents who live on the border of Delano, the county and Delano share Joint Powers Agreement within the County Service Line and a Tax Transfer Agreement whereby half of the related taxes go to Delano for serviced

properties. In addition, Delano has caused development pressure from commercial and residential interests who want to develop in Tulare County next to Delano, despite not having available services.

City of Kingsburg General Plan

The City of Kingsburg is located in Fresno County just north of Tulare County on SR 99. Kingsburg is comprised of 9,199 (U.S. Census Bureau, 2000b) residents and is similar to other SR 99 cities having much of its growth centered along the highway, which it also relies on for distribution, transit, and economic growth. Kingsburg makes up a triad of cities, including Reedley (Fresno County) and Dinuba, which rely on each other for residential growth, employment, and retail.

City of Reedley General Plan

The City of Reedley is located in Fresno County, about six miles north of Dinuba on Road 80 (Alta Avenue). Reedley is comprised of 20,756 (U.S. Census Bureau, 2000c) residents and provides support services to surrounding agriculture. The city also has a junior college, which provides education opportunities to surrounding communities. Reedley is also a part of the triad of cities, including Kingsburg (Fresno County) and Dinuba, which rely on each other for residential growth, employment, and retail. Reedley has continued to grow south in recent years with several residential projects now (2004) in the approval process. This recent growth trend has put pressure on Road 80 (Alta Avenue) which is expected to surpass its capacity by 2010. This is documented in the General Plan where anticipated population in 2012 is expected to be between 30,205 and 55,201 (a large difference due to large fluctuations in recent growth rates).

The City of Reedley General Plan contains eight elements as follows: Land Use, Circulation, Housing, Open Space, Conservation, Recreation, Safety, and Noise. The land use element (the element that directly guides growth) is comprised of eleven sections that cover existing conditions, growth indicators, growth and development policies, and land uses. Land use designations described by the plan include: Agriculture, Urban Reserve, Estate Density Residential, Medium Density Residential, High Density Residential, Office Commercial, Neighborhood Commercial, Community Commercial, Central Business Commercial, Service, Commercial, Recreation Commercial, Floating Neighborhood Commercial, Limited Industrial, General Industrial, Public Facilities, Open Space, and Buffers.

3.9 Regional Plans and Policies

Introduction

State law requires Tulare County and various regional agencies to undertake special planning efforts to address certain issues that are either not required to be addressed in the General Plan, or include a larger area than a single county. This section discusses plans affecting regional land use, growth, and development in Tulare County.

Method

The information provided in this section was provided from various regional agencies. Each is described in relation to how it influences certain aspects of the county.

Key Terms

- **Approach Zone**. The air space at each end of a landing strip that defines the glide path or approach path of an aircraft and which should be free from obstruction.
- **Air Pollution**. Concentrations of substances found in the atmosphere which exceed naturally occurring quantities and are undesirable or harmful in some way.
- **California Environmental Quality Act (CEQA)**. A state law requiring state and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an environmental impact report (EIR) must be prepared and certified as to its adequacy before taking action on the proposed project.
- **Clear Zone**. That section of an approach zone of an airport where the plane (defining the glide path) is 50 feet or less above the center-line of the runway. The clear zone ends where the height of the glide path above ground level is above 50 feet. Land use under the clear zone is restricted.
- **Emission Standard**. The maximum amount of a pollutant that is legally permitted to be discharged from a single source, either mobile or stationary.

- **Hazardous Material**. Any substance that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant presence or potential hazard to human health and safety or to the environment if released into the workplace or the environment. The term includes, but is not limited to, hazardous substances and hazardous wastes.
- **National Ambient Air Quality Standards**. The prescribed level of pollutants in the outside air that cannot be legally exceeded during a specified time in a specified geographical area.
- **Ozone**. A tri-atomic form of oxygen (O_3) created naturally in the upper atmosphere by a photochemical reaction with solar ultraviolet radiation. In the lower atmosphere, ozone is a recognized air pollutant that is not emitted directly into the environment, but is formed by complex chemical reactions between oxides of nitrogen and reactive organic compounds in the presence of sunlight, and becomes a major agent in the formation of smog.
- **Pollutant**. Any introduced gas, liquid, or solid that makes a resource unfit for its normal or usual purpose.
- **Pollution**. The presence of matter or energy whose nature, location, or quantity produces undesired environmental effects.
- **Solid Waste**. A general category that includes organic wastes, paper products, metals, glass, plastics, cloth, brick, rock, soil, leather, rubber, yard wastes, and wood. Organic wastes and paper products comprise about 75 percent of typical urban solid waste.

Regulatory Setting

This section provides for the assessment of the regional plans and policies of agencies as they pertain to the categories listed below.

Existing Conditions

The following topical categories provide a framework for the different regional agencies that influence land use in the county. Under each topic the existing conditions and regulations of each is described as it pertains to land use. Included in this discussion is land use and population, flood

control, watersheds, airport land use policy plans, hazardous waste management, solid waste management, water quality, and air quality.

Land Use and Population

Tulare County Association of Governments

The Tulare County Association of Governments (TCAG) is the product of a Joint Powers Agreement between Tulare County and its eight cities. The purpose of TCAG is to assist local jurisdictions in obtaining federal assistance, review and coordinate applications for federal programs, and provide a clearinghouse for the coordination and review of state funded projects. In addition, TCAG is the Metropolitan Planning Organization for Tulare County, which makes it responsible for, "continuous, cooperative, and comprehensive planning" in the Visalia urbanized area. In addition, TCAG acts as Tulare County's Regional Transportation Planning Agency.

TCAG is directed by a Board of Governors, which is comprised of sixteen members: one from each of the eight cities, five member of the Board of Supervisors, and three members-at-large. These members act as the Council of Governments, the Regional Transportation Planning Agency, and the Metropolitan Planning Organization. These members and the District Director of Caltrans act as the Policy Advisory Committee, providing advice to issues being presented to the Board of Governors.

TCAG provides population projections based on DOF estimates to use in regional transportation and housing planning. As required by state law, TCAG administers the apportionment of housing allocation requirements for various income and housing categories for all communities in the county. These are based on DOF data, census data, and data received from each city and the county.

TCAG also prepares and coordinates numerous regional transportation planning services and studies including the Regional Transportation Plan (RTP) and mitigation banking. In 2006, Measure R was passed, which provided for a ½ cent sales tax increase for Tulare County over the next 30 years. The funding received from this increase in sales tax goes towards funding major transportation needs in the county and the county's incorporated cities. TCAG coordinates all aspects of Measure R.

In May 2007, TCAG adopted the 2007 RTP. The RTP is a 20-year planning document that is consistent with the Regional Transportation Improvement Program (RTIP) to qualify projects for the State

Transportation Improvement Program (STIP). The RTP determines which projects are eligible for funding, identifies project parameters and schedules an approximate time of construction within the 20-year horizon. The RTP is required to be updated every four years. The scope of the 2007 RTP extends to 2030. The 2004 RTP is based on regional transportation facilities and the proposed constrained improvements funded during the time frame of this plan. More information on the 2007 RTP is provided in Section 5, Transportation and Circulation (TCAG, 2007).

TCAG designates Urban Area Boundaries (which define expansion boundaries around cities and unincorporated urban communities) using updated city and county general plans to adjust existing urban boundaries. Urban Boundary Plans provide the cities and county with the ability to coordinate plans, policies and standards relating to construction, subdivision development, land use and zoning regulations, street and highway construction, public utility systems, environmental impact reports, Urban Area Greenbelt studies, and other matters affecting development on the urban fringe. TCAG is currently in the process of developing the Blueprint Planning Process that consolidates long range regional planning concerns throughout the San Joaquin Valley.

Tulare County Flood Control

There are several flood control and storm drainage systems and programs within incorporated cities, unincorporated areas, and among certain cities. They address flood control issues at the sub-regional and city level. Tulare County has a 1970 Flood Control Master Plan and several ordinances related to flood damage prevention. These are derived mainly from Federal Emergency Management Agency (FEMA) programs.

Tulare County Watersheds

There are at least 11 major watersheds that contribute to the water supply for Tulare County. The watersheds identified by the Environmental Protection Agency (EPA) and the California Rivers Assessment are listed below:

- Upper Kern;
- South Fork Kern;
- Upper Poso;

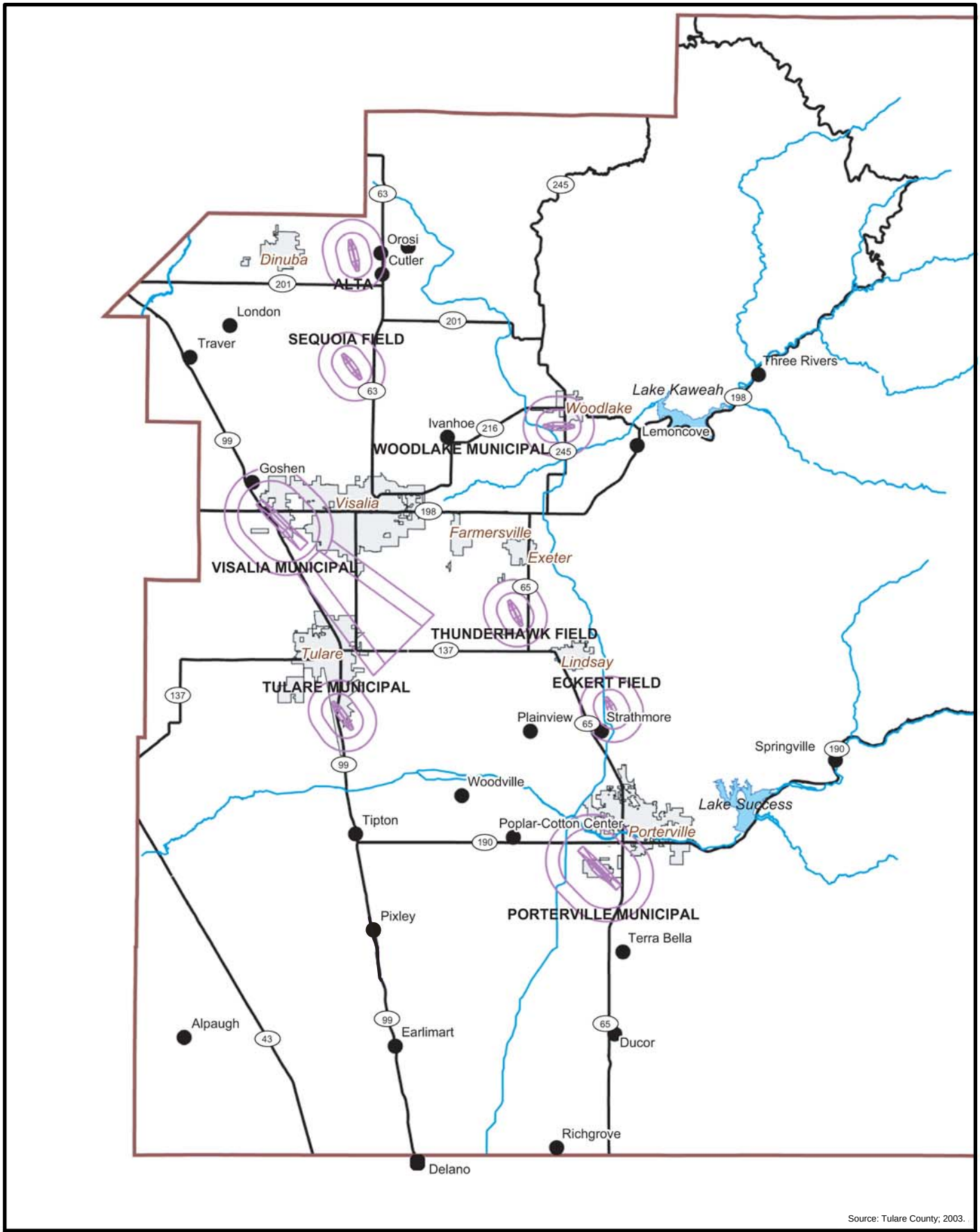
- Upper Deer-Upper White;
- Upper Tule;
- Upper Kaweah;
- Mill;
- Upper King;
- Tulare-Buena Vista Lakes;
- Owens Lake; and
- Indian Wells-Searles Valleys.

Tulare County Airport Land Use Commission

Tulare County's role in air transportation is strictly limited to land use considerations in support of state and federal regulations. California Public Utilities Code, Sections 21670-21679.5 (Chapter 4, Article 3.5) provide the statutory authority for the establishment of the Tulare County Airport Land Use Commission (ALUC) and its adoption of procedures and policies.

Section 21675 requires that ALUC adopt a land use compatibility plan for each public airport and for the surrounding area. Tulare County has found its General Plan to be consistent with the California Airport Land Use Plan. These plans are important to the Tulare County General Plan update process because the General Plan of any city or county must be consistent with the applicable airport land use plan.

The Tulare County Airport Land Use Commission is the board that oversees airport issues and development of the Airport Land Use Plan (ALUP) in Tulare County. The commission is consists of two aviation specialists as defined by the ALUP and seven Tulare County Planning Commissioners.



Source: Tulare County; 2003.

Tulare County General Plan Update

0 1.5 3 6 Miles

Major Roads
Rivers
Lakes
County Boundary
City Limits
Airport Zones
Communities

FIGURE 3-9

Airport Safety Zones

Airport land use plans determine compatible uses and building heights to ensure the continued viability of each facility. The plans contain policies and regulations that discourage land uses that would be inconsistent with safe airport operations. The plans prohibit high-occupancy uses (such as apartments, hospitals and schools) as well as uses sensitive to noise (such as residences) within both clear and high day-night noise level (DNL) zones around each airport based on the expected noise exposure and the likelihood of an accident.

In addition to the adopted Airport Land Use Plans for existing airports, Tulare County has also adopted an Aviation Element (1985) as part of the General Plan. This element outlines the county's goals and objectives pertaining to the growth and maintenance of its airports. The goals and objectives of the element identify existing conditions and future needs, analyze existing programs related to the county's airports, provides alternative growth measures for the future, and recommends improvement and implementation measures for the airports.

A total of nine public airports (7 active) operate within Tulare County. These include six publicly owned and operated facilities (Harmon Field [currently closed], Porterville Municipal, Sequoia Field, Tulare Municipal [Mefford Field], Woodlake Airport, and Visalia Municipal) and three privately owned and operated airports (Alta Airport [currently closed], Thunderhawk Field, and Eckert Field). The only airport whose runways do not run northwest-southeast is Woodlake. Its runway runs east-west. The locations of airports in the county and the airport zones are shown on Figure 3-9.

- **Alta Airport.** Alta Airport, which is currently closed, is a Basic Utility; Stage 1 Airport located four miles east of the City of Dinuba.

- **Eckert Field.** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Eckert Field Airport to ensure compatibility. The Tulare County General Plan and Zoning Ordinance provide additional land use controls.

- **Harmon Field.** Harmon Field is closed due to hazardous waste cleanup operations. The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Harmon Field Airport to ensure compatibility. Land use controls are provided by the Tulare County General Plan.

- **Porterville Municipal Airport.** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Porterville Municipal Airport to ensure compatibility. Both the City of Porterville and Tulare County General Plans and Zoning Ordinances provide land use controls for the Porterville Municipal Airport. The Federal Aviation Regulations (FAR), Part 77, also apply to the Porterville Municipal Airport. An Airport Master Plan has been prepared for the facility by the City of Porterville.

- **Sequoia Field.** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Sequoia Municipal Airport to ensure compatibility. Land use controls are provided by the Tulare County General Plan.

- **Thunderhawk Field.** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Thunderhawk Field Airport to ensure compatibility. Land use controls are provided by the Tulare County General Plan and Zoning Ordinance, as well as the General Plan and Zoning Ordinance of the City of Lindsey.

- **Tulare Municipal Airport (Mefford Field).** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Tulare Municipal Airport to ensure compatibility. Both the City of Tulare Master Plan and Zoning Ordinance and the Tulare County General Plan and Zoning Ordinance provide land use controls for the Tulare Municipal Airport. The Federal Aviation Regulations (FAR), Part 77, also apply to the Tulare Municipal Airport. An Airport Master Plan has been prepared for the facility by the City of Tulare.

- **Visalia Municipal Airport (VMA).** The Tulare County Comprehensive Airport Land Use Plan (adopted June 24, 1992, amended November 30, 1995) guides land use decisions within the vicinity of the Visalia Municipal Airport to ensure compatibility. The City of Visalia and Tulare County General Plans and Zoning Ordinances as well as the Goshen Community Plan provide land use controls for the Visalia Municipal Airport. The Federal Aviation Regulations (FAR), Part 77, also apply to the Visalia Municipal Airport. An Airport Master Plan has been prepared for this facility, and is currently being updated.

- **Woodlake Municipal Airport.** The Tulare County Comprehensive Airport Land Use Plan guides land use decisions within the vicinity of the Woodlake Municipal Airport to ensure compatibility. Land use controls are provided by the Tulare County and City of Woodlake General Plans and Zoning Ordinances.

The operations of these airports are discussed in greater detail in Chapter 5, Transportation and Circulation.

Hazardous Waste Management

The Tulare County Hazardous Waste Management Plan (HWMP) was adopted by the Board of Supervisors in May of 1989. The plan contains descriptive background information and policy guidance for: current hazardous waste generation; projected hazardous waste generation to the year 2000; capacity analyses; hazardous waste reduction; siting of hazardous waste management facilities; hazardous waste transportation; underground storage tank regulations; disclosure information on contaminated sites; and asbestos and infectious waste. The plan also includes programs for hazardous waste management, enforcement, inspection and monitoring, small quantity generators, household hazardous wastes, and implementation.

The Tulare County HWMP also identifies a comprehensive set of siting criteria for hazardous waste facilities and identifies areas of the County where such criteria might be applicable upon more detailed site-specific investigations. Siting criteria reflects four broad categories: high hazard areas, public safety, physical limitations of the site area, and site-specific features.

Solid Waste Management

Tulare County and its eight cities worked together in a countywide effort to prepare a Countywide Integrated Waste Management Plan (CIWMP). The CIWMP includes a Source Reduction and Recycling Element (SRRE), Household Hazardous Waste Element (HHWE) and Non-disposal Facility Element (NDFE). The CIWMP is required by the California Integrated Waste Management Act of 1989, Assembly Bill 939 (AB 939). AB 939 mandates that all cities and counties in California meet waste diversion goals of 25 percent and 50 percent by 1995 and 2000, respectively. Additional information is provided in Chapter 10, Safety.

Tulare County and each of the incorporated cities are responsible for SRRE planning, implementation, and monitoring. In addition, each is

responsible for the public information, budgeting, implementation, and enforcement of waste management and plan administration. The Solid Waste Management Technical Advisory Committee (SWMTAC) acts as the LTF and provides advice and assistance for the preparation of the CIWMP. This committee is comprised of representatives of the solid waste and recycling industries and cities.

The county's SRRE includes four main components: source reduction, recycling, composting, and special waste. Each identifies existing diversion programs and examines, evaluates, and selects future diversion programs. Additionally, the SRRE includes goals and objectives on education and public information, disposal facility capacity evaluation, funding, and integration.

According to the Tulare County Integration Summary Plan, approximately 425,102 cubic yards of solid waste was generated in the county in 1995. About 109,989 tons (26 percent) were diverted through source reduction, recycling, and composting activities. As of 2008, there are three operating landfills in the county. These include Teapot Dome, Visalia, and Woodville. There are twelve transfer facilities located in Badger, Balance Rock, Camp Nelson, Earlimart, Kennedy Meadows, Orosi, Pine Flat, Porterville, Springville, and Visalia. Additional information is provided in Chapter 6, Public Services and Utilities.

According to disposal projection needs in the SRREs of the cities and unincorporated area, the permitted municipal solid waste (MSW) landfills are projected to provide combined disposal capacity to the county through 2012, assuming implementation of selected SRRE programs. Table 3-29 lists the quantity of waste collected in each jurisdiction in the county as well as the landfill used by each jurisdiction.

Table 3-29. Waste Quantities Collected, Tulare County Jurisdictions

Jurisdiction	Waste Quantity Collected per Day		Waste Quantity Collected per Year	
	Tons	Cubic Yards	Tons	Cubic Yards
Dinuba	64	108	20,000	33,333
Exeter	35	59	11,040	18,400
Farmersville	22	38	7,080	11,800
Lindsay	3	56	10,440	17,400
Porterville	138	230	42,600	71,000
Tulare	243	405	75,000	125,000
Visalia	467	779	144,000	240,000
Woodlake	17	29	5,440	9,066
Unincorporated	355	592	109,502	182,503
Total	**1,380**	**2,300**	**425,102**	**708,503**

Source: Tulare County Solid Waste Management Plan; 2003

Central Valley Regional Water Quality Control Board (CVRWQCB)

Tulare County is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB) (Regional Board). The board is comprised of nine members from various jurisdictions and agencies related to water quality and control. The mission of the board is to preserve and enhance the quality of California's water resources for present and future generations.

Tulare County is included in the Water Quality Control Plan for the Tulare Lake Basin. This basin comprises the drainage area of the San Joaquin Valley south of the San Joaquin River. This basin only drains north into the San Joaquin River in years of extreme rainfall. The basin is enclosed by five different mountain ranges, creating a horseshoe shape. It comprises approximately 10.5 million acres, of which 3.25 million acres are in federal ownership. The maximum length and width of the basin is 170 miles and 140 miles, respectively. The basin encompasses numerous surface water features including lakes, rivers, streams, canals, and subsurface waters. Aquifers and ground water comprise all subsurface waters that occur in fully saturated zones, fractures within soils and other geologic formations. The closed nature of the Tulare Lake Basin allows for minimal subsurface outflow. This restricted outflow can lead to an accumulation of salts within the basin due to importation and evaporative uses of water. The largest water quality problem of the basin is the accumulation of salts. This problem can be compounded by overdrafting ground water for municipal, agricultural, and industrial purposes. Extracting groundwater from deeper hydrogeologic formations and outside sources can exacerbate the concentration of salts in ground water.

The CVRWQCB attempts to maintain water quality through control of wastewater discharge types. Point source wastewater in Tulare County includes: municipal wastewater; oil field wastewater by (by Terra Bella); winery discharges; solid waste sites; and other industrial uses. Point source discharges must meet wastewater discharge requirements, or obtain a wastewater waiver. Non-point sources include drainage and percolation from a variety of activities comprising: agriculture; forestry; recreation; and stormwater runoff. Non-point sources are difficult to identify, but can be mitigated by State management practices.

These point and non-point discharge types are created by a variety of land uses. These land uses are affected by the standards set forth by the Regional Board. The Board attempts to maintain and enhance water quality through the implementation of standards in the following

categories: agriculture; overdraft; salinity; silviculture; mineral exploration and extraction; erosion; recreation; well standards; controlled burning; municipal and domestic wastewater; industrial wastewater; stormwater; hazardous and non-hazardous waste disposal; and other discharge activities. Each of these categories is directly related to a type of land use that has generated it. Agriculture is a prime example of a non-point source of wastewater. Agricultural uses many types of fertilizers, pesticides and large amounts of water. The fertilizers and pesticides may increase the salinity and toxicity of water quality. The large amounts of water used for irrigation also increase the salinity of the water supply and can lead to groundwater overdrafting.

The CVRWQCB administers the National Pollutant Discharge Elimination System (NPDES) permit program which controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Identified point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Tulare County's biggest water quality issue is with natural occurring nitrate and arsenic. This is especially a problem in the western portions of the county near Alpaugh. Chapter 10, Natural Resources, provides a more in-depth discussion of water related issues.

San Joaquin Valley Unified Air Pollution Control District

Tulare County is located within the San Joaquin Valley Air Basin (SJVAB) which includes eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. The basin is bordered by mountains on the west, south, and east; to the north, the basin extends to the Sacramento Valley Air Basin. For purposes of regulating and monitoring air quality, Tulare County is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). See Chapter 6, Air Quality and Climate Change, for more details.

3.10 Federal and State Plans and Policies

Introduction

Land use policies or plans adopted for federal or state-owned land within Tulare County are important to the General Plan update process

because the management and use of such public lands can have significant effects on existing and future surrounding land uses transportation systems, and quality of life. Because federal and state agencies are generally not subject to the policies and plans adopted by local governments such as Tulare County, an understanding of the issues of federal and state agencies is vital to ensure effective inter-jurisdictional cooperation and coordination during the county's planning process.

Methodology

The information provided in this section was provided from various federal and state agencies. Each is described in relation to how it influences certain aspects of the county.

Key Terms

- **Acre-Feet**. The volume of water one-foot deep covering an acre of land.

Regulatory Setting

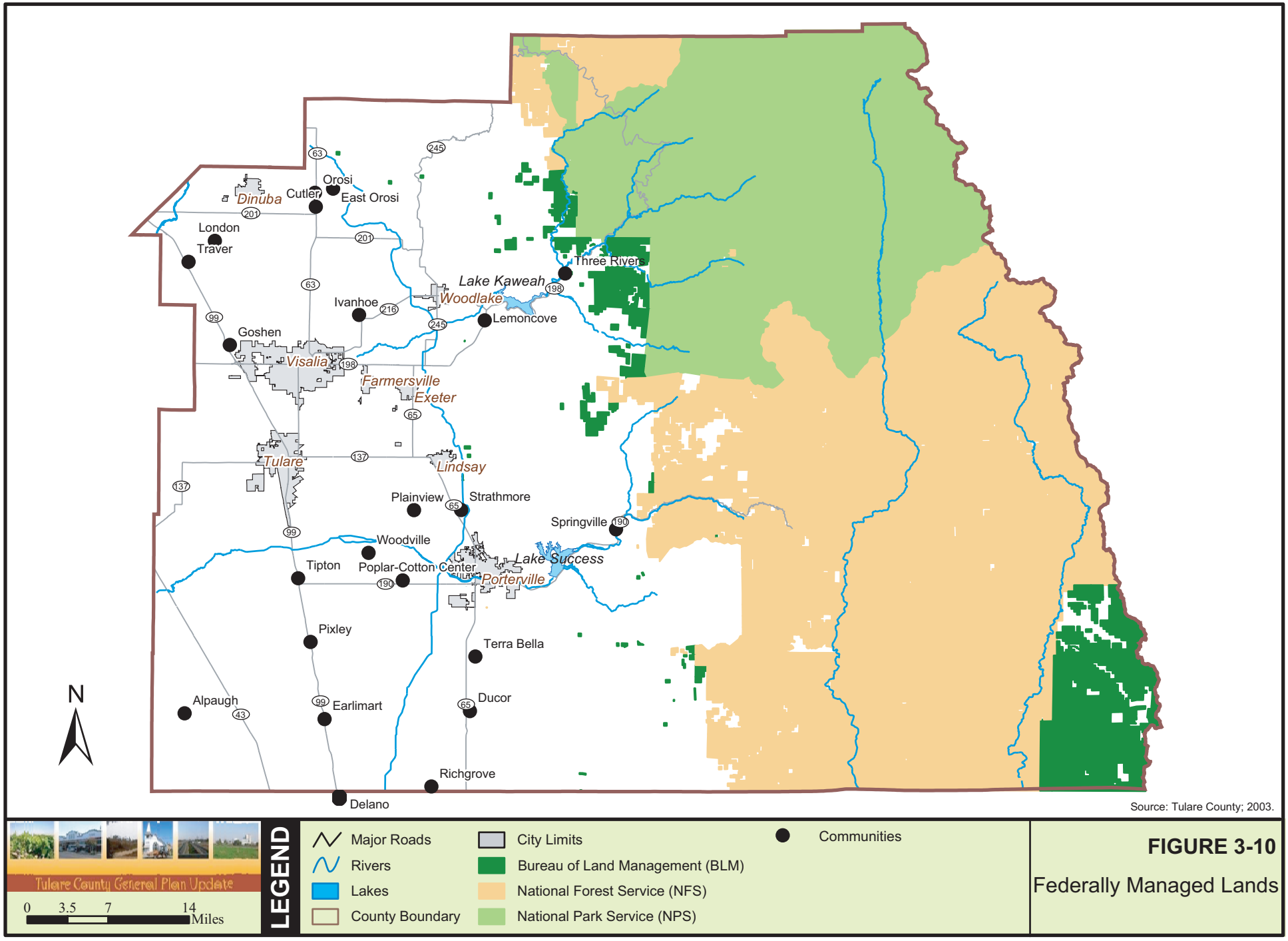
This section provides for the assessment of the Federal and State plans and policies of agencies as they pertain to the categories listed below.

Existing Conditions

The most significant land holding in Tulare County are managed by the United States Forest Service (USFS), National Park Service (NPS), and the State of California. Figure 3-10 shows the location of federal lands in Tulare County.

U.S. Department of Agriculture U.S. Forest Service

National forests are managed by the United States Forest Service (USFS), which is a part of the U.S. Department of Agriculture. Tulare County contains portions of two national forests: Sequoia National Forest which includes a majority of the northeastern portion of the County, and Inyo National Forest which makes up the remaining southeastern portion of the County.



Source: Tulare County; 2003.

FIGURE 3-10

Federally Managed Lands

Land use and resource management decisions within the National Forests are outside of the Tulare County's jurisdiction, although the USFS typically seeks County input on major issues under consideration. However, activities and land use decisions within the National Forests can affect Tulare County in a number of ways, especially to the extent that economic use and enjoyment of the Forest contributes to the economy and quality of life in Tulare County.

In an effort to establish long-range planning and management of the national forests, Congress passed the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), and the National Forest Management Act of 1976 (NFMA), that amended the RPA. These laws require comprehensive, long-range forest plans to be prepared for each national forest that details, among other things, how the resources within the forest will be managed, used, and preserved for the next 10 to 15 years. The management plans stress "multiple use" strategies that encourage the economic use of resources within the forest. Such resources include timber, water, and mineral resources, as well as recreation.

Sequoia National Forest and Giant Sequoia National Monument

Located at the extreme southern end of the Sierra Nevada range, 62 percent of Sequoia National Forest is located within Tulare County, with 26 percent in Kern County and 12 percent in Fresno County. The forest boundary includes 1,119,045 acres of national forest land and 54,155 acres under other ownership (private, county, state, etc.). Several small communities are also located within the forest boundary.

Management of the Sequoia National Forest is directed by the Sequoia National Forest Land and Resource Management Plan (1988), which has been amended by the Sierra Nevada Forest Plan Amendment. The plan provides a management program reflecting a mix of activities that allow for the use and protection of forest resources. It also fulfills the legislative requirement for the Sequoia National Forest while addressing local, regional, and national issues. To accomplish this, the plan: allocates land uses; establishes management direction and associated goals and objectives of the forest for 10 to 15 years; specifies the standards, approximate timing and intensity of practices necessary to achieve that direction; and establishes the monitoring and evaluation requirements needed to ensure that the plan is being implemented in a predictable manner. The intent of the plan is to provide increased public benefits from the forest while maintaining the long-term productivity of the land.

The Giant Sequoia National Monument (Monument) is also located in the Sequoia National Forest. The 327,760-acre monument was established by Presidential Proclamation on April 15, 2000. The Monument Final Environmental Impact Statement (FEIS) presents seven alternatives designed to manage the giant sequoias and other objects of interest. The management plan for the monument will consist of a selected alternative that establishes the management direction for its land and resources. It will amend the current Sequoia National Forest Land and Resource Management Plan (Forest Plan), as previously amended by the Sierra Nevada Forest Plan Amendment (Framework).

U.S. Department of Interior, National Parks Service

Sequoia/Kings Canyon National Parks encompass a portion of eastern Tulare County. Management of this area is carried out by the National Park Service, an agency of the U.S. Department of the Interior. The Natural and Cultural Resource Management Plan (NPS, 1999) for Sequoia and Kings Canyon National Parks, guides overall management of the parks. The Plan addresses broad resource topics including vegetation, wildlife, fire ecology, water resources, and impact of human use.

The Backcountry Management Plan (1986) discusses the approach to backcountry management, which encompasses nearly 90 percent of Sequoia and Kings Canyon National Parks. Presented in the plan are goals to "provide recreational settings that do not significantly impair park resources, the processes that shape them or the quality of experience distinctive to them." The plan provides an overview of existing backcountry facilities and resources and describes the management objectives for various activities including the policies and actions required to implement them.

In December 2007, the General Management Plan and Comprehensive River Management Plan was adopted. This plan addresses all land management issues in the parks for the next 15 to 20 years. The comprehensive river management plan covers management of portions of the Middle and South Forks of the Kings River and the North Fork of the Kern River. These segments are designated as wild and scenic rivers (NPS, 2007).

Recently (2004), Sequoia/Kings Canyon National Park prepared a Transportation Plan to guide the usage, development, and maintenance of roads leading to and crossing over the parks.

U.S. Department of Interior

Tule River Indian Reservation. The Tule Indian Reservation is located east of the City of Porterville and south of Springville. According to Census 2000 the reservation is home to 579 people (U.S. Census Bureau, 2000d). The reservation covers about 84.47 square miles of land and has approximately 179 housing units.

U.S. Department of Interior, Bureau of Land Management

The Bureau of Land Management (BLM) is an agency of the U.S. Department of the Interior. The BLM manages approximately 112,000 acres of land and resources that are owned by the federal government and an additional 43,000 acres that is split between private land ownership and federally owned resources. BLM land in Tulare County is located in the Caliente Planning Area, and is managed by the Bakersfield Field Office. The guiding resource management document is the Caliente Resource Management Plan (1997). The RMP is the basis for determining land use decisions for the planning area. Management decisions focus on discrete areas that can be separated on the basis of similar issues, problems, resources, or management needs. The management areas are generally segregated by geographic areas for development or maintenance of resources.

The RMP has four major areas. Each describes a combination of management objectives, allocations, and guidelines that direct the location for activities, the resource conditions to be maintained, and the use limitations expected to be necessary to meet management objectives. Each area is preceded by a brief summary of the characteristics of the management area and existing land use allocations.

The RMP provides policies, goals, and objectives developed to guide long-range as well as day-to-day land use decisions. The plan assesses current authorizations and actions to ensure conformity with the plan within a set timeline. The RMP is used to screen actions initiated by the private sector and/or other agencies to determine whether they may be permitted.

Uses of the Caliente Area BLM lands include: grazing leases, mostly for cattle operations; mineral exploration and development; and recreational uses. The RMP also manages cultural, air quality, 14 special management areas, biological, and recreation lands. The planning area is broken down into three separate management areas: Coast, Valley, and Southern Sierra. Tulare County is located within the Valley and

Southern Sierra management areas. The term Special Management Area (SMA) is a locally generated identification designed to highlight locations which have specialized management concerns or needs. These areas contain resources or opportunities that warrant a level of management narrowly focused on a localized resource or resource use concern (BLM, 1997). The BLM is currently in the process of updating the Caliente RMP.

United States Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) oversees and maintains two dams in Tulare County: the Terminus Dam of Lake Kaweah and the Success Lake Dam. Through their work, the County is provided with flood safety, water resources, electricity, recreation, and camping. Both dams are located within the boundaries of the county's Foothill Growth Management Plan.

Lake Kaweah lies on the western Sierra Nevada foothills, and is approximately 30 miles east of the City of Visalia on State Route 198. The lake is situated about 20 miles west of the entrance to Sequoia National Park. Management of the Terminus Dam and Lake Kaweah administered by the Sacramento District of the ACOE regional office in Lemon Cove, California. The lake was formed by the construction of the dam on the Kaweah River. The dam was completed in 1962 by the ACOE to provide flood control and water conservation. Energy production was added in 1990 with the construction of the Terminus Power Plant.

The Lake Kaweah facility includes: a lake; dam; spillway; power penstocks; day use area; camping facilities; and a commercial marina. The spillway of the Terminus Dam was recently raised by 21 feet increasing the storage space of Lake Kaweah by 42,600 acre-feet.

Management of Lake Success and its dam is administered by the Sacramento District of the ACOE regional office in Porterville, California. It includes a recreation area, located 8 miles east of the City of Porterville in the western portion of the Sierra Nevada foothills. Construction of the earth-filled dam was completed in 1961. It spans 3,490 feet across the Tule River and is 142 feet high. When full, the lake holds 82,000 acre-feet of water with a surface area of 2,450 acres.

The Lake Success facility includes: a lake; dam; spillway; power penstocks; day use area; camping facilities; and a commercial marina. Seasonal hunting is also permitted in the 1,400 acre Wildlife

Management Area. Future plans for Success Dam include raising the spillway by 10 feet and lengthening the spillway by 165 feet. This addition will increase Lake Success' capacity by 28,000 acre feet. The dam raising is currently (2008) on hold pending further analysis of the seismic integrity of the dam. The dam is at risk of collapsing from minor groundshaking. Currently, the level of the lake is kept at lower levels in order to minimize stress on the dam.

California Department of Fish and Game

The California Department of Fish and Game (CDFG) overseas all waterways in the state, including lakes, streams, or rivers containing fish or wildlife. The CDFG is the authority for the permitting of streambed alteration agreements and dredging permits. Tulare County is located in the Southern Sierra District of the CDFG. Monache Meadows Wildlife Area is also located within Tulare County. This 248-acre area lies within the Inyo National Forest. Monache Creek and the South fork of the Kern River cross this area. The wildlife area is the habitat of the golden trout, Sierra Nevada fox, wolverine and the spotted owl.

California State Lands Commission

The State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The state holds these lands for the benefit of its residents and visitors for statewide public trust purposes that include: waterborne commerce; navigation; fisheries; water-related recreation; habitat preservation; and open space. The Commission has the authority to grant three kinds of permits: mineral extraction leases; dredging permits (required to dredge navigable waterways for the improvement of navigation, reclamation, and flood control); and land use leases.

California Department of Forestry and Fire Protection (Cal Fire)

Fire risk management and prevention is crucial to the hundreds of thousands of acres of open space and communities that span across unincorporated Tulare County. The state, in conjunction with the Tulare County Fire Department, implements the Tulare Unit's Fire Management Plan (2004). The plan describes the County, its fire history, stakeholders, and best course of action to limit the impact of fires. Through careful calculations the partnership between the county and state assures that land uses are such that the destructive forces of fire are limited.

Cal Fire also operates the Mountain Home Demonstration State Forest in Tulare County. The Demonstration Forest is one of eight research forests which provide a place to test and demonstrate improved forest management practices. The Mountain Home Forest is comprised of 4,807 acres. Office and contact information is located in Springville at P.O. Box 517, Springville, CA 93265. More information on fire protection is provided in Chapter 6, Public Services and Utilities.

The State Reclamation Board

The State Reclamation Board maintains jurisdiction over all federal flood control projects and levees that are either part of such projects or that may affect such projects. The Reclamation Board is authorized to grant encroachment permits for any activity proposed along or near flood control levees, including changes in land use, construction, earthwork, or removal of vegetation. Examples of projects that the Reclamation Board oversees include the dam expansions at Lake Kaweah and Lake Success.

California State Parks and Recreation Department

The California Department of Parks and Recreation administers state park land in southern Tulare County at the Colonel Allensworth State Historic Park. The park is located seven miles west of Earlimart on County Road J22.

Allensworth is the only California town to be founded, financed and governed by African Americans. The small farming community was founded in 1908 by Colonel Allen Allensworth and a group of others dedicated to improving the economic and social status of African Americans. Uncontrollable circumstances, including a drop in the area's water table, resulted in the town's demise. With continuing restoration and special events, the town is coming back to life as a state historic park. The park's visitor center features a film about the site. A yearly rededication ceremony reaffirms the vision of its pioneers.

State Department of Parks and Recreation

The State Department of Parks and Recreation reviews development projects in relation to State recreation facilities. Within the department of Parks and Recreation, the State Office of Historic Preservation (SHPO) monitors state and federally registered historic resources, as well as carrying out other statutory responsibilities.

California Regional Water Quality Control Board

The California Regional Water Quality Control Board (RWQCB) maintains jurisdiction over discharges into all rivers, creeks, streams, and canals. Any project that will discharge wastes into any surface waters must conform to waste discharge requirements established by the RWQCB. The requirements serve as the Federal National Pollutant Discharge Elimination System (NPDES) permit. The RWQCB also works to obtain coordinated action in water quality control, including prevention and abatement of water pollution and nuisances.

California Department of Transportation

The California Department of Transportation (Caltrans) has authority over all state route and freeway right-of-ways, including easements, and undeveloped right-of-ways that have been acquired in anticipation of future construction. Any project that proposes to construct a road connection or perform earthwork within a state route or freeway must obtain an encroachment permit from Caltrans.

State Department of Boating and Waterways

The State Department of Boating and Waterways comments on river oriented features of a riverfront project such as potential for navigation hazards, relation to existing or planned boating facilities, and the public trust doctrine. The department also administers grants and loans for marina development and boat ramps, and reviews federal and local ordinances regulating boating activities.

State of California Native American Heritage Commission

The State of California Native American Heritage Commission reviews projects and comments on potential impacts to Native American archaeological resources. The Commission is directly involved with a procedure if Native American artifacts or remains are discovered during construction activities.

Non-Governmental Land Management Agencies

Introduction

The non-governmental land use management agencies, such as foundations and trust, within Tulare County are important to the General Plan Update process because these agencies can have significant

impacts on existing and future land uses. An understanding of these organizations is vital to ensuring cooperation with Tulare County.

Methodology

The information provided in this section was provided from various non-governmental agencies. Each is described in relation to how it influences certain aspects of the county.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of the general goals and policies of non-governmental agencies as they pertain to the categories listed below.

Existing Conditions

Non-governmental agencies hold land in Tulare County and provide land management such as agricultural protection and wildlife habitat conservation. These organizations generally conserve lands though habitat restoration and land trusts. Other organizations act as lobbyists to promote land conservation and habitat protection.

The Nature Conservancy & Sequoia Riverlands Trust The partnership between the Sequoia Riverlands Trust (SRT) and The Nature Conservancy took place in December of 2000 to protect over one million acres of natural and agricultural lands in Tulare County. The Nature Conservancy provides technical consultation services and on ground support for land acquisition and restoration to SRT. Both organizations goal is to plan for long-term land stewardship to keep the Sequoia foothills in their natural state.

Mountain Lion Foundation

The Mountain Lion Foundation is a non profit organization that holds lands and provides habitat restoration and protection throughout California. In Tulare County this group is most active in the protection of species habitat. Examples of the work the Mountain Lion Foundation conducts in Tulare County includes improving trout habitat on the Little Kern River, acquiring 154 acres of land for the protection of vernal pools,

and accepting 40 acres of valley lands near Allensworth to protect San Joaquin Kit Fox and Sink Scrub habitat.

Sequoia Riverlands Trust

The Sequoia Riverlands Trust was originally established as the Sierra Los Tulares Land Trust. Sierra Los Tulares Land Trust was formed when three land trusts combined in 2000. In 2003, the Sierra Los Tulares Land Trust became the Sequoia Riverlands Trust (SRT). SRT is a community-based conservation organization with the mission of to protect natural, scenic, agricultural, and historic lands in the southern Sierra Nevada and San Joaquin Valley. The focus area of this organization spans from the southern Sierra foothills in the Kings, Kaweah, Tule, and Kern watersheds, into the Tulare Lake Basin of the Kings, Kern, and Tulare Counties. SRT's conservation activities involve working with willing landowners to establish and manage conservation easements and other forms of land protection, educating the community about the value of land conservation, and participating in local planning efforts. The organization owns and manages seven preserves covering approximately 4,570 acres, which includes the Kaweah Oaks, James K. Herbert Wetland Prairie, Circle J, Dry Creek, Homer Ranch, Blue Oak Ranch, and Lewis Hill Preserves. SRT also has conservation easements on 14 properties covering approximately 2,650 acres (SRT, 2008).

American Farmland Trust

The American Farmland Trust provides advocacy and land conservation programs to the agricultural regions in Tulare County. Overseeing agricultural land protection in Tulare County is a joint effort between AFT and local governments and agencies known as the Growth Alterative Alliance. This organization works in Tulare County with local farmers to establish agricultural conservation easements. In addition, public outreach is conducted to educate and gain support for agricultural land preservation.

4. AGRICULTURE, RECREATION, AND OPEN SPACE

4.1 Introduction

This chapter of the Background Report describes how the agricultural, recreational and open space resources within Tulare County contribute to both the quality of life and economic well being of its residents. Current conditions regarding active and passive recreation, natural and developed open space, and farming practices, will be addressed. This chapter is divided into two sections:

- Recreation and Open Space (Section 4.2); and
- Agricultural Resources (Section 4.3).

4.2 Recreation and Open Space

Introduction

Tulare County contains several county, state, and federal parks. Aside from parks in the county, there are many open space areas as well. This section will highlight these various parks and open space areas and identify recreational opportunities within them.

Methods

The information contained in this section was compiled from a variety of sources including the Tulare County Resource Management Agency, Parks and Recreation Branch.

Key Terms

- **Open Space Land**. Open space land is any parcel, area, or waterway that is essentially unimproved and devoted to an open space use. Under Section 65560 of the California State Government Code, open-space land is broadly defined as land designated for the preservation of natural resources (i.e., lakeshore and watershed lands); managed production of resources (i.e., lands for agriculture, forestry, recharge of ground water basins); outdoor recreation (i.e., parks, scenic highway corridors, and areas with outstanding scenic, historic and

cultural values); and public health and safety (i.e., flood plains, unstable soil areas).

- **Recreational Area**. Any public or private space set aside or primarily oriented to recreational use. This includes both parks and community centers.

Regulatory Setting

State Regulations

- **Sections 65560 – 65570, State Government Code: Open-Space Lands.** This portion of California Planning Law defines open-space and requires every city and county to prepare open space plans as a required element of their General Plan. Building permits, subdivision approvals, and zoning ordinance approvals must be consistent with the local open space plan.

Local Policies

- **Tulare County General Plan.** The Environmental Resources Management section (1972) of the existing Tulare County General Plan contains a number of policies that identify park standards for the county. These policies are identified below.

  Policy 6.M.3. Neighborhood recreation centers at three acres per 1,000 population, if adjoining an elementary school and six acres if separate.

  Policy 6.M.4. Community recreation parks of one-acre per 1,000 population if adjoining a high school and double this if separate.

  Policy 6.M.5. City-wide recreation facilities of ten acres per 1,000 population.

  Policy 6.M.6. One half of the city total park acreage for active recreation and one-half for large parks.

  Policy 6.M.7 One-quarter mile is the goal for maximum travel distance for a neighborhood playground.

  Policy 6.M.8. Minimum size of play and recreation areas, as a desirable standard:

  a. Neighborhood play lot – 2,000 square feet

b. Neighborhood park – 10-15 acres

c. Community park – 15-40 acres

d. Reservation (natural wild land park) – 500 acres.

Existing Conditions

For the purposes of this section the existing facilities and programs will be broken down into county, state and federal parks and other recreational resources (see summary provided in Table 4-1). A number of neighborhood parks, play lots, pocket parks and other recreation facilities are also located within the incorporated cities in the county. As these are operated and planned by the cities these parks are not discussed further.

County Parks

There are a total of 13 park and recreation facilities that are owned and operated by Tulare County. The location, acreage and features of these parks (along with other State and federal park and recreation facilities) are indicated in Table 4-1. Figure 4-1 shows the locations of parks located inside the county's boundaries. According to the Tulare County Parks and Recreation Division, the county is currently (Pilegard, 2008) not proposing any new parks due to budget restrictions for operation of the facilities.

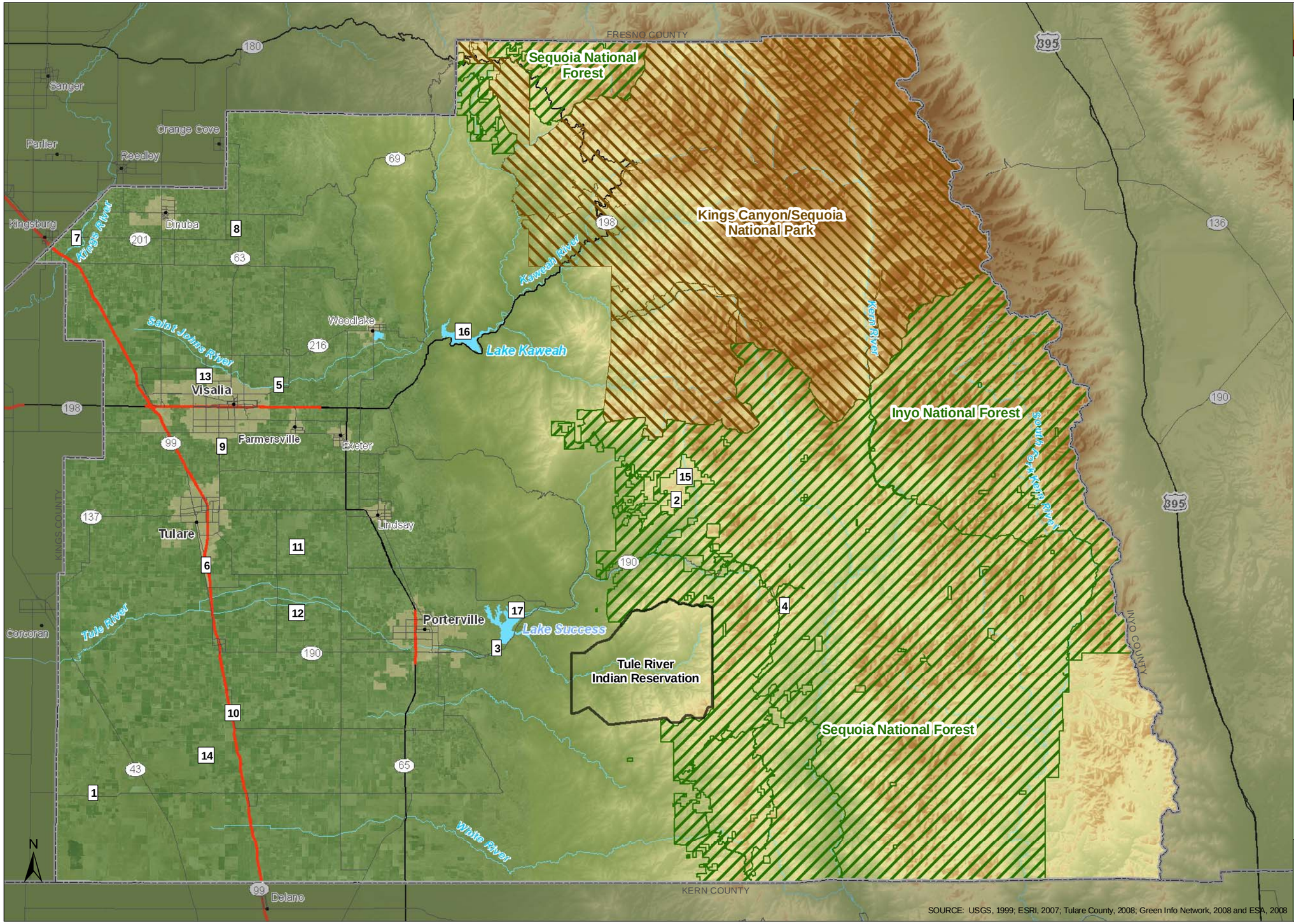
State Parks and Forests

Colonel Allensworth State Park. The only State Park in Tulare County is Colonel Allensworth State Historic Park discussed in Section 9.3. The park contains a museum and a visitor center addressing the town's history, as well as camping facilities. Allensworth is the only California town to be founded, financed and governed by African Americans. The small farming community was founded in 1908 by Colonel Allen Allensworth and a group of others dedicated to improving the economic and social status of African Americans. Uncontrollable circumstances, including a drop in the area's water table, resulted in the town's demise. With continuing restoration and special events, the town is coming back to life as a state historic park. The park's visitor center features a film about the site. A yearly rededication ceremony reaffirms the vision of its pioneers.

Table 4-1. Recreational Areas in Tulare County

ID	Recreation Area	Location	Acres	Type of Use/Features
County				
1	Alpaugh Park	Located in Alpaugh on Road 40.	3.0	Reservations for picnic areas are taken. No entrance fee.
2	Balch Park Campgrounds	20 miles NE of Springville in the Sierras.	160.0	71 Campsites. No reservations taken; first come first serve basis. Entrance fee for vehicles.
3	Bartlett Park	8 miles east of Porterville on North Drive.	127.5	Reservations for picnic areas are taken. Entrance fee for vehicles.
4	Camp COTYAC	Near Ponderosa in Eastern Tulare County.	8.0	County of Tulare Youth Adventure Camp (Camp COTYAC). Cabins, lodge with kitchen, restrooms and showers.
5	Cutler Park	5 miles east of Visalia on Highway 216 to Ivanhoe.	50.0	Reservations for picnic areas are taken. Entrance fee for vehicles.
6	Elk Bayou Park	6 miles SE of Tulare on Avenue 200.	60.0	Reservations for picnic areas are taken. No fee for day use.
7	Kings River Nature Preserve	2 miles east of Highway 99 on Road 28	85.0	This park is only for school environmental programs.
8	Ledbetter Park	1 mile northwest of Cutler on Road 124/Hwy 63	11.0	Reservations for picnic areas are taken. No fee.
9	Mooney Grove Park	2 Miles south of Caldwell Avenue on Mooney Blvd. In South Visalia.	143.0	Reservations for picnic areas are taken. Paddle boats, playground, baseball diamonds. Home of the End Trail statue. One of the largest oak woodlands in Tulare County. Location of the Agriculture and Farm Labor Museum.
10	Pixley Park	1 mile NE of Pixley on Road 124.	22.0	Reservations for picnic areas are taken. No fee.
11	Tulare County Museum	In Mooney Grove Park, South Visalia.	8.5	Free admission with park fee. Museum is opened Thursday thru Monday (closed Tuesday and Wednesday).
12	Woodville Park	Located in Avenue 166 in Woodville.	10.0	Reservations for picnic areas are taken. Day use no entrance fee.
13	West Main Street Park	2 blocks west of County Courthouse on Main Street in Downtown Visalia.	5.0	Day use no entrance fee.
State				
14	Colonel Allensworth State Historic Park	7 miles west of Earlimart on County Road J22.	na	15 campsites, open year round.
15	Mountain Home State Forest	Located in Sequoia National Forest	na	No reservations taken for campgrounds.
Federal				
16	Lake Kaweah	25 miles east of Visalia on Highway 198.	2,558.0	Horse Creek Campground, boat ramps, picnic areas, swimming, and hiking.
17	Lake Success	10 miles SE of Porterville on Highway 198.	2,450.0	Tule Campground, boating, fishing, picnic areas, playgrounds, and softball field. Hunting is permitted in the Wildlife Management Area.
18	Sequoia National Forest	Southeastern portion of Tulare County.	na	Campgrounds include Gray's Meadow, Oak Creek, Onion Valley, Stony Creek, Sunset, and Whitney Portal with over 300 campsites.
19	Giant Sequoia National Monument	Covers areas north and south of Sequoia and Kings Canyon National Parks.	na	
20	Sequoia and Kings Canyon National Parks (SEKI)	Northeastern portion of Tulare County.	na	Campgrounds include Atwell Mill Campground, Buckeye Flat, Cold Springs, Crystal Springs, Dorst Campground, Lodgepole, Moraine, Potwisha, Sheep Creek, and South Fork with over 800 campsites.
Total Acres				**5,701**

Source: Tulare County Resource Management Agency, Parks and Recreation Branch, 2008; Automobile Club of Southern California, Tulare County Map.



Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Existing Parks

- # Recreation Area
- National Forest
- National Park
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- Lakes
- City Boundary
- County Boundary

PARKS KEY

1 - Alpaugh Park
2 - Balch Park Campgrounds
3 - Bartlett Park
4 - Camp COYTAC
5 - Cutler Park
6 - Elk Bayou Park
7 - Kings River Nature Preserve
8 - Ledbetter Park
9 - Mooney Grove Park
10 - Pixley Park
11 - Tulare County Museum
12 - Woodville Park
13 - West Main Street Park
14 - Colonel Allensworth State Historic Park
15 - Mountain Home State Forest
16 - Lake Kaweah
17 - Lake Success

SOURCE: USGS, 1999; ESRI, 2007; Tulare County, 2008; Green Info Network, 2008 and ESA, 2008

Figure 4-1

Existing Parks

Mountain Home State Forest. The Mountain Home State Forest is a State Forest managed by the California Department of Forestry and Fire Protection (CDF). The Forest consists of 4,807 acres of parkland containing a number of Giant Sequoias, and is located just east of Porterville. The Forest is a Demonstration Forest, which is considered timberland that is managed for forestry education, research, and recreation. Fishing ponds, hiking trails, and campsites are some of the amenities that can be found in the Forest.

Federal Recreation Areas

The two federal recreational areas in Tulare County are Lake Kaweah and Lake Success, which are operated by the U.S. Army Corps of Engineers (see Table 4-2).

Lake Kaweah. Lake Kaweah was formed after the construction of the Terminous Dam on the Kaweah River in 1962. The lake offers many recreational opportunities including fishing, camping, and boating. Lake Kaweah is located 20 miles east of Visalia on Highway 198 and was constructed by the U.S. Army Corps of Engineers for flood control and water conservation purposes. The lake has a maximum capacity to store 143,000 acre-feet of water. There are a total of 80 campsites at the lake's Horse Creek Campground, which contains toilets, showers and a playground. Campfire programs are also available. Aside from camping, boat ramps are provided at the Lemon Hill and Kaweah Recreation Areas. Both Kaweah and Horse Creek provide picnic areas, barbecue grills and piped water. Swimming is allowed in designated areas. In addition, there is a one-mile hiking trail between Slick Rock and Cobble Knoll, which is ideal for bird watching.

Lake Success. Lake Success was formed by construction of the Success Dam on the Tule River in 1961. The lake offers many recreational activities including fishing, boating, waterskiing, and picnicking. The U.S. Army Corps of Engineers (USACOE) constructed this reservoir for both flood control and irrigation purposes. The lake has a capacity of 85,000 acre-feet of water. The lake is located eight miles east of Porterville in the Sierra Nevada foothills area. Recreational opportunities include ranger programs, camping at the Tule campground, which provides 104 sites, boating, fishing, picnic sites, playgrounds and a softball field. Seasonal hunting is also permitted in the 1,400-acre Wildlife Management Area.

National Parks and National Forests

Most of the recreational opportunities in the county are located in Sequoia National Forest, Giant Sequoia National Monument, and in Sequoia and Kings Canyon National Parks (SEKI). Although these parks span adjacent counties, they make a significant contribution to the recreational opportunities that Tulare County has to offer. See Table 4-2 for a list of campgrounds and their locations.

Table 4-2. National Park and Forest Facilities

Recreation Area	Location	Camping Sites
Sequoia National Forest		
Gray's Meadow	5 miles West of Independence on Onion Valley Road.	52 tent/RV sites
Oak Creek	4 ½ miles NW of Independence off Highway 395.	21 tent/RV sites
Onion Valley	14 miles West of Independence on Onion Valley Road.	29 tent/RV sites
Stony Creek	14 miles SE of Grant Grove on Generals Highway.	49 tent/RV sites
Whitney Portal	13 miles West of Lone Pine on Whitney Portal Road.	43 tent/RV sites
Total		**194 sites**
Kings Canyon and Sequoia National Park		
Atwell Mill	Sequoia, 19 miles from Highway 198 on Mineral King Road.	21 tent sites
Azalea	Kings Canyon, 3 ½ miles from Kings Canyon Park entrance.	110 tent sites
Buckeye Flat	Sequoia, 11 miles South of Giant Forest of Generals Highway.	28 tent sites
Canyon View	Cedar Grove in Kings Canyon	23 tent sites
Cold Springs	Sequoia, Mineral King Area.	25 tent sites
Crystal Springs	Kings Canyon, ½ mile North of Grant Grove.	67 tent/RV sites
Dorst Creek	Sequoia, 9 miles North of Lodgepole off Generals Highway.	210 tent/RV sites
Lodgepole	Sequoia, 4 miles NE of Cedar Grove.	203 tent/RV sites
Moraine	Kings Canyon, 1 mile East of Cedar Grove.	120 tent/RV sites
Potwisha	Sequoia, 4 miles NE of Ash Mountain entrance off Generals Highway.	42 tent/RV sites
Sentinel	In the Cedar Grove area near the Kings River.	82 tent sites
Sheep Creek	Kings Canyon, 1/2-mile West of Cedar Grove.	111 tent/RV sites
South Fork	Sequoia, 13 miles on South Fork from Highway 198.	10 tent sites
Sunset	In the Grant Grove area 3 miles from Kings Canyon park entrance.	157 tent sites
Total		**1,209 sites**

Source: Tulare County Resource Management Agency, Parks and Recreation Branch, 2008; Automobile Club of Southern California, Tulare County Map.

Sequoia National Forest. Sequoia National Forest takes its name from the Giant Sequoia, which is the world's largest tree. There are more than 30 groves of sequoias in the lower slopes of the park. The park includes over 1,500 miles of maintained roads, 1,000 miles of abandoned roads and 850 miles of trails for hikers, off-highway vehicle users and horseback riders. The Pacific Crest Trail connecting Canada and Mexico, crosses a portion of the forest, 78 miles of the total 2,600 miles of the entire trail. It is estimated that 10 to 13 million people visit the forest each year.

Giant Sequoia National Monument. The Giant Sequoia National Monument was created in 2000 by President Clinton in an effort to preserve 34 groves of ancient sequoias located in the Sequoia National Forest. The Monument includes a total of 327,769 acres of federal land, and provides various recreational opportunities, including camping, picnicking, fishing, and whitewater rafting. According to the Giant Sequoia National Monument Management Plan EIS, the Monument includes a total of 21 family campgrounds with 502 campsites and seven group campgrounds. In addition, there are approximately 160 miles of system trails, including 12 miles of the Summit National Recreation Trail.

Sequoia and Kings Canyon National Parks (SEKI). The U.S. Congress created the Kings Canyon National Park in 1940 and Sequoia National Park in 1890. Because they share many miles of common boundaries, they are managed as one park. The extreme large elevation ranges in the parks (from 1,500 to 14,491 feet above sea level), provide for a wide range of vegetative and wildlife habitats. This is witnessed from exploring Mt. Whitney, which rises to an elevation of 14,491 feet, and is the tallest mountain in the contiguous United States. During the summer months, park rangers lead walks through the parks, and tours of Crystal and Boyden Caves. During the winter, visitors explore the higher elevations of the parks via cross country skis or snowshoes, or hike the trails in the foothills. The SEKI also contains visitor lodges, the majority of which are open year round. According to the National Parks Conservation Association, a combined total of approximately 1.4 million people visit the two parks on an annual basis.

The SEKI is also home to the Sequoia Natural History Association (SNHA), which is located at the Beetle Rock Education Center inside the Park. The SNHA is a non-profit educational organization that provides services to SEKI otherwise not available through federal funding. Services that SHNA provides include conducting Crystal Cave tours,

operating the Beetle Rock Education Center, providing visitor information and nature center staff, and offering field seminar courses.

Other Recreational Resources

Trails and Wilderness Areas

Pacific Crest Trail. The Pacific Crest Trail connects Canada and Mexico. A portion of the trail (78 miles) passes through eastern Tulare County. The U.S. Forest Service, Bureau of Land Management and the National Park Service administer the Pacific Crest Trail jointly. The Pacific Crest Trail was one of the first trails to be designated as a scenic trail in the National Trails System authorized by Congress in 1968. According to the Pacific Crest Trail Association, an average of 300 hikers attempts to complete the trail annually. However, roughly 60% actually finish the entire trail.

South Sierra Wilderness Area. The South Sierra Wilderness Area borders both the Golden Trout Wilderness (on the northern boundary) and Dome Land Wilderness (on its southern boundary). All three of these wilderness areas are located within the Sequoia National Forest. The entire South Sierra Wilderness Area is located within the South Fork of the Kern River Watershed and consists of gentle terrain between forested ridges. This area covers 63,000 acres, with 53,400 acres (85 percent) located within Tulare County. The presences of over 25 miles of streams in this wilderness create ideal fishing conditions. In addition, the many trails enhance hiking and horseback riding opportunities. Hunting is also permitted under state regulations.

Dome Land Wilderness Area. Dome Land Wilderness Area is located at the southern end of the Kern Plateau approximately 70 miles northeast of Bakersfield. The South Fork of the Kern River drains the eastern portion of this wilderness area. Dome Land consists of about 95,000 acres of land. The unique features of this wilderness area are the granite dome landforms. There are also approximately 45 miles of hiking/horse trails within the area.

Golden Trout Wilderness Area. The Golden Trout Wilderness Area comprises over 303,000 acres and was designated by Congress in 1978. This area is named for the brightly colored native trout, which is also the California state fish. Cattle grazing has been one of the primary uses for this area for well over 100 years. Stockmen originally established many of the trails before the area was designated as a wilderness area.

Recreation activities include backpacking, hiking, horseback riding, fishing, and hunting.

Other Recreational Facilities

International Agri-Center. The International Agri-Center located in Tulare is home to both the World Ag Expo and the California Antique Farm Equipment Show. The World Ag Expo is the largest agricultural exposition in the world. In 2004, there were a total of 79,000 attendees. Both of these shows draw many visitors outside Tulare County to the area. According to Agri-Marketing, the 2003 event had a $1.2 billion impact on the regional economy. In addition to these shows, the International Agri-Center is also home to the Heritage Complex. This facility is an ideal location for parties, weddings, receptions, concerts and meetings.

Tulare County Fairgrounds. The Tulare County Fairgrounds host the annual Tulare County Fair, but there are also ongoing barrel races, satellite wagering, shows and exhibits. The facilities at the fairgrounds include a horse track, barns and stables for animals, a milk house, BMX racing track, stadium area, and a number of buildings that can be rented for a variety of uses.

4.3 Agricultural Resources

Introduction

Agricultural production is the most important economic base in Tulare County, accounting for over $4.8 billion dollars in production value in 2007. Tulare County has consistently ranked second in the state in agricultural production value for over ten years. In 2001, Tulare County ranked first in the state and the nation in agricultural production (NASS, 1995-2008). Most of the county's crop agricultural activities take place in the western portion of the county due to the fact that a majority of the eastern part of the county consists of more mountainous terrain, most of which is publicly owned. The primary agricultural products produced in Tulare County include milk, oranges, grapes and cattle.

Methods

The information contained in this section was compiled from a variety of sources, including the California Department of Conservation-Farmland

Mapping and Monitoring Program, and the Tulare County Agricultural Commissioner/Sealer.

Key Terms

- **Important Farmlands.** A collective term for farmlands designated as Prime, Unique, or as Farmlands of Statewide Importance under the Department of Conservation's Farmland Mapping and Monitoring Program.

- **Farmland Security Zone.** An area created within an agricultural preserve by a board of supervisors upon request by a landowner or group of landowners.

- **Soil Quality.** The capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation.

- **Williamson Act.** The most prevalent regulatory method of preserving farmland in the State of California, as well as Tulare County.

- **Williamson Act Contract – Active.** A contract between a landowner and a city or county to restrict land to agricultural or open space uses in return for reduced property tax assessments. The minimum term for a Williamson Act contract is 10 years. Since the term automatically renews on each anniversary date of the contract, the actual term can be indefinite.

- **Williamson Act Contract – Cancellation.** Under a set of specifically defined circumstances, a contract may be cancelled without completing the process of term non-renewal. Contract cancellation, however, involves a comprehensive review and approval process, and the payment of fees by the landowner equal to 12.5% percent of the full market value of the subject property.

- **Williamson Act Contract – Notice of Non-Renewal.** Contracts may be terminated at the option of the landowner or local government by initiating the process of term non-renewal. Under this process, the remaining contract term (nine years in the case of an original term of 10 years) is allowed to lapse, with the contract null and void at the end of the term. Property tax rates gradually increase during the nonrenewable period, until they

reach normal (i.e., non-restricted) levels upon termination of the contract.

- **Williamson Act Contract – Expired.** Expired parcels are those parcels that have previously been subject to a Williamson Act contract, and have since been removed from the contract through non-renewal, cancellation or annexation.

- **Williamson Act – Home Site.** A designated Williamson Act parcel may or may not contain a home. In the case that the parcel does contain a home, the acreage of the home site must be tabulated and reported. For any home site that occupies a significant amount of the Williamson Act parcel, approximately 10% or more of the parcel acreage, the home site acreage must be tabulated and represented spatially in the parcel data.

- **Williamson Act – Prime.** Land enrolled under California Land Conservation Act contract which meets any of the following criteria:

    1. Land which is class I or class II in the Natural Resources Conservation Service land use capability classification system;

    2. Land which rates 80 to 100 in the Storie Index Rating system;

    3. Land which supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture;

    4. Land planted with fruit or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years and which will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than two hundred dollars per acre;

    5. Land returned from the production of unprocessed agricultural plant production having an annual gross value of not less than two hundred dollars per acre for three of the previous five years.

- **Williamson Act – Non-Prime.** Land enrolled under California Land Conservation Act contract, which does not meet any of the criteria for classification as Prime Agricultural Land. Non-Prime Land is defined as Open Space Land of Statewide Significance under the California Open Space Subvention Act and may be identified as such in other documents. Most Non-Prime Land is in agricultural uses such as grazing or non-irrigated crops. However, Non-Prime Land may also include other open space uses, which are compatible with agriculture and consistent with local general plans.

Regulatory Setting

- **California Department of Conservation – Farmland Mapping and Monitoring Program**. The California Department of Conservation (DOC), under the Division of Land Resource Protection, has developed the Farmland Mapping and Monitoring Program (FMMP), which monitors the conversion of the state's farmland to and from agricultural use. Data is collected at the county level to produce a series of maps identifying eight land use classifications using a minimum mapping unit of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of state agricultural land and updates the "Important Farmland Series Maps" every two years (Department of Conservation, 2000).

- The **FMMP** is only an informational service and does not constitute state regulation of local land use decisions. Agricultural land is rated according to several variables including soil quality and irrigation status with Prime Farmland being considered the most optimal for agricultural production. Table 4-3 provides a summary of the rating categories used by the FMMP.

Table 4-3. Description of Farmland Designations from the California Department of Conservation

Farmland Designation	Description
Prime Farmland	Land that has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained yields of crops when treated and managed, including water management, according to current farming methods. It must have been used for the production of irrigated crops within the last three years. It does not include publicly owned lands for which there is a policy preventing agricultural use.
Farmland of Statewide Importance	Similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to hold and store moisture. Considered to have an excellent combination of physical and chemical characteristics for the production of crops.
Unique Farmland	Land of lesser quality soils used for the production of specific high-economic value crops at some time during the monitoring program's two update cycles prior to the mapping date. It has the special combination of soil quality, location and growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. Unique farmland is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California.
Farmland of Local Importance	Farmlands not covered by the categories of Prime, Statewide, or Unique. They include lands zoned for agriculture by County Ordinance and the California Land Conservation Act as well as dry farmed lands, irrigated pasturelands, and other agricultural lands of significant economic importance to the county and include lands that have a potential for irrigation from Tulare County water supplies.
Grazing Land	Grazing Land is land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock. The minimum mapping unit for Grazing Land is 40 acres.
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. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
Other Land	Land not included in any other mapping category. Common examples include: 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 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
Water	Perennial water bodies with an extent of at least 40 acres.

Source: California Department of Conservation, 2000.

- **Williamson Act** – California Land Conservation Act of 1965. The California Land Conservation Act (CLCA) of 1965, Sections 51200 et seq. of the California Government Code, commonly referred to as the "Williamson Act", enables local governments

to restrict the use of specific parcels of land to agricultural or related open space use. Landowners enter into contracts with participating cities and counties and agree to restrict their land to agriculture or open space use for a minimum of ten years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market (speculative) value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971.

The DOC reports that the Land Conservation Act Program has remained stable and effective as a mechanism for protecting agricultural and open space land from premature conversion of land to urban uses. The DOC indicates that the program might have remained small if not for the addition of Article 28 (now part of Article 13) to the State of California Constitution. Article 13 declares the interest of the state in preserving open space land and provides a constitutional basis for valuing property according to its actual use. The amendment originated with groups interested in the preservation of open space land. Agricultural interests added their support after recognizing the importance of a constitutional backing for preferential tax assessments. Article 13 allows preferential assessments for recreational, scenic, and natural resource areas as well as areas devoted to the production of food and fiber.

Legislation Affecting the Williamson Act

- **Farmland Security Zones.** In August 1998, the Williamson Act's Farmland Security Zone (FSZ) provisions were enacted with the passage of Senate Bill 1182 (California Government Code Section 51296-51297.4). This sub-program, dubbed the "Super Williamson Act," enables agricultural landowners to enter into contracts with the county for 20-year increments with an additional 35 percent tax benefit over and above the standard Williamson Act contract.
- **Annexation of FSZ's is generally not allowed.** Section 56749 of the California Government Code requires Local Agency Formation Commissions (LAFCO's) to reject plans that would result in the annexation of FSZ territory into cities. However, FSZ annexation is permissible under certain circumstances including voter approval, necessary public improvements, and landowner consent.

- **Senate Bill 1835 and the Cortese-Knox Local Government Reorganization Act of 2000.** Senate Bill 1835 (Johnston, Chapter 690, Statutes of 1998) requires the LAFCO to determine whether a particular city is required to succeed to the rights, duties and powers of the county under the contract or whether the city may exercise an option to not succeed to the rights, duties and powers of the county.
- **Senate Bill 2227 and the Cortese-Knox Local Governmental Reorganization Act** (Monteith, Chapter 590, Statutes of 1998) added new requirements to the Cortese-Knox Local Governmental Reorganization Act regarding any proposed annexation of Williamson Act contract land. If the proposal would result in the annexation of land that is subject to the Williamson Act, then the petition shall state whether the city shall succeed to the contract or whether the city intends to exercise its option to not succeed to the contract.

Local Zoning for Agricultural Uses

- **Agricultural Zone (A-1).** Within Tulare County's A-1 Agricultural Zone, no subdivision may be created. Contiguous land units, which are owned by the same person or persons shall not be divided unless it complies with the ordinance. This zone has been grandfathered.
- **Exclusive Agricultural Zone (AE).** This zone permits intensive and extensive agricultural uses of land, including field and orchard crops and the raising of livestock. Dairies and feedlots with fewer than 25 animals are allowed in the AE Zone. Dairies and feedlots with more than 25 animals require a Special Use Permit.
- **Foothill Agricultural Zone (AF).** This zone specifies the types of structures that can be built in the zone. Some of these include residences, barns, windmills, silos etc. All types of commercial crops are allowed except for the growth of mushrooms (requires a special permit). Animal restrictions also apply to this zone. Dairies and feedlots with fewer than 25 animals are allowed in the AE Zone. Dairies and feedlots with more than 25 animals require a Special Use Permit.

Existing Conditions

Agricultural Production

Agricultural products are one of Tulare County's most important resources. Between 2000 and 2008 gross agricultural production values for Tulare County increased steadily. As shown in Table 4-4, the gross production value during this period increased by approximately 1.9 billion dollars. The majority of the increased value is focused on livestock and poultry products production (which also includes dairy production).

Table 4-4. Gross Production Values, 2000, 2005, and 2008

Commodity Type	2000 Gross Production Value	2005 Gross Production Value	2008 Gross Production Value	Net Change (2000 – 2008)
Fruit and Nut Products	1,336,284,000	1,745,966,000	1,835,198,000	498,914,000
Vegetable Crop	35,478,000	26,942,000	16,115,000	-19,363,000
Field Crops	282,041,500	404,130,000	630,631,000	348,589,500
Nursery Products	72,747,000	82,260,000	85,413,000	12,666,000
Apiary Products*	13,443,000	25,420,000	36,503,000	23,060,000
Livestock & Poultry**	452,103,000	583,457,000	602,761,000	150,658,000
Livestock & Poultry Products***	871,695,000	1,489,997,000	1,806,178,000	934,483,000
Seed Crops	974,700	1,497,000	3,372,000	2,397,300
Industrial Crops	3,882,000	3,069,000	1,851,800	-2,030,200
Total	**3,068,648,200**	**4,362,738,000**	**4,874,960,000**	**1,949,374,600**

Source: Tulare County Agricultural Commissioner/Sealer, 2000, 2005, and 2009.
*This includes honey and beeswax.
** Includes dairy cattle.
*** Includes milk.

Unlike the gross production values identified above in Table 4-4, the overall number of harvested acreage has steadily decreased through 2007, with a slight increase in 2008. Table 4-5 identifies the harvested acreage for 2004 through 2007. The total harvested acreage has fluctuated between 2004 and 2008, revealing that the total production value for Tulare County harvested crops is focused on crop values rather than additional increases in harvested acreages.

Table 4-5. Harvested Acreage for 2004 – 2008

Commodity Type	2004 Harvested Acreage	2005 Harvested Acreage	2006 Harvested Acreage	2007 Harvested Acreage	2008 Harvested Acreage
Fruit and Nut Products	300,961	307,741	289,820	288,456	296,917
Vegetable Crop	7,916	6,878	5,569	4,995	4,904
Field Crops	1,308,930	1,293,502	1,287,295	1,249,844	1,306,170
Seed Crop	210	422	172	108	367
Total	**1,618,017**	**1,608,543**	**1,582,856**	**1,543,403**	**1,608,358**

Source: Tulare County 2004, 2005, 2006, 2007, and 2008 Annual Crop and Live Stock Report

Tulare County agricultural crops and commodities vary annually on their individual rankings based on the amount of acreage dedicated to each commodity. Table 4-6 identifies the rankings for the top 15 commodities over the 2000 to 2008 timeframe. According to County records, milk has consistently ranked as the number one commodity over the past eight year reporting period. Additionally, oranges, grapes, cattle and calves, alfalfa, and corn have consistently been ranked within the top ten agricultural commodities, even though their individual rankings have varied from year to year.

Table 4-6. Tulare County's Top 15 Agricultural Commodity Values and Rankings, 2000-2008

Commodity Type	2000	2005	2008	Net Change (2000-2008)	Ranking (2000)	Ranking (2008)
Milk	857,214,000	1,475,011,000	1,796,425,000	939,211,000	1	1
Oranges	451,258,000	582,657,000	592,797,000	141,539,000	2	2
Cattle and Calves	375,210,000	514,017,000	502,106,000	126,896,000	4	3
Grapes	419,088,000	399,974,000	488,035,000	68,947,000	3	4
Alfalfa – Hay and Silage	78,622,000	144,304,000	215,552,000	136,930,000	7	5
Corn – Grain and Silage	51,898,000	102,721,000	213,582,000	161,684,000	10	6
Almonds	26,659,000	90,862,000	89,388,000	62,729,000	15	7
Tangerines	24,072,000	39,483,000	86,292,000	62,220,000	16	8
Silage – Small Grain	17,388,000	39,560,000	82,139,000	64,751,000	21	9
Pistachio Nuts	22,260,000	97,170,000	78,585,000	56,325,000	17	10
Peaches	67,414,000	75,551,000	77,233,000	9,819,000	8	11
Plums	91,575,000	95,584,000	77,010,000	-14,565,000	5	12
Walnuts	42,340,000	94,526,000	76,635,000	34,295,000	12	13
Nursery (Trees and Shrubs)	48,936,000	55,824,000	64,042,000	15,106,000	12	14
Nectarines	62,238,000	87,618,000	59,844,000	-2,394,000	9	15
Total	**2,636,172,000**	**4,718,083,000**	**4,417,146,000**	**1,863,493,000**		

Source: Tulare County Agricultural Commissioner/Sealer, 2001, 2006, and 2009.

Over the last seventeen years, Tulare County has continued to increase its amount of harvested acreage and value of the crops. See Table 4-7 for harvested acreage and crop value for years 1990-2008.

Table 4-7. Tulare County Historical Agricultural Trends, 1990 - 2008

Year	Harvested Acreage	Percent Change	Value	Percent Change
1990	1,438,611	-	$2,169,448,000	-
1991	1,457,212	1.3%	$1,878,425,400	-13.4%
1992	1,490,976	2.3%	$2,221,612,100	18.3%
1993	1,477,015	-0.9%	$2,365,202,000	6.5%
1994	*	-	*	-
1995	1,537,583	4.1%	$2,611,088,000	10.4%
1996	1,512,589	-1.6%	$2,805,452,000	7.4%
1997	1,511,613	-0.1%	$2,898,582,000	3.3%
1998	1,566,456	3.6%	$2,924,235,800	0.9%
1999	1,578,952	0.8%	$3,078,369,000	5.3%
2000	1,567,908	-0.7%	$3,068,648,200	-2.6%
2001	1,556,053	-0.8%	$3,475,999,600**	13.3%
2002	1,568,884	0.8%	$3,201,084,900	7.9%

Table 4-7. Tulare County Historical Agricultural Trends, 1990 - 2008

Year	Harvested Acreage	Percent Change	Value	Percent Change
2003	1,604,658	2.3%	$3,296,522,000	3.0%
2004	1,618,017	8.3%	$4,039,524,000	22.5%
2005	1,608,543	-5.9%	$4,362,783,000	8.0%
2006	1,582,856	-1.6%	$3,872,059,700	-11.2%
2007	1,543,403	-2.5%	$4,874,960,000	26.0%
2008	1,608,358	4.2%	$5,018,022,000	2.9%

Source: Tulare County Agricultural Commissioner/Sealer, 1991, 1993, 1996, 1998, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008.

* Data missing from reports.

** Adjusted from 2001 crop report

Timber Production

Timberlands that are available for harvesting are located in the eastern portion of Tulare County in the Sequoia National Forest. Hardwoods found in the Sequoia National Forest are occasionally harvested for fuel wood, in addition to use for timber production.

Since most of the timberlands are located in Sequoia National Forest, the U.S. Forest Service has principal jurisdiction, which encompasses over 3 million acres. The U.S. Forest Service leases these federal lands for timber harvests.

In 2000, President Bill Clinton designated 327,769 acres of federal land in the Sequoia National Forest as the Giant Sequoia National Monument to preserve 34 groves of ancient sequoias. The proclamation indicated that no portion of the Monument shall be considered to be suited for timber production. Furthermore, the Proclamation stated that tree removal would only be allowed for personal use for fuel wood, ecological restoration, or maintenance of public safety.

For private lands outside of the National Forest that are not regulated by the U.S. Forest Service, different regulations apply. First the county zones the land, and then the state approves a timber harvest plan. These harvest plans must be registered by a Professional Forester and submitted to the California Department of Forestry and Fire Protection for approval.

For U.S. Forest Service leases, which comprise the majority of timberland harvests in the county, a portion of the revenue from the harvest is apportioned to the county in the form of a property tax. For private land, the county determines the parcel size for harvesting.

Overall, timber production has declined in the county in recent years partly due to increased federal restrictions on logging practices and the decline in lumber prices (see Table 4-8). However, timber production increased in 2003 due to changing market conditions according to the 2003 Tulare County Annual Crop and Livestock Report, the volume of timber harvested in the county from 2002 to 2003 increased by over 100 percent. In 2004, the increased volume of harvested time was a result of salvage timber being harvested and resulted in a 67 percent increase.

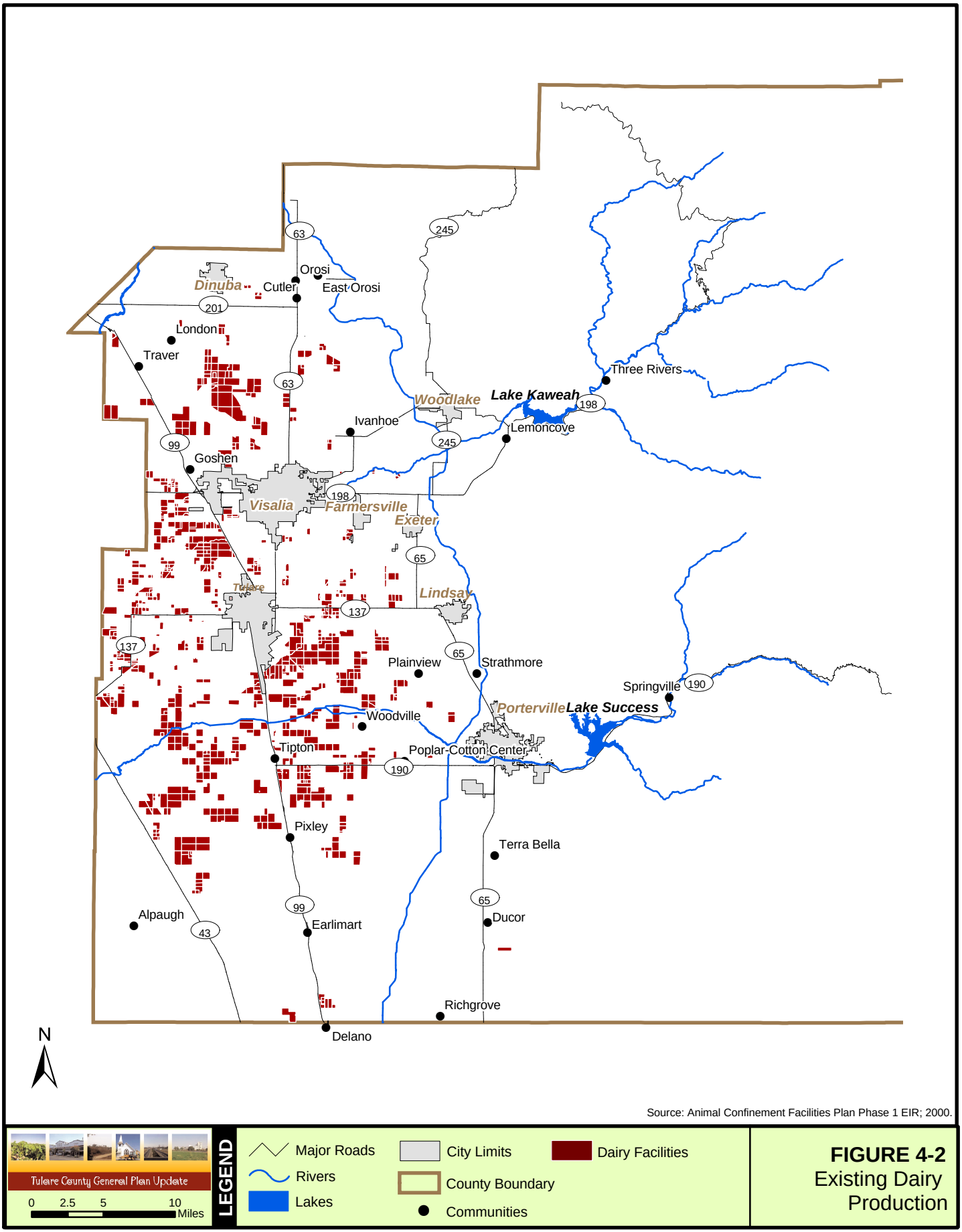
Table 4-8. Timber Harvested in Tulare County, 2000-2008

Year	Timber Harvested (board foot)	Net Change
2000	7,894,000	--
2001	5,445,000	-2,449,000
2002	4,844,000	-601,000
2003	9,802,000	4,958,000
2004	16,339,000	6,537,000
2005	10,703,000	-5,636,000
2006	5,849,000	-4,854,000
2007	1,743,000	-4,106,000
2008	1,028,000	-715,000

Source: Tulare County Agricultural Commissioner/Sealer, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008.

Dairy Production

Dairies are one of the most important aspects of Tulare County's agricultural resources. In 2007, milk was the number one ranking agricultural commodity with well over $1.5 billion dollars in total value in Tulare County. According to the California Department of Food and Agriculture and the U.S. Department of Agriculture, there were a total of 332 dairies and over 481,000 dairy cows in the county in 2007. As of November 2008, the County has received approximately 124 applications for new or expanding dairy facilities. Currently, these applications are pending until the Entitlement or "Permit" Review Process is complete. Existing dairy expansions account for approximately 85 percent of the approximately 124 applications on file. Most of the dairies in Tulare County are family operated, and are located on the county's valley floor area. Figure 4-2 shows the locations of existing dairies in the county.



Source: Animal Confinement Facilities Plan Phase 1 EIR; 2000.

Tulare County General Plan Update

0 2.5 5 10 Miles

LEGEND

Major Roads
Rivers
Lakes
City Limits
County Boundary
Communities
Dairy Facilities

FIGURE 4-2
Existing Dairy Production

There are several policies and standards that have been adopted to guide the development and operation of dairies in Tulare County. In 1974, the Tulare County Planning Commission approved the Animal Waste Management Element (AWME) that was prepared as part of the Environmental Resources Management Element of the Tulare County General Plan. However, since the AWME was never adopted, it was not incorporated into the County's General Plan. However, the Tulare Planning Commission has adopted the AWME standards by resolution to be used as guidelines when considering and approving use permits for new dairies.

In 1992, the Agricultural Advisory Committee (AAC) was activated by the Board of Supervisors (BOS) to update the AWME. Some of the specific issues that the BOS requested to be addressed included:

- Lack of tracking solid waste disposal;
- Existing dairies were increasing herd sizes without obtaining a special use permit; and
- Animal density standards in the county's guidelines were more permissive than the Central Valley Regional Water Quality Control Board requirements.

As a result of the AAC effort, in 2000, Phase I of the Animal Confinement Facilities Plan (ACFP) was prepared. The ACFP includes a set of recommended dairy and animal confinement facility policies which address the issues raised by the AAC, including location and animal density criteria for new bovine dairies and animal confinement facilities. A program EIR was prepared for the ACFP to identify potential environmental impacts that might result from its adoption and subsequent development of dairy facilities and other bovine animal confinement facilities. Since the ACFP was originally adopted as a policy document, the program EIR discusses the potential impacts and mitigation measures in a generalized fashion focusing on cumulative effects. The issues raised in the EIR included: degradation of surface water, groundwater and air quality; land use conflicts; potential health hazards; and loss of natural habitat. Since this was a program EIR that was prepared, when a specific project is proposed, a site-specific review will be conducted using a supplemental environmental checklist. In addition to this EIR, the county is currently preparing a Supplemental Program EIR to further examine cumulative air and water quality issues (Jones and Stokes, 2006). Furthermore, a future phase of the ACFP (Phase II) will address animal confinement facilities for poultry, swine, and other types of animals.

Agricultural Land Use

As described under "Regulatory Setting" above, the California Department of Conservation Farmland Mapping and Monitoring Program identifies and monitors changes to the state's farmland. The FMMP uses classifications to distinguish between varying degrees of productive farmland and also identifies urban and other land uses. The total acreage for all categories of farmland remained relatively stable between the years 1998 and 2004 (see Table 4-9). The most current data shows that the County lost over 6,000 acres of farmland between 2004 and 2006.

Table 4-9. Tulare County's Agricultural Land by California Department of Conservation Farmland Category, 1998 – 2006

Farmland Category	Total Acres Inventoried				
	1998	2000	2002	2004	2006
Prime Farmland	396,130	393,030	387,620	384,340	379,760
Farmland of State Wide Importance	357,220	351,720	345,760	339,580	332,160
Unique Farmland	11,790	11,720	12,750	12,530	12,220
Important Farmland Subtotal	**765,140**	**756,470**	**746,130**	**736,450**	**724,140**
Farmland of Local Importance	110,040	124,140	126,820	137,440	143,830
Grazing Land	439,960	434,050	440,550	440,620	440,140
Total	**1,315,140**	**1,314,651**	**1,313,500**	**1,314,510**	**1,308,110**

Source: California Department of Conservation, Division of Land Resource Protection, 2001, 2003, 2005, and 2007.
Note: Acreage totals have been rounded.

Table 4-10 shows the net acreage change between 1998-2000, 2000-2002, 2002-2004, and 2004-2006. Acreage has been consistently decreasing during the time shown on this table. Prime Farmland and Farmland of Statewide Importance, the most productive of all the farmland use categories, have faced the most significant loss in acreage between 1998 and 2006. Tulare County has continued to lose increasing amounts of Prime Farmland and Farmland of Statewide Importance during each two-year period. The County lost 12,355 acres of important farmland from 2004 to 2006. Almost 1,100 acres of these converted lands were converted to urban uses.

Table 4-10. Acreage Change for 1998-2006

	Acreage Change			
	1998-2000	2000-2002	2002-2004	2004-2006
Prime Farmland	-3,090	-5,400	-3,230	-4,630
Farmland of State Wide Importance	-5,530	-4,420	-6,180	-7,420
Unique Farmland	-40	-270	-220	-310
Important Farmland Subtotal	**-8,660**	**-10,090**	**-9,630**	**-12,360**
Farmland of Local Importance	7,700	9,340	10,620	6,390
Grazing Land	-20	-430	70	-490
Total	**-980**	**-1,180**	**1,060**	**-6,460**

Source: California Department of Conservation, Division of Land Resource Protection, 2001, 2003, 2005, and 2007

Notes: Acreage totals have been rounded.

Figure 4-3 shows existing farmland in Tulare County by farmland category.

The conversion of important farmlands is the result of a number of activities. Table 4-11 identifies these types of activities and provides acreage amounts of farmland converted by two-year period. As shown in the table, only 1,140 acres of important farmlands were converted into urban uses during the most recently reported period. Since 1998, the conversion of important farmlands to urban uses has fluctuated from 7 to 14% of all important farmland conversions to other uses. These changes to urban lands have typically occurred around established cities, communities, and hamlets.

As shown in Table 4-11, the majority of important farmland conversions involves the downgrading of classified lands (for example: the conversion of irrigated farming to non-irrigated farming or grazing, prolonged fallow land, expansion of existing livestock facilities, or developing new livestock facilities). Other contributors that have resulted in the increase or decrease in farmland acreages consist of new soil mapping data available in 2000, improvements to digital imagery, new or expanded agricultural related uses (e.g., packing facilities, agricultural staging areas, etc.), expanded conservation areas, and new rural residential and commercial land uses. While the conversion of lands classified as "Grazing Lands", "Other Lands", and "Urban and Built-Up Lands" to the important farmland categories do occur, these conversions generally constitute a much smaller percentage of the overall conversion of important farmlands. Examples of such conversions may occur, for example, due to the replacement of a dry grain crop with an irrigated crop or even an improvement in digital imagery that shows an area as containing an irrigated crop where previously it appeared to be vacant land near urban development.

Table 4-11. Important Farmland[1] Conversion

	1998-2000		2000-2002		2002-2004		2004-2006	
	Acres Converted	% of Converted Important Farmland	Acres Converted	% of Converted Important Farmland	Acres Converted	% of Converted Important Farmland	Acres Converted	% of Converted Important Farmland
Important Farmland to Urban and Built-Up Land	770	7%	3,020	14%	1,460	14%	1,140	7%
Important Farmland to Other Land	480	4%	6,460	30%	2,410	23%	4,830	31%
Important Farmland to Farmland of Local Importance and Grazing Land	9,660	88%	11,720	55%	6,520	63%	9,520	61%
Total	**10,910**		**21,200**		**10,390**		**15,490**	

1 Important Farmland includes Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.

2 These statistics show the amount of important farmland that was converted to a different important farmland type. For example, Prime Farmland that becomes Farmland of Statewide Importance.

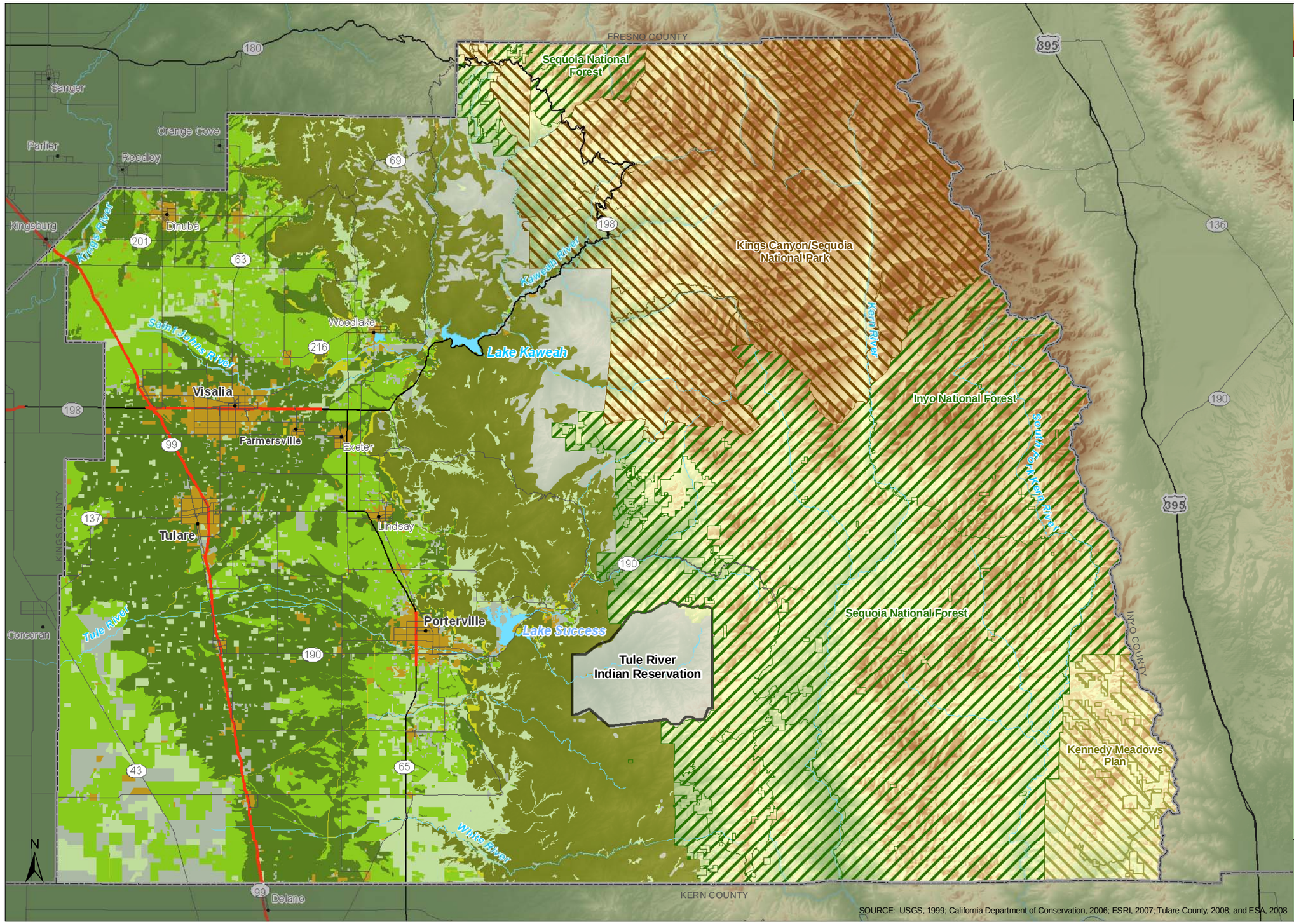
Williamson Act Lands

As of 2006, over one million acres of active Williamson Act lands existed in the county. As of 2006, approximately 23,000 acres of Williamson Act lands are under non-renewal. Non-renewal on contracts has been the primary reason for this net decrease in the amount of land protected by the Williamson Act over the past several years. Table 4-12 identifies the categories and amounts of Williamson Act lands in the county. The county contains an additional 9,560 acres of land that are designated as Farmland Security Zone lands (California Department of Conservation, Division of Land Resource Protection, 2007). Figure 4-4 identifies County farmland that is under the Williamson Act.

Table 4-12. Lands Under a Williamson Act Contract

Contract Status	Acres
Prime – Active Contract	571,320
Non-Prime – Active Contract	495,830
Home Site – Active Contract	3,140
Active Contract Subtotal:	***1,070,290***
Prime – Non-Renewal	12,320
Non-Prime – Non-Renewal	11,140
Home Site – Non-Renewal	400
Total	**1,094,150**

Source: California Department of Conservation, Division of Land Resource Protection, 2007.
Notes: Acreage totals have been rounded.



Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Important Farmland

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Grazing Land
- Urban and Built Up Land
- Other Land
- Water
- National Forest
- National Park
- BLM Lands
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- Lakes
- County Boundary

Figure 4-3

Important Farmland

SOURCE: USGS, 1999; California Department of Conservation, 2006; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Williamson Act Classification

- Farm Security Zone
- Prime
- Prime (non-renewal)
- Non-Prime
- Non-Prime (non-renewal)
- Homesite
- Homesite (non-renewal)
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- Lakes
- City Boundary
- County Boundary

FRESNO COUNTY
KINGS COUNTY
KERN COUNTY
INYO COUNTY
Sanger
Orange Cove
Parlier
Reedley
Kingsburg
Dinuba
Woodlake
Visalia
Farmersville
Exeter
Lindsay
Tulare
Porterville
Corcoran
Delano
Kings River
Saint Johns River
Kaweah River
Lake Kaweah
Kern River
South Fork Kern River
Tule River
Lake Success
White River
Tule River Indian Reservation
180
69
198
201
63
216
99
137
190
65
43
136
395

N

SOURCE: USGS, 1999; California Department of Conservation, 2006; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Figure 4-4

Williamson Act Land

5. TRANSPORTATION AND CIRCULATION

5.1 Introduction

Tulare County is located in the lower San Joaquin Valley in Central California and is served by a network of highway, bicycle, pedestrian, rail, and air systems. Safe and efficient transport of people and goods within the county is of crucial importance to the well being of the residents. The mobility of people and goods will continue to be an important issue that the county has to face in the future.

The purpose of this chapter is to provide a common understanding of existing transportation and circulation conditions in Tulare County considering each primary mode of transportation. It is important to define the existing transportation and circulation system in order to identify any existing deficiencies. Such deficiencies will be addressed during development of the planned transportation and circulation system as well as during development of the implementation program.

This chapter of the Background Report summarizes the current state of transportation and circulation within the county. Key terms that are relevant to this discussion and a summary of local, state and federal regulations that apply will be covered.

This chapter is divided into the following sections:

- Streets and Highways (Section 5.2);
- Funding (Section 5.3);
- Capital Road Improvements (Section 5.4);
- Road System Condition (Section 5.5);
- Air Quality (Section 5.6);
- Transportation System Management/Transportation Demand Management (Section 5.7);
- Rail Transportation (Section 5.8);
- Aviation System (Section 5.9);
- Goods Movement (Section 5.10);
- Public Transportation (Section 5.11);
- Non Motorized Systems (Section 5.12);
- Commute Modes of Transportation (Section 5.13); and

- Major Trip Attractors (Section 5.14).

History and framework

The Tulare County General Plan was originally adopted in 1963. Since then there have been numerous elements adopted and revisions of those elements. Community Land Use Plans were prepared for the unincorporated communities of the county. The *Environmental Resource Management Element (ERME*) was adopted in 1972; *the Noise Element* was adopted in 1988; *the Housing Element* was originally adopted in 1971 with the most recent revision in 2003; *the Urban Boundaries Element* was adopted in 1971 with revisions in 1974 and amended in 1983, 1988, and 1996; *the Foothill Growth Management Plan* was adopted in 1981; *the County Circulation Element* was originally adopted in 1963; finally, *the Safety Element* was adopted in 1975.

The common relationship between the 1963 General Plan and its amendments and the Regional Transportation Plan (RTP) are as follows:

- To improve the physical environment of the county and its communities;
- To guide and direct the development of urban land uses into urban areas of the country and to discourage or guide these urban land uses away from agricultural activities;
- To provide for sufficient, well located places for various land uses, including industry, recreation, residential development, commercial activity and agricultural uses;
- To improve the circulation and transportation routes;
- To provide for the provisions of public facilities for the redevelopment of many small communities areas in the county; and
- To encourage the advance acquisition and planned development of recreational facility.

In many ways, the 1963 Circulation Element and the Tulare County RTP have acquiesced into a way to incorporate the need for feasible transit, planning, a multimodal terminal facility, and the need to preserve scenic corridors. Aviation and rail travel been a paramount discussion in these two documents with little changed between the two. Providing a backbone to transportation needs and solid planning for the future shows that these two documents parallel the same goals, although times and needs have changed.

Regulatory Setting

Government Code Section 65302(b): [The General Plan shall include] a Circulation Element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other local public utilities and facilities, all correlated with the Land Use Element of the plan.

Government Code Section 65303: The General Plan may address any other subjects, which in the judgment of the legislative body, relate to the physical development of the county or city.

Transportation Equity Act for the 21st Century (TEA-21): On June 9, 1998, the Clinton Administration signed into law PL 105-178 authorizing highway, highway safety, transit, and other surface transportation programs for the next six years. TEA-21 builds on the initiatives established in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, which was the previous major authorizing legislation for surface transportation.

Safe, Accountable, Flexible and Efficient Transportation Equity: A Legacy for Users (SAFETEA-LU): The Bush Administration's transportation bill is intended to make our highways safer. Enactment of this bill is an important step in reducing highway fatalities and injuries, and provides greater flexibility to State and local governments to use these funds consistent with a comprehensive strategic highway safety plan. SAFETEA-LU provides funding for highway and safety programs and for public transportation programs from fiscal year 2004 through fiscal year 2009.

TRANSPORTATION CONTROL MEASURES

Transportation Control Measures (TCM) are designed to reduce vehicle miles traveled, vehicle idling, and/or traffic congestion in order to reduce vehicle emissions. Currently, Tulare County is a non-attainment region under the Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA). Both of these acts require implementation of TCMs that will be identified in following sections. These TCMs for Tulare County are as follows:

- Rideshare Programs;
- Park and Ride Lots;
- Alternate Work Schedules;
- Bicycle Facilities;
- Public Transit;

- Traffic Flow Improvement; and
- Passenger Rail and Support Facilities.

EXISTING CONDITIONS

Implementation of the Tulare County General Plan Circulation Element will improve the existing regional transportation and circulation systems. Such improvements are intended to fulfill existing and future circulation needs. Implementation of planned improvements to the street and highway network, improvement to county airports, provision of mass transportation services and facilities, identification of additional bikeways and pedestrian improvements, and improved transportation systems that accommodate existing and future goods movement, will have beneficial effects on a localized and region-wide basis.

Tulare County's transportation system is composed of several State Routes, including three freeways, multiple highways, as well as numerous county and city routes. The county's public transit system also includes two common carriers (Greyhound and Orange Belt Stages), the AMTRAK Service Link, other local agency transit and paratransit services, general aviation, limited passenger air service and freight rail service.

Travel within Tulare County is a function of the size and spatial distribution of its population, economic activity, and the relationship to other major activity centers within the Central Valley (such as Fresno and Bakersfield) as well as more distant urban centers such as Los Angeles, Sacramento, and the Bay Area. In addition, there is considerable travel between the northwest portions of Tulare County and southern Fresno County and travel to/from Kings County to the west. Due to the interrelationship between urban and rural activities (employment, housing, services, etc.) and the low average density/ intensity of land uses, the private automobile is the dominant mode of travel for residents in Tulare County.

Transit-dependent populations within the county include the elderly, students, low-income residents, and the physically handicapped. These segments of the population generally have limited access to automobiles.

The agricultural economy of the county depends upon the safe and efficient movement of goods. Tulare County is responsible for maintaining an extensive network of low to moderate volume farm-to-market roadways in sparsely settled areas to service its significant agricultural industry. Large trucks and vanpools are the primary means of transporting such goods and labor.

Non-motorized forms of transportation are also available in Tulare County including numerous bikeways, pedestrian facilities, and non-designated equestrian trails. The equestrian trails are located on farms, ranches, in the foothills, and in parks and forests.

The sprawling pattern commonly associated with California transportation networks provides fewer modal options to commuters. Multimodal efforts in the county are focused on enhancing existing conditions and creating environmentally favorable patterns of travel. One approach involves enhancement of park-and-ride facilities and transit services.

5.2 Streets and Highways

INTRODUCTION

This section identifies the regional street and highway setting as it pertains to streets, highways, freeways, etc. In addition, this section provides a description of the county's federal functional classification, identifies existing roadway operations, describes the number of lanes, and provides daily traffic count data.

Methods

Existing traffic count data was obtained from a variety of sources, including the following:

- Caltrans website for State Route information;
- Tulare County Resource Management Agency (RMA) Transportation Services Division;
- 2007 Tulare County Association of Governments (TCAG) Regional Transportation Plan (RTP);
- TCAG Regional Transportation Monitoring Program (2004-07); and
- Recently prepared Traffic Impact Studies and Environmental Impact Reports.

In order to evaluate roadway facilities, the latest methodologies from the Highway Capacity Manual (HCM) were utilized.

Key Terms

- **Functional Classification System.** Functional Classification System identifies existing roadway classification based upon number of lanes, capacity, location, etc. Typically, functional classification refers to local roads, collectors, arterials, expressways, and freeways.

- **Level of Service (LOS).** LOS is used to measure the operating conditions of an intersection or a roadway segment by considering many factors including traffic volume and capacity. LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.
- **Highway Capacity Manual 2000 (HCM).** The Transportation Research Board's (TRB) HCM provides a collection of state-of-the-art techniques for estimating the capacity and determining the LOS for transportation facilities for intersections, roads, public transit, etc. TCAG has adopted a LOS threshold for roads.
- **Average Daily Traffic (ADT) or Average Annual Daily Traffic (AADT).** ADT volume is based upon traffic counts that record the number of vehicles (cars and trucks) that travel on the roadway on a typical weekday (Tuesday, Wednesday, or Thursday). These counts are typically conducted by using "hose" or "tube" counts, but can also be collected utilizing more advanced sensor devices. Both of these methods have the ability to collect heavy-duty vehicle classification counts and directional information. In this report, the total ADT is used for the LOS analysis. It should be noted that in the transportation industry ADT is an acronym that is interchangeable with AADT, or the annual average daily traffic.
- **Peak hour.** That hour during which the maximum amount of travel occurs. It is typically specified as the peak one hour of traffic experience during the morning peak hour (between 7:00 and 9:00 a.m.) and/or the afternoon peak hour (between 4:00 and 6:00 p.m.). In some of the agricultural areas in the county, the peak hour may be earlier than the times above due to seasonal factors such as harvesting, picking, etc. Peak hour roadway traffic counts are usually used in analyzing intersections and interchanges.
- **Farm to Market.** Generally refers to heavy vehicle trips from agricultural related purposes with impacts to the county's road system.
- **State Route (SR).** State Routes that are owned, operated, and maintained by the State of California Department of Transportation (Caltrans).
- **Department of Finance (DOF).** Federal and State departments that, among other things, develop population projections.

EXISTING CONDITIONS

Regional Setting

Figure 5-1 shows Tulare County's relationship to the State Route system, nearby counties, cities and communities. Figure 5-2 identifies the designated street and highway network contained in the existing Circulation Element adopted by the county in 1963. It provides a definition of roads of significance throughout the county. The county's State Route network, which lies primarily west of the Sierra Nevada Mountains, includes State Routes 43, 63, 65, 99, 137, 180, 190, 198, 201, 216, and 245.

Some prominent county roadways include, but are not limited to, Alta Avenue (Road 80), Caldwell Avenue/Visalia Road (Avenue 280), Demaree Road/Hillman Street (Road 108), Tulare Avenue (Avenue 232), Olive Avenue (Avenue 152), Spruce Road (Road 204), El Monte Way (Avenue 416), Paige Avenue (Avenue 216), Farmersville Boulevard (Road 164), Road 192, and Road 152. Additionally, the highway system includes numerous county-maintained local roads, as well as local streets and highways within each of the eight cities and several unincorporated communities.

The county is linked to Fresno County and Kern County principally by State Route 99. This route provides the only continuous north-south route through the county and is heavily used for regional travel. The entire length of State Route 99 in Tulare County and State Route 198 through Visalia and a portion of State Route 65 in Porterville are constructed to freeway standards.

Functional Classification System

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the type of service they are intended to provide. Fundamental to this process is the recognition that individual streets and highways do not serve travel independently in any major way; most travel involves movement through a network of streets and roads.

The following sections define roadway classification systems currently used by the Federal Highways Administration (FHWA), the county and local agencies. Since issues related to the classification of roadways range from funding to operational considerations, each agency has its own classification system. These sections define and clarify the role of each system, and present the classification system used in this Element. A description of how the county roadway classification system relates to the others is also provided in this section.

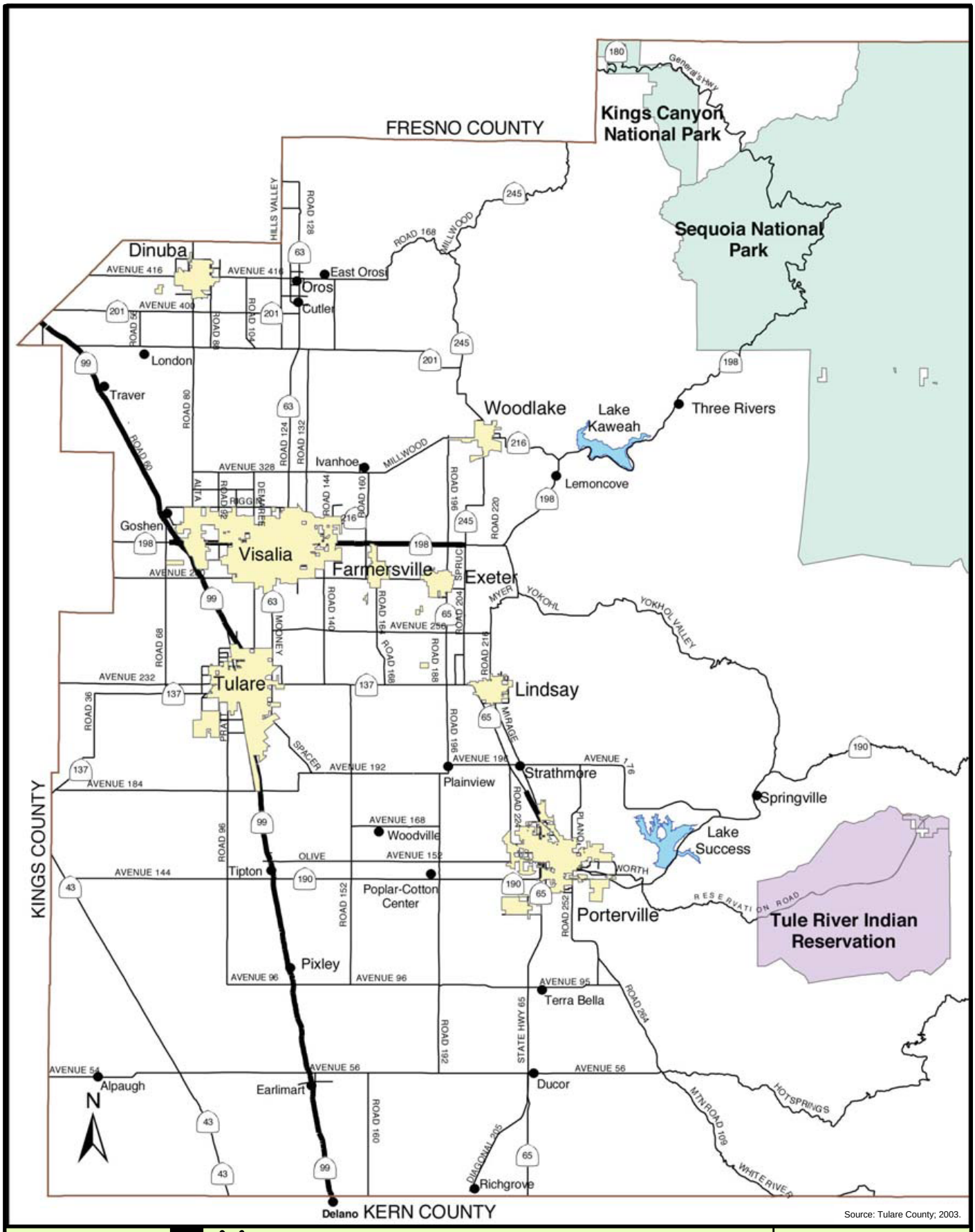
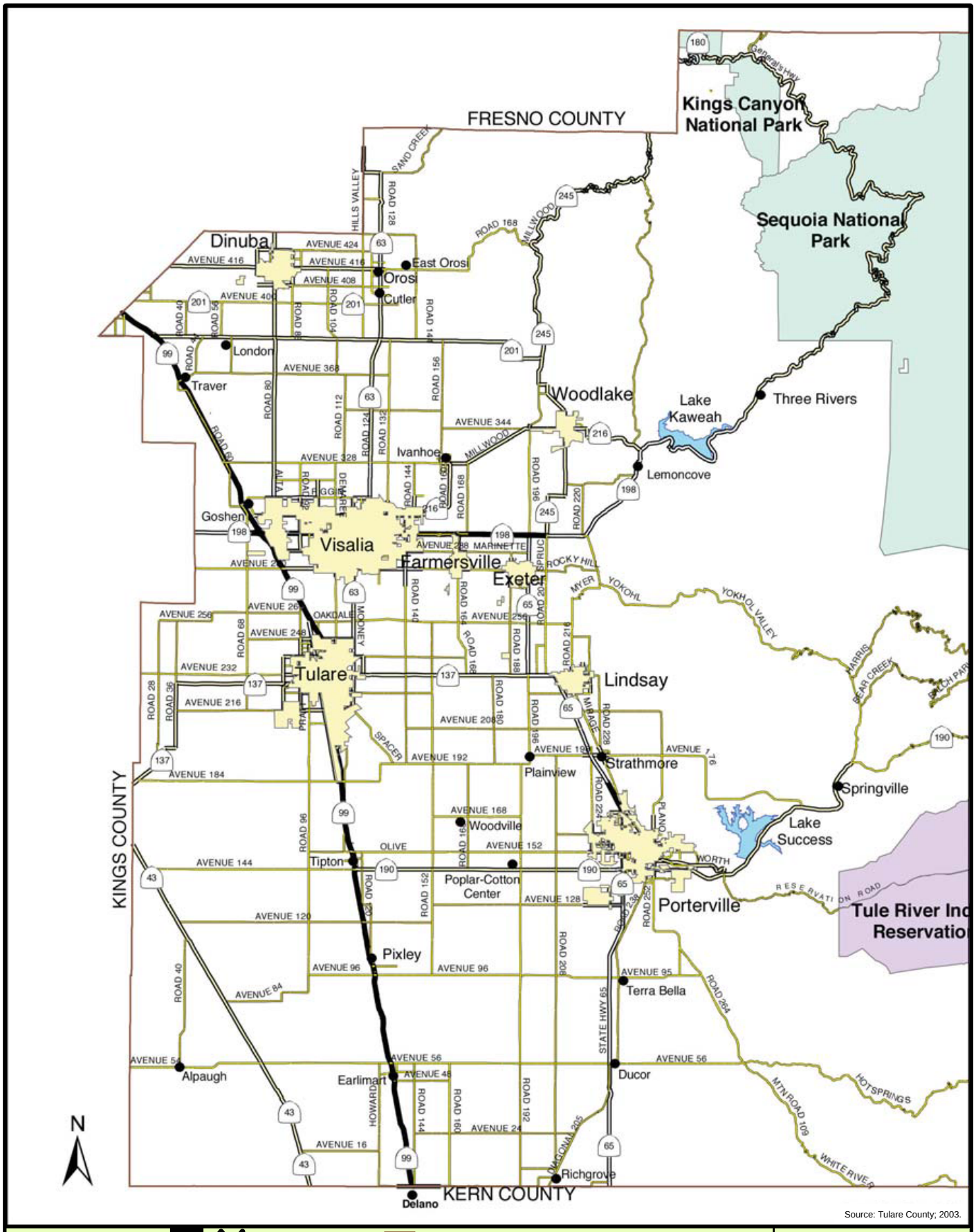


FIGURE 5-1

Regional Roadway Network


FRESNO COUNTY
KINGS COUNTY
KERN COUNTY
Kings Canyon National Park
Sequoia National Park
Dinuba
East Orosi
Orosi
Cutler
London
Traver
Woodlake
Lake Kaweah
Three Rivers
Lemoncove
Ivanhoe
Goshen
Visalia
Farmersville
Exeter
Tulare
Lindsay
Strathmore
Plainview
Springville
Lake Success
Woodville
Tipton
Poplar-Cotton Center
Porterville
Pixley
Terra Bella
Alpaugh
Earlimart
Ducor
Richgrove
Delano
Tule River Indian Reservation
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
Freeways
Arterial (Major)
Arterial (Minor
Collector (Major)
Collector (Minor)
County Boundary
National Parks
Tule River Indian Reservation
City Limits
Unincorporated Communities
State Highway
Lakes
FIGURE 5-2
Functional Classification System

It is necessary to determine how travel can be directed along the street and highway system in a logical and efficient manner. Functional classifications define the channeling process by defining the area that a particular street or highway should service through a circulation network. Table 5-1 defines the functional classes in the urban portion of Tulare County and Table 5-2 defines functional classes in the rural portion of the roadway system.

Federal Functional Classifications

Federal functional classifications, designated for both the rural and urban areas, are as follows:

Rural

Interstate
Principal Arterial
Minor Arterials
Major Collectors
Minor Collectors

Urban

Interstate
Freeways and Expressways
Other Principal Arterials
Minor Arterials

Table 5-1. Urban Functional Classification System-Definitions

Classification	Primary Function	Direct Land Access	Speed Limit	Parking
Freeway/ Expressway	Traffic Movement	None	45-70	Prohibited
Major Arterial	Traffic Movement/Land Access	Limited	35-55	Generally Prohibited
Other Arterial	Traffic Movement/Land Access	Restricted	30-35	Limited
Collector	Distribute Traffic Between Local Streets & Arterials	Safety Controls, Limited Regulation	25-30	Limited
Local	Land Access	Safety Controls Only	25	Permitted

Table 5-2. Rural Functional Classification System-Definitions

Classification	Primary Function	Direct Land Access*	Speed Limit**	Parking***
Fwy/Exprwy	Traffic Movement	Safety Controls	70	Prohibited
Major & Other Arterial	Traffic Movement/ Land Access	Safety Controls	55	Permitted
Collector	Distribute Traffic Between Local Streets & Arterials	Safety Controls	55	Permitted
Local	Land Access	Safety Controls	55	Permitted

* Access to arterials is generally limited or restricted if it provides access to a land subdivision or an industrial, commercial or multi-family use. Access is granted on a controlled basis to parcels fronting on expressways where there is not a frontage road or access to another road;

** All county roads have a 55 mph operating speed unless otherwise indicated;

*** Parking is permitted on all county roads unless otherwise indicated.

Functional Classifications Used in This Element

In order to identify roadway infrastructure needs for the county to the Year 2030 and beyond, several broad roadway classifications have been identified. These roadway classifications, though not as detailed or specific as those used for some urban areas in the county, are sufficient to identify roadway infrastructure needs from the county's perspective. Typical cross sections for the valley and mountainous areas, as per the Tulare County Improvement Standards, are referenced in the Appendix. The roadway classifications used in this document are as follows:

Freeways: a freeway is a divided, limited access highway (access is provided at grade separated interchanges and vehicular crossing of these facilities is provided at grade separations). Freeways are designed to carry large volumes of traffic traveling long distances, although localized use of freeways in urban areas is considerable.

Caltrans designs and constructs all freeways to federal and State design standards. Alignments and key design details, such as interchange locations, are determined in consultation with local and federal authorities when involved. Nothing actually precludes local jurisdictions from building their own freeways. However, Caltrans' State Highway System contains virtually all candidate routes for freeways. The high cost of freeways has historically made it impractical for any agency other than Caltrans to construct new freeways.

Expressways: these are highways that carry large volumes of traffic relatively long distances within or through an urban or rural area. They also often serve considerable local traffic traveling short distances. Intersections along these expressways can be at grade to accommodate traffic entering and exiting the roadway. Expressways should be continuous through the urban or rural community they serve and link to arterial routes. The designated right-of-way for expressways varies dependant upon the needs of the specific facility. Additional right-of-way may be required at some intersections.

Major Urban Arterials: these are highways within Urban Area Boundaries (UAB) or Urban Development Boundaries (UDB) that carry large volumes of traffic traveling relatively long distances within or through an urban area. They also serve considerable local traffic traveling short distances. Along these facilities, priority is placed on through traffic mobility rather than access to fronting property; direct access to individual fronting parcels is discouraged. A major arterial with fully controlled frontage access is an expressway. Major Urban Arterials should be continuous through the urban community they serve and link to arterial routes in adjacent communities or the rural areas.

Major Rural Arterials: these are highway routes outside of the UAB or UDB that are intended to link urban areas with one another as well as serving through traffic movements across the county.

Other Urban Arterials: these are highways within the UAB or UDB that can carry moderately high volumes of long distance and local traffic. Although access to abutting property is permitted, priority is given to through traffic mobility.

Other Rural Arterials: these are highways outside the UAB or UDB that complement the Major Rural Arterial system. They normally link smaller communities and may be continuous over shorter distances than major rural arterials.

Urban Collectors: these are highways within the UAB or UDB that are intended to carry local traffic between the local street system and the arterial highway system. In urban areas, collectors may serve average daily volumes in excess of 10,000 although volumes are normally less. The right-of-way standard for these facilities is 60 feet, and additional right-of-way may be required at some intersections.

Rural Collectors: these highways are located outside the UAB or UDB and provide access to adjacent property. These facilities also provide for traffic movement to and from the arterial system. Rural collectors generally serve less than 10,000 AADT.

Urban Local Roads these roads provide access to abutting property and link properties to the collector system.

Rural Local Roads: these roads provide access to property and activity nodes in sparsely settled areas of the county. All roads not shown on the Circulation Element Map are considered standard local roads.

The intent of the functional classification system used in this Element and in city and community circulation elements is to describe the

intensity and character of traffic using each type of facility, the character of adjacent uses, the priority placed on access to adjacent property versus through traffic mobility, and roadway right-of-way standards. The intent of the Federal Functional Classification System described previously, is to identify what types of federal funding each type of facility is eligible to receive. The intent is not to characterize usage, adjacent development and right-of-way standards.

Existing Improvement Standards

Improvement standards for local roads are broken into several classes; the standards vary depending on the minimum parcel sizes in the area and the number of parcels to be served by the roadway. The improvement standards also are dependent upon where the roadway is located in valley or mountainous areas. The typical cross sections for each class of local roadway are shown in the Appendix. These illustrations are shown as reference only; however, it closely follows the Federal Road Functional Classification.

FREEWAYS AND EXPRESSWAYS

State Route 99

Currently, State Route 99 is a 4/5 lane divided freeway with a landscaped median. The northbound segment between Betty Drive in Goshen to Avenue 384 south of Kingsburg (Fresno County) contains three travel lanes; the remainder of State Route 99 in Tulare County contains two northbound and two southbound travel lanes. With 55,000 daily trips near Avenue 264 (Tagus), State Route 99 is the second most traveled roadway in the county. In addition, it is estimated that 28% of these trips are trucks.

The City of Tulare, western Visalia, and the communities of Earlimart, Teviston, Pixley, Tipton, Goshen, and Traver are located on State Route 99 and are directly impacted by this freeway. Specifically, positive economic impacts are realized along this corridor for highway commercial type uses, such as fast food restaurants, service stations, and motels. During this General Plan Update, alternative land uses will be explored and impacts related to economics and traffic will be identified.

According to the State Route 99 Corridor Plan, traffic volumes beyond 2030 show a need for an eight-lane freeway. In some locations there may also be a need for high occupancy vehicle (HOV) lanes and auxiliary lanes in urban areas.

State Routes 65 and 198

The two other freeway segments in Tulare County are State Route 65 in Porterville and State Route 198 in Visalia. State Route 65 in Porterville is constructed to freeway standards from just south of State Route 190 to just north of Henderson Avenue. State Route 65 also provides a connection to Bakersfield for south county residents in Strathmore, Terra Bella, Ducor, Porterville, and Lindsay areas. State Route 65 carries 26,000 daily vehicles near State Route 190.

The segment of State Route 198 that is constructed to freeway standards is between State Route 99 and Road 180. The last major construction project on a State Route in Tulare County was on State Route 198 through the City of Visalia where four at grade intersections were eliminated. The $100 million plus project was completed in 2001. Continuing west into Kings County, State Route 198 links the City of Visalia and the community of Goshen (in Tulare County) to the cities of Hanford and Lemoore in Kings County, and beyond to Interstate 5. To the east of the City of Visalia, State Route 198 provides direct access to the unincorporated communities of Lind Cove, Lemon Cove and Three Rivers as well as to Sequoia National Park where State Route 198 terminates and continues on as the General's Highway. With 64,000 daily trips in central Visalia, State Route 198 is the most heavily traveled roadway in Tulare County.

State Routes 137 and 190

Both of these expressways are at grade and offer major throughways for southern Tulare County in an east west direction. State Route 137 starts at Waukena, west of Tulare, where it eventually turns into Tulare Avenue and heads east where it merges with State Route 65 near Lindsay. Average daily trips on State Route 137 reach 22,100 in central Tulare. State Route 190 begins at State Route 99 heading east as a typical two lane county road until the road crosses State Route 65 into Porterville, where it changes into an at grade expressway through town, eventually turning into a two lane mountainous roadway where it ends in Ponderosa. State Route 190 carries 25,100 daily trips near State Route 65. In the future these state routes are planned as four lane roadways.

Avenue 416

Avenue 416 is a four-lane expressway between the City of Dinuba and Cutler/Orosi. The County of Tulare primarily maintains this east-west roadway.

SCENIC HIGHWAYS

Many state highways are located in areas of outstanding natural beauty. California's Scenic Highway Program was created by the Legislature in 1963. Its purpose is to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from Caltrans' Scenic Highway Coordinators.

There are minimum requirements for scenic corridor protection:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

A scenic highway can create a positive image for a community, preserve and protect environmental assets and encourage tourism.

Although there is no official list of county highways eligible for scenic designation, county highways that are believed to have outstanding scenic qualities are considered eligible. To receive official designation, the county must follow the same process required for official designation of state scenic highways.

Tulare County currently does not have an officially designated state scenic highway. However, in Tulare County two State Routes are eligible to be on the list of California's scenic highway list. These include State Route 190 from State Route 65 near Porterville to State Route 127 near

Death Valley Junction and State Route 198 from State Route 99 to the Sequoia and Kings Canyon National Park boundary.

Most travelers only know the communities of a scenic corridor from what they see from the highway. Communities that put forth an appealing image to drivers along the corridor are more likely to draw drivers off the highway and into local businesses and tourist attractions. To address the corridor as a special and distinct area of the community, that image should be developed thoughtfully.

Within the zoning ordinances, communities along a corridor may use overlay zones to protect particular natural or cultural features, such as historical districts, scenic views, agricultural areas, or watersheds. An overlay zone would build on the underlying zoning, by establishing additional or stricter standards and criteria that apply in addition to the standards of the underlying zone districts. Overlaying zoning can be an effective tool for communities to use in protecting specific resources from development pressures or to encourage a selective mix of development pressures or to encourage a selective mix of development that is in keeping with community goals along a scenic corridor.

INTERCHANGES

No single design feature has a greater impact on the urban corridor than the interchange. An interchange is a high volume intersection characterized by a grade separation between the highway and the cross street that is accessed by a ramp. The ability to accommodate high volumes of traffic safely and efficiently through the interchanges depends largely on the type of ramp, ramp volumes, and the conditions between the ramp connections and local roads. Today, the state owned right of way and local development limits simple modifications to existing interchanges on State Route 99. Spot congestion or bottlenecks are becoming more common as traffic volumes increase.

Many interchanges in Tulare County have limited room for vehicles waiting to enter or exit the highway. They also have short acceleration and deceleration lengths. This creates congestion when high volumes of traffic back up on ramps, when drivers must slow down on the freeway or when slow moving trucks interrupt the flow of traffic.

Limited spacing between interchanges has a negative impact on the flow of traffic. This is evident in urban areas during peak commute periods when the traffic is forced to slow because of the traffic entering and exiting the highway. Whenever possible, spacing between interchanges needs to be increased to reduce congestion. In the future, this may result in closing some interchanges to improve spacing. Based upon Caltrans

Highway Design Manual, interchanges in urban areas should have a minimum of one mile spacing; in rural areas, the minimum spacing should be no less than two miles.

Changes to existing interchanges, however, are limited by the development next to the freeway, environmental issues, and cost. Minor changes to the existing geometry have provided some improvements, but more congestion will likely occur unless modifications are made.

Table 5-3 provides a list of all the current interchanges and their respected geometries. On State Route 198 some of the interchanges, especially in Visalia, are fairly new and have been built accordingly for the present and the near future. Sections of State Route 65, 190, and 198 pass through rural lands and do not always have the volumes to warrant an interchange. On State Route 99, many of the interchanges are antiquated, have capacity problems, and subsequently safety hazards associated with them.

Table 5-3. Interchange Designs

Freeway	Interchange	Interchange Design
SR 65	State Route 190	Cloverleaf
	Pioneer Avenue	Hook Ramps
	Henderson Street	Diamond
	Olive Avenue	Diamond
	Linda Vista Avenue	At Grade EB / Hook Ramps WB
SR 99	Avenue 16	SB Hooks
	Avenue 24	NB Tight Diamond
	Avenue 48 (Armstrong Avenue)	SB Off Hook/NB Diamond
	Avenue 56 (Sierra Avenue)	Tight Diamond
	Avenue 72	SB Off Hook / SB On / NB Off
SR 99 (cont.)	Avenue 80	NB Hook / SB Diamond
	Avenue 96	NB Diamond / SB Off Hook
	Avenue 100	SB Off / NB Hook
	Avenue 104 (Orrland Avenue)	NB Hook
	Avenue 120 (Hesse Avenue)	NB Hook / SB Tight Diamond
	Avenue 144 (State Route 190)	NB Hook /T on SB
	Avenue 152	Hook Ramps
	Rest Area (near Avenue 176)	NB and SB On/Off
	Avenue 184	Hook Ramps
	Avenue 200	Hook Ramps
	Paige Avenue	Hook Ramps
	Bardsley Avenue	Tight Diamond
	State Route 137 (Tulare Avenue)	Hook-NB/SB On/Diagonal NB/SB Off
	Prosperity/Blackstone	NB On/SB Off/SB On @ Blackstone
	Cartmill Avenue	Diamond to the South/NB on @ Frontage Road/SB Off to North
	Avenue 264	NB Hook / SB Diamond
	Avenue 280 (Caldwell)	NB Hook / SB Diamond
	State Route 198	Cloverleaf (F-3)

Table 5-3. Interchange Designs

Freeway	Interchange	Interchange Design
	Avenue 304 (Goshen Avenue)	Hook Ramps
	Avenue 308 (Betty Drive)	Tight Diamond
	Avenue 368	Tight Diamond
	Avenue 384	Diamond / additional NB on
SR 198	Road 80 (Plaza Drive)	Diamond
	Road 92 (Shirk Road)	Diamond
	Road 100 (Akers)	Diamond
	Road 108 (Demaree Avenue)	Diamond
	State Route 63 (Mooney Boulevard)	Diamond
	Central Visalia Exit	L-4
	Ben Maddox Way	Hook
	Lovers Lane	EB Diamond / WB Hook
	Road 156 (Ivanhoe)	EB Hook / WB L-4
	Farmersville Boulevard	Hook Ramps

Source: 2007 Regional Transportation Plan, Tulare County Regional Traffic Model, Google Earth 2008

Given some of the problems facing the interchanges on major transportation corridors, many of the deficiencies have been analyzed and are in the process or already have sought funds for major construction of new interchanges or to modify current freeway access. Table 5-4 provides a list of major improvements planned to decrease congestion on State Routes in the county. Interchanges and widening of these freeways and expressways are the major improvements planned in the future with the proper funding documents to pay for these improvements and the approximate year started and completed provided.

Table 5-4. Roadway/Interchange Construction

	Segment / Interchange	Improvement	Funding Document	Target Dates-Begin/End
SR 65	North Grand Avenue (Interchange)	New Interchange	2007 RTP/RIP/ Measure R	2025
	Kern Co. Line - State Route 190	2E to 4E	TCRP/2007RTP/STIP	2006/2015
	Cedar Ave - State Route 198	2C to 4E	STIP/2007 RTP/ Measure R	2015/2021
	Scranton Avenue	2C to 4C	2007 RTP/City/ Measure R	2008/2011
SR 99	Goshen OH – Fresno County	4 to 6 Lanes	STIP/RTP/Earmark	2008/2013
	Prosperity Avenue – Goshen OH	4 to 6 Lanes	RIP/1B/RIP	2008/2013
	Ave 200 – Prosperity Avenue	4 to 6 Lanes	RTP/IIP	2008/2013
	South of Tipton – Avenue 200	4 to 6 Lanes	RTP/IIP	2008/2013
	Kern County – South of Tipton	4 to 6 Lanes	RTP/IIP	2008/2013
	Commercial Avenue (Agri Center)	Construct Interchange	RTP/RIP/ Measure R	2018
	Betty Drive	Interchange Improvements	RIP/R/RTP	2012
	Caldwell Avenue	Widen on/off ramps	RIP/R/RTP	2015
	Cartmill Avenue	Widen on/off ramps and bridge	RIP/R/RTP	2012
	Paige Avenue	Interchange Improvements	RIP/R/RTP	2022
	South County Interchanges	Minor widening/ Safety improvements	RIP/Measure R/ SHOPP	2015

Table 5-4. Roadway/Interchange Construction

	Segment / Interchange	Improvement	Funding Document	Target Dates-Begin/End
SR 190	State Route 99 - State Route 65	Passing Lanes	RIP/RTP/SHOPP	2020
	State Route 99 - State Route 65	4 to 6 Lanes	RIP/RTP/ Measure R	2030
	Main Street	Widen on/off ramps and bridge	RIP/RTP/ Measure R	2025
SR 198	State Route 99 – Kings County Line	2C to 4E/4F	RIP/IIP/TCRP/ RTP/1B	2013
	Road 80 at Plaza Drive	Modify Interchange	RIP/RTP	2011
	Shirk Street	Widen on/off ramps and bridge	RIP/RTP/ Measure R	2018
	Akers Street	Minor widening/ Safety improvements	RIP/RTP/ Measure R	2018
	Downtown Visalia Corridor	Widen on/off ramps and bridge	RIP/RTP/ Measure R	2018
	Lovers Lane	Widen on/off ramps and bridge	RIP/RTP/ Measure R	2018
	Avenue 148	Widen on/off ramps and bridge	RIP/RTP/ Measure R	2025

Source: Caltrans Transportation Concept Reports and 2007 Regional Transportation Plan (RTP)

Existing Conditions Analysis (Street and Highway Level of Service)

The first step toward the development of a functional street and highway system is to evaluate existing traffic operating conditions. To accomplish this task, an existing roadway segment level of service (LOS) analysis was conducted. LOS standards are used by Tulare County, TCAG, Caltrans, and local agencies to quantitatively assess the street and highway system's performance. In order to determine the type and number of transportation projects that may be necessary to accommodate Tulare County's projected growth, freeway, expressway, arterial, and collector facility LOS was assessed. These roadways were selected based upon review of the RTP, federal functional classification maps, and adopted circulation elements.

According to the HCM, LOS is categorized by two parameters of traffic: uninterrupted and interrupted flow. Uninterrupted flow facilities do not have fixed elements such as traffic signals that impede traffic flow. Examples of such facilities would be freeways, including State Routes 65 in Porterville, State Route 99 throughout the entire county, and State Route 198 in Visalia. Interrupted flow facilities have fixed elements that cause an interruption in the flow of traffic, such as stop signs and signalized intersections along arterial roads. The LOS threshold volumes for roadway segments are defined in Table 5-5.

Table 5-5. Street and Highway Level of Service Threshold Volumes

Roadway Type	Total Average Daily Traffic (Both Directions) ADT				
	Level of Service A	Level of Service B	Level of Service C	Level of Service D	Level of Service E
6-Lane Freeway	36,900	61,100	85,300	103,600	115,300
4-Lane Freeway	23,800	39,600	55,200	67,100	74,600
6-Lane Arterial	7,300	44,700	52,100	53,500	----
4-Lane Arterial	4,800	29,300	34,700	35,700	----
2-Lane Collector	----	4,200	13,800	16,400	16,900

Based on Florida DOT Tables which are used as an industry standard (2000 HCM).
All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each LOS listed above may vary depending on a number of factors including curvature and grade, intersection or interchange spacing, percentage of trucks and other heavy vehicles, lane widths, signal timing, on-street parking, amount of cross traffic and pedestrians, driveway spacing, etc. ADT = Average Daily Traffic

An important goal is to maintain an acceptable LOS on the highway, street, and road networks. To accomplish this, the county, Caltrans, and local agencies adopt minimum LOS standards in an attempt to manage congestion that may result as new development occurs.

LOS standards vary throughout the county and its eight incorporated cities. The *1995 Tulare County Congestion Management Program* (CMP), prepared by TCAG, identified that the "minimum" LOS standard within the county shall be no lower than LOS "E" for urban areas and LOS "D" for rural areas. However, each local agency that owns and operates transportation facilities may select a LOS standard more stringent than the minimum LOS standards identified in the CMP. Although TCAG rescinded the CMP, it kept some of the components of the program including the LOS threshold, review of traffic impact studies, and the monitoring of intersections throughout the county. For purposes of this report, LOS of "D" is taken as the threshold for acceptable traffic operations for the Tulare County street and state highway system.

To determine the existing LOS for each segment of the street and highway network, segment LOS was identified from information referenced in the existing Regional Transportation Plan (RTP), and from data provided by TCAG from their annual transportation monitoring program. LOS was also estimated using the Modified HCM-Based LOS Tables (Florida Tables). These tables consider the capacity of individual street and highway segments based on numerous roadway variables (freeway design speed, signalized intersections per mile, number of lanes, saturation flow, etc.). These variables were identified and applied to reflect existing traffic LOS conditions in Tulare County. The variables are consistent with HCM variables referenced above in Table 5-5.

Existing Traffic Counts and Roadway Geometrics

Traffic volumes used to determine LOS were obtained from Caltrans, TCAG, and various local agencies, including Tulare County. Traffic volumes were available from these agencies from year 2000 through 2008. On roadways where recent traffic counts were not available (within three years), traffic counts were adjusted by 3% per year. The percentage increase applied is consistent with historical annual growth rates for vehicle trips in Tulare County.

As shown in Table 5-6, all of the roadway segments, except for State Route 63 (Mooney Boulevard) from Caldwell Avenue to State Route 198, State Route 65 from State Route 137 to Hermosa Avenue, and State Route 198 from the Kings County line to State Route 99, are currently operating at acceptable (LOS "D") conditions or better. Improvements, including widening this roadway, are in the planning stages. Based upon current information from TCAG and Caltrans, this project is expected to be constructed within five to seven years.

Another roadway segment that experiences unacceptable LOS is the one-mile segment of State Route 65 near Lindsay. This roadway transitions from a 4-lane expressway north of Lindsay to a two-lane facility resulting in traffic congestion.

Although this volume to capacity (V/C) analysis generally shows that roadways within the county currently operate at acceptable levels of service, other factors should be considered. For instance, road conditions are not considered in the V/C analysis. Deteriorating roads that are narrow or do not have adequate shoulders are not factored in this analysis. Therefore, other factors should be taken into consideration when discussing existing conditions. A subsequent Section 5.5 of this chapter describes road conditions in Tulare County and outlines maintenance needs related to road repair.

Table 5-6. Annual Average Daily Traffic Volumes and Level of Service (2007)

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 43	Kern Co. Line - Kings Co. Line	2	Arterial	4,700	C
State Route 63	Fresno Co. Line - Avenue 419	2	Arterial	2,200	B
State Route 63	Avenue 419 - Avenue 416 (El Monte)	4	Arterial	7,500	B
State Route 63	Avenue 416 (El Monte) - Avenue 402	4	Arterial	13,300	B
State Route 63	Avenue 402 - Avenue 400	2	Arterial	8,500	C
State Route 63	Avenue 400 - Avenue 384	2	Arterial	9,600	C
State Route 63	Avenue 384 - Avenue 328	2	Arterial	7,600	C
State Route 63	Avenue 328 - Ferguson	2	Arterial	7,200	C
State Route 63	Ferguson - Houston	4	Arterial	15,400	B
State Route 63 (Court/Locust)	Houston - Oak	4	Arterial	11,300	B
State Route 63 (Court/Locust)	Oak - State Route 198	4	Arterial	15,200	B
State Route 63 (Mooney)	**State Route 198 - Walnut**	**4/5**	**Divided Arterial**	**36,000**	**F**
State Route 63 (Mooney)	**Walnut - Caldwell**	**4/5**	**Divided Arterial**	**36,000**	**F**

Table 5-6. Annual Average Daily Traffic Volumes and Level of Service (2007)

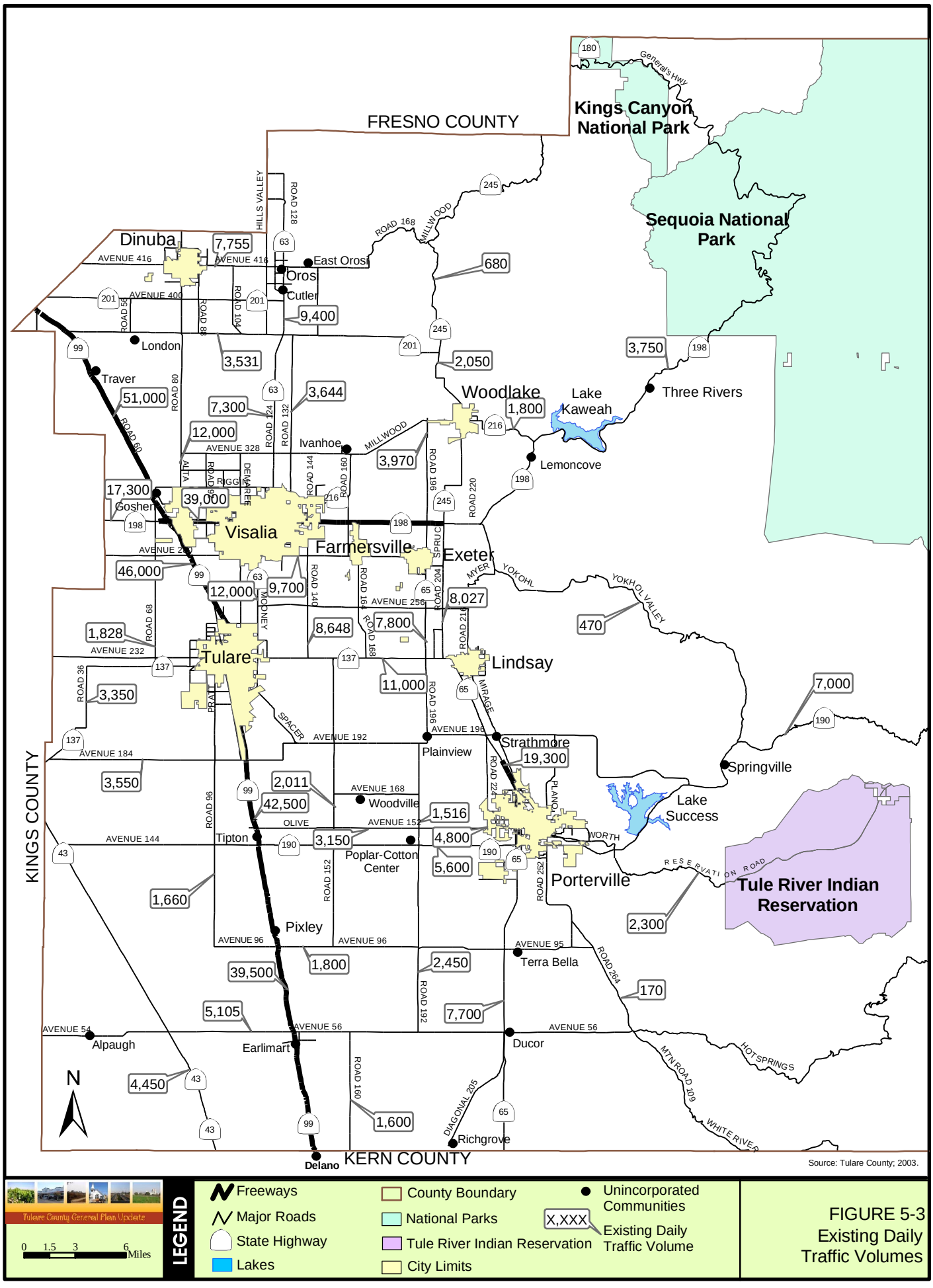
Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 63 (Mooney)	Caldwell - Avenue 264	4	Divided Arterial	29,500	C
State Route 63 (Mooney)	Avenue 264 - Avenue 248	4	Divided Arterial	22,400	B
State Route 63 (Mooney)	Avenue 248 - State Route 137	4	Divided Arterial	16,500	B
State Route 65	State Route 198 - Pine	2	Arterial	13,600	C
State Route 65 (Kaweah)	Pine - D Street.	2	Arterial	8,500	C
State Route 65	D Street. - State Route 137 (West)	2	Arterial	5,300	C
State Route 65	**State Route 137 (West) - Hermosa**	**2**	**Arterial**	**19,000**	**F**
State Route 65	Hermosa - Grand	4	Expressway	20,700	B
State Route 65	Grand - Porterville S. Limits	4	Freeway	26,000	B
State Route 65	Porterville S. Limits - Avenue 96	2	Arterial	12,200	C
State Route 65	Avenue 96 - Kern Co. Line	2	Arterial	9,500	C
State Route 99	Fresno Co. Line - Avenue 368	4	Freeway	53,000	C
State Route 99	Avenue 368 - State Route 198	5	Freeway	53,000	C
State Route 99	State Route 198 - State Route 137	4	Freeway	56,000	D
State Route 99	State Route 137 - State Route 190	4	Freeway	55,000	C
State Route 99	State Route 190 - Kern Co. Line	4	Freeway	45,000	C
State Route 137	Kings Co. Line - Road 68	2	Arterial	3,350	B
State Route 137	Road 68 - West	2	Arterial	8,500	C
State Route 137	West - J Street	2	Arterial	13,000	C
State Route 137	J Street - Kern	4	Arterial	7,500	B
State Route 137	Kern - Blackstone	4	Arterial	22,100	B
State Route 137	Blackstone - State Route 63	4	Divided Arterial	19,800	B
State Route 137	State Route 63 - State Route 65	2	Arterial	11,100	C
State Route 190	State Route 99 - Newcomb	2	Arterial	5,800	C
State Route 190	Newcomb - Road 265	4	Divided Arterial	25,100	B
State Route 190	Road 265 - Sequoia Nat'l Forest	2	Arterial	11,400	C
State Route 198	**Kings Co. Line - State Route 99**	**2**	**Arterial**	**33,000**	**F**
State Route 198	State Route 99 - Akers	4	Freeway	56,000	C
State Route 198	Akers - State Route 63 (south)	4	Freeway	64,000	D
State Route 198	State Route 63 (south) - Road 168	4	Freeway	39,000	B
State Route 198	Road 168 - Spruce	4	Expressway	14,000	A
State Route 198	Spruce - State Route 216	2	Arterial	9,500	C
State Route 198	State Route 216 - North Fork	2	Arterial	4,000	B
State Route 198	North Fork - Mineral King	2	Arterial	3,800	B
State Route 198	Mineral King - Sequoia Nat'l Park	2	Arterial	1,500	B
State Route 201	Fresno Co. Line - State Route 63	2	Arterial	5,200	C
State Route 201	State Route 63 - State Route 245	2	Arterial	4,800	C
State Route 216	State Route 198 (Visalia) - Houston	4	Divided Arterial	24,000	B
State Route 216	Houston - Road 144	2	Arterial	11,200	C
State Route 216	Road 144 - Road 158	2	Arterial	5,200	C
State Route 216	Road. 158 - Avenue. 344	2	Arterial	5,900	C
State Route 216	Road 196 - Castlerock	2	Arterial	5,400	C
State Route 216	Castlerock - State Route 198 (Lemon Cove)	2	Arterial	1,700	B
State Route 245	Fresno Co. Line - State Route 201	2	Arterial	670	B
State Route 245	State Route 201 - Avenue 352 (Cajon)	2	Arterial	2,200	B
State Route 245	Avenue 352 (Cajon) - Woodlake S. Limits	2	Arterial	7,700	B
State Route 245	Woodlake S. Limits - State Route 198	2	Arterial	3,300	B
Avenue 54	Kings Co. Line - State Route 43	2	Arterial	650	B
Avenue 56	State Route 43 - State Route 99	2	Arterial	5,560	C
Avenue 56	State Route 99 - Road 192	2	Arterial	1,910	B
Avenue 56	Road 192- State Route 65	2	Arterial	880	B
Avenue 56/M56	State Route 65 - Old Stage Road	2	Arterial	1,100	B

Table 5-6. Annual Average Daily Traffic Volumes and Level of Service (2007)

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
Avenue 56/M56	Old Stage Road - Sequoia National Forest	2	Arterial	980	B
Avenue 96	Road 96 - State Route 99	2	Arterial	1,360	B
Avenue 96	State Route 99 - Road 192	2	Arterial	1,960	B
Avenue 96	Road 192- State Route 65	2	Arterial	2,800	B
Avenue 96	State Route 65 - M109	2	Arterial	1,290	B
Avenue 152	State Route 99 - Road 192	2	Arterial	3,350	B
Avenue 152	Road 192- Road 222	2	Arterial	4,800	C
Avenue 152 (Olive)	Road 222 - State Route 65	4	Divided Arterial	5,180	B
Avenue 152 (Olive)	State Route 65 - Road 252 (Plano)	4	Divided Arterial	19,800	C
Avenue 184	Road 28 - Road 96	2	Collector	3,870	B
Avenue 196	Road 196 - State Route 65	2	Arterial	2,250	B
Avenue 196	State Route 65 - Road 236	2	Arterial	4,500	C
Avenue 196	Road 236 - State Route 190	2	Arterial	2,000	B
Hermosa	State Route 65 - Mirage	2	Arterial	1,910	B
Avenue 216	Road 84 - K Street.	2	Arterial	1,680	B
Avenue 216	K Street - State Route 99	2	Arterial	8,280	C
Avenue 232	Kings Co. Line - Road 92	2	Arterial	10,000	B
Avenue 232 (Tulare Avenue)	Road 92 - (West) - I Street	2	Arterial	3,020	B
Avenue 256	State Route 99 - Road 216	2	Arterial	2,210	B
Avenue 280 (Caldwell)	Kings Co. Line - State Route 99	2	Arterial	4,110	B
Avenue 280	State Route 99 - Akers	2	Arterial	9,610	C
Avenue 280 (Caldwell)	Akers - Shady	4	Arterial	14,950	B
Avenue 280 (Caldwell)	Shady - Fairway	6	Arterial	25,800	B
Avenue 280 (Caldwell)	Fairway - Lovers Lane	4	Arterial	21,940	B
Avenue 280	Lovers Lane - Stevens	2	Arterial	8,700	C
Avenue 280	Stevens - Brundage	4	Arterial	12,640	B
Avenue 280	Brundage - Road 180	2	Arterial	8,090	C
Avenue 280	Road 180 - Elberta	3	Arterial	13,900	D
Avenue 280	Elberta - Belmont	4	Arterial	12,590	B
Pine Street	G Street - Kaweah	2	Arterial	3,530	B
Avenue 304	State Route 99 - Road 76	2	Arterial	5,760	B
Avenue 304 (Goshen)	Road 76 - Road 80	2	Arterial	7,610	C
Avenue 304 (Goshen)	Road 80 - Shirk	4	Arterial	9,590	B
Avenue 304 (Goshen)	Shirk - Giddings	4	Arterial	15,400	B
Avenue 304 (Murray)	Giddings - Locust	2	Arterial	12,500	B
Avenue 312 (Riggin)	Road 80 - State Route 63	2	Arterial	3,060	B
Avenue 328	State Route 99 - State Route 63	2	Arterial	2,130	B
Avenue 328	State Route 63 - Road 132	2	Arterial	4,870	C
Avenue 328	Road 132 - State Route 216	2	Arterial	5,020	C
Avenue 384	State Route 99 - Road 80	2	Arterial	4,100	B
Avenue 384	Road 80 - State Route 63	2	Arterial	3,530	B
Avenue 416	Fresno Co. Line - Road 72	4	Divided Arterial	9,830	B
Avenue 416 (El Monte)	Road 72 - Euclid	4	Divided Arterial	8,610	B
Avenue 416 (El Monte)	Euclid - Nichols	4	Divided Arterial	9,160	B
Avenue 416 (El Monte)	Nichols - Perry	4	Divided Arterial	6,320	B
Avenue 416 (El Monte)	Perry - Road 92	4	Expressway	17,100	B
Avenue 416	Road 92 - Road 120	4	Expressway	12,320	B
Avenue 416	Road 120 - State Route 63	2	Arterial	930	B
Avenue 416/Boyd Dr	State Route 63 - State Route 245	2	Arterial	4,220	B
Road 56	Avenue 384 - Fresno Co. Line	2	Arterial	2,690	B
Road 68	State Route 99 - State Route 198	2	Arterial	4,360	B
Road 68	State Route 198 - State Route 137	2	Arterial	8,490	C

Table 5-6. Annual Average Daily Traffic Volumes and Level of Service (2007)

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
Road 80	Avenue 384 - Goshen	2	Arterial	17,000	B
Road 80 (Plaza)	Goshen - Neeley Street	2	Arterial	13,750	C
Road 80 (Plaza)	Neeley Street - State Route 198	2	Arterial	9,370	C
Road 92	Avenue 320 - Avenue 280	2	Arterial	4,860	C
Road 92	Avenue. 280 - State Route 198	2	Arterial	9,160	C
Road 92	State Route 198 - Avenue 320	2	Arterial	1,810	B
Road 96	State Route 137 - Avenue 96	2	Arterial	3,920	B
Road 108 (Demaree)	Avenue 328 - Riggin	2	Collector	5,560	B
Road 108 (Demaree)	Riggin - Houston	2	Collector	7,630	B
Road 108 (Demaree)	Houston - Goshen	2	Collector	13,950	B
Road 108 (Demaree)	Goshen - State Route 198	4	Arterial	15,140	B
Road 108 (Demaree)	State Route 198 - Walnut	4	Arterial	17,220	B
Road 108 (Demaree)	Walnut - Caldwell	4	Arterial	12,990	C
Road 108	Caldwell - Cartmill	2	Collector	8,450	B
Road 108 (Hillman)	Cartmill - Leland	6	Arterial	10,100	B
Road 108 (Hillman)	Leland - Prosperity	6	Arterial	3,640	B
Road 132	State Route 201 - Avenue 328	2	Arterial	7,400	B
Road 132	Avenue 328 - Saint John's Pkwy	2	Arterial	11,340	B
Road 132 (Ben Maddox)	Saint John's Pkwy - Houston	4	Arterial	20,340	B
Road 132 (Ben Maddox)	Houston - State Route 198	4	Arterial	19,510	B
Road 140 (Lovers Lane)	State Route 216 - State Route 198	4	Divided Arterial	11,660	B
Road 140 (Lovers Lane)	State Route 198 - Caldwell	4	Divided Arterial	8,610	C
Road 140	Caldwell - Avenue 272	2	Arterial	8,200	C
Road 140	Caldwell - State Route 137	2	Arterial	3,800	B
Road 152	State Route 137 - Avenue 192	2	Arterial	2,300	B
Road 152	Avenue 192 - State Route 190	2	Arterial	1,850	B
Road 152	State Route 190 - Avenue 96	2	Arterial	1,740	B
Road 160	Avenue 56 - Kern Co. Line	2	Arterial	7,650	C
Road 164 (Farmersville Blvd)	State Route 198 - Walnut	2	Arterial	7,950	C
Road 164 (Farmersville Blvd)	Walnut - Visalia Road	2	Arterial	5,960	C
Road 164 / Road 168	Visalia Road - State Route 137	2	Arterial	2,050	B
Road 192	Avenue 196 - Avenue 152	2	Arterial	2,700	B
Road 192	Avenue 152 - Avenue 56	2	Arterial	5,600	B
Road 196	State Route 216 - State Route 198	2	Arterial	8,900	C
Road 204 (Spruce)	State Route 198 - State Route 65	2	Arterial	1,090	B
Road 216/ Avenue 272	Avenue 232 - M296	2	Arterial	14,700	C
Mooney Boulevard	State Route 137 - Laspina in Tulare	4	Arterial	12,100	C
Main Street (Porterville)	State Route 190 - Olive	4	Divided Arterial	8,670	C
Main Street	Olive - Morton	4	Collector	7,980	C
Main Street	Morton - Henderson	4	Divided Arterial	8,210	C
Main Street	Henderson - Grand	2	Divided Arterial	3,270	B
Mirage	Hermosa - Lindmore	2	Collector	4,850	C
Diagonal 242 (Orangebelt)	Avenue 220 - Avenue 196	2	Arterial	6,320	B
Diagonal 242 (Orangebelt)	Avenue 196 - Avenue 194	4	Arterial	5,180	C
Diagonal 242 (Orangebelt)	Avenue 194 - Grand	2	Arterial	3,910	B
Road 256/Diagonal 252/Plano	Avenue 196 - State Route 190	2-4	Arterial	185	B
Road 264	Avenue 95 - Avenue 56	2	Collector	2,300	B
Reservation Road	Worth Road - Tule River Indian Reservation Border	2	Collector	10,900	C
Plano/Avenue 116/M109	State Route 190 - Avenue 56	2	Arterial	470	B
Yokohl Valley Road	State Route 198 - Balch Park	2	Collector	2,750	B
Avenue 304	Kings Co. Line - State Route 99	2	Arterial	4,600	C


FRESNO COUNTY
KINGS COUNTY
KERN COUNTY
Kings Canyon National Park
Sequoia National Park
Tule River Indian Reservation
Dinuba
7,755
East Orosi
Orosi
Cutler
9,400
680
London
3,531
2,050
Traver
51,000
7,300
3,644
Woodlake
1,800
Lake Kaweah
Three Rivers
3,750
12,000
Ivanhoe
3,970
Lemoncove
17,300
Gosher
39,000
Visalia
Farmersville
Exeter
46,000
12,000
9,700
8,027
470
1,828
8,648
7,800
Tulare
Lindsay
11,000
7,000
3,350
Strathmore
19,300
Plainview
Springville
3,550
2,011
42,500
Woodville
1,516
Lake Success
Tipton
3,150
4,800
Poplar-Cotton Center
5,600
Porterville
1,660
Pixley
2,300
39,500
1,800
2,450
Terra Bella
5,105
7,700
170
Alpaugh
Earlimart
Ducor
4,450
1,600
Richgrove
Delano
Source: Tulare County; 2003.
Tulare County General Plan Update
0 1.5 3 6 Miles
LEGEND
Freeways
Major Roads
State Highway
Lakes
County Boundary
National Parks
Tule River Indian Reservation
City Limits
Unincorporated Communities
X,XXX Existing Daily Traffic Volume
FIGURE 5-3
Existing Daily Traffic Volumes

5.3 Funding

INTRODUCTION

This section discusses the type of funding and financing alternatives to fund county transportation projects.

Methods

The Regional Transportation Plan (RTP) and websites from TCAG, Caltrans, California Transportation Commission (CTC), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) were used to collect data.

Key Terms

Congestion Mitigation and Air Quality (CMAQ)

Interregional Improvement Program (IIP)

Intermodal State Transportation Equity Act (ISTEA)

Local Transportation Sales Tax (Measure R)

Regional Improvement Program (RIP)

Regional Transportation Plan (RTP)

State Transportation Improvement Programs (STIP)

Surface Transportation Program (STP)

Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

Traffic Impact Fee (TIF)

Transportation Equity Act for the 21st Century (TEA-21)

EXISTING CONDITIONS

With the increasing costs of providing streets and roads to new developments, combined with increased congestion and deterioration of existing roadways, the county has begun to use other funding mechanisms. Tulare County recently passed Measure R (dedicated half cent sales tax measure) to have a dedicated source of transportation funding for 30 years.

Currently, the majority of available funds are generated from federal and state gas taxes and distributed through various grants. Another means of collecting revenue for transportation improvements is through development impact fees. Such impact fees may be imposed on new development to recoup a proportionate share of the costs required to accommodate such development. These costs may include such improvements as street widening, signalization, turn lane construction, and air quality improvements. Tulare County is currently going through the process of developing a Traffic Impact Fee.

Another alternative funding mechanism is Assessment District financing, which involves the formation of one or more districts where specific needed capital improvements have been identified. All the property owners in the district are assessed a proportionate share of the costs of the improvements and only projects within the district are eligible for funding. Finally there are several state and federal programs to fund some of the transportation improvements of Tulare County. Considering all of the different improvements that the county currently has (we need to document improvements first), the county uses all three of these methods to achieve its transportation goals.

For the current STIP 2008 based upon the RTP, there is deficit of approximately $13.15 million; this has resulted in postponing several project funds until the 2008 STIP. Funding environmental and design services on State Route 99, State Route 198, State Route 63, State Route 65, and Road 80 will continue for this STIP cycle. Although funds are limited, TCAG proposes programming the many improvements to regional roads and State Highways.

Many requested projects will not be funded through the 2007 RTP because of lack of funding; this includes approximately $250 million in deferred maintenance in the unincorporated roads in the county and over $20 million in deferred maintenance on the Tulare County Regional Road System. In addition, a third of the total maintenance costs for the Caltrans road system improvements are under-funded.

Since publication of the original Background Report, several major funding decisions have been made. First, federal transportation legislation (SAFETEA-LU) was passed; the state of California passed several infrastructure bonds; and a local half cent sales tax measure (Measure R) was passed by voters in Tulare County.

Although the funding picture still looks bleak, Tulare County is better equipped to handle increasing congestion and continued maintenance.

TCAG Involvement in Funding

TCAG is involved in the process of procuring federal and state funds for the member agencies based on needs. TCAG is responsible for overseeing transportation planning and helps member agencies receive federal assistance. TCAG also acts as a clearinghouse for projects requiring state or federal funding. The purpose is to provide a forum for coordination of governmental activities that require long-term planning.

STATE FUNDING

Propositions 1A and 1B

In November of 2006, California voters passed several statewide propositions that will ensure funding for major transportation projects. *Proposition 1A: Transportation Funding Protection*: Proposition 1A restricts state authority to reduce major local tax revenues, however its restrictions apply to future state actions only, and allowed the $1.3 billion property tax shift to take place in 2004-05 and 2005-06. In future budgets, Proposition 1A allows for limited, short-term shifting of local property taxes. The state must repay local governments for these property tax losses within five years.

Proposition 1B: Highway Safety, Traffic Reduction, Air Quality and Port Security Bond: would authorize nearly authorize nearly $20 billion in bonds for transportation project throughout the state. The bond would provide $11.3 billion for capacity, $4.0 billion for public transit, $3.0 billion for goods movement, $1.5 billion for security and $200 million for school bus retrofit. The passage of Proposition 1B will most likely result in the widening of State Route 198 between Hanford and State Route 99. The State Route 198 widening project is expected to use $90 million in bond funding. Another project that may be funded with bond revenue includes the State Route 99 widening (6 lane freeway) from Prosperity Avenue to Goshen Avenue. Over $108 million will be needed for the widening.

State Transportation Improvement Program (STIP)

State law requires the California Transportation Commission (CTC) to adopt a STIP every two years. Previously, the STIP allocated anticipated State and federal funding to projects over a seven-year period, but since SB 45 has passed this process has changed. TCAG is responsible for preparing the Regional Transportation Improvement Programs (RTIP) for the County of Tulare.

The STIP is a document that programs State and federal gas tax funding for highway and mass transit projects, including intercity, commuter,

urban, and light rail projects. The STIP allocates anticipated State and federal funding to projects over multiple years. The STIP considers projects that are submitted in each agency's RTIP.

Interregional Improvement Program (IIP)

IIP funds the previously known Interregional Road System (IRRS). The IIP is a state funded program for projects identified as providing the most adequate interregional road system to all economic centers in the state. The projects are submitted by Caltrans through the Interregional Transportation Improvement Program (ITIP) process for programming in the STIP. Currently, State Routes 63, 65, 99, 190, and 198 are the only eligible IRRS facilities. State Route 99, which is planned to be widened from a four to six lane freeway from Kern County to Fresno County, is an IIP project in Tulare County. Another IIP funded project is State Route 198 widening project from two to four lanes between Hanford in Kings County to State Route 99 in Tulare County.

The IIP deals with identified projects that would be beneficial to the IRRS, leading to all economic centers throughout the State. Funding for this program is equal to 25% of all funds allocated through the SB 45 process. Local agencies can nominate candidate projects if they can show more cost effective use of funds. Caltrans submits the projects through the State Transportation Improvement Program (STIP) to be scheduled within the program. The IIP is a program based on the current adopted STIP and the most recent Project Delivery Report. It may include additional schedule changes and/or cost changes, plus new projects that Caltrans proposed for the interregional road system, as well as the intercity rail program, mass transit guide way, and grade separation programs.

Regional Improvement Program (RIP)

The RIP funds are available to regional transportation planning agencies (RTPAs) for a broad range of transportation improvements. These include State Route improvements, but also grade separation projects, transportation demand management (TDM), sound walls, rail transit projects, local street and road projects, intermodal facilities, and pedestrian and bicycle facilities. The projects selected by the region must be included in the RTIP.

These regional choice funds represent approximately 75% of the funds available in the State Highway Account (SHA). The funds are programmed by the Transportation Authorities in their RTIPs for inclusion into the STIP. The RIP deals with identified projects that provide a benefit to the regional road system of all economic centers

throughout the State. The projects are submitted through their RTIP process to program into the STIP. Currently, all State Routes and other regional facilities are eligible for RIP funding. TCAG has scheduled projects using this type of funding that ranges from pavement rehabilitation to major capital improvement projects.

Pursuant to SB 45, allocations of these funds are known as County Shares and replace the previous County Minimums. Eligible projects include:

- Local Roads;
- Public transit;
- Intercity transit;
- Pedestrian and bikeway facilities;
- State highway improvements;
- Grade separations;
- Inter modal facilities;
- Safety projects; and
- Transportation System Management projects.

State Highway Operation and Protection Program (SHOPP)

State legislation created the SHOPP for Caltrans to be responsible for state highway safety and rehabilitation projects, seismic retrofit projects, land and building projects, landscaping, operational improvements, bridge replacement, and the minor program. Local streets and road projects are not eligible. Unlike STIP projects, SHOPP projects may not increase roadway capacity; SHOPP is a four-year program of projects, adopted separately from the STIP cycle. The majority of the funds for this project come from the "old" nine-cent state gas tax from federal funds, but a portion is also funded through the recent State gas tax increase.

Transportation Development Act

The Transportation Development Act (TDA) is California law that provides funding for transit through Local Transportation Funds (LTF) and State Transit Assistance Funds (STAF). These funds are California State sales tax funds that are available for transit operations and street and road purposes. The LTF has been in existence since 1972 and is derived from 1/4 cent of retail sales tax collected in the State of California. STAF has been in existence since 1980 and is generated by gasoline sales tax revenue. The LTF is distributed to each city and the

unincorporated areas based upon population. In Tulare County, the LTF may be used for transit, street, and road purposes as long as all unmet transit needs are addressed, whereas STAF must be used for transit purposes only.

Table 5-7 below shows the State Transit Assistance Funds (STAF) to be allocated in Tulare County for the next 25 years.

Table 5-7. STAF 25 Year Projections for Tulare County (x1000)

06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	Short-Term
917	935	954	973	993	1,012	1,033	1,053	1,074	1,096	1,118	1,140	**$ 12,229**
18/19	**19/20**	**21/22**	**23/24**	**24/25**	**25/26**	**27/28**	**28/29**	**29/30**	**30/31**	**31/32**	**32/33**	**Long-Term**
1,163	1,186	1,210	1,234	1,259	1,284	1,310	1,336	1,363	1,390	1,418	1,446	**$ 27,897**

Note: Based on FY 2005/06 actual STAF using a straight-line projection of gasoline tax with a 2% inflation factor.

Source: Regional Transportation Plan 2007

Total	**$ 27,897**

FEDERAL FUNDING

Transportation Equity Act for the 21st Century

TEA-21, also known as "federal reauthorization," was passed by Congress in December of 1998 and provided a major restructuring of the highway program. TEA-21 was adopted to provide funding for highways, highway safety, and mass transportation for six years to improve air quality and congestion and was a very successful program until it expired in 2005. The House, Senate and President renewed TEA-21 under the name SAFETEA-LU on August 10, 2005.

Just as TEA-21, SAFETEA-LU and future legislation will continue to be a contributor to Tulare County transportation improvements. Key components of this Act included a great flexibility in the programming of projects, leveling the playing field between highway and transit projects with a consistent 80/20 matching ratio, ties to the Federal Clean Air Act and Americans with Disabilities Act and earmarked construction projects. The TEA-21 program consisted of programs designed to provide funds to special projects that must qualify through the Federal Transportation Improvement Program (FTIP) before they received funds.

TEA-21 as well as the Clean Air Act Amendment (CAAA) changed the way transportation planning is accomplished in California. The 1998 Tulare County FTIP fulfilled each of the TEA-21 requirements and conformed to the RTP and other regional plans.

TEA-21 replaced the Intermodal Surface Transportation Efficiency Act (ISTEA), which was adopted in June 1991. It provided funding for highways, highway safety, and mass transportation. The TEA program was successful throughout California.

Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

SAFETEA-LU (August 10, 2005) replaced the TEA-21 that continues to fund transportation improvements throughout the United States. Funds are directed toward projects and programs for a broad variety of highway and transit work through several funding components, which include the STP, CMAQ, TE, Safety Program, Rail Programs and Emergency Relief Programs.

The law established funding levels and policies for the federal government's highway, highway safety, transit, motor carrier and some rail programs administered by the U.S. Department of Transportation (DOT). SAFETEA-LU allocates $286 billion for these projects over a six year period, including $228 billion for the FHWA as well as nearly $53 billion for transit.

Surface Transportation Program (STP)

The STP provides flexible funding that may be used by States and localities for projects on any Federal Aid Highway, including the National Highway System (NHS), bridge projects on any public road, transit capital projects, and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors.

The STP (exchange) program provides flexible funding that may be used by states and localities for projects on any federal aid highway, including the National Highway System, bridge projects on any public road, transit capital projects, public bus terminals and facilities, infra-structure based intelligent transportation systems, capital improvements and a host of additional categories. The STP program is the most flexible of the federal programs.

STP funds are typically used for highway construction and are handled by the state highway department. Beginning under ISTEA, and now with TEA-21, STP funds may be used for any capital project including transit. Nationally, 4% to 5% of STP funds are used for transit projects such as bus procurement or transit facilities, with the vast majority going to highway projects. This use of STP funds for anything other than highways was infrequent at the beginning of ISTEA in the early 1990s,

but has been steadily increasing since, a trend that will continue with SAFETEA-LU.

Local governments may use the STP funds for projects on any Federal-aid highway system. The Act also allows STP funds to be used for improvements to the NHS, bridge projects on any public roads, and transit capital projects. Federal legislation requires the STP funds to be spent as follows:

- Highway projects;
- Bridges (including construction, reconstruction, seismic retrofit and painting) on all public roads;
- Transit capital improvements;
- Carpool, bicycle and pedestrian facilities;
- Safety improvements and hazard elimination;
- Planning; and
- Transportation enhancement activities and control measures.

By funding safety improvements and bridge replacement projects on local roads and rural minor collectors, some projects in Tulare County have used this funding for local bridges.

While the Department of Transportation (DOT) has administrative authority over the STP funds, these funds are distributed to urban areas with a population greater than 200,000, metropolitan planning organizations (MPO), and regional planning affiliations through agreements between local authorities and the DOT. Under the agreement, the local authorities are responsible for determining the highway programming priorities on the federal-aid system within their jurisdictions.

Table 5-8 shows the STP apportionment projections for Tulare County through 2016 (short term) and through 2029 (long term). The county road improvement shows small increases in budget during this time and primarily focused on infrastructure improvements within Tulare County's cities.

Table 5-8. Surface Transportation Program (STP) Apportionment Projections for Tulare County (x1000)

	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	Short-Term
Cities/ County	3,197	3,278	3,362	3,446	3,533	3,621	3,711	3,803	3,896	3,992	4,089	4,189	**$44,117**
County	877	877	877	877	877	877	877	877	877	877	877	877	**$10,524**
	19/20	**20/21**	**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**26/27**	**27/28**	**28/29**	**29/30**	**30/31**	**Long-Term**
Cities/ County	4,290	4,393	4,499	4,606	4,716	4,828	4,942	5,058	5,177	5,298	5,421	5,547	**$102,890**
County	877	877	877	877	877	877	877	877	877	877	877	877	**$21,048**

Note: These figures are an estimate based on a 2% increase per year for STIP allocations.
Tulare County Apportionment does not change (Pre ISTEA old FAS Rules Calculating Road in a county).
Source: Regional Transportation Plan 2007

Total	**$123,938,668**

Transportation Enhancement Program

Transportation Enhancements (TE) are transportation-related activities that are designed to strengthen the cultural, aesthetic, and environmental aspects of the Nation's intermodal transportation system. The TE program is a competitive grant program in which public agencies submit TE project applications for scoring and regional prioritization based on a bid target determined by the CTC.

Projects must have a direct relationship to the intermodal transportation system by function, proximity, or impact. Also projects must be over and above the required project environmental mitigation and fall within established categories for project eligibility. Eligible projects include:

- Facilities for pedestrians and bicycles
- Acquisition of scenic or historic easements and scenic or historic sites
- Scenic or historic highway programs
- Landscaping and other scenic beatification
- Historic preservation
- Rehabilitation and operation of historic transportation building, structures, or facilities
- Preservation of abandoned railway corridors (including conversion and use as pedestrian or bicycle trails)
- Control and removal of outdoor advertising
- Archaeological planning and research
- Mitigation of water pollution caused by highway runoff

Table 5-9 shows the funding apportionment for Tulare County by year concerning the TE Program for the next 25 years.

Table 5-9. Transportation Enhancement Year Apportionment Projections for Tulare County (x1000)

07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	Short-Term
529	2,218	309	832	908	1,908	1,946	1,985	2,025	2,065	2,107	2,149	**$18,981**
19/20	**20/21**	**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**26/27**	**27/28**	**28/29**	**29/30**	**30/31**	**Long-Term**
2,192	2,236	2,280	2,326	2,372	2,420	2,468	2,518	2,568	2,619	2,672	2,725	**$48,376**

Note: These figures are an estimate based on previous increases in TE allocations with a 2% increase after FY 2011.
Source: Regional Transportation Plan 2007

Total	**$48,376,786**

LOCAL FUNDING

Local contribution to State Highways and regional roadway system in Tulare County is optional by the cities. In Tulare County, Measure R was passed that will generate at least $650 million (30 years) to fund local transportation improvements within the cities and County. These projects may advance projects in the RTP and providing more funds for interchanges and road maintenance. The Measure R expenditure plan can be found on TCAG's website (www.tularecog.org).

Another means of collecting revenue for local streets and roads is through impact and developer fees. Each of the cities and Tulare County has the responsibility and authority to enact and collect these fees in order to make transportation improvements. Tulare County is in the process of creating a Traffic Impact Fee for improvements on county roadway facilities. A Traffic Impact Fee Study (October 2009) has been prepared. This Traffic Impact Fee is expected to be considered and if adopted, implemented following adoption of the General Plan and related EIR.

According to the RTP, several cities will be spending local funds to implement road improvements within their city limits on the regional road system. Traffic Impact Fee programs that have been or may be adopted by the County and the major cities in the County will supplement other funding opportunities to reduce current congestion levels and maintenance conditions on local streets and roads.

FAIR SHARE ALLOWANCE

Fair share allowance of cost will be determined consistent with the requirements of Government Section Code 66000 (AB1600) so that new development can pay a fee for their fair share of mitigation costs for the traffic impacts that will be created. In addition, improvement of local transportation projects can be considered under this program.

5.4 Capital Road Improvements

Methods

TCAG, STIP, FTIP, and RTP.

Key Terms

There are no key terms for this section.

EXISTING CONDITIONS

Regional streets and highways funds are fully programmed through the STIP. As part of the RTP, various transportation modes are discussed and analyzed. The transportation modes include highways, mass transportation, railroad, bicycle, pedestrian, and aviation facilities. The following is a brief summary by transportation mode of proposed action and expected deficiencies.

Over the next thirty years, approximately $615 million in federal and state funding will be available for construction of major road improvements. Over the same time period, approximately $650 million will be available from Measure R sales tax revenue. The following is a summary of major STIP funded projects included as part of the constrained list of projects with the anticipated construction year(s). The list of projects includes a list similar to the 2004 RTP. No new major projects were added to the 2007 RTP due to the budget crisis and project cost increases to approved STIP projects. With the passage of Measure R in 2006; most of the major projects will be on time or advanced. Table 5-10 shows the funding stage and source for various road improvement projects in Tulare County.

Table 5-10. Funding Description and Source for Tulare County Roads

Year	Project	Function	Funding Stage	Funding Amount (X 1000)/Source
City of Dinuba				
2007	Ventura Street	New 2-lane roadway	RTP	$450 / RDA
2007	Saginaw Street	New 2-lane roadway	RTP	$800 / RDA – Private
2008	Road 72	New 2-lane roadway	RTP	$600 / RDA
2007	East Crawford	New 2-lane roadway	RTP	$90 / Private
2007	Nebraska	New 2-lane roadway	RTP	$300 / Private
2007	West Crawford	New 2-lane roadway	RTP	$90 / Private
2007	Crawford	New 2-lane roadway	RTP	$200 / Private
2008	Kamm Avenue	New 2-lane roadway	RTP	$200 / Private
City of Farmersville				
2010	Farmersville Boulevard	Widen to 4 Lanes	RTP	$900 / Measure R
2015	Farmersville Industrial Park	New 2-lane roadway	RTP	$400 / Private – RDA
2010	Hacienda Avenue & Walnut Avenue	Railroad crossing	RTP	$125 / Private – RDA

Table 5-10. Funding Description and Source for Tulare County Roads

Year	Project	Function	Funding Stage	Funding Amount (X 1000)/Source
City of Porterville				
2009	Westwood Street	Widen to 4 Lanes	RTP	$1,100 / Local
2008	Jaye Street – near Gibbons	New 2-lane roadway	RTP	$1,500 / Local
2010	Main Street – near Westwood	Widen to 4 Lanes	RTP	$1,400 / Local
2008	Jaye Street – near SR190	Widen to 4 Lanes	RTP	$1,300 / Local
2010	Gibbons Avenue	Widen to 4 Lanes	RTP	$1,000 / Local
2011	Main Street – near Yates	Widen to 4 Lanes	RTP	$400 / Local
City of Tulare				
2015	Blackstone Drive	Widen to 4 Lanes	RTP	$700 / Local
2025	Bardsley Street	Railroad crossing	RTP	$5,000 / Local
2025	Bardsley Street	Widen to 4 Lanes	RTP	$1,840 / Local
City of Tulare				
2025	Cross Avenue	Widen to 4 Lanes	RTP	$1,415 / Local
2025	Cross Avenue	New 2-lane roadway	RTP	$270 / Local
2025	Prosperity Avenue	Widen to 4 Lanes	RTP	$5,595 / Local
2025	Cartmill Avenue	Widen to 4 Lanes	RTP	$3,300 / Local
2025	Paige Avenue	Widen to 4 Lanes	RTP	$2,600 / Local
2025	Foster Drive	Widen to 4 Lanes	RTP	$870 / Local
2025	West Street	Widen to 4 Lanes	RTP	$3,200 / Local
2025	E Street	Widen to 4 Lanes	RTP	$1,700 / Local
2025	K Street	Widen to 4 Lanes	RTP	$550 / Local
2025	J Street	Widen to 4 Lanes	RTP	$570 / Local
2025	M Street	Widen to 4 Lanes	RTP	$1,800 / Local
2025	O street	Widen to 4 Lanes	RTP	$110 / Local
2015	Blackstone Street	Widen to 4 Lanes	RTP	$220 / Local
2015	Laspina Street	Widen to 4 Lanes	RTP	$145 / Local
2025	Laspina Street	Widen to 4 Lanes	RTP	$245 / Local
2015	Mooney Boulevard	Widen to 4 Lanes	RTP	$2,700 / Local
2025	Turner Drive	Widen to 4 Lanes	RTP	$2,030 / Local
2025	Levin Avenue	New construction	RTP	$750 / Local
2025	Tulare Avenue	Widen to 4 Lanes	RTP	$870 / Local
2025	State Route 137	Rehabilitation	RTP	$700 / Local
2025	Elk Bayou	Widen to 4 Lanes	RTP	$320 / Local
2025	Eastgate Avenue / canal	Bridge	RTP	$80 / Local
2025	Alpine Avenue / canal	Bridge	RTP	$80 / Local
2025	Levin Avenue / canal	Bridge	RTP	$80 / Local
City of Tulare				
2025	Paige Avenue / canal	Widen to 4 Lanes	RTP	$160 / Local
2025	Cartmill Avenue	Widen to 4 Lanes	RTP	$2,100 / Local
2025	Enterprise Street	Widen to 4 Lanes	RTP	$1,850 / Local
2025	West Street	Widen to 4 Lanes	RTP	$1,380 / Local
2025	Blackstone Street	Widen to 4 Lanes	RTP	$1,140 / Local
2025	Bardsley Avenue	Widen to 4 Lanes	RTP	$1,500 / Local
2025	Cartmill Avenue	SPRR Overcrossing	RTP	$5,500 / Local
2025	Pleasant Avenue	New Construction	RTP	$300 / Local
2025	Pratt Street	Widen to 4 Lanes	RTP	$1,200 / Local
2025	Bardsley Avenue	Grade Separation	RTP	$4,856 / Local
2025	Cartmill Avenue	Grade Separation	RTP	$5,315 / Local
2015	Cartmill Avenue	Interchange improvements	RTP	$30,000 / Local
2020	Agri Center Drive	New interchange	RTP	$25,000 / Local
2020	Paige Avenue	Interchange improvements	RTP	$30,000 / Local
Tulare County				

Table 5-10. Funding Description and Source for Tulare County Roads

Year	Project	Function	Funding Stage	Funding Amount (X 1000)/Source
2009	State Route 63	Widen to 6 Lanes	ROW	$27,900 / RIP
2015	State Route 65	Widen to 4 Lanes	RTP	$93,000 / RIP, TCRP
2021	State Route 65 (Spruce)	4 Lane Expressway	RTP	$100,000 / RIP, R
2013 - 2026	State Route 99	Widen to 6 Lanes	Various	$608,000 / IIP, Bonds, Earmark
2030	State Route 190	Passing lanes, Widen to 4	RTP	$70,000 / RIP, R, SHOPP
2013	State Route 198	Widen to 4 Lanes	ROW	$91,000 / RIP, IIP, TCRP, 1B
2013	State Route 216	Widen to 4 Lanes	RTP	$15,000 / RIP
2012	Road 80	Widen to 4 Lanes	PA&ED	$100,900 / RIP, R
2010	Road 108	Widen to 4 Lanes	PA&ED	$22,000 / RIP, R
2014	Avenue 416	Widen to 4 Lanes	RTP	$51,000 / RIP, R
Tulare County				
2015	Avenue 280	Widen to 4 Lanes	RTP	$55,000 / RIP, R
2009	Betty Drive	New Bridge	RTP	$15,000 / RIP, R. Local
2015	Betty Drive	Widen to 4 Lanes	RTP	$8,000 / RIP, R
City of Visalia				
2010	Ben Maddox Way	Widen to 4 lanes	RTP	$5,380 / Local
2010	Houston Avenue	Widen to 4 lanes	RTP	$1,530 / Local
2008	Houston Avenue	Widen to 4 lanes	RTP	$1,500 / Local
2010	Hurley Avenue	Widen to 4 lanes	RTP	$884 / Local
2010	Murray Avenue	Widen to 4 lanes	RTP	$1,500 / Local
2010	Santa Fe Street	Widen to 4 lanes	RTP	$2,000 / Local
2010	Santa Fe Street	Widen to 4 lanes	RTP	$5,680 / Local
2010	Tulare Avenue	Widen to 4 lanes	RTP	$750 / Local
2008	Walnut Avenue	Widen to 4 lanes	RTP	$2,660 / Local
2010	Caldwell Avenue	Widen to 4 lanes	RTP	$1,220 / Local
2007	Caldwell Avenue	Widen to 4 lanes	RTP	$1,680 / Local
2010	Court Street	Widen to 4 lanes	RTP	$1,000 / Local
2010	Ferguson Avenue	Widen to 4 lanes	RTP	$570 / Local
2008	Houston Avenue	Widen to 4 lanes	RTP	$1,280 / Local
2010	Houston Avenue	Widen to 4 lanes	RTP	$3,000 / Local
2008	McAuliff Street	Widen to 4 lanes	RTP	$1,080 / Local
2010	Mooney Boulevard	Widen to 4 lanes	RTP	$690 / Local
2008	Demaree Street	Widen to 4 lanes	RTP	$1,450 / Local
2015	Hurley Avenue	Widen to 4 lanes	RTP	$1,200 / Local
2015	Tulare Avenue	Widen to 4 lanes	RTP	$500 / Local
2025	Demaree Avenue	Widen to 4 lanes	RTP	$1,630 / Local
City of Visalia				
2025	Goshen Avenue	Widen to 4 lanes	RTP	$1,980 / Local
2025	McAuliff Street	Widen to 4 lanes	RTP	$1,760 / Local
2010	Shirk Road	Widen to 4 lanes	RTP	$3,000 / Local
2015	Shirk Road	Widen to 4 lanes	RTP	$4,000 / Local
2020	Akers Road	Widen to 4 lanes	RTP	$1,800 / Local
2020	Shirk Road	Widen to 4 lanes	RTP	$1,600 / Local
2015	Santa Fe Street	Widen to 4 lanes	RTP	$2,000 / Local

Source: TCAG Regional Transportation Plan 2007

5.5 Road System Condition



INTRODUCTION

This section addresses the status of the county's rural roads. The current physical status of the county roadways is noteworthy. Due to a significant reduction of available funding for road maintenance over the past two decades, the county has not been able to adequately maintain its roadway system. This is critical for the agricultural industry that uses these roads for farm-to-market trips and also significantly contributes to road deterioration.

Methods

Information for this section was primarily gathered from the Tulare County RMA.

Key Terms

Pavement Management System (PMS)

EXISTING CONDITIONS

Currently, rural road conditions are deteriorating at an accelerated rate. These county roads are increasingly used by the agricultural and dairy industries to haul their product to market. Large potholes, alligator cracking, and deterioration of the asphalt exist on county roads.

From a capacity standpoint, widening of county roads may not be necessary; however, maintenance to these facilities is critical. Heavy-duty vehicles associated with the agricultural and dairy industries use the roads regularly and are the primary factor for the roads increased deterioration. The increase in dairy and other agricultural activities has exceeded original loading capacities of these rural roads. For over three decades, the increased use of county roads and limited funding for repairs has left many miles of these roads in poor condition.

Heavy duty trucks contribute to the damage of roads much faster than do automobiles. According to the American Association of State Highway and Transportation Officials (AASHTO), a fully loaded truck (80,000 pounds) has an impact on roads equal to the passage of approximately 9,000 cars. In addition, deferred maintenance and water intrusion in the roadbed results in further degradation of roadways.

Understanding that agriculture is the region's economic base, Tulare County strives to maintain and improve the transportation infrastructure that is essential to this industry. For years it has been increasingly difficult to keep pace with necessary maintenance on existing facilities due to financial constraints. In some cases deferred maintenance has become evident. According to Tulare County RMA, deferred maintenance for these poorly maintained roads is estimated to be at least $250 million dollars. The diffused movement of farm to market and other truck dependent industries result in high maintenance costs that restrict funds that otherwise would be used for much needed expansion.

Maintenance for the county's 3,072 miles of roads is provided by four road yards located in Dinuba, Visalia, Porterville, and Terra Bella. Services include road repair projects, pothole patching, snow removal, debris removal, and road drainage. Traffic operations are centralized in Visalia and perform duties including installing and replacing traffic control signs, traffic signal maintenance, and roadway striping. The Operations Division of the Tulare County RMA oversees contract administration, bridge maintenance, road use investigations, materials testing, and coordinates road yard activities. The Project Coordination Division is also responsible for road funding and the Road Pavement Management system.

The *Tulare County Infrastructure Valuation Report,* dated June 2005, found the value for the Tulare County road system. The breakdown was $844 billion for 3,072 miles of roads, $209 billion for 390 bridges, and $950 billion for 18,000 acres of right of way. The conditions of Tulare County roads were rated as either in good, fair, or poor quality. 54.0% of the roads are in good condition, while 36% are in fair condition, and 10% are in poor condition. Gravel roads are rated as being in poor condition.

In the past 30 years there has been an overall increase in road costs. Motor grader has increased by five times and construction maintenance worker labor has increased 3.5 times. In 1966, road oil prices were approximately $22.00 dollars per ton; 40 years later, the cost has now been raised to ten times that at $220.00 dollars per ton.

According to the American Public Works Association (APWA), there has been a significant increase in truck traffic. There has been a steady increase of truck and commodity growth in Tulare County. 30 years ago there were 150,000 trucks with 4,000,000 in tonnage; now, there are 550,000 trucks with 14,000,000 in tonnage.

In Tulare County there is an increase in costs and reduced buying power. For example, in 1970 nearly three times more roadwork was completed than in 2003 (689 miles vs. 250 miles). If the 1970 work was done in 2003, it would have costs nearly five times more than what was available for 2003 ($42 million vs. $9 million). The Pavement Management System Policy that was adopted January 12, 1999, is as follows:

> "Adopted the Pavement Management system that includes a strategy of first priority to funding road repairs serving the greatest number of users and that can be preserved by cost effective preventative maintenance procedures."

The findings of the Pavement Management System are:

- Deferred road repairs have resulted in $254 million of immediate needs to restore the road system;
- Predicts that some roads with low traffic volumes will revert to gravel roads over the next ten years;
- By implementing a strategy of prioritized funding, the overall deterioration of the road system can be slowed but not halted;
- Present funding is inadequate to allow pavement repairs to keep up with the rate of deterioration; and
- Surface deterioration has advanced to the point of needing costly reconstruction in many cases and is the result of deferred maintenance over many years.

Maintenance to Bridges

The widening of any type of roadway often takes into account the high amount of funding that goes along with replacing a bridge for modification to the new roadway system. With Tulare County's abundance of irrigation canals and rivers from the Sierra Nevada mountain range and freeway over crossings, bridge maintenance is a concern.

The Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provides bridge funding with the Highway Bridge Replacement and Rehabilitation Program (HBRRP). Locally, Caltrans Headquarters oversees this program in Tulare County. The purpose of this program is to replace or rehabilitate public highway bridges over waterways, other topographical barriers, other highways, or railroads when the State and FHWA determine that a bridge is significantly important and is unsafe because of structural deficiencies, physical deterioration, or functional obsolescence.

Bridge replacement project candidates selected for the HBRR program shall be structurally deficient or functionally obsolete, have a sufficiency rating below 50, and shall be selected from bridges shown on the federal eligible bridge list (EBL). The EBL is available from the Caltrans District Local Assistance Engineer. Bridge rehabilitation project candidates selected shall be deficient or functionally obsolete, have a sufficiency rating less than or equal to 80, and shall be selected from bridges shown on the EBL.

Reimbursable scopes of work include replacement, rehabilitation, painting, scour countermeasure, bridge approach barrier and railing replacement, low water crossing replacement, and ferry service replacement.

In Tulare County, bridges cross rivers, creeks, canals, ditches, and sloughs. The EBL includes 79 such bridges in Tulare County. Currently, all but one of the 79 bridges are eligible for rehabilitation (a sufficiency rating less than or equal to 80) and 19 bridges (25%) are eligible for bridge replacement (a sufficiency rating below 50).

RURAL ROAD FUNDING

Population instead of road miles apportions monetary funding of roads. Tulare County has nearly 3,100 miles of county maintained roads but proportionally the county has a small population compared other counties in the state. Tulare County has as many as 50 miles of road scheduled for improvements.

The Tulare County RMA receives approximately $6.8 million per year for maintenance with an estimated need of $16.4 million to maintain county roads. Due to this shortage, the county pursues other funding sources to address the unprogrammed needs. Local Transportation Funds (LTF) available for transit can also be utilized for maintenance of local streets and roads, only if there are no unmet transit needs determined.

As stated throughout this document, given the overall increase in sources of local, state, and federal funds that have materialized over the previous decades, the current transportation funding situation for regional and local agencies has resulted in a revenue shortfall both in the areas of capital improvement projects, maintenance and rehabilitation. It is anticipated that revenue shortfalls will continue because the revenues that support the maintenance and improvement of the transportation network are not increasing enough to keep pace with inflation. However, it should be noted that Measure R will lessen that shortfall.

5.6 Air Quality



INTRODUCTION

This section provides a discussion of air quality issues that are related to transportation-related air quality impacts that affect Tulare County. For more details regarding air quality, see Chapter 6.0 Air Quality and Climate Change. Mobile source emissions contribute to emissions that are generated in Tulare County and the San Joaquin Valley that contribute to air pollution. This section provides a description of the types of pollutants that are present in Tulare County and discusses plans and programs that are being undertaken and implemented by local agencies to mitigate these impacts.

Methods

Information from TCAG, San Joaquin Valley Air Pollution Control District (SJVAPCD), California Air Resources Board (ARB), legislation from the California Clean Air Act (CCAA), California Environmental Protection Agency (CEPA), Federal Highway Administration (FHWA), and the United States Environmental Protection Agency (EPA) was used to present the data in this section.

Key Terms

There are no key terms for this section.

EXISTING CONDITIONS

Tulare County is centrally located in the southern section of the San Joaquin Valley. The San Joaquin Valley contains eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the western portion of Kern. These counties represent approximately 16% of California's geographic area. The Valley is surrounded by the Coastal Mountain Range on the west; the Sierra Nevadas on the east; the Tehachapi Mountains on the south; and the Sacramento Valley in the north. For many years, this basin has been the subject of concern for air quality.

High-pressure cells are common to the San Joaquin Valley Air Basin (SJVAB) and create periods of poor ventilation and air stagnation. Due to the Basin's light wind patterns and surrounding mountains, air quality problems occur during any time of the year, especially during the hot summer months. The topography and climate support poor air quality in the Basin. These conditions, coupled with the continuing increase in population, congestion, existing agricultural production, and the high percentage of mobile source emissions has led to significant air quality problems.

In the SJVAB poor air quality can be traced to a number of factors. Major contributors to the deterioration of air quality include: ambient air from coastal air basins; agricultural industry; industrial factors; and vehicle travel characteristics throughout the SJVAB. Concentrations of gaseous pollutants are largely generated by identified mobile and stationary sources. These pollutants include: carbon monoxide; nitrogen dioxide; sulfur dioxide; and hydrocarbons.

Particulate matter can be traced to agricultural activities, mining, planned and unplanned fires, and unpaved and entrained road dust (i.e., car brakes and side road dust). Fuel combustion, solvent use, industrial processes, waste burning, petroleum process, landfills, and pesticides cause ozone. These sources generate significant levels of ROG and NO_x that react in the presence of sunlight to create ozone. This ozone is one of the major air pollutants found in the Valley. Particulate matter can also be formed in chemical reactions in the atmosphere.

The SJVAB is classified nonattainment for ozone, particulate matter less than 10 microns in diameter (PM10) and particulate matter less than 2.5 microns in diameter (PM2.5).

Federal and State Legislation

The Federal Clean Air Act, coupled with TEA 21 and SAFETEA-LU, requires that the RTP integrate transportation and air quality during the planning process. The 1990 California Clean Air Act (CCAA) Amendment requires the following stipulations in order to receive federal funding:

- Establish a permitting program that achieves no net increase in stationary source emissions;
- Develop a strategy to reduce vehicle trips, use and miles traveled;
- Increase average vehicle ridership to 1.5 persons per vehicle during commute hours;
- Establish Best Available Retrofit Control Technology (BARCT) requirements for all permitted sources; and
- Development of indirect and area source programs.

Other Federal Clean Air requirements include the following:

- Reasonably Available Control Measures for transportation sources to comply with federal ozone planning requirements
- Best Available Control Measures for transportation sources to comply with federal PM10 planning requirements

Failure to meet Federal Clean Air Act requirements may result in the following disciplinary actions:

- Limitations on the use of federal funds for highway construction;
- Cut off of federal grants for construction of sewage treatment plants; and
- New and modified stationary sources of air pollution are required to provide a two to one emission offset ratio.

Air Quality Standards

The ARB has created a Air Quality Index (AQI) based on research related to pollutant levels. This AQI is used to inform the public about the quality of the air each day. The AQI in simplest terms is a scale from zero to 500 designed to measure air pollution episode levels. Any measurement on the AQI that is greater than 100 but less than 150 is considered unhealthful for sensitive groups. An AQI of 151 to 200

represents unhealthful air quality for everyone. The AQI also measures first through third stage smog alerts from 200 up to 500 on the index. The AQI scale provides a method of informing the public of air quality problems in an easy to understand format. Tulare County falls into the unhealthful category on many days each year due to elevated particulate matter and ozone concentrations.

The SJVAB topography and climate are two factors that create poor air quality conditions. When an upper layer of warm air forms over the Valley, it traps cooler air along with pollutants at ground level within this natural basin creating a temperature inversion. When there are long periods of stable air, temperature inversions form at elevations between 2,500 and 3,000 feet. Pollutants that are trapped under these inversions cannot rise and subsequently cannot be removed from the Valley through upper air circulation. Thus they remain near the Valley floor continuing to build.

The conditions described above cause the Central Valley to have some of the worst air quality in the nation. Cloudless, hot, dry Valley summers create conditions for the build-up of ozone causing pollutants. Stagnant air in the winter also allows for the build-up of carbon monoxide (CO), PM_{10} and $PM_{2.5}$. As population levels continue to grow in the San Joaquin Valley, increased air pollution counters some of the reductions achieved through air pollution controls.

Due to the air quality conditions of the San Joaquin Valley, the SJVAPCD was created to aid in dealing with these conditions by reducing industrial and vehicle emissions. The SJVAPCD has implemented programs, rules and regulations to reduce the most damaging pollutants threatening agricultural and human health in the San Joaquin Valley.

The pollutants that are of the most concern to the SJVAPCD are Ozone (O_3), PM_{10}, $PM_{2.5}$ and carbon monoxide. Ozone is a colorless, toxic gas produced by a photochemical reaction of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the presence of sunlight. It is the primary component of smog. In Tulare County peak ozone levels occur in the mid-afternoon and can be the cause of a variety of health problems, crop, and even material damage.

Particulate matter less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in size are other pollution hazards found in the SJVAB. These particles may be either in liquid or solid form and include particles of sulfur, nitrogen, carbon or any other variety of combinations of materials. PM_{10} is formed from a variety of sources, including agricultural and mining activities and vehicle traffic, and its effects include reduction in visibility. Because

of the individual particle's size, it can cause respiratory problems when inhaled deeply in the lungs.

Carbon monoxide and nitrogen oxides are produced through combustion processes such as agricultural burning, engine operation, and industrial activities such as boilers, and gas turbines. Carbon monoxide is a poisonous gas that, because its primary source is the automobile, can reach peak levels during heavy traffic episodes. Nitrogen oxides are formed by an airborne chemical reaction between nitrogen and oxygen at high temperatures. The primary problem NO_x poses to Valley air quality is the role it plays in the formation of ozone. Vehicle emissions, other mobile emissions, and stationary sources are the primary sources of NOx in Tulare County.

AIR QUALITY FUNDING

According to TCAG's RTP, over the next thirty years approximately $108 million in Congestion Mitigation and Air Quality (CMAQ) funds are projected to be available for air quality improvement projects. CMAQ funding maybe used for projects that improve air quality. Examples include: low emission vehicles such as hybrid cars, heavy-duty engine replacement, alternative fuel vehicles, alternative fueling stations, sidewalk and shoulder stabilization, bike facilities, paving of unpaved roads, and PM_{10} street sweepers. One possible commitment would dedicate a given percentage or funding level of CMAQ funds to be used for one or more of the following categories:

- Alternative fueling facilities – regional alternative fueling facilities lead to a reduction of emission and encourage multiple agencies to use alternative fuels;
- PM_{10} street sweepers (requires consideration as part of the adoption of the RTP);
- Paving unpaved roads (requires consideration as part of the adoption of the RTP); and
- Heavy-duty engine replacement or retrofit.

The primary purpose of the CMAQ program is to fund projects and programs that reduce transportation related emissions in air quality non-attainment and maintenance areas for ozone, carbon monoxide (CO), and small particulate matter (PM_{10}). Local agencies in the county submit applications for eligible projects when funds are available. Projects are eligible for CMAQ funding are those, which will contribute to attainment of National Ambient Air Quality Standards (NAAQS) with a focus on the above pollutants. Typical projects are:

- Public transit improvements

- Highway occupancy vehicle (HOV) lanes
- Employer-based transportation management plans and incentives
- Traffic flow improvement programs (signal coordination)
- Fringe parking facilities serving multiple occupancy vehicles
- Bicycle and pedestrian facilities
- Flexible work-hour programs
- "PM_{10}" projects under certain conditions
- Passenger Rail and Support Facilities

Current population levels are listed in Table 5-11.

Table 5-11. Department of Finance (DOF) Population Estimates – 2008

Dinuba	20,993
Exeter	10,656
Farmersville	10,524
Lindsay	11,546
Porterville	51,638
Tulare	57,375
Visalia	120,958
Woodlake	7,489
Unincorporated	144,075
TOTAL	**435,254**

Source: California Department of Finance (2008)

All of these measures will be summarized in subsequent sections of this report. On Table 5-12, the 25-year funding plan is shown for improved CMAQ measures in Tulare County.

Table 5-12. CMAQ 25 Year Apportionment Projections for Tulare County (x1000)

07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	Short-Term
4,000	4,300	4,200	5,100	5,100	5,100	5,100	5,300	5,300	5,300	5,300	5,300	**$59,400**
19/20	**20/21**	**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**26/27**	**27/28**	**28/29**	**29/30**	**30/31**	**Long-Term**
5,300	5,500	5,500	5,500	6,000	6,000	6,000	6,500	6,500	6,500	6,500	6,500	**$72,300**
											Total	**$131,700,000**

Note: These figures are an estimate based on historic increases in CMAQ allocations (2007-2030)
Source: Regional Transportation Plan 2007

5.7 Transportation System Management/Transportation Demand Management

INTRODUCTION

This section discusses strategies to increase roadway capacity without relying on major construction improvements.

Methods

The TCAG RTP was used to obtain data regarding Transportation Systems Management and Transportation Demand Management programs in Tulare County.

Key Terms

Transportation Systems Management (TSM)

Transportation Demand Management (TDM)

Traffic Signal Synchronization. Coordinating traffic signals (more than one) that are within a close proximity in order to enhance vehicular progression on roadways, minimize delay and continual starts/stops.

EXISTING CONDITIONS

TSM provides for short-range transportation strategies designed to improve the movement of people, goods, and the operational efficiency of the existing transportation system at minimal cost. The TSM strategies that are currently implemented in the cities within Tulare County on an on-going basis include traffic signal synchronization, provision of left-turn channelization, parking and access management, and similar traffic engineering techniques that maximize the use of existing streets and roads without major construction. These improvements have increased the overall capacity of the highway system in Tulare County without the provision of major capital expenditures.

Transportation Demand Management

TDM consists of managing behavior regarding how, when, and where people travel. TDM strategies are designed to reduce vehicular trips during peak hours by shifting trips to other modes of transportation and reduce trips by providing employment and housing balance. TDMs are specifically targeted at the work force that generates the majority of peak hour traffic. Tulare County participates in the Central Valley Ridesharing outreach program, which is designed to educate employers

and employees toward the benefits of TDMs. Some of the TDM strategies include the following techniques:

- Rideshare programs
- Transit usage
- Flex hours
- Vanpools
- Bicycling & walking
- Telecommuting
- Mixed land uses

Through education, TDM strategies can be implemented and utilized in the circulation system. However, in order to change peoples traveling habits, employers must suggest transportation alternatives such as encouraging employees to reduce single occupant vehicle trips.

Applicable Regions

In Tulare County, the areas with the most severe traffic congestion and which are potential candidates for TDM strategies include the Cities of Visalia, Tulare and Porterville. The City of Visalia, with a population of 120,958, has the highest peak hour congestion in the county. The City of Tulare has a population of 57,375. Trips generated between industries and employment in Visalia and Tulare contribute to the congestion on the State Route 63 (Mooney Boulevard), the Demaree Street/Hillman Street/Road 108, and State Route 137 (Tulare Avenue) corridors during peak hours. In addition, interchanges on State Route 99 in Tulare and State Route 198 in Visalia also experience peak hour congestion.

The City of Porterville, with a population of 51,638, is also showing signs of congestion on portions of its primary street network, i.e., the Olive Avenue, Henderson Avenue, Jaye Street, State Route 190 corridors. Dinuba, with a population of 20,993, experiences peak hour congestion on the Alta Avenue and El Monte Way corridors. These regions in the county have the highest potential to experience severe traffic congestion and are prime candidates to utilize TDM strategies. TCAG currently encourages these cities to study TDM strategies and take advantage of available programs to implement such strategies in their communities.

Strategies

A valuable TDM resource is available to the county and cities. TCAG actively educates and encourages employers to inform their employees about alternatives for transportation. TCAG provides its member agency

with TDM programs such as the Central Valley Rideshare outreach program that matches compatible commuters within and beyond Tulare County. TCAG also educates the public through informational flyers and booths at local events and fairs. As a tool to reduce congestion and environmental improvements the SJVAPCD, TCAG, and local agencies endorse TDM strategies. Employers are encouraged to endorse the following TDM strategies:

- Economic incentives
- Regulatory parking spaces; locker rooms and showers (for pedestrians and bikers)
- Satellite work stations
- Institute flexible work hours
- Subsidize transit cost
- Form a Transportation Management Agency (TMA)

5.8 Rail Transportation

INTRODUCTION

This section provides a description of three existing railroad operators and shows a map of existing railroads in the county. There is also a discussion regarding AMTRAK services that are provided to county residents in neighboring Kings County.

Methods

In order to obtain information related to rail transportation, the websites of Burlington Northern & Santa Fe Rail Road (BN&SF), Union Pacific Railroad (UP), San Joaquin Valley Railroad (SJVRR), and AMTRAK were utilized as the primary source of information. This information included maps, passenger/freight information, and schedule of routes (if known). In addition, information from the 2007 TCAG RTP was used.

Key Terms

There are no key terms for this section.

EXISTING CONDITIONS

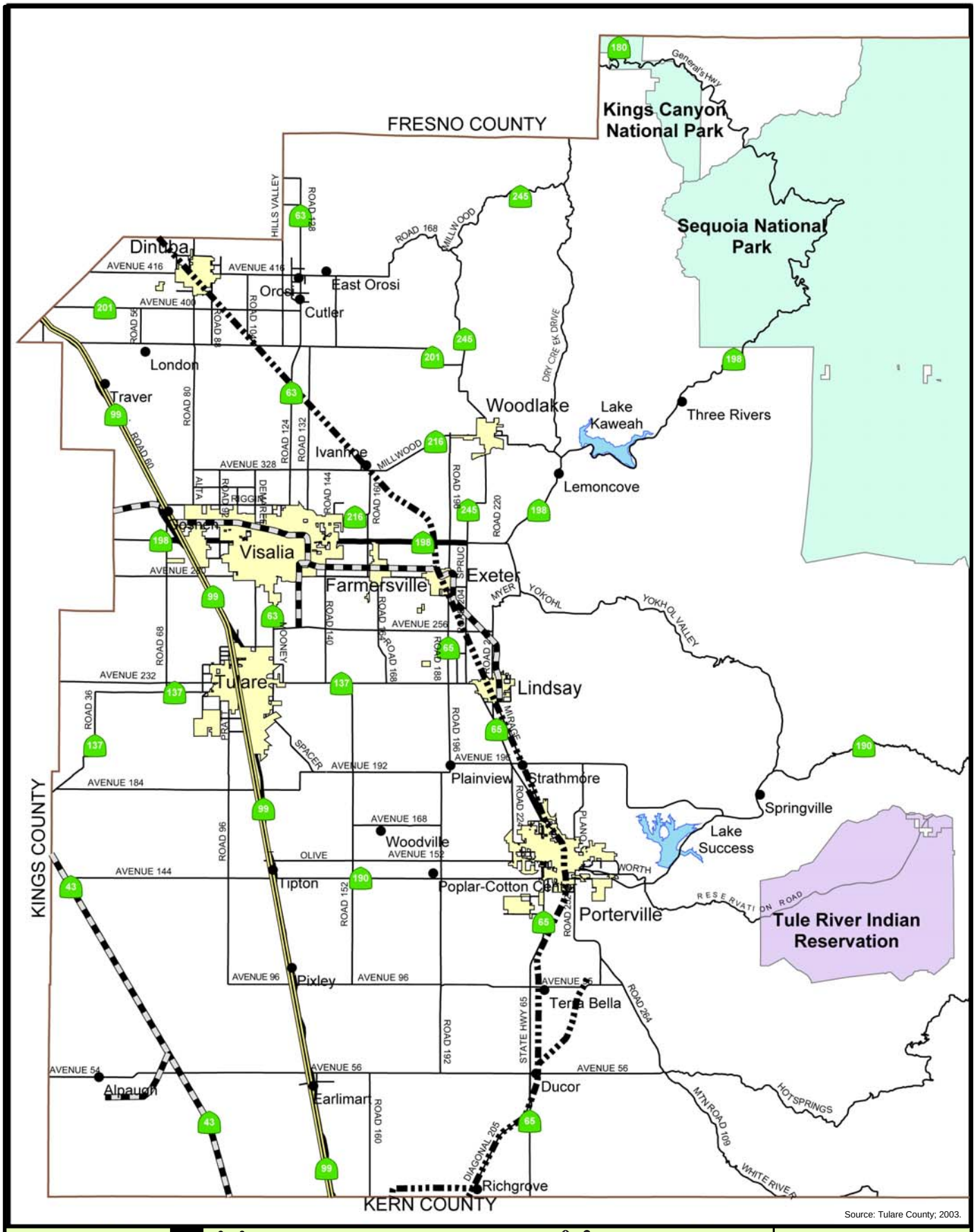
UP, BN&SF, and SJVRR provide freight service in Tulare County, connecting the county with major markets within California (Oakland/San Francisco/San Jose, Sacramento, and Los Angeles) and to other destinations. Routes of principal rail lines in the county are identified in Figure 5-4. However, the SJVRR recently abandoned an approximately 30 mile stretch of rail between Jovista and Strathmore on the eastern side of the County. Freight terminals and service to specific industries are located throughout the county. Though the railroads are reluctant to provide information on the amount of freight originating in the county, it is likely that the predominant mode for freight movements in the county will continue to be by truck in the foreseeable future. Grain/ethanol plants have been proposed in Goshen, Pixley, and Dinuba that have rail transport as a common denominator in their project sites; these railroads would allow corn and other feedstock to be transported to/from the plant efficiently.

Passenger rail service (six round trips daily) in the county is provided by AMTRAK on its San Joaquin service, with the nearest rail station facility located in the City of Hanford (Kings County). AMTRAK provides bus connections to and from Visalia (twice daily) and Goshen Junction (two times daily) to the Hanford station. Either Orange Belt Stages or Greyhound provides service to AMTRAK from downtown Visalia.

Cross Valley Rail Project

In 1994 the conception of upgrading and renovating the 44-mile east-west San Joaquin Valley Rail line from Huron (Fresno County) to Visalia was proposed. This plan has potentially profound benefits to the following:

- Increased opportunities for industrial development, which would improve the economic viability of communities along the corridor;
- Improved air quality as a pair of locomotives can pull the equivalent of 225 trucks;
- Reduction in road maintenance costs because of decreased truck traffic; and
- Improved safety on rural roads with less truck traffic.



Tulare County General Plan Update

0 2 4 8 Miles

Freeways
Major Roads
State or County Route
Lakes
County Boundary
National Parks
City Limits
Unincorporated Communities
Burlington Northern Railroad
San Joaquin Valley Railroad
Union Pacific Railroad

FIGURE 5-4

Existing Rail Transportation System

Cross Valley Rail Improvements

The Cross Valley Rail improvement project was completed in 2003. It cost approximately $14 million for the 44-mile track improvement project between Huron and Visalia. The project is designed to allow food processing and industrial businesses to ship by rail as opposed to heavy-duty trucks. Funding was made possible through funds from public and private entities, including CMAQ funds from Tulare, Kings, and Fresno County Council of Governments (COFCG), contributions from the Los Gatos Tomato Company, and SJVAPCD.

High Speed Rail

The California High Speed Rail Authority is currently in the process of implementing a high-speed rail system that would provide passenger transportation and goods movement services throughout much of California. Through the EIR process, the preferred alignment and stations have been identified. Although the preferred alignment travels through the southwest portion of Tulare County, the nearest stations would likely be located in Hanford, Fresno, and Bakersfield. The board acknowledged that routing the rail through Hanford would save significantly on EIR's and noise issues. Having a stop between Fresno and Bakersfield adds time to the trip and was considered a determining factor.

The purpose of the High Speed Rail system is to provide a reliable mode of travel that links the major metropolitan areas of the state and delivers predictable and consistent travel times. According to the Authority, high-speed rail is projected to carry as many as 117 million passengers annually by 2030 with estimated revenue of $3.9 billion.

Further objectives of the High Speed Rail system are to provide an interface with commercial airports, mass transit, and the highway network, and to relieve vehicular capacity constraints of the existing transportation system as intercity travel demand in California increases. Given that the highest growth rate in California's future is in the Central Valley, the need for improved intercity transportation is demonstrated by the insufficient capacity of the existing vehicular transportation system to meet current and expected future travel demand. The need is also reflected in the poor air quality, impaired travel reliability, and increased travel congestion and longer travels times. According to the Authority, in most instances the High Speed Rail is an alternative that would improve the travel options available in the Central Valley and other areas of the state when compared to limited bus, rail, and air service for intercity trips that exist today.

According to the Authority, the cost of this project is estimated to be between $40 billion and $66 billion (2006 dollars), depending upon the alignment and the station options selected. The cost estimate includes right-of-way track, guide way, tunneling, stations, and mitigation. The right-of-way requirements for expansion of the freeways in the Central Valley would potentially impact 609 acres of farmlands. The high-speed rail, based on the system wide application of a 100-foot right of way, could potentially impact a maximum of 2,096 to 3,002 acres. By reducing the right-of-way to 50 feet this could potentially reduce the acquisition of farmland taken for right-of-way in the valley. Funding for this project may occur in November of 2008 in the form of a ballot measure.

After completing the EIRs, if the State of California decides to proceed with the development of the proposed High Speed Rail system, an initial implementation phase of the project would include preliminary engineering and project level environmental review to the extent needed to assess potential environmental impacts not already addressed. Project level environmental review would focus on a portion or portions of the proposed high speed rail system and would provide further analysis of potential impacts and issues at an appropriate level of detail in order to obtain needed permits and to proceed with the project.

RAILROAD FUNDING

Major improvements were completed to the Cross Valley Rail. The project was funded with a number of financial sources including CMAQ funding. Phase II of the Cross Valley rail will consider the provision of passenger service from Visalia to Lemoore Naval Air Station (NAS). CMAQ funding may be used for rail improvements that demonstrate a reduction of pollutants. Other areas related to rail is the preservation of abandoned rail corridors for future improvements or conversion to bike/pedestrian facilities.

The High Speed Rail Program EIR has been released for public review. The preferred alignment through the San Joaquin Valley has been selected. Following this selection, regional access will be evaluated including adjacent land uses, transit, and road capacity. Capital funding for the High Speed Rail would have to be approved by voters and would appear as a bond measure. In addition to the HSR lines receiving funds, conventional railroads will be improved to serve the HSR.

5.9 Aviation System

INTRODUCTION

In this section, the existing airport facilities within the county are described. This section includes a discussion of airport types and locations.

Methods

The Tulare County Aviation Element and Airport System Plan, Central California Aviation System Plan (CCASP), 2007 TCAG RTP, and local circulation elements were obtained in order to reference existing conditions. In addition, data was obtained from the Visalia Airport.

Key Terms

Public Airport. Airports owned by public agencies, such as a city or county.

Public Airport with Special Use. Publicly owned airports that allow special uses such as crop dusting activities.

Private Airport. Privately owned and operated airport.

EXISTING CONDITIONS

The Tulare County Board of Supervisors adopted the Tulare County Aviation Element and Airport System Plan in April 1985, as part of the Tulare County Circulation Element. The element addresses the aviation needs within the county as shown in Figure 5-5. There are seven public use airports in the county. The public owned airports are Visalia Municipal, Porterville Municipal, Woodlake, Mefford Field and Sequoia Field. Two of the airports are private airports open to public use (Eckert and Thunderhawk). There are also a number of privately owned, special use airports. According to Tulare County, Alta and Pixley (Harmon Field) airports are currently closed and Badger Field is under Federal Aviation Administration (FAA) recertification as a restricted private airfield.

Only Visalia, Porterville, and Mefford Field (City of Tulare) airports generate significant air traffic for the county's circulation system. The only passenger air service within the county is provided at the Visalia Municipal Airport (VIS). This service is a daily circuit from VIS to Ontario (ONT) Las Vegas (LAS) with connections to other destinations.

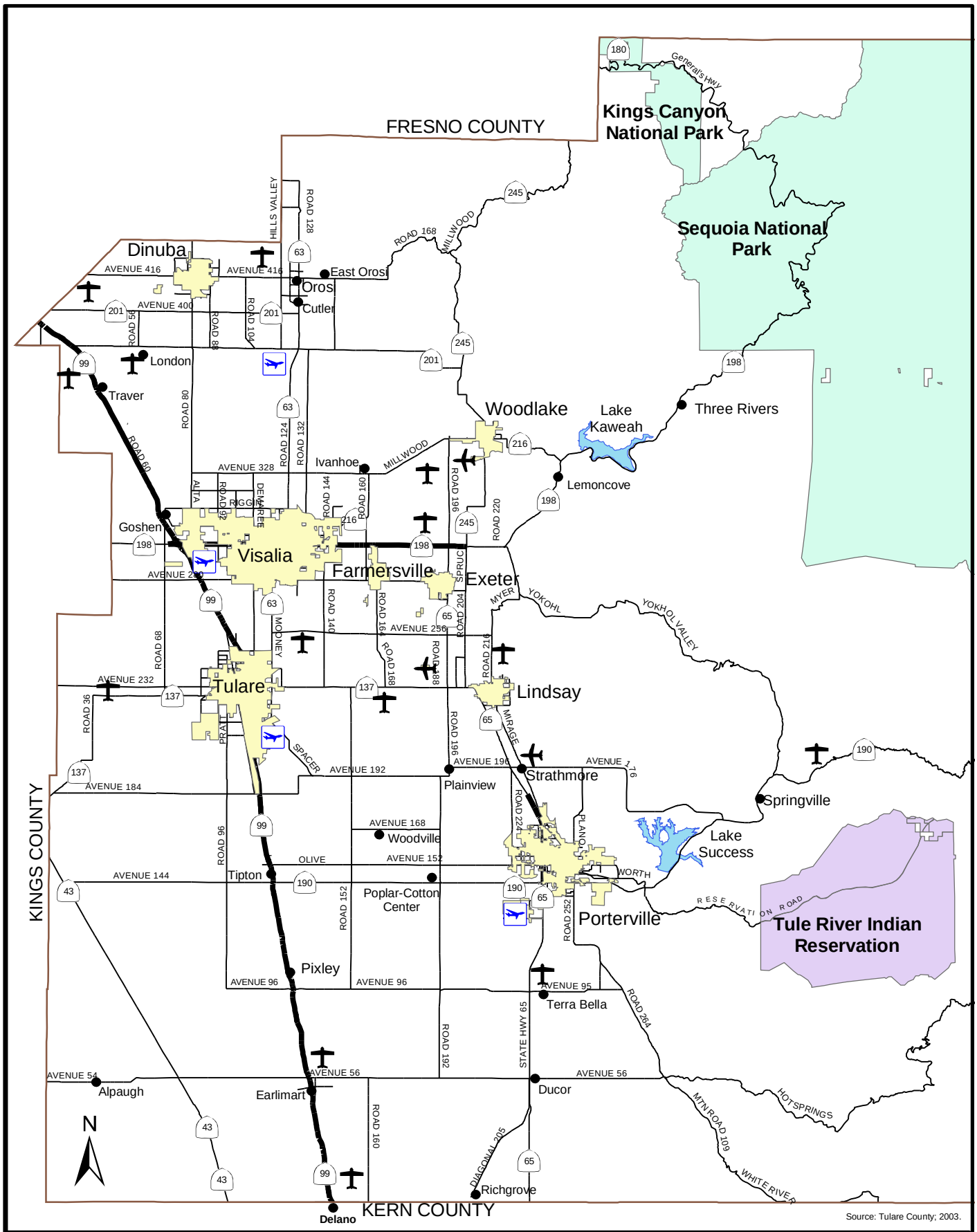


FIGURE 5-5
Existing Airports

AVIATION FUNDING

On March 8, 2007, the TCAG Board adopted the 2007 Regional Transportation Plan (RTP). The RTP included the Tulare County Aeronautics Capital Improvement Plan (CIP). The CIP identifies a list of potential public-use, aeronautical projects for the next tens years. The projects listed are eligible for funding from the State Aeronautics Account, including the State portion of the local match for the FAA Airport Improvement projects (AIP). The CIP lists of projects totals approximately $17.8 million. The City of Visalia Airport identifies $19.4 million in improvements over the next twenty years.

On Table 5-13, The Long Range and Short Range Budget Plan for the Visalia Airport for the next 25 years is shown below.

Table 5-13. City of Visalia Long Range and Short Range Improvement Plans (Costs in 1,000's)

	Short Range Projects (Within 5 Years)	**Total**	**Federal**	**City**
1	Construct T-Hangar	730	80	650
2	Construct hangar taxiway	270	243	27
3	Property acquisition (fee simple)	560	504	56
4	Reconstruct commercial apron	650	585	65
5	Overlay transient apron	250	225	25
6	Construct south side parallel taxiway (south half)	2500	2250	250
7	Reconstruct east apron	385	270	115
8	Install fire station vehicle exhaust system	25	0	25
9	Purchase new tractor	26.4	0	26.4
10	Paint trim on nine T-Hangar buildings	19.9	0	18.9
11	Extend sewer and water to south side	60	0	60
12	Construct John Jay Inn storm sewer improvements	20	0	20
13	Replace 10 runway / taxiway signs	25.5	0	25.5
14	Purchase aircraft towing vehicle (replacement)	22.5	0	22.5
15	South side safety area drainage	385	346.5	38.5
16	Construct airport maintenance facility	65.4	0	65.4
17	Replace commercial ramp	615	553.5	61.5
18	Overlay slurry seal east hangar area and access taxiway	200	135	65
19	Purchase 4WD sport utility vehicle (replacement)	30	0	30
20	Terminal and baggage claim remodel	80	40	40
	Subtotal	***6919.7***	***5232***	***1686.7***
	Mid-Range Projects (approximately 5 to 10 Years)	**Total**	**Federal**	**City**
1	Construct hangar taxi lane	250	225	25
2	Construct T-Hangar	650	0	650
3	Property acquisition (fee simple)	570	513	57
4	Reconstruct based aircraft tie down apron	750	540	210
5	Seal cargo apron, west & central hangar & taxiways A and B	150	135	15
6	Seal Taxiway D, north connector taxiways, south apron, south apron taxiway	225	202.5	22.5
	Subtotal	***2595***	***1615.5***	***979.5***
	Long-Range Projects (approximately 10 to 20 Years)	**Total**	**Federal**	**City**
1	Construct runway and parallel taxiway extension	6200	5580	620
2	Seal tiedown and hangar pavements	350	270	80
3	Property acquisition (fee simple & approach protection easement)	1500	1350	150
	Subtotal	***8050***	***7200***	***850***
	Very Long-Range Projects (beyond 20 Years)	**Total**	**Federal**	**City**
1	Construct south side parallel taxiway north half)	1800	1620	180
	Subtotal	***1800***	***1620***	***180***
	Total	***$19,365***	***$15,668***	***$3,696***

Source: City of Visalia 2004, Shutt Moen Associates (May 2000)

Central California Aviation Systems Plan (CCASP)

The most recent CCASP update was completed in 1997. The purpose of the CCASP is to develop an integrated aviation plan for the Central Valley. The plan displays a summary of current aviation activity, establishes goals, and objectives for improving the present aviation systems, and forecasts future needs and courses of action for each county. The CCASP is a direct result of a legislative mandate requiring the State of California to have a comprehensive aviation system plan. The CCASP is integrated into the California Aviation System Plan (CASP), fulfilling the mandate. The CCASP encompasses the counties of Yuba, Sutter, Placer, Yolo, Sacramento, San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Kern, and Tulare.

On Table 5-14 funding is broken down by the open airports in the county, the capital expenditures involved, and where the funding is derived from.

Table 5-14. Central California Aviation System Plan (CCASP) Capital Improvement Program (CIP)

	PROJECT DESCRIPTION	COST	Funding		Year Requested
			State	FAA	
Mefford Field					
	Environmental assessment	$157,900	X	X	2006
	Purchase & install AWOS – extend power	$360,000	X	X	2006
	Land Exchange & fencing	$75,000	X	X	2007
	Land Exchange & fencing	$276,000	X	X	2008
	Water and sewer infrastructure – well	$569,000	X	X	2009
	Relocation of Dale Fry Road	$300,000	X	X	2010
		$2,627,425			
Porterville Municipal Airport					
	Airport Master Plan update	$150,000	X	X	2006
	Environmental documentation	$150,000	X	X	2006
	Construct ramp & compass calibration apron	$199,500	X	X	2007
	Rehabilitate TWY (Convert Abandoned Runway)	$2,161,250	X	X	2008
	Land acquisition	$0	X	X	2010
		2,660,750			
Sequoia Field Airport					
	Runway improvements & new MIRL system	$760,000	X	X	2006
	Reconstruct parallel & connecting taxiways	$712,500	X	X	2006
	Airport master plan update	$150,005	X	X	2010
	Reconstruct portion of apron	$475,000	X	X	2007
	Environmental assessment	$150,005	X	X	2008
	Airfield grading & drainage	$332,500	X	X	2009
		$2,580,010			
Visalia Municipal Airport					
	Construct south side taxiway – phase III	$981,667	X	X	2006
	Engineering design – project 3 thru 9	$160,000	X	X	2006
	New electrical service to East tee hangers	$100,000	X	X	2006
	Replace existing VASI with new 2-box PAPI on runway 30	$65,000	X	X	2006
	Construct 10 unit nested tee hanger	$500,000	X	X	2006
	West side hanger development	$1,072,000	X	X	2007
	Construct service road to ARFF building	$78,000	X	X	2007

Table 5-14. Central California Aviation System Plan (CCASP) Capital Improvement Program (CIP)

	PROJECT DESCRIPTION	COST	Funding		Year Requested
			State	FAA	
	East side access road	$216,000	X	X	2007
	Commercial ramp replacement	$952,000	X	X	2008
	Engineering design	$250,000	X	X	2008
	Airport layout plan update	$300,000	X	X	2009
	Terminal expansion – 30% increase	$625,000	X	X	2009
	Taxiway & apron to golf course	$423,000	X	X	2009
	Runway 12-30 extension, blast pad, relocate MALSF	$3,076,000	X	X	2010
	Environmental assessment	$350,000	X	X	2010
	Visalia Total	$9,148,667			
Woodlake Airport					
	Apron	$136,563	X	X	2008
	Hanger TWY	$91,852	X	X	2008
	T-hangers (8 units)	$237,500	X	X	2008
	Access road	$33,447	X	X	2010
	Auto parking	$50,630	X	X	2010
	Apron	$136,563	X	X	2010
	RWY, TWY and apron seal coat / markings	$120,974	X	X	2010
		$807,529			

Source: Regional Transportation Plan 2007

5.10 Goods Movement

INTRODUCTION

This section discusses typical ways in which goods are transported in Tulare County. Heavy-duty trucks account for the majority of goods movement in Tulare County with rail providing the regional shipment mode.

Methods

The 2007 TCAG RTP was the primary source used to obtain data related to goods movement in Tulare County. In addition, the Caltrans and California Trucking Association (CTA) websites were researched.

Key Terms

Surface Transportation Assistance Act (1982) (STAA). This act established a National Network of long haul truck routes. These routes are also called Terminal Access Routes.

Heavy Duty Truck. Any truck that has a gross vehicle weight more than 8,500 pounds.

EXISTING CONDITIONS

Agricultural, commercial, and industrial land uses are the principal generators of truck traffic in the county. Since agriculture is the largest industry in the county, overall truck traffic generated by agricultural uses should remain stable in the future. However, relocation and replacement of individual agricultural processing plants and other new industries can significantly alter regional and localized traffic patterns. The concentration of truck traffic within cities and unincorporated communities is also a concern. As continued industrial growth is expected to increase within the county, the scale of industrial-related truck traffic will continue to increase.

Several state highway facilities in Tulare County are designated STAA routes or terminal access routes. Many State highways within the county, including State Routes 43, 63, 65, 99, 137, 190, 198, 201, 216, and 245 are included in the state truck network. STAA routes permit a single trailer with a 48-foot maximum length or double trailers with a maximum length of 28 ½ feet (each trailer).

Portions of State Routes 190 (2 miles east of Springville), 198 (Three Rivers post office), and 245 (north of Woodlake), which are predominantly mountain corridor areas, are designated as STAA California Legal Advisory Routes. This designation means that travel is not advised for trailers longer than 38 feet. In Sequoia and Kings Canyon National Park, trucks longer that 22 feet are restricted. In general, city streets and county roads are not included in the STAA network.

According to Caltrans, the percentage of heavy-duty trucks on State highways ranges by location. For instance, the vehicle composition on State Routes 65 and 198 generally contain approximately 16% heavy-duty trucks; and State Route 99 contains 26 to 28% heavy-duty trucks, which is well above the normal percentage for a major transportation facility. These high percentages make transportation in Tulare County potentially more hazardous and pollution adds to the growing air quality problem in the area. Many of the truck trips on State Route 99 are not generated by trucks in Tulare County; rather they are inter-regional with origins and destinations generally north and south of Tulare County. Intrastate travel in California traverses State Route 99 and Interstate 5 to bring goods movement to the urban centers to the north, south and in-between.

Types and locations of freight terminals in Tulare County are as diverse as the commodities that are produced here. Many of the terminals are agriculture based in the form of packing and processing plants. These facilities are spread throughout the county. There are citrus-related

facilities in the eastern and northern portion of the Valley floor in the county and many of these are located along rail lines or spurs. There are cotton gins and other grain facilities located in western Tulare County. The Porterville vicinity has these types of facilities, as well as others. One notable facility in Porterville is the Wal-Mart distribution center. This facility was planned for exclusive truck delivery and distribution, and generates and attracts several hundred-truck trips each day to and from the Porterville area.

Regardless of the type of terminal, there is always a trip to the facility for every trip from the facility (i.e., trip end). Economics dictate the most efficient use of trucks, but cooperation and communication between operators, terminals, trucking associations, and transportation planners ensures the most efficient use of resources.

Cooperative efforts between the trucking industries, the driving public, and local officials are made to assess the impacts that trucks have on local streets, and to create regulatory guidelines for trucks in urban areas. Alternative transportation modes for long haul movement of goods should be explored. These include improved intermodal freight transfer facilities and access at major airports and rail terminals.

As a result of surveys conducted for the San Joaquin Valley Goods Movement Study, several significant truck operational issues were found. These trucking issues include congestion, railroad crossings, roadway geometry, parking rest area problems, route restrictions, and signal timing. These issues should be considered throughout the transportation planning process.

NAFTA Cross Border Trucking Regulations

According to the General Accounting Office, cross-border traffic has soared 170% since NAFTA went into effect, with more than 4.2 million truck crossings in 1999 alone.

This corridor has shown a dramatic growth in vehicle traffic since NAFTA was implemented in 1994. In 2005, there were nearly 12 million truck crossings into the United States from Canada and Mexico. With this tremendous increase in traffic, existing facilities and infrastructure have been overwhelmed, resulting in lengthy delays for vehicles waiting to clear customs and inspection.

Trucks, which are heavy emitters of nitrogen oxides and particulates, can idle for hours while waiting to cross the border. Moreover, once they do so, their sheer numbers are severely congesting the roadways in California and Mexico, further exacerbating air quality problems.

More than 4 million trucks enter the United States from Mexico every year, but they were required to stay within 20 miles of the border. The federal government estimates the latest U.S. Supreme Court decision would allow up to 34,000 more Mexican Trucks to enter the United States and travel farther into the country, possibly traveling on State Route 99 to get to their desired destination.

Although it is careful to assume that most destinations will conclude in the greater Los Angeles Basin and that long haul trucks from Mexico have the latest in emission standards, this may not always be the case; all trucks entering the country did not have emission standards until 1993 and destinations were throughout California and the United States. In every case lawmakers concede pros and cons with the latest NAFTA ruling, the pros being a cheaper product for the consumer and the cons being congestion and unsatisfactory emission standards that can have a negative effect on air quality in Tulare County.

5.11 Public Transportation



INTRODUCTION

This section describes the existing transit service providers in the county and its eight incorporated cities. It also provides transit ridership data for Fixed Route and Dial-a-Ride services. A discussion is also included regarding the county's common carriers.

Methods

In order to collect transit and common carrier information, every transit provider in Tulare County was contacted. Tulare County and cities that provide transit services – Exeter, Dinuba, Porterville, Tulare, Woodlake, and Visalia – submitted ridership numbers and information related to schedules and fares. TCAG also provided data related to the annual unmet transit needs meeting.

Key Terms

FTA. Federal Transit Administration.

TCaT. Tulare County Area Transit.

Fixed Route. Regularly scheduled routes that operate on set days and times. Transit riders are able to obtain route maps that show pick-up and drop-off times and bus stop locations.

Dial-a-Ride. This service picks up and drops off passengers anywhere within the designated jurisdiction. Elderly and handicapped passengers generally use this service.

Common Carrier. A privately owned bus or charter service that provides service to destinations beyond the county, i.e., Orange Belt Stages, Greyhound Bus Lines, and Eagle Mountain Casino Shuttle.

EXISTING CONDITIONS

The cities of Dinuba, Woodlake, Exeter, and Porterville provide either dial-a-ride service or fixed-route transit service. The cities of Tulare (fixed route service annual ridership of 346,343 and a Dial-a-Ride service annual ridership of 34,328), and Visalia (total ridership of 1,460,000) operate their own public transportation services and intermodal transit centers to diversify travel linkage.

Short and Long Term Transit Plans

The City of Visalia has completed both short and long-range transit plans. The Cities of Porterville, Tulare, Dinuba, Woodlake and the incorporated areas of Tulare County have completed short-range transit plans in the form of five year Transit Development Plan (TDP) funded through Federal Transit Administration (FTA) grant assistance programs.

TDPs serve as a short-range transit plan that is to be updated every five years for cities that operate fixed route transit or demand responsive service. The incorporated City of Lindsay is a small rural community that does not operate transit; however, the County provides these cities with transit service. Visalia City Coach (VCC) currently offers transit service to the City of Farmersville, City of Exeter and Sequoia National Park. The following is a summary of Tulare County's public transit system including a brief overview of the operations, fares, schedules, and long and short-range transportation development plans.

Tulare County Area Transit

Tulare County Area Transit (TCaT) has been providing rural route service between various cities and towns since 1981. Trans West Specialists has been the contractor and operator of TCaT since its inception. TCaT provides both rural route service and local demand responsive service in and around various County communities. TCaT operates 8 different fixed route services between communities and provides a local dial a ride program within communities.

TCaT is the primary transportation outlet linking Tulare County's rural and unincorporated communities to other communities within the region. Consisting of several routes from Three Rivers to Delano to Dinuba, TCaT interconnects the County's transportation needs in relation to the rural composition of the area.

TCaT offers bus service between cities and communities in the county via eight routes:

- The North County route serves Visalia, north Visalia, Seville, Cutler, Orosi, Patterson Tract, East Orosi, Yettem, Seville, Sultana, and Dinuba (Monday through Saturday);
- The South County route includes Delano (Kern County), Richgrove, Earlimart, Teviston, Pixley, Tipton, Matheny Tract, and Tulare (Monday through Saturday);
- The Northeast County route includes Visalia, Three Rivers, Woodlake, Ivanhoe, and Lemon Cove (Monday through Saturday);
- The Southeast County route includes Visalia, Tulare, Lindsay, Strathmore and Porterville (Monday through Saturday);
- The Lindsay-Strathmore-Plainview-Porterville route runs Monday through Friday;
- The Woodville-Poplar-Porterville route, which serves Woodville, Cotton Center, Poplar, and Porterville (Monday through Friday);
- The Dinuba-London-Traver-Delft Colony Route that serves Delft Colony, London, Dinuba, and Traver (Monday through Friday);
- Porterville-Springville route runs Tuesday, Thursday and Friday only and Porterville-Terra Bella route runs Monday and Wednesday only.

Operating Monday through Saturday, TCaT begins at 5:30 am and ends at 7:30 p.m., making numerous stops per day. The fare for an adult one-

way ticket is $1.50 and Dial-a-Ride is $0.75. Children six (6) years of age and younger can ride for free when accompanied by a fare-paying adult. TCaT also provides monthly passes for $45.00. In addition, discounts are available on purchases of 10 or more passes. Figure 5-6 identifies existing TCAT transit routes and also shows city and community transit service areas. However, some rural communities are underserved compared with other similar areas. The Porterville-Springville and the Porterville-Terra Bella routes offer limited services on alternating days but now offers service on Fridays.

Visalia City Coach

Visalia City Coach (VCC) is the main public transportation link within the City of Visalia as well as several surrounding cities. VCC operates seven days a week, with a one-way fare of $1.00 ($0.75 for handicapped and disabled). An all day ride pass is offered for $2.00. On weekdays service is provided from 6:00 am to 9:30 p.m., Saturday and Sunday service is provided between 9:00 a.m. to 6:30 p.m. VCC offers many stops within Visalia and provides transit service to the downtown transit center to better provide the community with a variety of transportation options throughout the county.

City of Porterville

Since 1997, City Owned Local Transit (COLT) has been the fixed route provider for the City of Porterville. COLT service provides eight routes within the City of Porterville, running Monday through Friday from 7:00 a.m. to 7:00 p.m. and 9:00 a.m. to 5:00 p.m. on Saturdays. These routes link to a downtown transit center and the general public can ride on a one-way trip for $1.00. According to the COLT website total ridership totaled 515,523 for the 2007/08 fiscal year. Dial-a-ride is offered from Monday through Friday from 7:00 a.m. to 8:00 p.m. and Saturday from 9:00 a.m. to 6:00 p.m. with a cost of $1.50 per ride for seniors and $3.00 for general passengers.

City of Dinuba

The City of Dinuba provides both fixed route service and dial-a-ride service for the surrounding residents. Dinuba is under contract with MV Transportation to provide transit service until 2009. Two fixed routes are provided; one is for citywide movements (Jolly Trolley) and the second provides a commercial route (Dinuba Connection) that serves major retail locations throughout the city. The Jolly Trolley operates from 9:00 a.m. to 6:00 p.m. with a fare of $0.25. The Dinuba Connection operates from 7:00 a.m. to 9:00 p.m. on Monday through Friday. The Dinuba Connection route is $1.50 for most riders and students/seniors pay $1.25. The dial-a-ride is offered from 7:30 a.m. to 4:30 p.m. with a cost of $1.50 per ride.

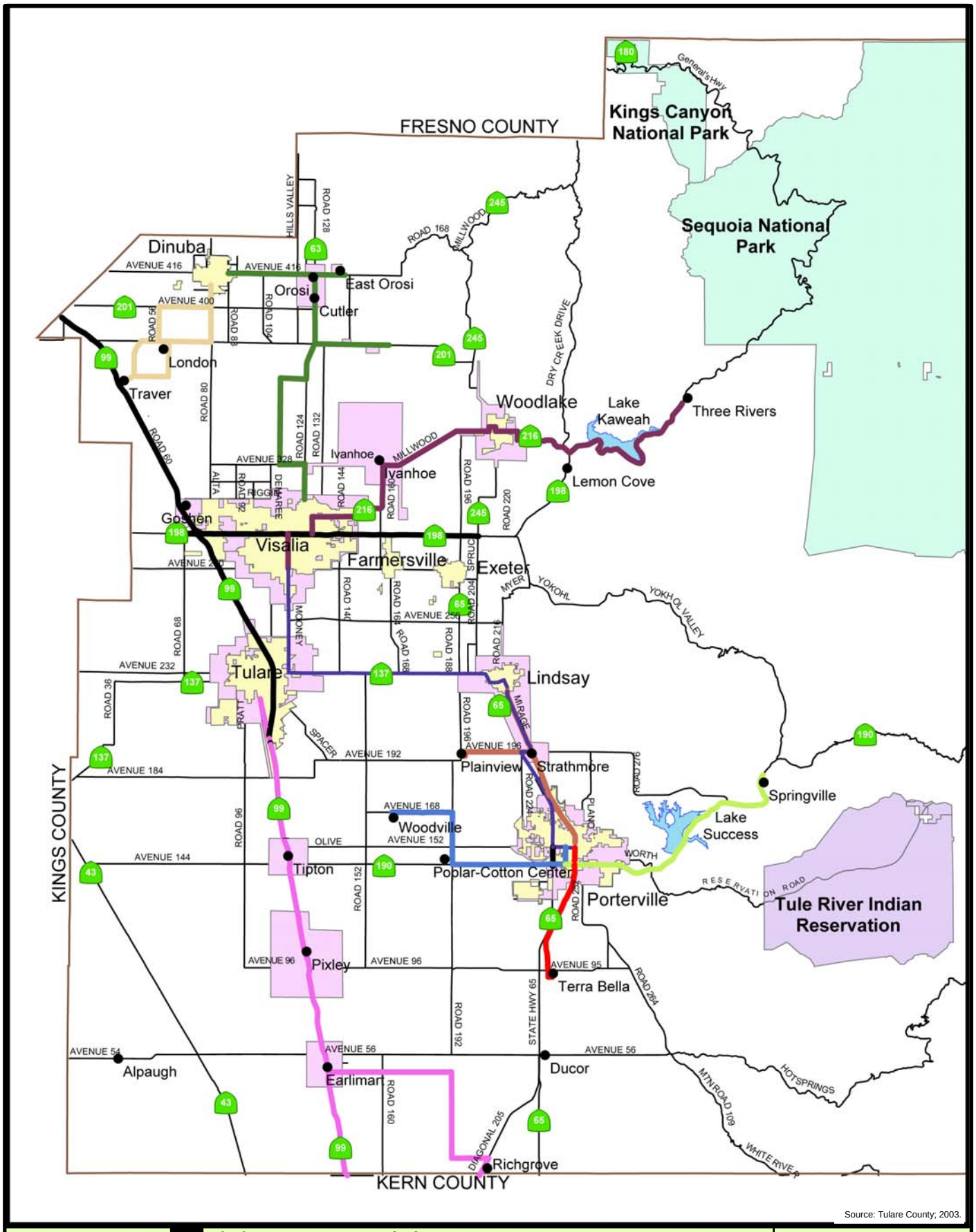


FIGURE 5-6

Existing Tulare County Transit Routes and Service Areas

City of Woodlake

The City of Woodlake provides Dial-A-Ride services. A one-way fare is $0.75 for general passengers and $0.25 for seniors. The service is available everyday between 7:00 a.m. to 3:30 p.m.

City of Exeter

The City of Exeter provides Dial-A-Ridge services. A one-way fare is $2.00 and service is available from 8:30 a.m. to 4:15 p.m. Monday thru Friday. Seniors 65 years of age and older ride for free.

Tulare Intermodal Express

Tulare Intermodal Express (TTE) has been city operated since 1992; currently, the routes have increased in number to the present day of six within the city limits. The fares for the general public are $1.00 with links to TCAT, VCC, and Greyhound's and Orange Belt's services. Services run from 6:30 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:30 p.m. on Saturdays. A Dial-A-Ride service is provided for $2.00 and operates Monday thru Friday from 6:00 a.m. to 6:00 p.m. and on Saturday from 7:00 a.m. to 6:00 p.m.

County of Tulare Dial-a-Ride

County of Tulare Dial-a-Ride offers service in most of the major communities of Tulare County. Dial-a-Ride service offers curb-to-curb service within most of the populated areas of Tulare County. This service operates on weekdays from 5:30 a.m. to 6:00 p.m. and on Saturdays 7:00 a.m. to 6:00 p.m. Currently, fares range from $0.75 to $1.50 for adults and pick-up is usually made in one hour of the phoned-in request. Punch passes ($13.00) and Monthly passes ($45.00) are also available for purchase. Dial-a-Ride also provides these services in Tulare County:

- Cutler/Orosi/East Orosi/Seville/Ivanhoe;
- Lindsay/Tonyville/Strathmore; and
- Pixley/Tipton/Earlimart/Woodlake.

Kings County also provides transit service in Tulare County. Kings Area Rural Transit (KART) brings transit riders into Visalia from the Hanford Area and primarily provides service to Visalia schools, including the College of the Sequoias (COS), Chapman College, Galen College, and the COS Agriculture Center. This route operates three times a day Monday through Friday.

Two common carriers (Greyhound and Orange Belt Stages) also provide private transit services within the county, linking with other regions in the San Joaquin Valley and California (reference Figure 5-7). Orange Belt Stages also offers daily trips to Las Vegas and to areas along the Central Coast, while Greyhound arrives/departs from the community of Goshen

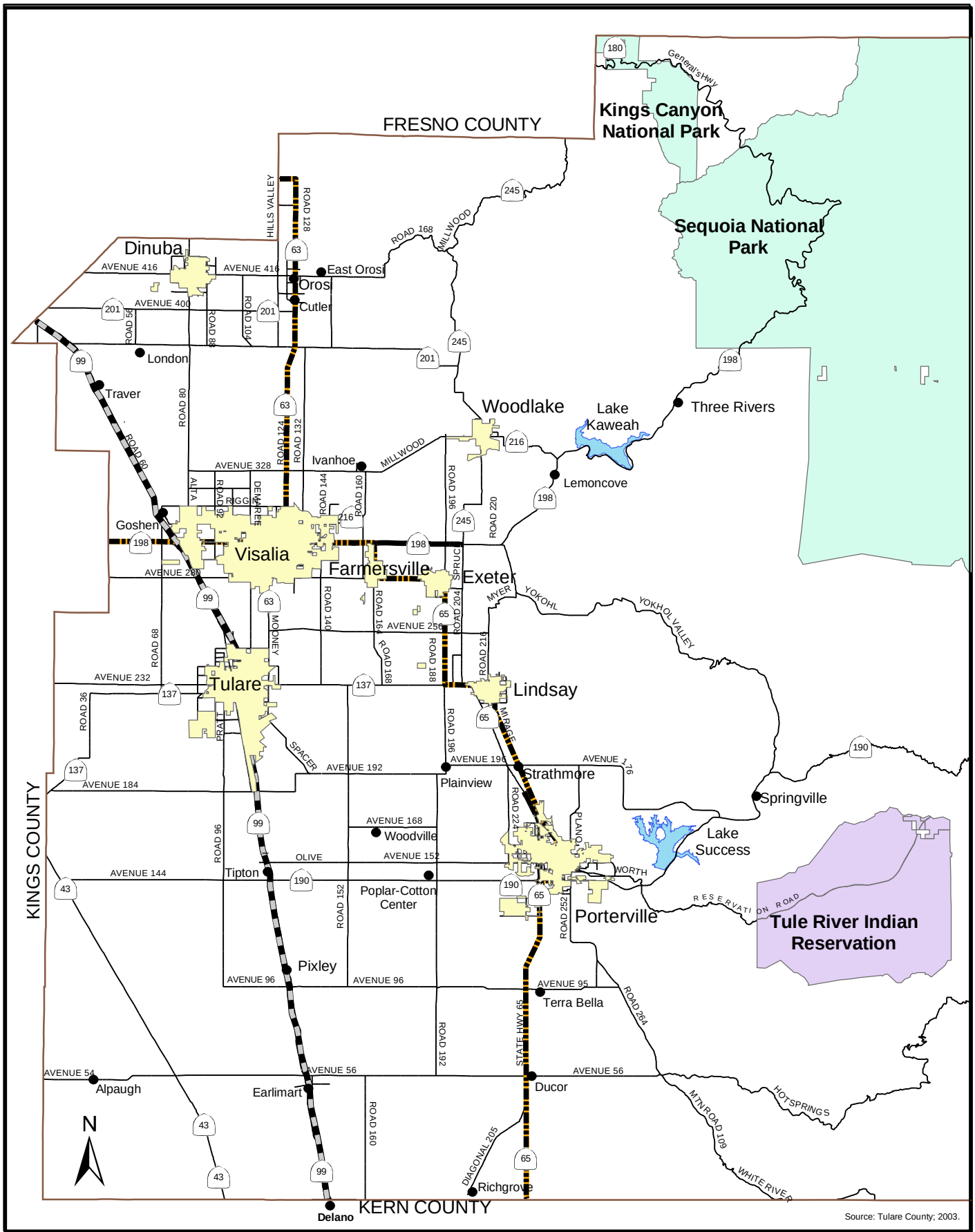


FIGURE 5-7
Existing Common Carriers

west of Visalia. Finally, TCaT and each of the city transit service providers coordinate their respective schedules and transfer stops to provide for enhanced and effective transit service.

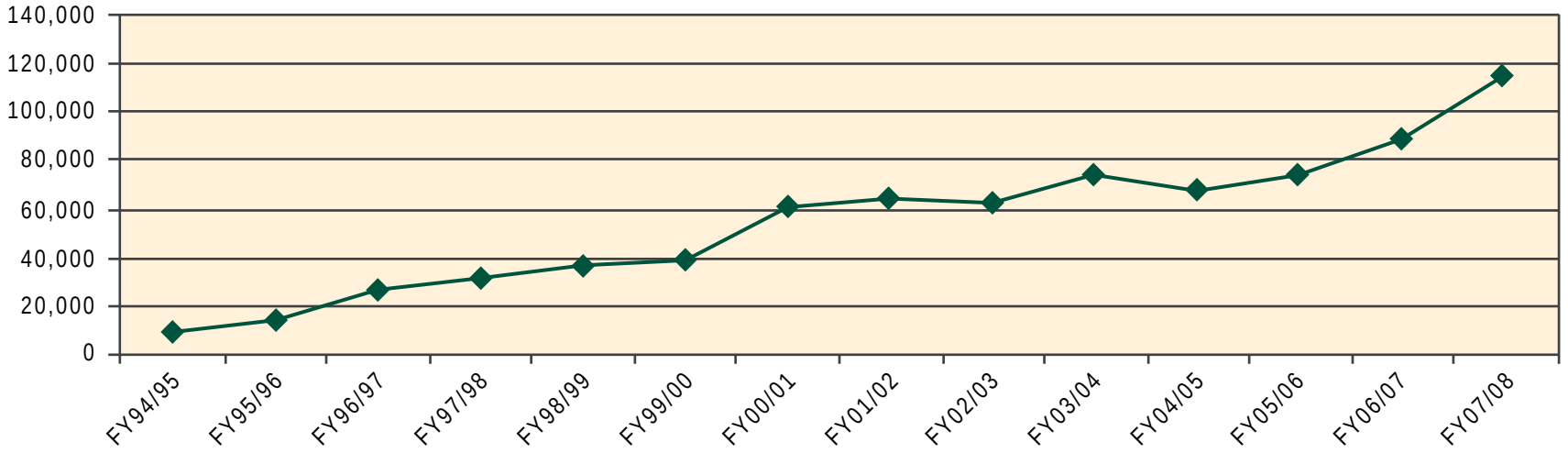
As shown in Figure 5-8, TCaT service has steadily increased in recent years. Over the past couple of years, more routes have been added to accommodate the rural unincorporated communities.

The increase in ridership points to positive policy choices and investment of transit funds. With population growth in the county, increased ridership has also continued. Trends show that ridership is increasing with expanded services in certain cities in Tulare County. In reference to the Triennial Performance Audit, all major communities in Tulare County experienced fixed route ridership increases with the expansion of transit routes. Measure R will also increase transit funding for next generation.

Unmet Transit Needs Process

TCAG holds an unmet transit needs hearing every March. A public notice is prepared and published in newspapers and posted thirty days prior to the hearing and comments regarding transit needs in Tulare County are submitted. In May, the Social Service Technical Advisory Committee (SSTAC) reviews the unmet transit needs expressed in the hearing. The advisory committee makes recommendations that are submitted to TCAG's Board; if any unmet transit needs are identified by the TCAG Board of Governors, they must be addressed before approving street and road funding. If an unmet transit need is found to be unreasonable to accomplish, it is noted and documented.

In Tulare County, typical unmet needs are generally related to the number of routes per day, operating times, weekend and holiday service, etc. The results of the unmet needs process assists local transit agencies as they plan for future transit services.



Source: Tulare County; 2007.

FIGURE 5-8

Fixed Route Ridership (TCT)

TRANSIT FUNDING

Member agencies supply TCAG with their short-term capital needs for operating their transit systems. Federal funding is available for capital improvements. FTA Section 5311 funding is received annually for rural agencies such as the county, Lindsay, Dinuba, and Woodlake. Based upon the requests from member agencies, funding is available for short-term bus replacements.

Through the Local Transportation Fund (LTF), funding is available for the operations of the various transit systems in Tulare County. Currently, the cities of Visalia and Tulare expend all of the LTF funds on transit; other future funding may be required for routes. There is potential federal funding available for new transit routes. As new routes are developed, new capital requirements could arise. CMAQ funds are also available for transit capital purchases. As new routes are generated, an evaluation of capital is conducted to determine if additional funding is required.

5.12 Non-Motorized Systems

INTRODUCTION

This section identifies non-motorized modes of transportation including bicycle, pedestrian, and equestrian facilities available to Tulare County residents.

Methods

Data was obtained from the 2007 TCAG RTP, TCAG Regional Bike Plan, and the Final Visalia Bikeway Plan Update.

Key Terms

Bicycle Facilities. Class I (separate path); Class II (striped lane that shares roadway); or Class III (non-striped path on roadway) bicycle routes.

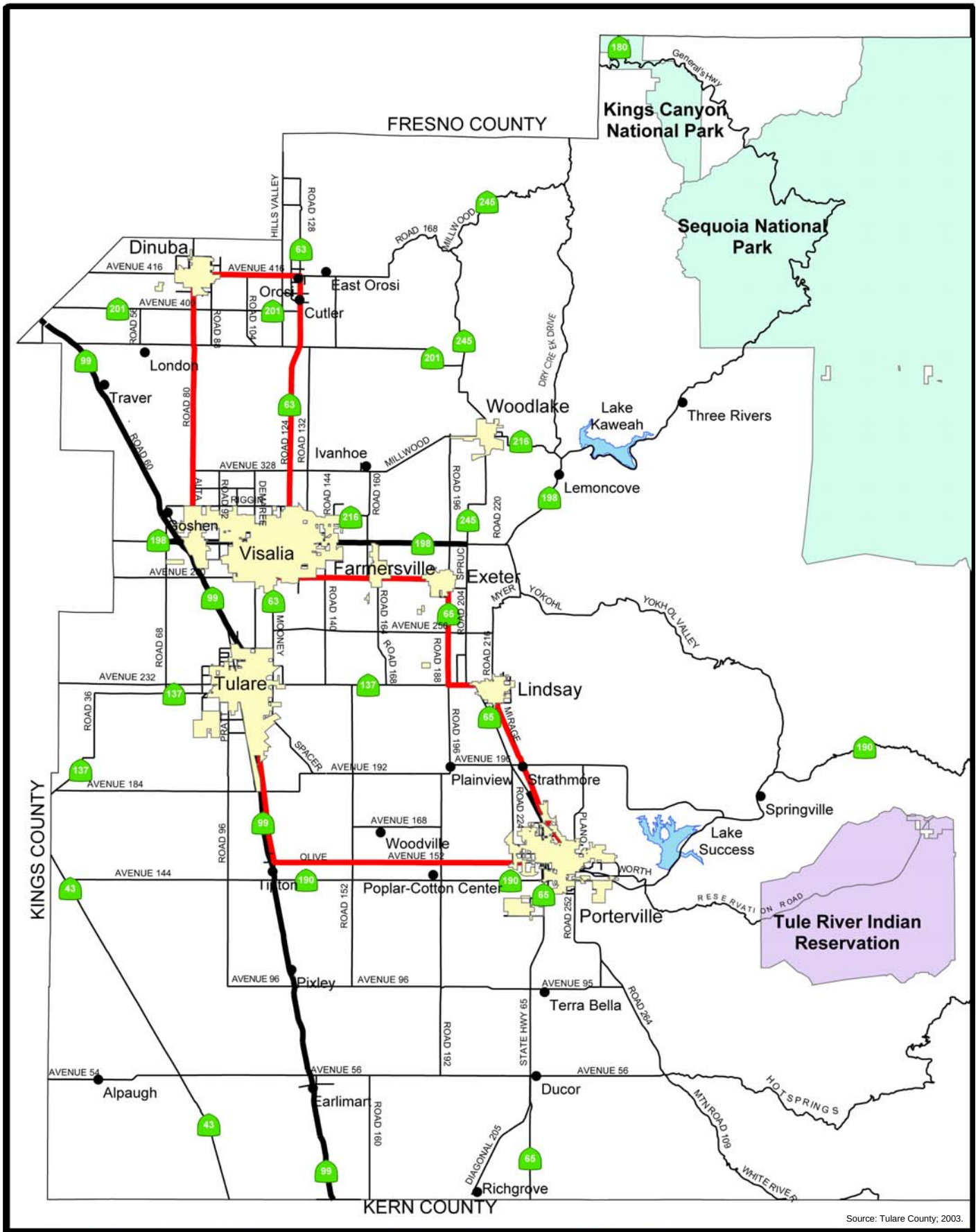
Pedestrian Facilities. Sidewalks, paths, and over-crossings built for pedestrians.

Equestrian Facilities. Paths reserved for horseback riding.

SR2S. Safe Routes to School.

EXISTING CONDITIONS

As part of the RTP, TCAG plans to adopt the Tulare County Regional Bike Plan (as shown on Figure 5-9) at the end of 2007. This Plan provides for connections between major urban and recreational facilities within the county. The Cities of Visalia and Tulare have recently updated their



Tulare County General Plan Update

0 1.5 3 6 Miles

Freeways
Major Roads
State Route
Lakes
County Boundary
National Parks
City Limits
Unincorporated Communities
Planned Bikeway

FIGURE 5-9

TCAG Regional Transportation Bicycle Plan

Bikeway Plan, which identify various phases of planning and the implementation of bikeway facilities. Exeter and Porterville have received grant funds to construct bikeways. Other local agencies are currently developing bicycle plans with help from TCAG to finance these plans through State Bicycle Transportation Account (BTA).

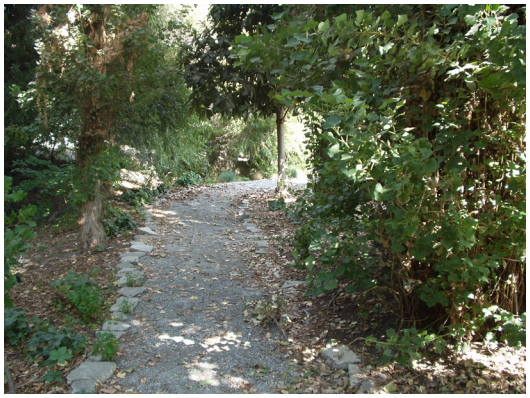
Along with bike routes in cities, transit carriers provide bike racks on their buses. In addition, pedestrian over crossings and recreational walkways are examples of some of the options in Tulare County that induce non-motorized behavior in the transportation element.

State Route 198 Pedestrian Over-Crossing (near Lovers Lane)



Pedestrian over crossings are seen as an effective way in which to facilitate walking in a safe environment over major roadways. These over crossings are a result of safe pedestrian travel by school children over busy roads. Existing pedestrian crossings in the county are found over State Route 198 near Mineral King School; Giddings Street near Redwood High School and over State Route 99 near Goshen. These are examples of capital improvements to walkways and a safe route to school.

Recreational Walkways



Tulare County has historically developed walkways for recreational and practical purposes. The Mill Creek Trail, St. John's Trail, and the Tule

River Trail are examples of a recreational walkways located in Tulare County. The Mill Creek Trail and St. John's Trail are located in the City of Visalia and the Tule River Trail is located in the City of Porterville. The Mill Creek Trail is a signed route that is intended for pedestrians while the St. John's Trail is paved and used by pedestrians and bicyclist. These facilities provide people the incentive to walk to places of interest while enjoying a preserved route.

The Tule River Trail is a continuous two-mile bike and pedestrian trail that is constructed along an existing railroad right-of-way. When developed fully, the trail will extend from one of the city's busiest east-west arterials to the city's busiest north-south arterial terminating at the proposed Tule River Parkway. Along its route, the trail connects portions of the city's industrial sector, the south County courthouse, Porterville Community College, an elementary school, a senior housing complex, a senior community center, the city fairgrounds and ballpark, a shopping center, and the Tule River Parkway.

Pedestrian facilities within the immediate vicinity of schools, recreational facilities, and retail and neighborhood service centers are also important components of the non-motorized transportation system. Pedestrian circulation facilities within and around school and recreational areas, in the form of county standard sidewalks, and are provided where appropriate and enhance the safety of those who choose to use these facilities.

Safe Routes to School

Safe Routes to Schools (SR2S) projects encourage and enable children to walk and cycle to school through a combined package of practical and educational measures.

The SR2S projects also:

- Improve road safety and reduce child casualties;
- Improve children's health and development; and
- Reduce traffic congestion and pollution.

SR2S projects involve:

- The whole school community;
- Local residents;
- Local authorities;
- Health and education workers; and

- Police.

Successful SR2S projects are child-centered to raise awareness, change travel behavior, and benefit the community by helping to create a safer environment. SR2S is a national program encouraging the use of active modes of transportation to and from school.

The benefits include:

- Increased physical activity for children and youth;
- A healthier lifestyle for the whole family;
- Less traffic congestion around schools;
- Safer, calmer streets and neighborhoods; and
- Improved air quality and a cleaner environment.

In Tulare County, cities, communities, school districts, and other agencies are eligible to apply for SR2S funding. All projects must be within two miles of the said school.

Bicycle Paths



With the onset of air quality attainment strategies and congestion management concerns, bicycling is considered an effective alternative mode of transportation. Bicycling can help improve air quality and reduce the number of vehicles traveling along roadway facilities within cities and communities. Tulare County offers a relatively level topography that allows for the opportunity to utilize bicycle facilities.

The Rails to Trails program has been proactive in turning abandoned railroad tracks into pedestrian/bicycling thruways. Recently, the City of Tulare has converted an old railway line into a biking trail that bisects most of the city. Similar efforts in Visalia have been implemented along Goshen Avenue and plans for a bike path on Santa Fe Road are being considered. In addition, the City of Visalia is acquiring a 100-foot wide

right-of-way north of Houston Avenue. This path would parallel the St. Johns River with room for a new road and a separate bike path. The Santa Fe railroad alignment (between Tulare & Visalia) is also another Class I bicycle route that would serve county residents.

Bicycle Accidents

Although the fatalities and injuries throughout the county are relatively low compared to the statewide average, agencies within Tulare County should ensure that bike routes are safe for the rider. This could be achieved by designating certain bike paths or routes; however, the city and/or county undertake a certain amount of liability. Bike routes are developed based upon the amount of safety a bicyclist can achieve. Table 5-15 identifies accident data for the eight cities and unincorporated communities in Tulare County.

Table 5-15. Statewide Integrated Traffic Records System Bicycle Accident Data 2003-2006

	# of Bicycle Involved Collisions (Year)									
	2003-04		2004-05		2005-06		Totals			
Jurisdiction	FAT	INJ	FAT	INJ	FAT	INJ	FAT	INJ	Avg./Year	2007 Population
Dinuba	0	4	0	3	0	2	**0**	**9**	3.00	20,002
Exeter	0	2	0	0	0	1	**0**	**3**	1.00	10,730
Farmersville	0	4	0	9	0	2	**0**	**15**	5.00	10,466
Lindsay	0	4	0	1	0	2	**0**	**7**	2.33	11,174
Porterville	0	22	0	20	0	9	**0**	**51**	17.00	51,467
Tulare	1	9	0	12	0	8	**1**	**29**	10.00	55,935
Visalia	0	22	1	52	0	32	**1**	**121**	40.66	117,744
Woodlake	0	2	0	0	0	0	**0**	**2**	0.67	7,394
Unincorporated	2	20	1	22	1	6	**4**	**48**	17.33	144,094
Totals	**3**	**89**	**2**	**119**	**1**	**62**	**6**	**285**	**97.00**	**429,006**

FAT indicates Fatalities; INJ indicates Injuries
Source: TCAG Countywide Bicycle Transportation Plan: SWITRS accident data in 2003-2006.

As shown in Table 5-15, six fatal accidents occurred during the three-year period within the Cities of Tulare (1) and Visalia (1) and unincorporated communities (4), accounting for all of the fatalities. Trends indicate that the number of injury accidents have seen a reduction as have the fatalities during the three-year period analyzed. The County of Tulare recognizes the positive trend in bicycle accidents and implement policies to continue to reduce accidents.

Equestrian Trails

Due to the nature of the topographical and geographical surroundings of Tulare County, horseback riding is found primarily in the foothill communities and on farmlands located on the Valley floor. Most of the recreational horseback riding occurs on private property in these areas.

The federal lands in eastern Tulare County have designated trails that provide for packing trips into the Sequoias and Sierras. In short, equestrian travel composes a small amount of trips in Tulare County.

BICYCLE PATH AND PEDESTRIAN FUNDING

In 2003, the TCAG Board adopted the Regional Transportation Bicycle Transportation Plan. TCAG has indicated that the Bicycle Plan was updated and adopted in 2007. The Plan identified both short-term and long-terms projects for potential implementation in Tulare County. In the current Plan, the total cost of constructing all of the bicycle projects was estimated at $31.2 million. To address this need, several state and federal funding sources exist to fund bicycle projects. The TE program and Measure R are potential funding sources. TCAG will continue to encourage member agencies to adopt transportation bicycle plans and apply for state Bike Transportation Account (BTA) funding. CMAQ funds may also be used for the implementation of bike projects such as bike paths.

In recent years, the biggest source of funds for pedestrian and bicycle improvements has been the TE program, which requires States to spend 10% of their STP funds on a specific list of eligible projects. This list includes the development of pedestrian and bicycle facilities and the conversion of abandoned railroad corridors to trails. More than half of the funds available under this program have been used for these two activities. Local cities and the county are now in line to receive BTA funding for local bicycle projects after the adoption of local bicycle plans.

5.13 Commute Modes of Transportation

INTRODUCTION

The purpose of this section is to provide information related to commuter patterns throughout the county. Specific information is provided for cities; however, information pertaining to unincorporated communities is not as detailed. Overall, a general commute pattern between the cities within Tulare County is summarized.

Methods

The information presented is based upon US Census Data from year 2000.

Key Terms

There are no key terms for this section.

EXISTING CONDITIONS

Table 5-16 shows the mode choice of commuters in Tulare County based upon the 2000 US Census. This table also identifies the duration of travel to work times.

As shown in Table 5-16, the majority of commuter trips are vehicular in nature. Public transportation only makes up for one-half of one percent for commuters. Table 5-16 also indicates that over 80% of commuters spend less than 29 minutes to travel to/from work. Only 3.5% have travel times greater than an hour; these are likely jobs outside of the county. On average the Tulare County worker spends 19.9 minutes commuting, which is one of the lowest times in the state, according to the U.S. Census Supplemental Surveys.

Table 5-16. Transportation to Work in Tulare County

Mode Choice	
% Car, truck or van to work	91.1
% Public transportation to work	0.5
% Other transportation to work	4.0
% Work at home	4.4
Travel Time	
% Travel time less than 15 minutes	49.3
% Travel time 15-29 minutes	31.5
% Travel time 30-59 minutes	15.7
% Travel time 60+ minutes	3.5

Source: 2000 Census

Park and Ride Lots



Park and ride facilities are used primarily by carpoolers, vanpoolers and transit riders for the daily commute, usually for free. Park and ride facilities in the county are open 24 hours a day, seven days a week. Currently, there are park and ride facilities in Porterville on Jaye Street

near the Tule River Parkway (30 parking spaces.) Bicycle lockers and stalls are not located at this facility. An additional park and ride lot next to a proposed Sequoia/Kings Canyon visitor center is being planned in Visalia, likely near the transit center.

Jobs to Housing Ratio

During the last decade, traffic congestion, housing costs, and the fiscal impacts on local governments have raised the issue of the relationship of jobs to housing. While commonly referred to as "jobs-housing balance," it actually focuses on the ratio of jobs to workers in the community. According to the State Economic Development Department (EDD) in August of 2008, the county had 178,500 people employed, out of 199,600 eligible, leaving 21,000 unemployed (10.6%).

In an ideal situation, there would be one local job for every employed resident. This balance between workers and jobs would, in theory, allow residents the opportunity to work in their community, thereby reducing long-distance commuting. Incorporated cities in the county would likely have a higher job to housing ratio than the unincorporated communities in the area based solely upon the employment opportunities provided. A more involved measure of jobs-housing balance would examine the types and wages of jobs available in a community versus the skills of workers and housing costs.

5.14 Major Trip Attractors

INTRODUCTIONS

This section provides the latest information pertaining to large employers in Tulare County. Generally, major employers are located in cities that contain employers. However, the employees must utilize county roads to travel between jurisdictions. Therefore, Tulare County must work with the cities to accommodate for commuter traffic patterns.

Methods

Data was collected through the US Census Bureau and local chambers of commerce.

Key Terms

There are no key terms for this section.

EXISTING CONDITIONS

Table 5-17 shows Tulare County's top employers by jurisdiction. As shown in Table 5-17, many of these industries are agricultural related,

with other large employers related to government, schools, and hospitals.

Table 5-17. Tulare County Top Employers

City of Exeter		**# Of Employees**
	Sequoia Orange	125
	Exeter/Ivanhoe Citrus	75-120
	Lo-Bue Bros. Inc.	420
	Bowsmith, Inc.	84
	Weyerhaeuser	300
City of Dinuba	**# Of Employees**	
	Ruiz Food Products	1,800
	Best Buy (West Coast Distribution Center)	405
	Dinuba Public Schools	314
	Odwalla Juice	160
City of Lindsay		**# Of Employees**
	Citrus Packing Houses (10)	1,800
	Lindsay Unified School District	475
	Lindsay District Hospital	300
	National Diversified Sales	200
	HIT Products	195
	Vita-Pakt Citrus Products	150
	Champion Home Builders	135
City of Porterville		**# Of Employees**
	Porterville Development Center	2,077
	Wal-Mart Distribution	1,527
	Sierra View Hospital	518
	Citrus Packing Facilities	358
	Royalty Carpet Mills	286
	Beckman-Coulter, Inc.	245
	Foster Farms	247
	Bank of the Sierra	185
	Mervyns	111
	Target	106
	National Vitamin	92
	Pro Document Solutions	80
City of Tulare		**# Of Employees**
	Dairyman's Cooperative Creamery / Land O' Lakes	650
	Haagen Dazs / Ice Cream Partners USA, LLC	300
	Wal Mart	280
	Golden Valley Dairy Products	215
	Southern California Edison	200
	Cheese and Protein International	170
	Morris Levin & Son Hardware	170
	Saputo Cheese	150
	Kings County Truck Lines	150
	Kraft USA South	130
City of Visalia		**# Of Employees**
	County of Tulare	4,320
	Kaweah Delta District Hospital	2,540
	CIGNA	1,000
	Jostens Printing and Publishing	720
	College of Sequoias	1,106
	City of Visalia	520
	Visalia Medical Clinic	360
	Wal-Mart	230
	Kraft	350
City of Woodlake		**# Of Employees**
	Monrovia Nursery	600

Table 5-17. Tulare County Top Employers

	Golden State Citrus Packer	85

Source: Tulare County Economic Development Corporation 2008 and Central Valley City websites.

As shown in Table 5-17, major employers in Tulare County range from retail department stores to major corporate companies. Many industrial companies also employ hundreds of Tulare County's residents.

Recreational Travel

Many highways in Tulare County experience the highest traffic volumes on weekends, particularly in the summer, as a result of recreational travel. Vehicular travel is likely to continue since major recreation facilities are located within the county, including:

- Sequoia and Kings Canyon National Parks
- Sequoia National Monument
- Golden Trout Wilderness
- Sequoia National Forest
- Lake Kaweah
- Lake Success

Roadway segments likely to experience significant weekend congestion during summer months include State Route 190 and 198 in the foothill areas. Maximum traffic volumes on summer weekends are projected to exceed average weekday volumes by factors ranging from 15 to 20%.

According to recent park service studies, Sequoia and Kings Canyon National Parks receive about 1.5 million visitors annually; however that visitation is expected to increase 23% by 2010. Sequoia and Kings Canyon National Parks now offers convenient transit connections.

Shuttle service is now provided by the Visalia City Coach in conjunction with TCAG and Tulare County. The new shuttle service provides 4 round trip routes from the Visalia Transit Terminal to the Park Visitors center with stops in Three Rivers. The shuttle service connects to an internal Park shuttle that provides service to the General Sherman Tree in Giant Forest, Moro Rock, Lodge Pole, etc. The Park Service indicates 68% of summer visitors come to Sequoia for one day or less and many of them use State Route 198; these new shuttle services are expected to ease congestion and enhance the experience of visiting the Sequoia National Park system.

6. AIR QUALITY AND CLIMATE CHANGE

6.1 Introduction

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. The primary factors that determine local air quality include the locations of air pollutant sources and the amounts of air contaminants emitted. Atmospheric conditions, such as wind direction, wind speed, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants that consequently affect air quality. Air quality information is presented below in section 6.2

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. These gases can prevent the escape of heat in much the same way as glass in a greenhouse, which can result in global climate change. Climate change information is presented below in section 6.3

6.2 Air Quality

This chapter of the Background Report describes existing regional topography and climate, federal and state ambient air quality standards, local air quality planning and management, and existing air quality conditions.

As will be discussed in greater detail in this chapter, although Tulare County does currently meet federal and state air quality standards for pollutants such as Carbon Monoxide (CO) and Sulfur Dioxide, the county does not meet Ozone and PM2.5 standards at the federal and state level, or PM10 at the state level. In addition, the county contains the Sequoia and Kings Canyon National Parks, which are designated a Class I area (Class I areas are subject to strict air quality requirements by the Federal Clean Air Act). According to the National Park Service, these parks periodically experience some of the worst air quality in the National Park Service.

Methods

The information contained in this section was obtained from various sources, including the 2001 Tulare County General Plan Background Report. Additional information is based on printed reports and monitoring data from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the California Air Resources Board (CARB).

Key Terms

The following key terms are used throughout this section to describe air quality conditions and the framework of regulations that pertain to these resources.

- **San Joaquin Valley Air Basin**. An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist with the statewide regional management of air quality issues. The San Joaquin Valley Air Basin (SJVAB) extends from San Joaquin County (northern boundary) to Kern County (southern boundary).

- **PM10**. Dust and other particulates exhibit a range of particle sizes. Federal and state air quality regulations reflect the fact that smaller particles are easier to inhale and can be more damaging to health. PM10 refers to particulates (including dust) that are 10 microns in diameter or smaller.

- **PM2.5**. The federal government has recently added standards for smaller particulates. PM2.5 refers to particulates that are 2.5 microns in diameter or smaller. PM2.5 is a subset of PM10 and this smaller fraction of particulates has recently become regulated at the state and federal level because it is considered to have potentially serious health effects, including increased morbidity and mortality.

- **Ozone Precursors**. There are several chemical steps in creating ozone. Ozone precursors are chemicals that lead to the eventual creation of ozone. Ozone precursors occur either naturally or as a result of human actives such as the use of combustion engines in cars and evaporated fuel. Ozone is a pungent, colorless, toxic gas created in the atmosphere rather than emitted directly into the air. Ozone is produced in complex atmospheric reactions involving oxides of nitrogen and reactive organic gases with ultraviolet energy from the sun in a photochemical reaction.

- **Stationary Source**. A non-mobile source of air pollution such as a power plant, refinery or manufacturing facility.
- **Mobile Source**. A moving source of air pollution such as on road and off-road vehicles, boats, airplanes, lawn equipment and small utility engines.
- **Sensitive Receptors.** Sensitive receptors are defined as land uses that typically accommodate sensitive population groups such as long-term health care facilities, rehabilitation centers, retirement homes, convalescent homes, residences, schools, childcare centers and playgrounds.
- **Sensitive Groups**. Sensitive groups are a subset of the general population that are at greater risk than the general population, to the effects of air pollution. These groups include the elderly, infants and children, and individuals with respiratory problems such as asthma.
- **Ambient Air Quality Standards.** These standards measure outdoor air quality. They identify the maximum acceptable average concentrations of air pollutants during a specified period of time. These standards have been adopted at a state and federal level.
- **Reactive Organic Gases (ROG).** Reactive organic gases are photochemically reactive and are composed of non-methane hydrocarbons. These gases contribute to the formation of smog. ROG is also referred to as Volatile Organic Compounds (VOC).
- **Nitrogen Oxides (Oxides of Nitrogen, NOx).** Nitrogen oxides are compounds of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen. Nitrogen oxides are primary created from the combustion process and are a major contributor to smog and acid rain formation.
- **Class 1 Designation.** As defined in the Clean Air Act "Class 1" areas are international parks, national wilderness areas (greater than 5,000 acres), national memorial parks (greater than 5,000 acres), and national parks (greater than 6,000 acres) that existed on August 7, 1977.
- **Global Warming**. Global warming is an increase in the temperature of the Earth's troposphere. Global warming has occurred in the past as a result of natural influences, but the term is most often used to refer to the warming predicted by computer

models to occur as a result of increased emissions of greenhouse gases.

- **Greenhouse Gas Emissions.** Greenhouse gas (GHG) emissions are the release of any gas that absorbs infrared radiation in the atmosphere. Generally when referenced in terms of global climate they are considered to be harmful. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrochlorofluorocarbons (HCFCs), ozone (O_3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

REGULATORY SETTING

Air quality in a defined location is described as the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or in micrograms per cubic meter (ug/m3). The type and amount of regulated air pollutants emitted into the atmosphere, the size and topography of the regional air basin, and the prevailing meteorological conditions, contribute to determining the air quality conditions of a particular location.

The significance of a particular pollutant's concentration is determined by its comparison with federal and state ambient air quality standards. Both the State of California and the federal government have established ambient air quality standards for several different pollutants, expressed as maximum allowable concentrations. The standard for some pollutants varies in its measurable time period. Generally these standards have been set to protect public health, although for some pollutants, standards have been based on other values (such as the protection of crops, protection of materials, or avoidance of nuisance conditions). Table 6-1 presents current national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant.

Federal Regulations

- **Federal Clean Air Act**. The federal Clean Air Act, adopted in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The act directs the Environmental Protection Agency (EPA) to establish ambient air standards for six pollutants: ozone, carbon monoxide, lead, nitrogen dioxide,

particulate matter, and sulfur dioxide. The standards are divided into primary and secondary standards; the former are set to protect human health with an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

Areas that do not meet the ambient air quality standards are called "nonattainment areas". The federal Clean Air Act requires each state to submit a State Implementation Plan (SIP) for nonattainment areas. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. For cases in which the SIP is submitted by the state but fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan. The EPA may also "bump up" the area to a higher classification with a later attainment date to allow more time to reach attainment, as was the case for the San Joaquin Valley.

- **Prevention of Significant Deterioration (PSD)** provisions within the Clean Air Act require that measures be taken to "preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreation, scenic or historic values." There are strict requirements for areas designated as "Class 1".
- **Visibility Protection.** One of the goals of the Clean Air Act is to protect visibility in Class 1 areas. To implement this goal, the EPA has created Regional Haze Regulations for Protection of Visibility in National Parks and Wilderness Areas.
- **Sequoia and Kings Canyon National Park (SEKI).** SEKI is mandated by the Clean Air Act (SEKI has a Class 1 designation) and the National Park Organic Act to protect the air quality-related values and resources within the SEKI. As a result of these regulations, the SEKI Air Resources program has been involved in air quality monitoring for approximately 20 years. The program currently includes implementation of a daily air quality advisory for SEKI; research into the effects of air pollutants on the decline of amphibians; research and monitoring of ozone, nitrogen, and particulates; monitoring of ultraviolet (UV) radiation, synthetic chemicals, PM10, and air quality effects on

visibility. The air program also includes cooperation with the federal, state, and regional governmental agencies that address air quality including the EPA, the California Air Resources Board (CARB), and the SJVAPCD.

Table 6-1. State and National Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
	8 hours	0.07 ppm[1]	0.075 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide	1 hour	0.18 ppm	---	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration - Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030	0.053 ppm		
Sulfur Dioxide	1 hour	0.25 ppm	---	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Avg.	---	0.03 ppm		

Table 6-1. State and National Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Respirable Particulate Matter (PM10)	24 hours	50 □g/m^3	150 □g/m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in PM2.5 levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 □g/m^3	---		
Fine Particulate Matter (PM2.5)	24 hours	---	35 □g/m^3		Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	Annual Avg.	12 □g/m^3	15 □g/m^3		
Lead	Monthly Ave.	1.5 □g/m^3	---	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction. The more serious effects of lead poisoning include behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs. Lead may also contribute to high blood pressure and heart disease.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 □g/m^3		
	3 Month Rolling Average		0.15 □g/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal Power Plants, Petroleum Production and refining
Sulfates	24 hour	25 □g/m^3	No National Standard	Breathing difficulties, aggravates asthma, reduced visibility	Produced by the reaction in the air of SO_2.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See PM2.5.

NOTE: ppm = parts per million; □g/m^3 = micrograms per cubic meter.

1 This concentration was approved by the Air Resources Board on April 28, 2005 and became effective May 17, 2006.

SOURCE: California Air Resources Board, 2008a. *Ambient Air Quality Standards,* available at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf Standards last updated November 17, 2008. California Air Resources Board, 2001. *ARB Fact Sheet: Air Pollution Sources, Effects and Control,* http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm, page last updated December 2005.

State Regulations

- **California Clean Air Act**. The California Clean Air Act (CCAA) of 1988 establishes an air quality management process that generally parallels the federal process. The CCAA, however, focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more

stringent than the comparable federal standards. Responsibility for meeting California's standards is addressed by the CARB and local air pollution control districts (such as the eight county SJVAPCD, which administers air quality regulations for Tulare County). Compliance strategies are presented in district-level air quality attainment plans. The SJVAPCD adopted a CCAA attainment plan for ozone in 1991. Recent plan updates to address state requirements have been included as a chapter of federal ozone plans.

The CCAA requires that air districts prepare an air quality attainment plan if the district violates state air quality standards for criteria pollutants including carbon monoxide, sulfur dioxide, nitrogen dioxide, or ozone. Locally prepared attainment plans are not required for areas that violate the state PM10 standards. However, in 2003, the Legislature passed Senate Bill 656 to reduce public exposure to PM10 and PM2.5. The legislation requires the CARB, in consultation with local air pollution control and air quality management districts (air districts), to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air districts to reduce PM10 and PM2.5. Air districts were required to develop implementation schedules for the measures they selected by July 31, 2005. The CCAA requires that the state air quality standards be met as expeditiously as practicable but does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

The air quality attainment plan requirements established by the CCAA are based on the severity of air pollution caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts.

- **California Air Resources Board**. The CARB is responsible for establishing and reviewing the state ambient air quality standards, compiling the California State Implementation Plan (SIP) and securing approval of that plan from the U.S. EPA. Federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop plans, known as State Implementation Plans. SIPs are comprehensive plans that

describe how an area will attain national ambient air quality standards (NAAQS). The 1990 amendments to the federal Clean Air Act set deadlines for attainment based on the severity of an area's air pollution problem. State law makes CARB the lead agency for all purposes related to the SIP. The California SIP is periodically modified by the CARB to reflect the latest emission inventories, planning documents, and rules and regulations of various air basins. The CARB produces a major part of the SIP for pollution sources that are statewide in scope; however, it relies on the local air districts air quality attainment plans that include emissions inventory data and additional strategies for sources under their jurisdiction, and demonstrate attainment within the air basin boundaries. The SIP consists of the emission standards for vehicular sources and consumer products set by the CARB, and attainment plans adopted by the local air agencies as approved by CARB. The EPA reviews the air quality SIPs to verify conformity with Clean Air Act mandates and that they will achieve air quality goals when implemented. If EPA determines that a SIP is inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area, and may impose additional control measures.

In addition to preparation of the SIP, the CARB also regulates mobile emission sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air pollution control districts and air quality management districts, which are organized at the county or regional level. The county or regional air pollution control districts and air quality management districts are primarily responsible for regulating stationary emission sources at industrial and commercial facilities within their jurisdiction and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act.

The CARB is the lead agency as identified by AB 32 for determining programs and regulations that will help California reduce its greenhouse gas emissions.

- **California Environmental Quality Act.** Appendix G of the CEQA Guidelines establishes significance criteria for certain specified air quality impacts. These criteria are presented below.

- Conflict with or obstruction of implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or project air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is non-attainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Local Regulations

- **San Joaquin Valley Air Pollution Control District**. Tulare County is located in the lower sub-region of the SJVAB. The SJVAB is currently designated as non-attainment for the federal and state 8-hour ozone and PM2.5 standards, and non-attainment for state PM10 standards.

  The SJVAPCD is primarily responsible for regulating stationary source emissions within Tulare County and preparing the air quality plans (or portions thereof) for its jurisdiction. SJVAPCD's primary approach of implementing local air quality plans occurs through the adoption of rules and regulations. Stationary sources within the jurisdiction are regulated by the SJVAPCD's permit authority over such sources and through its review and planning activities. The SJVAPCD also adopts prohibitory rules that regulate air polluting activities. For example, the SJVAPCD adopted its Regulation VIII-Fugitive Dust Control, on October 21, 1993 and last amended it September 16, 2004. This regulation consists of a series of emission reduction rules intended to implement previously adopted PM10 attainment plans and the current PM10 Maintenance Plan. The PM10 Maintenance Plan emphasizes continued reductions of fugitive dust as a means of maintaining federal standards for PM10. Regulation VIII specifically addresses the following activities:

- construction, demolition, excavation, extraction;
- handling and storage of bulk materials;
- landfill disposal sites;
- paved and unpaved roads; and
- vehicle and/or equipment parking, shipping and receiving, transfer, fueling, and service areas.

Since this regulation's adoption, it has been amended in September 1994, April 1996, November 2001, and most recently in August 2004.

The SJVAPCD has limited authority to regulate transportation sources and indirect sources that attract motor vehicle trips. SJVAPCD Rule 9510 – Indirect Source Review requires developers to mitigate project emissions through onsite design features that reduce trips and vehicle miles traveled and other emission sources and with reductions obtained through the payment of a mitigation fee used to fund off-site air quality mitigation projects.

Other SJVAPCD Rules and Regulations that affect development in Tulare County include:

SJVAPCD Rule 2201 (New and Modified Stationary Source Review). This rule requires new and modified stationary emission sources to implement best available control technology and to offset emissions exceeding thresholds contained in the rule. The rule implements the federal Title V permitting program for the San Joaquin Valley Air Basin.

SJVAPCD Rule 4102 (Nuisance). The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.

SJVAPCD Rule 4601 (Architectural Coatings) The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling.

SJVAPCD Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.

Rule 4901 (Woodburning Fireplaces and Woodburning Heaters). The purpose of this rule is to reduce carbon monoxide (CO), and PM10 from the installation and use of wood burning fireplaces (open-hearth fireplace), and wood burning heaters. The rule limits the sale of certain woodburning devices and limits the installation of fireplaces and wood burning heaters per acre. The rule includes a woodburning curtailment program that goes into effect on days with unhealthful air quality. Areas not served by natural gas are exempt from the rule requirements.

The district has published a *Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI)* (SJVAPCD, 2002), an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. A major part of the *GAMAQI* includes a discussion of air quality control measures that are recommended for use in mitigating construction and operation impacts in environmental documents. The district has also published *Air Quality Guidelines for General Plans* (SJVAPCD, 2005), which provides guidance to local officials and staff on developing and implementing local policies and programs to be included in local jurisdictions' general plans.

ENVIRONMENTAL SETTING

The topography of Tulare County significantly varies in elevation from its eastern to western borders, which results in large climatic variations, ultimately affecting air quality. The western portion of the county is within the low-lying areas of the San Joaquin Valley Air Basin. This portion of the county is much dryer in comparison to the eastern portion that is located on the slopes of the Sierra Nevada Mountains. The higher elevation contributes to both increased precipitation and a cooler climate.

Wind direction and velocity in the eastern section varies significantly from the western portion of the county. The western side receives northwesterly winds. The eastern side of the county exhibits more

variable wind patterns, but the wind direction is typically up-slope during the day and down-slope in the evening. Generally, the wind direction in the eastern portion of the county is westerly, however terrain differences can create moderate directional changes.

Existing Emission Sources

Unlike other air basins in California, the pollution of the San Joaquin Valley Air Basin is not produced in large urban areas. Instead emissions are generated in many moderate sized communities. Emission levels in the valley have generally been decreasing overall since 1990. This can be primarily attributed to motor vehicle emission controls, reducing the amount of vehicle emissions.

The main source of carbon monoxide (CO) and nitrogen oxides (NOx) emissions occurs from motor vehicles. The largest contributor to reactive organic gases (ROG) emissions is mobile sources and agriculture. ROG emissions from dairy operations are an important source in Tulare County. ROG emissions from vehicles have been decreasing since 1985 due to stricter standards even though the vehicle miles have been increasing. ROG emissions are also generated in significant amounts by natural sources like trees. As man-made sources have been reduced, natural source emissions have become a larger fraction of ROG emissions. SJVAPCD modeling conducted for recent ozone plans indicates that NOx controls are more effective at reducing ozone concentrations than ROG controls. Control efforts for ozone are relying more on reducing NOx, but the attainment strategy still requires ROG reductions. Direct PM10 emissions have decreased between the years 1975 and 1995 and have remained relatively constant since 2000. Vehicles traveling on unpaved roads, and agricultural activities are a substantial source of PM10 emissions in the San Joaquin Valley Air Basin.

Air Quality Monitoring and Existing Emission Levels

Geographic areas and air basins are classified for each pollutant as either attainment or nonattainment. In general, "nonattainment" means that the federal standard has been exceeded more than twice per year anywhere within the air basin (Table 6-1). Measured ambient air pollutant concentrations determine the attainment status within an area. There are several ambient air monitoring stations in Tulare County, three of which are located in mountainous areas at Sequoia National Park: Lower Kaweah (measures ozone); Sequoia and Kings Canyon National Park (measures ozone); and Lookout Point at Sequoia National

Park (measures ozone). An air monitoring station is also located in a low-lying area of the county in Visalia (North Church Street - measures ozone, PM10, PM2.5, and CO). The air monitoring station at SEKI typically records the highest levels of ozone in Tulare County. According to the National Parks Conservation Association, SEKI ranked number 1 in ground-level ozone production out of all the National Parks in 2004. This ground-level ozone is responsible for hazy conditions that SEKI often experiences. As a result, SEKI does conduct visibility monitoring. Table 6-2 shows ambient air quality data for maximum concentrations of the non-attainment pollutants at each of the air monitoring stations in SEKI and Visalia.

The federal nonattainment designation for ozone is subdivided into five categories (listed in order of increasing severity): marginal, moderate, serious, severe, and extreme. The degree of an area's non-attainment status reflects the extent of the pollution above the standard and the expected time period required in order to achieve attainment.

Designated nonattainment areas are subject to increased oversight and more stringent review by CARB and EPA. In the endeavor to improve air quality to achieve the standards, new stationary source (industrial) projects are subject to more stringent pollution control technology requirements. Development projects in the San Joaquin Valley are subject to requirements for mitigation measures (such as mobile source reduction measures) to comply with SJVAPCD regulations adopted to meet attainment targets. If the National Ambient Air Quality Standards (NAAQS) are not achieved within the specified timeframe and no corrective action is taken by the air district and the State, federal highway funding penalties, and increased offset requirements for new stationary sources (and a federally administered implementation plan incorporating potentially harsh measures to achieve the NAAQS) will result.

Table 6-2. Selected Air Quality Monitoring Data by Monitoring Station – Number of Days Above the State and/or National Standard for Years 1998-2007

Station	Pollutant and Averaging Time[1, 2, 3]	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Visalia N Church Street	Ozone, Max, 1-hour concentration (ppm) – days above State Standard	54	52	46	36	35	43	17	27	30	11
	Ozone Max, 8-hour concentration (ppm) – days above State Standard	78	92	87	79	87	89	73	62	72	56
	Ozone Max, 8-hour concentration (ppm) – days above National Standard	45	33	29	25	26	31	12	13	24	10
	PM10 Max 24-hour concentration (ug/m3) – Est. days above State Standard	101.8	182.1	195.6	167.9	178.8	107.9	90.7	146.3	156.3	91.5
	PM10 Max 24-hour concentration (ug/m3) – Est. days above National Standard	5.8	0	0	0	0	0	0	0	0	0
	PM2.5 Max 24-hour concentration (ug/m3) – Est. days over National Standard	NA	38.0	24.9	NA	15.4	0	0	6.1	0	3.5
	Carbon Monoxide, Max 8-hour concentration (ppm) – days above State or National Standard	0	0	0	0	0	0	0	0	0	0
Sequoia NP-Lower Kaweah	Ozone, Max, 1-hour concentration (ppm) – days above State Standard	34	36	8	21	69	44	17	28	21	21
	Ozone Max, 8-hour concentration (ppm) – days above State Standard	71	91	61	104	128	96	70	73	81	88
	Ozone Max, 8-hour concentration (ppm) – days above National Standard	27	39	8	27	73	42	24	32	17	25
Sequoia & Kings Canyon NP	Ozone, Max, 1-hour concentration (ppm) – days above State Standard	NA	48	41	58	72	69	41	47	53	37
	Ozone Max, 8-hour concentration (ppm) – days above State Standard	NA	92	69	144	137	129	113	104	97	105
	Ozone Max, 8-hour concentration (ppm) – days above National Standard	NA	52	40	61	80	72	52	54	49	44
Sequoia NP-Lookout Point[4]	Ozone, Max, 8-hour concentration – days above National Standard	31	73	52	40	81	53	50	NA	NA	NA

NOTE: "NA" denotes that no data is available.

1 ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

2 The 8-hour State ozone standard was approved by the California Air Resources Board (CARB) on April 28, 2005 and became effective on May 17, 2006.

3 PM10 is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

4 Monitoring information for the Sequoia National Park – Lookout Point Station is from the National Park Service, whereas data for the other monitoring stations is from the CARB.

SOURCES: California Air Resources Board, 2008b. *Summaries of Air Quality Data*, 1998 through 2007, http://www.arb.ca.gov/adam/; Site accessed October 21, 2008; National Park Service, 2007. *Historical Ozone Exceedances in National Parks, 1982-2006*, http://www.nature.nps.gov/air/Monitoring/docs/2006_O3ParkExceedDays.pdf, Site accessed October 22, 2008.

In summary, the attainment status of Tulare County is presented below in Table 6-3.

Table 6-3. SJVAB Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone – one hour	No Federal Standard[4]	Nonattainment/Severe
Ozone – eight hour	Nonattainment/Serious[3]	Nonattainment[4]
PM10	Attainment[1]	Nonattainment
PM2.5	Nonattainment[2]	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Vinyl Chloride	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

[1] On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.
[2] The Valley is designated nonattainment for the 1997 federal PM2.5 standards. EPA released final designations for the 2006 PM2.5 standards in December 2008 (effective in 2009), designating the Valley as nonattainment for the 2006 PM2.5 standards.
[3] 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 nonattainment for the federal 8-hour ozone standards. The California Air Resources Board, on June 14, 2007, approved this request and forwarded it to the EPA for action on November 16, 2007. This request would become effective upon EPA final rulemaking after a notice and comment process; it is not yet in effect.
[4] Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked in the federal 1-hour ozone standard, including associated designations and classifications. However, EPA had previously classified the SJVAB as extreme nonattainment for this standard. Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

SOURCE: SJVAPCD, 2008, *Ambient Air Quality Standards and Valley Attainment Status*, available at http://www.valleyair.org/aqinfo/attainment.htm; accessed June 5, 2009.

County Responses to Air Quality Conditions

Ozone

The SJVAB has severe ozone problems. The EPA required the SJVAPCD to demonstrate in a plan, substantiated with modeling, that the 1-hour ozone NAAQS be met by November 15, 2005. However, the district could not provide this demonstration for several reasons, including that its achievement would require regulation of certain source categories not currently under the jurisdiction of the district. According to the district, in order to meet the standard the SJVAB must reduce the total emissions inventory by an additional 30 percent (300 tons per day). Because attainment by the deadline could not be demonstrated by the mandated deadlines,

the federal sanction clock was started. The district, through petition by the state on behalf of SJVAPCD, sought a change in the federal nonattainment classification from "severe" to "extreme" nonattainment with the ozone standard. An extreme nonattainment designation would effectively move the compliance deadline to year 2010 before federal sanctions would begin.

On February 23, 2004, EPA publicly announced its intention to grant the request by the State of California to voluntarily reclassify the SJVAB from a "severe" to an "extreme" 1-hour ozone nonattainment area. The SJVAPCD submitted all of the required severe area plan requirements and they were deemed complete. The CARB submitted the 2004 Extreme Ozone Attainment Demonstration Plan to EPA on November 15, 2004. On August 21, 2008, the District adopted Clarifications for the 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone, and on October 16, 2008, EPA proposed to approve the District's 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone. On June 30, 2009, after receiving comments on proposed approval, EPA proposed approval and partial disapproval of the plan.

On April 30, 2007, the SJVAPCD Governing Board voted to request the EPA to reclassify the San Joaquin Valley Air Basin as nonattainment/extreme for the federal 8-hour ozone standard. The extreme classification would allow for a 2023 attainment date for this standard. The CARB, on June 14, 2007, approved this request and forwarded it to the EPA for action on November 16, 2007. The reclassification would become effective upon EPA final rule making after a notice and comment process and is not yet in effect.

The county continues to evaluate and consider a variety of federal, state, and SJVAPCD programs in order to respond to the non-attainment designation for Ozone that the SJVAB has received, and will continue to adopt resolutions to implement these programs. Some examples of Tulare County Board of Supervisor resolutions are described below. These resolutions were adopted in 2002 and 2004, respectively.

- **Resolution 2002-0157.** Resolution 2002-0157, as adopted on March 5, 2002, requires the county to commit to implementing the Reasonably Available Control Measures (RACM's) included in the Resolution. The following RACM's were included in the resolution:

- Increasing transit service to the unincorporated communities of Woodville, Poplar and Cotton Center;
- Purchase of three new buses and installation of additional bicycle racks on buses;
- Public outreach;
- Providing preferential parking for carpools and vanpools;
- Removing on-street parking and providing bus pullouts in curbs to improve traffic flow;
- Supporting the purchase of hybrid vehicles for the County fleet;
- Mandating that the General Plan Update implement land use policies supporting public transit and vehicle trip reduction; and
- Programming $13,264,000 of highway widening projects to reduce entrained road dust from unpaved shoulders.

Resolution 2004-0067. As part of a follow up effort to Resolution 2002-0157 and to address the federal reclassification to Extreme non-attainment for Ozone, the County Board of Supervisors adopted Resolution 2004-0067. The resolution contains additional RACM's as summarized below:

- The development and implementation of recommended procedures, thresholds, and policies related to land use projects to help achieve air quality goals;
- Encouraging land use patterns which support public transit and alternative modes of transportation;
- Exploring concepts of Livable Communities as they address housing incentives and transportation;
- Consideration of incentives to encourage developments in unincorporated communities that are sensitive to air quality concerns; and

- Exploring ways to enhance van/carpool incentives, alternative work schedules, and other Transportation Demand Management strategies.

PM10

On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 NAAQS and approved the PM10 Maintenance Plan. Under a maintenance plan, the SJVAPCD is required to continue to enforce measures in place to prevent future exceedances and to include contingency measures that would go into effect if an exceedance were to take place. The Tulare County Board of Supervisors adopted the following resolution (Resolution 2002-0812) on October 29, 2002.

The resolution contains the following Best Available Control Measures (BACMs) to be implemented in order to reduce PM10 emissions in the county:

- Paving or stabilizing of unpaved roads and alleys;
- Paving, vegetating, chemically stabilizing unpaved access points onto paved roads;
- Curbing, paving, or stabilizing shoulders on paved roads;
- Frequent routine sweeping or cleaning of paved roads;
- Intensive street cleaning requirements for industrial paved roads and streets providing access to industrial/ construction sites; and
- Debris removal after wind and rain runoff when blocking roadways.

6.3 Climate Change

This section provides an analysis of the current regulatory and environmental framework related to climate change in California.

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The major concern is that increases in GHGs are causing global climate change. Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. The gases believed to be most responsible for global warming are water vapor, carbon dioxide

(CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

REGULATORY SETTING

Federal Regulations

As of yet there are no federal regulations, plans or programs that provide direction on preventing contributions to global climate change. However, there are regulations under development and a federal Executive Order that will have significant reductions.

Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards. On September 15, 2009, EPA and the Department of Transportation's National Highway Safety Administration (NHTSA) proposed a National Program that would dramatically reduce greenhouse gas emissions and improve fuel economy for new cars and trucks sold in the United States. The combined EPA and NHTSA standards that make up this proposed National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these proposed standards would cut carbon dioxide emissions by an estimated 950 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

Stationary Source Regulation: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. On September 30, 2009, EPA announced a proposal that is focused on large facilities emitting over 25,000 tons of greenhouse gases a year. These facilities would be required to obtain permits that would demonstrate they are using the best practices and technologies to minimize GHG emissions. The rule proposes new thresholds for greenhouse gas emissions (GHG) that define when Clean Air Act (CAA) permits under the New Source Review (NSR) and Title V operating permits programs would be required for new or existing industrial facilities.

The proposed thresholds would "tailor" the permit programs to limit which facilities would be required to obtain NSR and Title V

permits and would cover nearly 70 percent of the national GHG emissions that come from stationary sources, including those from the nation's largest emitters—including power plants, refineries, and cement production facilities. Small farms, restaurants and many other types of small facilities would not be subject to these permitting programs. The proposal anticipates a five-year initial phase after which the program thresholds will be re-evaluated.

Executive Order 13423. This Executive Order requires federal agencies to measure, manage, and reduce greenhouse gas emissions toward agency-defined targets. It describes a process by which agency goals will be set and reported to the President by the Chair of Council on Environmental Quality. The Executive Order also requires agencies to meet a number of energy, water, and waste reduction targets, including:

- 30% reduction in vehicle fleet petroleum use by 2020;
- 26% improvement in water efficiency by 2020;
- 50% recycling and waste diversion by 2015;
- 95% of all applicable contracts will meet sustainability requirements;
- Implementation of the 2030 net-zero-energy building requirement;
- Implementation of the stormwater provisions of the Energy Independence and Security Act of 2007, section 438; and
- Development of guidance for sustainable Federal building locations in alignment with the Livability Principles put forward by the Department of Housing and Urban Development, the Department of Transportation, and the Environmental Protection Agency.

State Regulations

- **Executive Order S-3-05**. In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger issued Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of GHGs would be progressively reduced, as follows:

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

The Executive Order additionally ordered that the Secretary of the California Environmental Protection Agency (Cal EPA) would coordinate oversight of the efforts among state agencies made to meet the targets and report to the Governor and the State Legislature biannually on progress made toward meeting the GHG emission targets. Cal EPA was also directed to report biannually on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and prepare and report on mitigation and adaptation plans to combat these impacts.

In response to the Executive Order, the Secretary of Cal EPA created the Climate Action Team (CAT), composed of representatives from the Air Resources Board; Business, Transportation, & Housing; Department of Food and Agriculture; Energy Commission; California Integrated Waste Management Board (CIWMB); Resources Agency; and the Public Utilities Commission (PUC). The CAT prepared a recommended list of strategies for the state to pursue to reduce climate change emission in the state (Climate Action Team, 2006).

- **Executive Order S-1-07**. Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS) (issued on January 18, 2007), calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. It instructed the California Environmental Protection Agency to coordinate activities between the University of California, the California Energy Commission and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed CARB to consider initiating regulatory proceedings to establish and implement the LCFS. In response, CARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010.
- **Assembly Bill 32: California Global Warming Solutions Act of 2006**. In 2006, California passed the California Global

Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

The bill also requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions. The bill authorizes CARB to adopt market-based compliance mechanisms. The bill additionally requires the state board to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board, pursuant to specified provisions of existing law. The bill also authorizes CARB to adopt a schedule of fees to be paid by regulated sources of GHG emissions. Because the bill requires CARB to establish emissions limits and other requirements, the violation of which would be a crime, this bill would create a state-mandated local program.

Under AB 32, by June 30, 2007, CARB was to identify a list of discrete early action GHG reductions that will be legally enforceable by 2010. By January 1, 2008, CARB was also to adopt regulations that will identify and require selected sectors to report their statewide GHG emissions. By January 1, 2011, CARB must adopt rules and regulations to achieve the maximum technologically feasible and cost-effective reductions in GHG reductions. CARB is authorized to enforce compliance with the program that it develops.

- **Early Actions to Mitigate Climate Change in California**. In June 2007, CARB directed staff to pursue 37 early actions for reducing GHG emissions under the California Global Warming Solutions Act. The broad spectrum of strategies to be developed—including a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, guidance and protocols for local governments to facilitate GHG reductions, and green ports (provide an alternative source of power for ships while they are docked)—reflects that the serious threat of climate change requires action as soon as possible (CARB, 2007a). In

addition to approving the 37 GHG reduction strategies, CARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to CARB within six months. The general direction of CARB suggested a desire to try to pursue greater GHG emissions reductions in California in the near term. Since the June 2007 CARB hearing, CARB staff has evaluated all 48 recommendations submitted by stakeholders and internally generated staff ideas and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration* in October 2007 (CARB, 2007b). Based on its additional analysis, CARB staff is recommending the expansion of the early action list to a total of 44 measures, which are presented in Table 6-4.

The 2020 target reductions are currently estimated to be 169 million metric tons (MMT) per year of CO_2 equivalent (CO_2e) emissions. CARB staff is working on 1990 and 2020 GHG emission inventories in order to refine the projected reductions needed by 2020. The 44 measures are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression.

- **Greenhouse Gas Mandatory Reporting Regulation**. In December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons of CO_2e per year. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons CO_2e per year, make up 94 percent of the point source CO_2e emissions in California (CARB, 2007c).

Table 6-4. Recommended AB32 Greenhouse Gas Measures to be Initiated by CARB Between 2007 and 2012

ID #	Sector	Strategy Name	ID #	Sector	Strategy Name
1	Fuels	Above Ground Storage Tanks	23	Commercial	SF_6 reductions from the non-electric sector
2	Transportation	Diesel – Offroad equipment (non-agricultural)	24	Transportation	Tire inflation program
3	Forestry	Forestry protocol endorsement	25	Transportation	Cool automobile paints
4	Transportation	Diesel – Port trucks	26	Cement	Cement (A): Blended cements
5	Transportation	Diesel – Vessel main engine fuel specifications	27	Cement	Cement (B): Energy efficiency of California cement facilities
6	Transportation	Diesel – Commercial harbor craft	28	Transportation	Ban on HFC release from Motor Vehicle AC service / dismantling
7	Transportation	Green ports	29	Transportation	Diesel – offroad equipment (agricultural)
8	Agriculture	Manure management (methane digester protocol)	30	Transportation	Add AC leak tightness test and repair to Smog Check
9	Education	Local gov. Greenhouse Gas (GHG) reduction guidance / protocols	31	Agriculture	Research on GHG reductions from nitrogen land applications
10	Education	Business GHG reduction guidance / protocols	32	Commercial	Specifications for commercial refrigeration
11	Energy Efficiency	Cool communities program	33	Oil and Gas	Reduction in venting / leaks from oil and gas systems
12	Commercial	Reduce high Global Warming Potential (GWP) GHGs in consumer products	34	Transportation	Requirement of low-GWP GHGs for new Motor Vehicle ACs
13	Commercial	Reduction of PFCs from semiconductor industry	35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
14	Transportation	SmartWay truck efficiency	36	Electricity	Reduction of SF_6 in electricity generation
15	Transportation	Low Carbon Fuel Standard (LCFS)	37	Commercial	High GWP refrigerant tracking, reporting and recovery program
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing	38	Commercial	Foam recovery / destruction program
17	Waste	Improved landfill gas capture	39	Fire Suppression	Alternative suppressants in fire protection systems
18	Fuels	Gasoline disperser hose replacement	40	Transportation	Strengthen light-duty vehicle standards
19	Fuels	Portable outboard marine tanks	41	Transportation	Truck stop electrification with incentives for truckers
20	Transportation	Standards for off-cycle driving conditions	42	Transportation	Diesel – Vessel speed reductions
21	Transportation	Diesel – Privately owned on-road trucks	43	Transportation	Transportation refrigeration – electric standby
22	Transportation	Anti-idling enforcement	44	Agriculture	Electrification of stationary agricultural engines

SOURCE: CARB, 2007b

- **Senate Bill 1368.** Senate Bill (SB) 1368 is the companion bill of AB 32, also signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was also required to establish a similar standard for local publicly-owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC. On May 28, 2007 the Energy Commission adopted regulations pursuant to SB 1368 establishing and implementing a GHG emission performance standard for baseload generation of local publicly owned electric utilities. The final rulemaking package was submitted to the Office of Administrative Law (OAL) on June 1, 2007 with a request for expedited review. On June 29, 2007 OAL issued a decision disapproving the rulemaking action. OAL provided several reasons for the disapproval, including lack of clarity regarding powerplants under 10MW, possible lack of adequate public comment opportunities, and others. After revisions, the OAL approved the regulatory action on October 16, 2007.
- **Assembly Bill 1493.** California Assembly Bill (AB) 1493 (Pavley), enacted on July 22, 2002, required the California Air Resources Board (CARB) to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. The regulation was stalled by automaker lawsuits and by the EPA's denial of an implementation waiver. On January 21, 2009, the CARB requested that EPA reconsider its previous waiver denial. On January 26, 2009, President Obama directed that EPA assess whether the denial of the waiver was appropriate. On June 30, 2009, EPA granted the waiver request, which begins with motor vehicles in the 2009 model year.
- **Senate Bill 97.** Governor Schwarzenegger signed Senate Bill (SB) 97 (Sutton), a CEQA and GHG emission bill, into law on August 24, 2007. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines

for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. OPR must prepare these guidelines and transmit them to the Resources Agency by July 1, 2009. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions. The Resources Agency must then certify and adopt the guidelines by January 1, 2010. OPR and the Resources Agency are required to periodically review the guidelines to incorporate new information or criteria adopted by CARB pursuant to the Global Warming Solutions Act, scheduled for 2012.

The OPR published a Technical Advisory in June of 2008 that is an "informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents" to serve in the interim until guidelines are established pursuant to SB 97 (OPR, 2008). This Advisory recommends that CEQA documents include quantification of estimated GHG emissions associated with a proposed project and that a determination of significance be made. With regard to significance the Advisory states that "lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact", individual lead agencies may undertake a project-by-project analysis, consistent with the available guidance and current CEQA practice".

- **Climate Change Scoping Plan**. The CARB published a *Climate Change Scoping Plan* in December 2008 (CARB, 2008c) that outlines reduction measures to lower the state's GHG emissions to meet the 2020 limit. The *Scoping Plan* "proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health". Key elements for reducing California's GHG emissions to 1990 levels by 2020 include:
    - Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;

- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

Recommended GHG emission reduction measures are presented in Table 6-5 below, including the 44 Early Action Measures, which were migrated into the *Proposed Scoping Plan* under individual sector categories (Ayala, 2008). The total reduction in GHG emissions from the measures slightly exceeds the 169 $MMTCO_2e$ per year reduction goal.

- **California Air Pollution Control Officers Association**. In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating GHG emissions under CEQA (CAPCOA, 2008). The CAPCOA white paper strategies are not guidelines and have not been adopted by any regulatory agency; rather, the paper is offered as a resource to assist lead agencies in considering climate change in environmental documents.

Table 6-5. Climate Change Proposed Scoping Plan Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Measures	Reductions Counted Toward 2020 Target ($MMTCO_2e$)
Estimated reductions resulting from the combination of cap-and-trade program and complementary measures	**146.7**
California Light-Duty Vehicle GHG Standards • Implement Pavley Standards • Develop Pavley II light-duty vehicle standards	31.7
Energy Efficiency • Building/appliance efficiency, new programs, etc. • Increase Combined Heat and Power (CHP) generation by 30,000 GWh • Solar Water Heating (AB 1470 goal)	26.3
Renewables Portfolio Standard (33% by 2020)	21.3
Low Carbon Fuel Standard	15
Regional Transportation-Related GHG Targets[1]	5
Vehicle Efficiency Measures	4.5
Goods Movement • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.7
Million Solar Roofs	2.1
Medium/Heavy Duty Vehicles • Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency) • Medium- and Heavy-Duty Vehicle Hybridization	1.4
High Speed Rail	1.0
Industrial Measures (for sources covered under cap-and-trade program) • Refinery Measures • Energy Efficiency and Co-Benefits Audits	0.3
Additional Reductions Necessary to Achieve Cap	34.4
Estimated reductions from uncapped sources/sectors	**27.3**
High Global Warming Potential Gas Measures	20.2
Sustainable Forests	5.0
Industrial Measures (for sources no covered under cap and trade program) • Oil and Gas Extraction and Transmission	1.1
Recycling and Waste (landfill methane capture)	1.0
Total reductions counted towards 2020 target	**174**
Other Recommended Measures	**Estimated 2020 Reductions ($MMTCO_2e$)**
State Government Operations	1-2
Local Government Operations	TBD
Green Buildings	26
Recycling and Waste (other measures)	9
Water Sector Measures	4.8
Methane Capture at Large Dairies	1.0

[1] This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. CARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders per SB 375.
SOURCE: CARB, 2008c

- **Senate Bill 375.** SB 375 (Steinberg) was signed into law in 2008. It builds on AB 32 to connect the reduction of greenhouse gas (GHG) emissions from cars and light trucks to land use and transportation policy. The transportation sector represents the state's largest contributor of greenhouse gases. Accordingly, SB 375 seeks (1) to use the regional transportation planning process to help achieve AB 32 goals; (2) to use CEQA streamlining as an incentive to encourage residential projects which help achieve AB 32 goals to reduce GHG emissions; and (3) to coordinate the regional housing needs allocation process with the regional transportation planning process. Implementation of SB 375 is a multi-year process, with regional GHG reduction targets to be determined in late 2010. The Regional Targets Advisory Committee (RTAC) organized by CARB made its recommendations regarding the targets setting process and implementation on September 29, 2009. The provisions of SB 375 have no direct requirements that would affect the proposed project, and the CEQA streamlining provisions do not apply at this time. However, the General Plan contains many policies and programs that support the goals of SB 375.
- **Title 24 of the California Code of Regulations.** The State of California regulates energy consumption under Title 24 of the California Code of Regulations. The Title 24 Building Energy Efficiency Standards were developed by the CEC and apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and non-residential buildings. The CEC updates these standards periodically. The current standards (2005 Standards) were effective through December 31, 2009. The 2008 Standards go into effect on January 1, 2010. Under Assembly Bill 970, signed September 2000, the CEC will update and implement its appliance and building efficient standards to make "maximum feasible" reduction in unnecessary energy consumption.

Local Regulations

As of yet there are no local regulations, plans or programs that provide direction on preventing contributions to global climate change.

ENVIRONMENTAL SETTING

Enhancement of the greenhouse effect can occur when concentrations of GHGs exceed the natural concentrations in the atmosphere. Of these gases, CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane primarily results from off-gassing associated with agricultural practices and landfills. SF_6 is a GHG commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. There is widespread international scientific agreement that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential resulting effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB, 2006). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

Greenhouse Gas Inventory

Summary of Emissions

GHG emissions produced within Tulare County in 2007 were estimated to be 5.2 million metric tons of CO_2 equivalent (tonnes of CO_2e). Projected emissions for 2030 are 6.1 million tonnes of CO_2e. In both 2007 and 2030, dairies/feedlots accounted for the largest portion of total emissions, making up 63 percent and 59 percent of total emissions, respectively. Mobile sources (on and off-road) accounted for the second largest portion of emissions, contributing 16 percent in 2007 and 20 percent in 2030. When normalized by population, total annual emissions equate to 36 tonnes of CO_2e per resident in 2007, and 27 tonnes of CO_2e per resident in 2030.

Organizational Boundaries

The organizational boundary for this assessment was established using the GHG Protocol's control approach. Under this approach, an entity (in this case, Tulare County) accounts for all of the GHG emissions generated by operations over which it has control. For Tulare County, this includes the emissions generated from activities occurring in unincorporated county land. Incorporated cities that are not a part of this inventory include: Dinuba; Exeter; Farmersville; Lindsay; Porterville; Tulare; Visalia and Woodlake.

Operational Boundaries

Operational boundaries are defined as "[t]he boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting company. This assessment allows a company to establish which operations and sources cause direct and indirect emissions, and to decide which indirect emissions to include that are a consequence of its operations" (GHG Protocol, 2008).

This inventory includes direct and indirect emissions resulting from the energy (electricity and natural gas), mobile source (on- and off-road), agriculture (dairy/feedlots), and solid waste (landfills) sectors in Tulare County. Table 6-6 identifies all sources of emissions included in the inventory, as well as information on where data for each source were obtained.

Table 6-6. Operational Boundaries of Greenhouse Gas Inventory

Sector	Source of Emissions	Data Source
Mobile Sources	On-Road	Tulare County Association of Governments (TCAG), EMFAC Model
	Off-Road	OFFROAD2007 Model, CARB
Solid Waste	Trash	LandGEM Model, Tulare County Resource Management Agency
Natural Gas	Residential	The Gas Company
	Commercial	The Gas Company
	Industrial	The Gas Company
Dairy/Feedlot	Dairy/Feedlot	Jones and Stokes, 2006; EPA
Electricity	Residential	PG&E, Southern California Edison (SCE)
	Commercial	PG&E, SCE
	Industrial	PG&E, SCE

Data

Data Sources and Quality

Data collection for the electricity and natural gas inventory was conducted by Tulare County staff and ESA analysts. Data collection for solid waste, mobile sources, and dairy/feedlot was conducted by ESA analysts. Underlying all calculations is the basic assumption that the data provided by utility service providers, the Tulare County Association of Governments (TCAG), and Jones and Stokes are accurate and complete.

Electricity

2007 Emissions

PG&E provided data for 2007 electricity consumption in unincorporated Tulare County in kilowatt-hours (kWh), separated by residential, commercial, and industrial usage. PG&E also provided PG&E-specific CO_2 emission rates (emission factors) for electricity for 2007. Of note, PG&E provided its ClimateSmart[1] emission rate, which is a multi-year average, as a proxy for its 2007 emission rate.

SCE provided data for electricity consumption in unincorporated Tulare County in kWh, separated by residential, commercial/industrial, agricultural, and street lighting usage. Data was provided for December 1, 2005 to November 30, 2006. This

[1] PG&E's ClimateSmart™ program provides a voluntary option for PG&E customers to calculate their monthly GHG emissions from electricity use, and to offset those emissions by funding GHG emissions reduction projects.

analysis assumes that electricity use during this period is similar to electricity use in 2007. SCE did not provide an SCE-specific emission factor; therefore, this analysis uses a regional emission factor from the California Climate Action Registry (CCAR).

Neither utility provide utility-specific emission factors for N_20 or CH_4. Therefore, this analysis uses a regional emission factor from CCAR for N_20 and CH_4 estimates.

2030 Emissions

Residential and street light electricity consumption in 2030 was estimated using the predicted population growth rate. This analysis assumes that, under a business-as-usual trajectory, residential electricity consumption will grow at the same rate as the population—approximately 54 percent from 2007 to 2030.

Commercial, industrial, and agricultural electricity consumption were assumed to increase commensurate with job growth. TCAG predicts that the number of jobs in unincorporated Tulare County will increase by approximately 11 percent between 2007 and 2030.

Natural Gas

2007 Emissions

The Gas Company (formerly Southern California Gas) provided data for calendar year 2007 in million cubic feet (Mcf), for residential, commercial, and industrial usage. The Gas Company also provided a company-specific emission factor for CO_2, but not for N_20 or CH_4. Therefore, this analysis uses a U.S. average emission factor from CCAR for N20 and CH4 estimates.

2030 Emissions

Residential natural gas consumption in 2030 was estimated using the predicted population growth rate. Commercial and industrial consumption were assumed to increase commensurate with job growth.

Solid Waste

2007 Emissions

Annual generation of methane emissions were calculated using the USEPA's LandGEM model (USEPA, 2008). The model uses as inputs the amount of waste placed in the landfill annually; a factor (Lo) for

the potential methane generation capacity, which depends on the type and composition of waste placed in the landfill; and a factor (k) for the methane generation rate, which determines the rate of methane generation for the mass of waste in the landfill, and which is related to environmental conditions within the landfill – primarily the amount of moisture.

Tulare County Resource Management Agency (RMA) provided data for the three active landfills in Tulare County: Visalia Disposal Site, Woodville Disposal Site and Teapot Dome Disposal Site. Because the landfills are owned, operated and managed by the county, landfill emissions are included as direct emissions by the county. RMA provided data for total tonnage of the waste in place as of 2007 and the annual tonnage reports for 1996-2007, as well as information about which landfills flare methane emissions and which use generators. ESA ran the LandGem model using the default values for the potential methane generation capacity (Lo) and methane generation rate (k).

2030 Emissions

Total production of solid waste in 2030 was projected using the predicted population growth rate. Also, according to RMA, Teapot Dome Disposal Site will reach its permitted capacity within the next calendar year if the current disposal rate continues. Consequently, emission calculations assume that future waste generation for Teapot Dome Disposal Site will be redirected to Woodville Disposal Site.

Mobile Sources

2007 Emissions

Off-road emissions were calculated using CARB's OFFROAD2007 Model (CARB, 2008a), and represent 2007 emissions. The off-road model captures emissions from various types of off-road equipment, including agricultural, construction, lawn and garden and off-road recreation, which includes equipment from hedge trimmers to cranes. Using the off-road model, ESA analysts generated a tons-per-day average for all off-road equipment, using a "Monday-Sunday" averaging period and "Annual" as the month or season. To obtain an annual estimate for 2007, this number was multiplied by 365. The model estimates emissions for all off-road mobile sources in Tulare County, including unincorporated and incorporated areas. Because the scope of this analysis includes unincorporated areas only, total county emissions were allocated to unincorporated Tulare County

based on the percent of the population that lived in unincorporated Tulare County in 2007 (34 percent).

On-road emissions were derived using vehicle miles traveled (VMT) data from the Tulare County Association of Governments (TCAG, 2007), and emission factors from CARB's EMFAC2007 model. This model is used to calculate emission rates from all motor vehicle classifications, from passenger cars to heavy-duty trucks, operating on highways, freeways, and local roads in California (CARB, 2008b). Because VMT data was for all of Tulare County, including incorporated cities, total county emissions were allocated to unincorporated Tulare County based on the percent of the population that lived in unincorporated Tulare County in 2007 (i.e., 34 percent) and 2030 (i.e., 30 percent).

2030 Emissions

Year 2030 off-road emissions were calculated using TCAG's predicted job growth rate. This analysis assumes that, under a business-as-usual trajectory, off-road equipment usage will grow at the same rate as employment, approximately 11 percent from 2007 to 2030.

Year 2030 on-road emissions were calculated using TCAG's VMT estimates for 2030.

Dairy/Feedlot

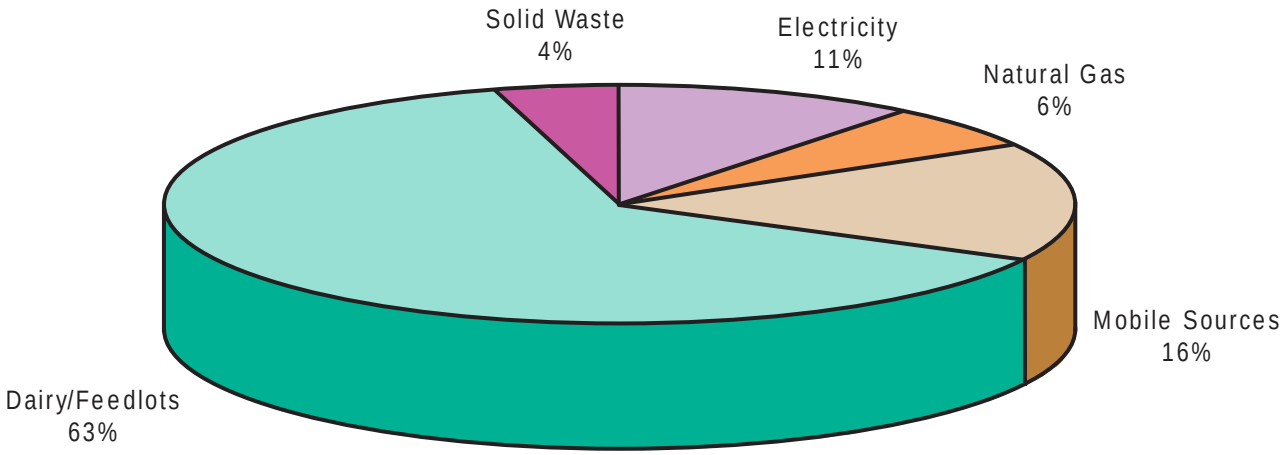
2007 and 2030 Emissions

Dairy and feedlot operational emissions were estimated in the Tulare County Draft Phase I Animal Confinement Facilities Plan Supplemental Program EIR (Jones and Stokes, 2006). Total dairy and feedlot emissions of methane are derived using emission rates associated with manure decomposition and enteric digestion. The analysis calculates methane emissions under existing conditions (2006), and complete build-out conditions (2020). This analysis assumes that emissions in 2006 emissions are similar to emissions in 2007, and that emissions in 2030 will be similar to those in 2020.

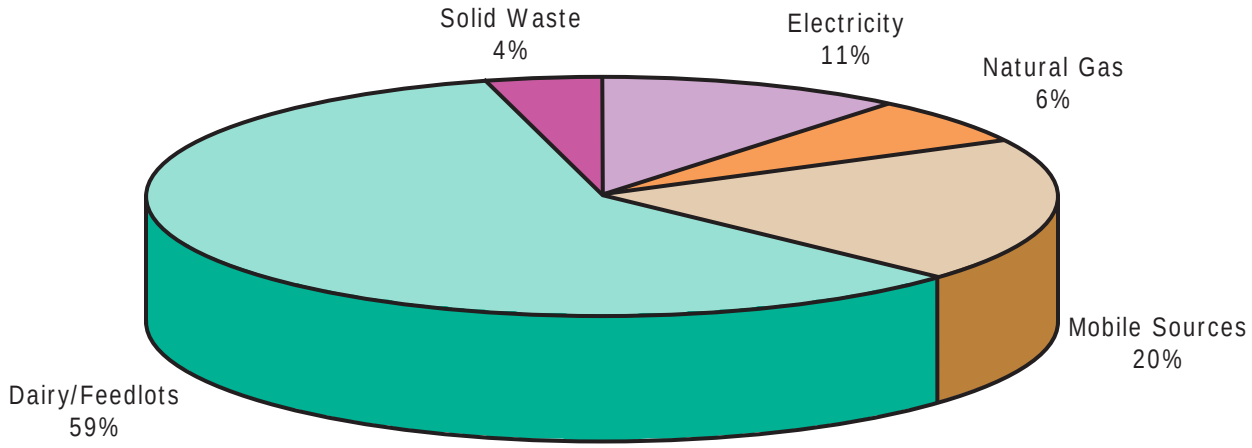
Results

In 2007, Tulare County generated approximately 5.2 million tonnes of CO_2e. The largest portion of these emissions (63 percent) is attributed to dairies/feedlots, while the second largest portion (16 percent) is from mobile sources. See Table 6-7 and Figure 6-1 for annual emissions per sector.

2007 – BREAKDOWN OF EMISSIONS BY SOURCE



2030 – BREAKDOWN OF EMISSIONS BY SOURCE



Source: ESA, 2010.

FIGURE 6-1
Breakdown of Emissions by Source - 2007 and 2030

Table 6-7. Emissions by Sector in 2007

Sector	CO_2e (tonnes/year)	% of Total
Electricity	542,690	11%
Natural Gas	321,020	6%
Mobile Sources	822,230	16%
Dairy/Feedlots	3,294,870	63%
Solid Waste	227,250	4%
Total	**5,208,060**	**100%**
Per Capita	**36.1**	

Per capita emissions in 2007 were approximately 36 tonnes of CO_2e per resident.

In 2030, Tulare County is forecast to generate approximately 6.1 million tonnes of CO_2e. The largest portion of these emissions (59 percent) is attributed to dairies/feedlots, while the second largest portion (20 percent) is from mobile sources. See Table 6-8 and Figure 6-1 for annual emissions per sector. Per capita emissions in 2030 are projected to be approximately 27 tonnes of CO_2e per resident.

Table 6-8. Projected Emissions by Sector in 2030

Sector	CO_2e (tonnes/year)	% of Total
Electricity	660,560	11%
Natural Gas	384,410	6%
Mobile Sources	1,212,370	20%
Dairy/Feedlots	3,601,390	59%
Solid Waste	246,750	4%
Total	**6,105,480**	**100%**
Per capita	**27.4**	

7. PUBLIC SERVICES AND UTILITIES

7.1 Introduction

This chapter of the Background Report summarizes the current state of public services and utilities within Tulare County. The methodology for assessing current conditions and future expansion potential is provided. In addition, key terms that are relevant to this discussion and a summary of local, state, and federal regulations that apply are covered.

This chapter is divided into the following Sections:

- Domestic Water Infrastructure (Section 7.2);
- Sanitary Sewer Infrastructure (Section 7.3);
- Storm Drainage Infrastructure (Section 7.4);
- Solid and Hazardous Waste (Section 7.5);
- Natural Gas and Electric Service (Section 7.6);
- Law Enforcement (Section 7.7);
- Fire Protection (Section 7.8);
- Schools (Section 7.9);
- Communications (Section 7.10);
- Court Services (Section 7.11);
- Library Services (Section 7.12);
- Hospital and Ambulance Services (Section 7.13); and
- Social Services (Section 7.14).

7.2 Domestic Water Infrastructure

Introduction

The purpose of this section is to summarize existing information regarding Tulare County's domestic water infrastructure. This section focuses primarily on water treatment (including general discussions pertaining to water quality), current demand (no. of connections), current supply capacity (wells, pumps, reservoirs, etc.), storage and

distribution infrastructure, and the condition of these facilities. Other water supply issues including groundwater levels, groundwater recharge, and irrigation are addressed in Section 10.2, Water Resources and in Appendix C, Water Resources.

Methodology

Current water infrastructure within Tulare County is described in terms of agency's providing service, as many of the domestic water systems are isolated and serve only individual small communities within the County. There are a multitude of domestic water service providers (both public and private) in Tulare County including community service districts (CSDs), irrigation districts (IDs), public utility districts (PUDs), sanitary districts, County Service Areas (CSAs) and mutual water companies. These Districts are self governing and are not subject to County control. The County must coordinate its plans for growth and development with these districts in order to assure that services can be provided on a timely basis to areas planned for development, including areas within designated Urban Development Boundaries (UDBs).

Data reported in this section includes the following:

- Number of connections to system (metered, non-metered);
- Maximum delivery and storage capacities (if available);
- Backup system capacities (if present);
- Water treatment processes and capacities (if applicable);
- Age and current condition of system (tanks, pipelines, pumping stations, and treatment facilities);
- Current population served by system; and
- Pressure requirements (domestic and fire flow).

The data reported in this section of the report was collected from a number of sources including but not limited to special districts that provide water service (including special district websites), the Tulare County Resource Management Agency, the California Department of Water Resources, the California Regional Water Quality Control Board (Central Valley Region), the State Department of Health Services Division of Drinking Water, and the U.S. Census Bureau.

Key Terms

Acre-Foot (acre-ft). The volume of water required to cover one acre of land (43,560 square feet) to a depth of one foot. One acre-ft is equal to 325,851 gallons or 1,233 cubic meters.

Aquifer. A geologic formation that is water bearing. A geological formation or structure that stores and/or transmits water, such as to wells and springs. Use of the term is usually restricted to those water-bearing formations capable of yielding water in sufficient quantity to constitute a usable supply for people's uses.

Appropriated Right. That right to put to reasonable beneficial use a quantity of water subordinate to the use thereof by prior appropriators and defined riparian diverters.

Central Valley Project. The water supply project in California owned by the United States and managed by the Department of the Interior, Bureau of Reclamation.

Commercial Water Use. Water used for motels, hotels, restaurants, office buildings, other commercial facilities, and institutions. Water for commercial uses comes both from public-supplied sources, such as a county water department, and self-supplied sources, such as local wells.

Confined Aquifer. Soil or rock below the land surface that is saturated with water. There are layers of impermeable material both above and below it and it is under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer.

Cubic Feet per Second (cfs). A rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second.

Domestic Water Use. Water used for household purposes, such as drinking, food preparation, bathing, washing clothes, dishes, dogs, flushing toilets, and watering lawns and gardens.

Drawdown. A lowering of the ground-water surface level caused by pumping.

Groundwater. (1) water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturate zone is called the water table. (2) Water stored underground in rock crevices and in the pores of geologic materials that make up the Earth's crust.

Groundwater Overdraft. The condition of a groundwater basin in which the amount of water extracted (through pumping) exceeds the amount of water that recharges the basin.

Groundwater Recharge. The natural or intentional infiltration of surface water into the zone of saturation (groundwater).

Industrial Water Use. Water used for industrial purposes in such industries as steel, chemical, paper, and petroleum refining. Nationally, water for industrial uses comes mainly (80%) from self-supplied sources, such as local wells or withdrawal points in a river, but some water comes from local water service providers.

Maximum Contaminant Level (MCL). The designation given by the U.S. Environmental Protection Agency (EPA) to water-quality standards promulgated under the Safe Drinking Water Act. The MCL is the greatest amount of a contaminant that can be present in drinking water without causing a risk to human health.

Milligram (mg). One-thousandth of a gram.

Milligrams per Liter (mg/L). A unit of the concentration of a constituent in water or wastewater. It represents 0.001 gram of a constituent in 1 liter of water. It is approximately equal to one part per million (PPM).

Million Gallons per Day (mgd). A rate of flow of water equal to 133,680.56 cubic feet per day, or 1.5472 cubic feet per second, or 3.0689 acre-feet per day. A flow of one million gallons per day for one year equals 1,120 acre-feet (365 million gallons).

Municipal Water System. A water system that has at least five service connections or which regularly serves at least 25 individuals for 60 days; also called a public water system.

Per Capita Use. The average amount of water used per person using a standard time period, generally per day.

Potable Water. Water of a quality suitable for drinking.

Riparian Right. Riparian water rights apply only to lands that are traversed by or border on a natural watercourse. Riparian owners have a right (correlative with the right of each other riparian owner) to share in the reasonable beneficial use of the natural flow of water that passes the owners land. No permit is required for such use. Riparian water must be used reasonably, beneficially, and solely on riparian (adjacent) land and cannot be stored for later use.

Safe Yield. The maximum dependable draft that can be made continuously on source of groundwater supply during a period of years

during which the probable driest period or period of greatest deficiency in water supply is likely to occur.

Surface Water. Water that is on the Earth's surface, such as in a stream, river, lake, or reservoir.

Unconfined Aquifer. An aquifer whose upper water surface (water table) is at atmospheric pressure, and thus is able to rise and fall.

Water Quality. A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Water Table. The top of the water surface in the saturated part of an aquifer.

Well (water). An artificial excavation put down by any method for the purposes of withdrawing water from the underground aquifers. A bored, drilled, or driven shaft, or a dug hole whose depth is greater than the largest surface dimension and whose purpose is to reach underground water supplies or oil, or to store or bury fluids below ground.

Regulatory Setting

Water in California is managed by a complex network of federal, state, and local regulations. California administers rights to surface water at the state level, but not rights to groundwater, which is managed under a variety of authorities including local governments. Major regulatory policies pertaining to domestic water management are summarized below.

California Water Code. The California Water Code, a section of the California Code of Regulations, establishes the governing law pertaining to all aspects of water management in California. The California Water Code establishes the Department of Water Resources (DWR) as the primary research and supply development and management agency for water, and the State Water Resources Control Board for overall water quality policy development and for dealing with water rights issues. There are also nine Regional Water Quality Control Boards that are responsible for the regulation, enforcement, and protection of the beneficial uses of water.

Safe Drinking Water Act. The Safe Drinking Water Act (SDWA), administered by the EPA in coordination with the states, is the main federal law that ensures the quality of America's drinking water. Under the SDWA, EPA sets standards for drinking water quality and oversees

the states, localities, and water suppliers that implement those standards. In 1996, Congress amended the Safe Drinking Water Act to emphasize sound science and risk-based standard setting, small water supply system flexibility and technical assistance, community-empowered source water assessment and protection, public right-to-know, and water system infrastructure assistance through a multi-billion-dollar state revolving loan fund.

Urban Water Management Planning Act. In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code Sections 10610 – 10656). The Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act requires that urban water suppliers adopt and submit an urban water management plan at least once every five years to the department of water resources. Non-compliant urban water suppliers are ineligible to receive funding pursuant to Division 24 (commencing with section 78500) or Division 26 (commencing with section 79000), or receive drought assistance from the State until the UWMP is submitted pursuant to the Urban Water Management Planning Act.

Agricultural Water Suppliers Efficient Water Management Practices Act of 1990 (AB 3616). AB 3616 establishes a relationship between DWR and agricultural water suppliers to develop and implement efficient water management practices. The intent of this act was to promote the implementation of voluntary, efficient water management practices (EWMPs) among agricultural water suppliers. It led to the creation of the Agricultural Water Management Council and the signing of a Memorandum of Understanding among agricultural water suppliers, environmental groups and other interested parties. As part of the EWMP evaluation process, a Net Benefits Analysis was developed that quantitatively and qualitatively evaluates technical, environmental, socioeconomic, financial, and third party impacts related to each EWMP. Accepted EWMPs are then included in an Agricultural Water Management Plan prepared by each water supplier. The following Districts serving areas within Tulare County have Water Management Plans that have been endorsed by the Agricultural Water Management Council:

- Alta Irrigation District;
- Orange Cove Irrigation District;
- Saucelito Irrigation District; and
- Terra Bella Irrigation District.

Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000. The Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000 requires California Local Agency Formation Commission's (LAFCO) to conduct municipal service reviews for specified public agencies under their jurisdiction. One aspect of a municipal service review is to evaluate an agency's ability to provide public services within its ultimate service area. A municipal service review is required before an agency can update its sphere of influence (SOI).

Senate Bills 610 and 221 (SB 610 and SB 221). New legislation took effect in January 2002 that requires increased efforts to identify and assess the reliability of anticipated water supplies and envisions increased levels of communication between municipal planning authorities and local water suppliers.

SB 221 requires that cities and counties impose a new condition of tentative subdivision approval, requiring that the applicant provide a detailed verification from the applicable water supplier that a sufficient water supply will be available before the final subdivision map can be approved. It applies to subdivisions of 500 units or more and projects that would employ 1,000 or more workers. This requirement also applies to increases of ten percent or more of service connections for public water systems with less than 500 service connections. The law defines criteria for determining *sufficient water supply* such as using normal, single dry, and multiple dry year hydrology and identifying the amount of water that the supplier can reasonable rely on to meet existing and future planned uses. Rights to extract additional groundwater if used for the project must be substantiated.

SB 610 amends the Urban Water Management Planning Act to require additional information in Urban Water Management Plans if groundwater is identified as a source available to the supplier. The information required includes a copy of any groundwater management plan adopted by the supplier, a copy of the adjudication order or decree for adjudicated basins, and if non adjudicated, whether the basin has been identified as being over drafted or projected to be over drafted in the most current DWR publication on that basin. If the basin is in

overdraft, that plan must include current efforts to eliminate any long term overdraft. A key provision in SB 610 assures that water supply issues are thoroughly considered as part of the environmental review process, but only for the larger projects as described above. These projects must include a water supply assessment, containing specified information from the local public water supplier likely to provide water in the project area.

Assembly Bill 2572. This bill, passed in 2004, requires, with certain exceptions, that all urban water suppliers to install water meters on all municipal and industrial water service connections that are located in its service area on or before January 1, 2025. The provisions of the bill supersede and preempt all enactments, including charter provisions and amendments thereto, and other local action of cities and counties, including charter cities and charter counties, and other local public agencies that conflict with the provisions of AB 2572, other than enactments or local action that impose additional or more stringent requirements. The bill authorizes urban water suppliers to recover the cost of providing services related to the purchase, installation, and operation of a water meter from rates, fees, or charges.

U.S. Environmental Protection Agency. The EPA is responsible for developing and enforcing regulations that implement environmental laws enacted by Congress. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance.

State Department of Health Services. A major component of the State Department of Health Services (DHS), Division of Drinking Water and Environmental Management is the Drinking Water Program (DWP) that regulates public water systems. DHS is responsible for regulating public water systems and small water systems and monitoring them for compliance with the State Water Code and Federal Drinking Water Quality requirements. Additional regulatory responsibilities include the issuance of operational permits, routine water system inspections, evaluation of water quality monitoring data, and follow up compliance activities. DHS provides oversight and enforcement for those systems in Tulare County with more than 200 connections. Other functions include supporting and promoting water systems security, providing support for small water systems and for improving technical, managerial, and financial (TMF) capacity, and providing subsidized funding for water system improvements under the State Revolving Fund (SRF) and Proposition 50.

Tulare County Health and Human Services Agency (HHSA). HHSA, which has been granted primacy by the DHS, is responsible for the administration and enforcement of the Safe Drinking Water Act involving those systems in Tulare County with less than 200 connections.

California Department of Water Resources. The California Department of Water Resources is responsible for preparing and updating the California Water Plan, which is a policy document that guides the development and management of the State's water resources. The plan is updated every five years to reflect changes in resources and urban, agricultural, and environmental water demands. It suggests ways of managing demand and augmenting supply to balance water supply with demand.

Existing Conditions

Demands for water resources within Tulare County are met from 4 major sources. These sources include groundwater, local streams and rivers, imported surface water and imported surface water by exchange. The predominant water supply for domestic use within the unincorporated communities of Tulare County is the individual system. Principal among these systems are those that utilize groundwater that is, in most cases, untreated. Large and small water systems that provide domestic water service to unincorporated communities in the County are typically operated and managed by CSDs, IDs, PUDs, and mutual water companies. These Districts are self governing and are not subject to County control. Although these Districts are not subject to County control, the County must coordinate its plans for growth and development with these districts in order to assure that services can be provided on a timely basis to areas planned for development, including areas within designated Urban Development Boundaries (UDBs).

Figure 7-1 shows a map of Tulare County with the locations of unincorporated communities. Table 7-1 identifies the urban water supplier for each community (as shown on Figure 7-1) including source of water supply, whether service is metered or flat rate, and existing (2003) population.

Figure 7-1. Tulare County Unincorporated Communities

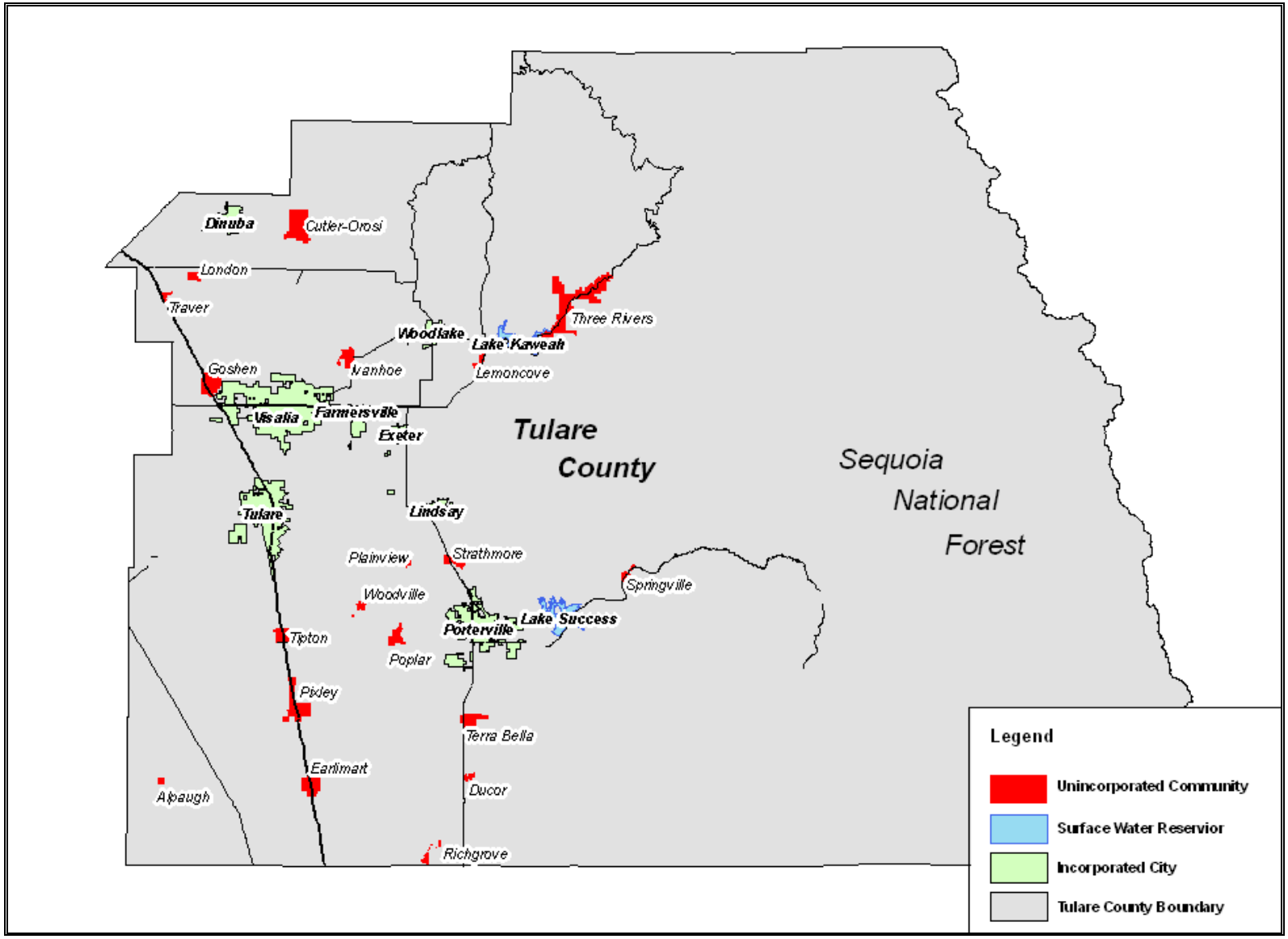


Table 7-1. Community Urban Water Suppliers

Community	Urban Water Supplier	Water Supply Source	Metered/ Flat Rate	Existing Population[1]
Alpaugh	Alpaugh JPA	Groundwater	Flat Rate	761
Cutler	Cutler PUD	Groundwater	Flat Rate	4,962
Orosi	Orosi PUD	Groundwater	Metered	8,086
Ducor	Ducor CSD	Groundwater	Flat Rate	504
Earlimart	Earlimart PUD	Groundwater	Flat Rate	7,393
Goshen	Cal Water (Private)	Groundwater	Metered	2,473
Ivanhoe	Ivanhoe PUD	Groundwater	Metered	4,524
Lemon Cove	Lemon Cove SD	Groundwater	Metered	251
London	London CSD	Groundwater	Flat Rate	1,848
Pixley	Pixley PUD	Groundwater	Flat Rate[2]	2,662
Plainview	Plainview MWC	Groundwater	N/A[3]	822
Poplar-Cotton Center	Poplar CSD	Groundwater	Flat Rate	1,789
Richgrove	Richgrove CSD	Groundwater	Flat Rate[4]	2,723
Springville	Springville PUD	Surface Water	Metered	2,755
Strathmore	Strathmore PUD	Groundwater/ Surface Water	Metered	2,800
Terra Bella	Terra Bella ID	Groundwater/ Surface Water	N/A[3]	3,714
Three Rivers	Three Rivers CSD	Groundwater/ Surface Water	Varies	2,300
Tipton	Tipton CSD	Groundwater	Flat Rate	1,809
Traver	County Service Area 1	Groundwater	Flat Rate	732
Woodville	Woodville PUD	Groundwater	Metered	1,623

1) Source: Tulare County Association of Governments (TCAG).
2) Approximately 320 of 800 connections are metered according to District Staff.
3) Information Not Available.
4) Commercial connections (19) are billed under a metered rate structure. District is currently in the process of installing water meters on all connections.

In addition to the communities identified in Figure 7-1 and Table 7-1, there are additional unincorporated urban areas of Tulare County that are not formally designated as "communities". Some of these other unincorporated urban areas are listed below:

- Allensworth;
- Delft Colony;
- East Orosi;
- East Tulare Villa;
- Lindcove;
- Monson;
- Seville;
- Sultana;
- Teviston;
- Tonyville;
- Waukena;
- West Goshen; and
- Yettem.

The above areas, in addition to other unincorporated urban areas of the County, are provided water through various agencies including County zones of benefit, County service areas, CSDs, and mutal water companies, etc. Examples include the East Orosi CSD, California Water Service Company, River Island Water Company, Triple R Mutual Water Company, California Hot Springs Water Company, and Williams Mutual Water Company. Water infrastructure data for these smaller unincorporated areas is summarized where the information is available, i.e., provided by agency.

The following paragraphs describe the current state of domestic water infrastructure in the unincorporated communities of the county, as listed in Table 7-1. Water system information for the smaller urban areas of the County (not formally designated as communities) is provided where the information has been made available for the preparation of this report.

Alpaugh Joint Power Authority

Alpaugh's problems with water have long been documented. The Alpaugh community water system had ongoing water quality problems that included high levels of arsenic and was deemed unsafe for cooking and drinking. The Alpaugh Joint Powers Authority (AJPA) has since addressed many of the health issues in regard to unsafe drinking water and the Department of Health Services rescinded a boil water order as of January 10, 2005.

The current infrastructure for domestic water service is the result of two former systems, previously owned and operated by the Alpaugh Irrigation District and Tulare County Water Works District (TCWWD) No. 1. When the two Districts formed the AJPA, rights to the domestic water infrastructure were relinquished to the Authority, which is now a separate governing body. A new well, referred to as Well #10, was added to the AJPA system through funding obtained from a U.S. Department of Agriculture (USDA) grant and loan. The AJPA expects to have an additional well drilled, at which time Well #10 would function as the Authority's backup well.

Much of the AJPA water distribution system was constructed over 70 years ago. The pipeline system consists of steel, transite, and plastic pipe varying in size from 2 to 8 inches in diameter. Most of the AJPA water system is un-metered; only the Alpaugh School and Western Farms have water meters, although they are currently being charged

flat rates. Although the water system is currently un-metered, AJPA staff has indicated that system will be metered in the future. Prior to the formation of the AJPA, the TCWWD requested funding from the Water Conservation Grant Program in order to install new water meters for all service connections, in order to better manage the amount of water use in the community. Currently water users are charged a flat monthly rate that does not promote water conservation.

The AJPA water system currently supports 295 connections including one industrial connection, a school connection, and 293 residential connections.

Since its formation, the AJPA has received over $4 million in grants and loans from the USDA, and the Department of Water Resources (DWR), to improve the community's water system. The funds are being used to construct several improvements to the community's water system including drilling a new well, replacing several miles of water mains, and constructing a new water tank.

The new well on the edge of town, Well #10, produces water that is safe to drink by government standards as indicated by State health officials. The arsenic maximum standard became more stringent as of January 2006 (10 PPB, previously 50 PPB).

While the Authority is unable to support additional connections at this time, ongoing system improvements will improve the system capacity and allow for additional service connections within the time horizon of the General Plan.

Cutler Public Utility District

Cutler's water supply, which is chlorinated but not treated, is derived from two deep underground wells, referred to as well #5 and well #6. District staff indicated the total production efficiency for well #5 is 1,100 GPM and 1,000 GPM for well #6, for a total production capability of 2,100 GPM, or 3.024 MGD. The District also has an elevated water storage tank with a capacity of approximately 50,000 gallons. Currently, two wells (wells #3 and #4) are not in service due to high nitrate levels. Two new wells are expected to be brought online in the near future.

The District has 3 active grant/loan funding applications being processed, including an SRF Loan for which an NOFA has been issued. The District is securing funding for a water system rehabilitation

project, a blending tank project, and to bring additional wells on-line. The blending tank project would mix water from one of the new wells (well #9) with wells #3 and #4 (which are currently not in service due to high nitrate levels). By mixing the water supply from wells that produce acceptable water quality with those which have contaminant levels which exceed maximum levels, the District's water supply capabilities will be increased, while bringing the water quality to within acceptable standards before entering the distribution system.

Lovell High School, which is operated by the Cutler-Orosi Joint Unified School District, has requested water service from the Cutler PUD. The District plans to provide the school with water service pending the approval and implementation of the blending tank project.

The District indicated the community water system (as of September 2004) supports 1,032 total connections, including 3 industry packing houses and one box plant. District staff has indicated that there are only thirteen connections that have a water meter; the District currently charges a flat rate for residential water service connections.

The District currently has a water conservation plan that limits when residents can water lawns and wash vehicles. Residents who violate the water conservation rules are warned on the first offense and fined for any additional offenses.

Based upon available information, the District's water system is currently operating at or near its capacity and cannot support additional connections at this time. The amount of developable land available, including the availability of infrastructure, are two factors that have limited community growth from occurring, i.e., affordable housing objectives and commercial enterprise. The District's plans to construct several upcoming water system improvement projects will significantly increase its ability to provide service to proposed development projects.

Orosi Public Utility District

Orosi's water supply is derived from 4 deep underground wells located at various sites throughout the community. Three of the wells discharge into 10,000 gallon hydro-pneumatic pressure tank, and one well discharges into a 750,000 gallon storage tank with booster pumps that discharge into a hydro-pneumatic pressure tank. The water from each supply source is chlorinated and then distributed throughout the

system. Currently, 40% of the District's water distribution system consists of asbestos-concrete pipe ranging in size from 2" to 6" in diameter. Ultimately, the District has indicated the need to replace the existing AC lines with 8" ductile iron piping. District staff also indicated the production efficiency of the wells ranges between 520 and 850 gallons per minute (GPM) and that the 4 wells have a total maximum production efficiency of approximately 2,930 GPM, or 4.22 MGD. Two additional existing wells are currently inactive due to nitrate contamination. A new well (#10) is expected to be brought online in the near future.

The District indicated that the community water system (as of October 2004) supports 1,788 total connections including 1,639 residential connections, 132 commercial connections, 3 agricultural connections, and 14 connections which are inactive. The District's water system also supports 164 fire hydrants located throughout the community. The Orosi PUD water system has been fully metered as of January 1, 2005. Since then the District has billed customers based upon a metered usage. Water consumption data provided by District staff indicated that there was an immediate decrease in domestic water usage as a result of metering. Prior to water metering, the District experienced a peak month flow of 62.742 MG in July 2004 and a max day flow of 2.172 MGD. After metering was implemented by the District, a peak flow rate of 48.102 MG in July 2005 was observed with a max day flow of 1.706 MGD. This equates to a reduction of 23.3% in the peak month flow and a 21.5% reduction in the max day flow.

Based upon available information, it is evident that the water system has excess capacity to accommodate additional growth and development within the community. The construction of a regional water treatment plant would enhance the District's ability to accommodate future growth, assuming rights to the surface water would be available to the District.

Ducor Community Services District

The Ducor Community Service District water supply originates from 2 underground wells with no use of surface water. The community water system supports approximately 150 service connections including a mix of residential and commercial uses.

Based upon available information, it is estimated that the community water system is operating at or near its capacity. Based upon

discussions with District staff, domestic water needs associated with projected General Plan population growth could be met with concerns. District staff indicated that capacity issues could be solved within the time horizon of the General Plan.

Information reported in an October 2003 Visalia Times Delta article describes recent problems Ducor has encountered with their water system. When residents noticed yellow, granite-filled water being pumped out of the main well, further inspection revealed that the well casing was cracked, leaving the districts primary well (south well) out of service. That well is one of 2 wells that supply all water users within the district. A broken primary well forced the district to rely on its sole backup well, which is very old, only operating at 25% of its initial capacity, and was considered as in "imminent danger of failing." The district had already spent thousands of dollars repairing the northern (backup) well, leaving no money left for emergency repairs to the south (primary) well.

To ensure the community did not go without water, it was reported that the Tulare County RMA issued a loan (approximately $35,000) for the district to make emergency repairs to Ducor's primary well. The loan was to pay to repair the well before Ducor received a $497,000 grant from the USDA to drill a new well. It was necessary to repair the cracked casing of the primary well, since the backup well needed to be out of service during the installation of the new well. The district also has a connection to a local industrial plant's (Dole Cold Storage) water well, that is available in emergency situations.

Upon the completion of the new well, the district abandoned the current backup well and relies on the repaired southern well for a backup. The district currently operates 2 wells, each with efficiencies of 200+ gpm. The district's water supply is automatically chlorinated but not treated. Water is pumped from the wells into two 220,000 gallon elevated tanks, that gravity feed water into the distribution system.

The district indicated that water lines in the community are old and are in need of rehabilitation and/or replacement. According to the district, leaks occur frequently and are repaired on an as needed basis. Meters are installed throughout the entire system, but are currently not in service, as the district cannot afford to have the meters calibrated and read, so flat rates for water are currently being assessed. The District indicated that additional service capacity is still limited and only expect to provide service to properties within their current district boundary.

Earlimart Public Utility District

Earlimart's water supply is derived from 4 600 feet deep underground wells, which pump at a consistent water level of approximately 250 feet. The 4 wells provide high quality water requiring no chlorination or treatment. The 4 wells have a total maximum production efficiency of 3,300 GPM, or 4.75 MGD.

The community water system supports 1,485 total service connections including 57 commercial connections, 1,424 residential connections, and 4 school connections. In 2000, Earlimart PUD started requiring water meters for all new development; however, very little development has occurred since then indicating that the majority of the Earlimart PUD's water system is un-metered. Water meters are also to be installed when properties change ownership.

Based upon available information, it is estimated that the community water system is operating at approximately 88% of its capacity. The Earlimart PUD's water system will need additional capacity to accommodate population increases associated with the build-out of the general plan. These additional supplies would likely come from additional groundwater wells.

California Water Service Company – Goshen Water System

The California Water Service Company (Cal Water) operates a water supply and distribution system that serves the community of Goshen. Cal Water's water supply is derived from over 70 deep water wells (including water delivered to the City of Visalia).

There are serious concerns for the water quality of the local Goshen wells. Cal Water operates 4 wells in or near the community of Goshen. Three of the 4 wells are out of service due to water quality issues. Nitrate levels have caused Cal Water to blend wells to keep them open. The Goshen water system is metered, which promotes water conservation.

Conversations with Cal Water staff exposed some concerns for future growth in the area. Water Company staff indicated that with the projected population growth, the water supply is adequate with concerns. The Goshen area has a maintenance program that should keep pace with current population growth. The concerns are in regard to higher than historic growth as well as water quality concerns.

Additional water supply to accommodate future growth would likely be derived from additional groundwater wells.

Ivanhoe Public Utility District

The Ivanhoe PUD's water supply is derived from six deep underground wells that pump at a consistent water level between 250 and 350 feet. According to Ivanhoe PUD staff, the six wells provide an ample excellent water supply requiring no chlorination or treatment. Ivanhoe PUD staff indicated that the production efficiency of the wells ranges between 500 and 1,000 GPM and that the six wells have a total maximum production efficiency of approximately 3,600 GPM, or 5.18 MGD. Wells are located at various sites throughout the community.

Ivanhoe PUD staff indicated that the community water system (as of August 2004) supports 1,114 single and multi-family residential connections. The Ivanhoe PUD was unsure exactly how many commercial connections were on the system, but estimated that there are approximately 1,200 total connections to the system. The Ivanhoe PUD water system has been fully metered since 1991. Since then the Ivanhoe PUD has billed customers based upon a metered usage. Water consumption data indicated that there was an immediate decrease in domestic water usage occurred as a result of metering.

Based upon available information, it is estimated that the community water system is operating at approximately 50% of its capacity. The community water system has excess capacity to accommodate projected general plan growth. Additional water supply needed to accommodate future growth would likely be derived from additional groundwater extractions.

In 2004, the Ivanhoe PUD received a $2 million State Revolving Fund (SRF) loan, a portion of which was used to replace old water lines with new water lines and relocate the lines from alleys to streets. Approximately $1.4 million in water line replacements has been completed. The remaining $600,000 was to be used to bring one new well online. Since the Ivanhoe PUD's water system has sufficient capacity, the Ivanhoe PUD's Board voted not to drill a new well at this time. It is anticipated that the $600,000 that was to be used for a new well will be returned to the State.

Lemon Cove Sanitary District

The Lemon Cove SD's water system consists of a single well with a two horsepower submersible pump, a 30,000 gallon storage tank, booster pump, a 4,000 gallon pressure tank, and the water distribution system. The water system has no permanently installed treatment at this time. In addition, there is no backup water supply on the Lemon Cove SD's system. There are approximately 50 active domestic water service connections within the Lemon Cove SD.

According to the Sanitary Survey Report completed by the County of Tulare Health and Human Services Agency (HHSA), the water system appears adequate to meet the needs of the Lemon Cove SD. The County Health Department is unaware of any complaints concerning water shortages or pressure problems. Fire hydrants on the Lemon Cove SD's system are used to fill tanker type fire trucks with no apparent negative effect to the system.

Items that were brought to the attention of the operator to bring the water system into compliance during the 2001 inspection by the County Health Department included repairing the leak at the turbine pressure tank site.

According to the Lemon Cove SD's 2004 Consumer Confidence Report, water samples taken in December 2004 contained nitrate levels of 55 mg/L, which exceeds the maximum contaminant level (MCL) of 45 mg/L. The Lemon Cove SD has been issued a compliance order (No. 04-95) to address the elevated nitrate levels.

The Lemon Cove SD's water system is fully metered. The Lemon Cove SD's implementation of a metered water rate structure is indicative of the Lemon Cove SD's desire to promote water conservation, and continue to provide effective water service to its residents.

Based upon available information, improvements to the community water system would be needed in order to support growth associated with the build-out of the general plan. These improvements would include addressing existing water quality problems, the installation of a backup well, and additional supply and distribution system improvements. Additional water supplies would likely be derived from groundwater sources.

London Community Services District

The London CSD water system consists of three active wells and one hydro-pneumatic pressure tank. The water system has no permanently installed treatment at this time, as it currently meets federal drinking water standards. London CSD staff has indicated that there are approximately 430 connections to their water system.

London CSD staff has indicated that the water system was constructed in 1952 and experiences minor leaks. Water system leaks have the potential for causing cross contamination problems. The district continues to make repairs on an as needed basis. The district's water deliveries are currently billed under a flat rate structure.

The London CSD received Proposition 13 funding in the amount of $98,156 to prepare an infrastructure rehabilitation feasibility study to detect and evaluate leaks and to determine the feasibility of replacing the distribution system. The feasibility study initiated a grant/loan proposal through the State Revolving Fund Program for construction of a new domestic water well and hydro-pneumatic tank, along with distribution system improvements. The London CSD water system is currently un-metered.

Specific capacity information for the community's water system is not available; however, it is likely that the London CSD would need to expand its water supply and improve the distribution system to support any significant growth associated with the build-out of the general plan.

The districts ability to provide water to support future development appears to be limited by the condition of the current infrastructure. However, the district is currently addressing this issue through applying for State funding to improve its water system. The district is confident that their water supply (three wells) could support additional development; however, the availability of the infrastructure to deliver the water is limited until improvements are implemented. Water needed to accommodate growth in the community would likely be derived from groundwater sources.

Pixley Public Utility District

Pixley PUD's water supply is derived from 4 deep underground wells. The 4 wells in operation have a total maximum production efficiency of approximately 2,700 GPM, or 3.88 MGD.

As indicated by the Pixley PUD's Engineer, 3 of the existing 4 wells exceed the acceptable arsenic level for drinking water that became effective January 2006 and the water supply system will require treatment or replacement of wells to meet current water quality standards.

Pixley PUD staff indicated that there are slightly more than 800 hookups to the water system including 25 commercial connections. Approximately 320 of the residential connections are metered.

Based upon available information, there is only sufficient water supply to meet existing domestic demands without considering fire flow requirements. The Pixley PUD Engineer indicated that no additional connections could be supported by the water system when considering fire flows and the possibility of the maximum producing well being out of service. For this reason, the Pixley PUD Engineer concluded that additional wells will be required in order to increase capacity and that fire flow requirements could be met with storage tanks. The Pixley PUD Engineer also noted that the existing water system includes many 4-inch and 6-inch diameter lines that may not be suitable for peak and fire flows.

Plainview Mutual Water Company

The Plainview Mutual Water Company (Plainview MWC) is a small organization that provides water for the residents of Plainview, located west of Strathmore. Based upon discussions with Plainview MWC staff, there are significant concerns with respect to population growth in the future. The Plainview MWC is currently rebuilding their system as funds become available. Many of the existing pipes and water supply facilities are dated. The concern for future growth is due in part to the existing capacity issues and deterioration of the current water system.

Plainview MWC's water is derived from groundwater sources. Information regarding the number of wells and associated production efficiencies has not been provided. It is likely that the Plainview MWC will continue to rely on groundwater sources to support any future growth.

Poplar Community Services District

Poplar CSD's water supply, which is chlorinated but not treated, is derived from 3 active underground wells with a total maximum production efficiency of 2,280 GPM or about 3.3 MGD. The Poplar CSD also has an elevated water storage tank with a capacity of 300,000 gallons.

Water meters were installed in 1979, but the Poplar CSD has indicated that they need to be serviced before being put back into use. For this reason, the Poplar CSD uses a flat rate structure to bill its customers. Based upon information provided by Poplar CSD staff, there are approximately 640 connections to the Poplar CSD water system.

Based upon the District's 2004 Annual Drinking Water Quality Report, there are no indications that the Poplar CSD's water supply has contaminant levels exceeding the maximum contaminant levels. There is no evidence suggesting that the Poplar CSD's water supply does not meet Federal drinking water standards.

Based upon available information, the community water system has apparent excess capacity to accommodate projected general plan growth. It is likely that the Poplar CSD would continue to rely on groundwater sources in order to accommodate growth in the community.

Richgrove Community Services District

The Richgrove CSD water system consists of 3 active wells (upon the completion of an additional well recently constructed). The Richgrove CSD's water is chlorinated at the well sites, but has no permanently installed treatment at this time. Richgrove CSD staff has indicated that there are 523 connections to their water system. There are 19 commercial customers that receive metered water from the Richgrove CSD. Residential connections are currently un-metered; however, the Richgrove CSD received a water meter retrofit grant in the amount of $119,000 from the Department of Water Resources and is currently working to install meters throughout the community. A fully metered water system will help with water conservation and minimize over usage and/or wasting of water.

Specific capacity information for the community's water system is not available; however, a new well was recently added to the system. For this reason, it is likely that the community water system has excess

capacity, but the level that it will meet projected growth associated with the build-out of the general plan cannot be determined at this time. It is likely that the Richgrove CSD would continue to rely on groundwater sources in order to accommodate future growth in the community.

Springville Public Utility District

The Springville PUD water supply is derived from surface water obtained from the Tule River. The Springville PUD operates and maintains a domestic water treatment facility that processes the surface water before entering the Springville PUD's distribution system. The water system supports about 410 total connections (about 390 are currently active), all of which are metered.

Based upon information provided by the Springville PUD, current water system demands average approximately 0.30 million MGD or 210 GPM. The Springville PUD estimates its current water system capacity at 1.5 MGD, or 1,040 GPM, indicating that there is excess capacity available for additional connections. The District's water system also includes 2 storage tanks with capacities of 150,000, and 200,000 gallons.

Based upon available information, it is estimated that community water system is operating at approximately 30% of its capacity. The community water system has excess capacity to accommodate projected general plan growth. Based upon information provided by the District Engineer, the District is currently pursuing the addition of more storage to its water system in an effort to optimize the water rights capabilities of the District. The District has sufficient surface water rights to continue using surface water in order to accommodate future growth in the community. For this reason, the District will continue to rely on surface water sources as its primary source of potable water deliveries to the community.

Strathmore Public Utility District

Strathmore's water supply is derived from a sub-contract through Tulare County for water made available from the Cross Valley Canal through an exchange with the Arvin Edison Water District. A water filtration plant was constructed in Strathmore for treatment of the surface water from the Cross Valley Canal. The Strathmore PUD constructed the plant in a joint venture with the Lindsay-Strathmore

Irrigation District (LSID). LSID has 22.8% ownership of the plant, and the Strathmore PUD has the remaining ownership. The Strathmore PUD also has an underground water well that is used to supplement the District's surface water supply and as a back-up water supply. Based upon information provided by the District, during the peak month, the District's metered water deliveries total about 0.62 million gallons per day (MGD), or 430 gallons per minute (GPM). Based upon information provided by Strathmore PUD staff, the water system supports about 455 connections.

As indicated by the District's Engineer, pending developments near Avenue 196 and S.R. 65 would max out the District's water system capacity, and further expansion of water service would require the District to acquire additional water rights. The District's continued reliance on surface water deliveries to support growth within the community will depend on the availability of additional water rights that can purchased by the District.

Terra Bella Irrigation District

Terra Bella ID operates 2 separate water systems, one system that receives surface water from the Friant Kern Canal, and is treated before entering the distribution system. This system is the primary source for domestic water service within the urban area of the Terra Bella ID. This system has 2 standby wells that are used for backup supplies. Based upon information provided by Terra Bella ID staff, there are approximately 700 connections which receive treated surface water. The Terra Bella ID water treatment plant was constructed in 1998 and was constructed to allow for additional capacity (approximately double according to staff) above and beyond what the expected 1998 demands would be. Terra Bella ID has a water contract with the U.S. Bureau of Reclamation to receive 29,000 acre feet of water per year from the Friant Kern Canal (water that is used for both domestic and irrigation purposes). Terra Bella's ID treated domestic water system is in good operating condition, and could be expanded to support 600 to 700 additional connections, according to staff.

Terra Bella ID also operates a second water system that has a primary function of providing irrigation water to the outlying rural areas of the community. Water for this rural water system is supplied from a series of underground wells and surface water from the Friant Kern Canal. This water is untreated. There are also domestic water connections to the Terra Bella ID's rural (irrigation) water system that

primarily serve rural residential homes related to agricultural. The water supplied by this system does not meet Federal drinking water standards, and is therefore considered to be non-potable. The Terra Bella ID sends out a quarterly letter to all residents that receive tap water from this system indicating that the water does not meet Federal drinking water standards, is considered to be non-potable, and shall not be used for drinking or cooking. The potable water source for such connections is considered to be bottled water.

Three Rivers Community Services District

There are over 35 private water companies in Three Rivers. Improvement District 1 (previously Alta Acres), which falls under the jurisdiction of the Three Rivers CSD, is the largest water district within the Three Rivers CSD boundary. Improvement District 1 has approximately 90 connections to their water system.

Improvement District #1 is operated by volunteers including parcel owners and residential users of the system. The ever increasing layers of regulations to protect the quality and availability of water is creating the inability of volunteers to comply with these regulations as a result of very complex licensing requirements imposed upon those who are certified to perform water quality tests and evaluate their results. During the summer the district is forced to access its river well which increases the layers of regulatory compliance and cost. The district is exploring ways to completely eliminate the use of its river well.

Improvement District #1 will need additional wells in the near future. All of the existing wells are on private land and all of the future wells will have to be on private land. Over the years just as the district has all benefited from the services of volunteer labors and committee members and has also benefited from the parcel owners who have allowed the district to drill wells on their property for the benefit of the entire district. The District will be identifying possible well sights in the future and looks forward in cooperation of the parcel owners on whose land these sights might lay. These new wells will continue the district's internal water independence and free it from the need to access its river well. This, in turn, will keep its increasing regulatory and compliance costs in check.

The District's pipelines, pumps, wells and storage facilities are all old and deteriorating rapidly. Some of the infrastructure is over 40 years

old. It has been repaired and patched to the point of near exhaustion. Without grants, repairs could come to as much as $10,000 dollars per parcel. The district, with support from Three Rivers' CSD, has applied for a $1.1 million loan/grant from the State of California and been designated a Level D priority, a relatively high priority.

Tipton Community Services District

Tipton's CSD water supply is derived from two active underground wells. The Tipton CSD has two additional wells which are currently inactive; one is currently non-operational due to oil contamination, and the other has been abandoned as a result of nitrate contamination. The two wells currently in use (referred to as well #2 and well #4) provide high quality water requiring no chlorination or treatment. Well #2 can produce water at a rate of 700 GPM, and well #4 can produce water at a rate of 800 GPM. Together the wells have a total maximum production efficiency of 1,500 GPM, or 2.16 MGD.

Tipton's CSD community water system currently supports 554 total service connections including 58 commercial connections and 496 residential connections. The Tipton CSD recently started requiring water meters to be installed for all new development projects although the Tipton CSD currently continues to charge a flat rate for water service. Based upon results other water districts have experienced by going to a metered water rate schedule, it is likely that metering will cause the usage to decrease.

Based upon available information, the community water system is operating at or near its capacity; however, Tipton CSD has plans to bring a new well online in the near future, in order to increase capacity. Tipton's CSD recently received a grant/loan in the amount of $1,833,865 that will be used to implement several water system improvements including well drilling, water line replacement, a pipeline replacement program, and maintenance and improvements to existing well sites.

County Service Area No. 1 – Traver Water System

Tulare County Zone of Benefit – Traver Water System is provided oversight by the County of Tulare Resource Management Agency. Traver is located in Tulare County Service Area No. 1 along with the communities of El Rancho, Delft Colony, Seville, Tonyville, and Yettem.

Based upon discussions with Resource Management Agency staff the future water supply for Traver, based on the projected General Plan populations, is adequate with concerns. The water supply for Traver is derived from groundwater sources, which will likely continue to the primary source of potable water deliveries in order to accommodate growth in the community.

Woodville Public Utility District

Woodville's PUD water supply is derived from two deep underground water wells that have a total maximum production efficiency of approximately 1,500 gpm, according to information provided by the Woodville PUD. Based upon information provided by Woodville PUD staff, the Woodville PUD water system supports about 480 connections.

Woodville's PUD water system is 100% metered, which helps promote water conservation. Woodville's PUD water system has no elevated storage tank, and operates with hydro-pneumatic pressure tanks.

Based upon available information, the community water system has apparent excess capacity to accommodate projected general plan growth. It is likely that Woodville, PUD would continue to rely on groundwater sources in order to accommodate growth in the community.

Allensworth Community Services District

The water supply for the community of Allensworth comes from two wells located east of the town. The older well, referred to as well #1, was constructed in the late 1960s/early 1970's , and operates with a 10 hp pump, and acts as the system backup well. Well #2, constructed as a part of the 1994-2000 USDA water project, operates with a 20 hp pump and is the primary well providing water to the town. Well #2 was put into operation in 1999.

Water is pumped from wells to a storage tank with a capacity of 46,000 gallons. The district indicated that the tank was recently cleaned and removed of sediment at the bottom of the tank. Furthermore, the tank has been in operation for over 24 years and is showing signs of deterioration such as rust pockets; it will need additional maintenance in the near term. From the storage tank water flows through 3 booster

pumps into a 5,000-gallon pressure tank then into the distribution system that delivers the water to consumer's taps.

Allensworth CSD received grant and loan assistance from the USDA in 1994 to complete a water system rehabilitation project. The project consisted of construction of a new well with a 20 hp pump, new booster pumps and pressure tank, new service lines and water meters, new fire hydrants, and new PVC water mains, and other improvements. Most water mains were upsized from 2", 3", and 4" to 6". The district indicated that due to a shortage of funding, 2-inch water mains still exist along portions of Avenue 24, Avenue 28, and Avenue 32E. The new water system was designed to accommodate 10 years of growth at annual rate of 4%. Although Allensworth has historically had problems with arsenic contamination in their water supply, water quality tests on the current water supply have met County and State Health Department regulations pertaining to MCLs. The district does not regularly chlorinate their water supply but chlorinates on an as needed basis, such as when a break or leakage in the line is discovered.

The district indicated that testing of the new system revealed that fire-flow pressures ranging between 750 gallons per minute (gpm) and 1,000 gpm were observed, meeting the County standard of 500 gpm for single family residential dwelling units.

Although the water project has provided a plentiful and safe drinking water supply to the community, the district is currently encountering problems with the power supply to the well pumps. The district is currently investigating solutions including the installation of soft starters on the pumps to help correct the problem. The district indicated that the well pumps fail to operate approximately 3 to 5 times per month, requiring either a manual reset of the pumps, a site visit by the pump consultants to correct the problem, or a site visit by Southern California Edison Company (SCE) to correct any power supply problems. When the pumps fail to operate, the community is often left without water for hours at a time, which causes the local school to close in some instances. The district is currently under a building moratorium until the well pump failure problems are corrected.

There are currently 117 total metered connections to the water system, with 85 current users. The 32 meters that are not currently in service include potential service to undeveloped and/or vacant properties. There are two major commercial water users on the ACSD water

system: the local school and Colonel Allensworth State Historic Park. The Colonel Allensworth State Historic Park has constructed a private well for irrigation purposes, but still utilizes the districts water system for domestic use.

The district has indicated that there are several factors contributing to high amounts of water demand within the community including the use of the domestic water system for irrigation purposes, high dwelling unit occupancy rates (ranging between 5 and 7 persons per dwelling unit), and double dwelling (more than one mobile home or trailer using the same water meter including persons allowing another mobile home to use water temporarily by hose or other means).

Allensworth CSD has adopted policies prohibiting the use of domestic water supply for irrigation purposes, and implemented water overuse charges, although the district has indicated that this has been ineffective in detouring users from using water for irrigation purposes. The district also has adopted ordinance 81-1 article 4, section 4-01 (a) which states that every unit shall be required to have its own service connection. The district assesses double monthly basic rates for double dwellers.

East Orosi Community Services District

The East Orosi CSD was contacted; however, the CSD was only willing to provide very limited information with regard to their water system. The districts water system currently supports 106 residential connections, and 2 commercial connections (the local store, and church). The district indicated that they were previously under a building moratorium and did not know if the moratorium was lifted. The district also indicated that the water system is currently at or near maximum capacity. It is not likely that the district can support additional connections to their system without significant research and further planning.

Ponderosa Community Services District

Current Ponderosa CSD water sources include 3 wells and a lake reservoir. Two of the water wells are located in the southern (Holby) portion of the community, one well is located in the northern (Fawn) portion of the community, and the lake is located in the central area of the community.

The Ponderosa water system currently supports 123 service connections, with an estimated 173 water service connections projected for year 2025. Ponderosa CSD water users are billed under a flat rate structure.

The Ponderosa CSD adopted a long-range strategic plan in August 1999, with the latest revision completed in March 2004. With regard to water infrastructure, the following immediate needs were identified:

- Develop financial plans needs plan;
- Grant availability;
- Local and/or with external assistance;
- Needs and cost estimates;
- Future water source(s);
- Storage requirements (tanks);
- Infrastructure replacements/additions;
- Automation requirements;
- Structural additions/replacements;
- Equipment needs;
- Well casing replacements;
- Well depth adequacy;
- Need for dry barrel hydrants ($3,500 per unit, installed);
- Loan availability rates and origination costs; and
- Determine immediate system needs and prioritize.

The following short-term needs were also identified in the long-range strategic plan:

- Need for additional fire hydrants in system; and
- Complete grant preparation.

The following long-term needs were also identified in the long-range strategic plan:

- System upgrade and modernization;
- Future acquisition of water storage tank property; and
- Prepare/identify future financial requirements (needs/ source).

Implementation of the long range strategic plan will be an ongoing effort by the Ponderosa CSD. Priorities may change based on several factors including demand, funding availability, needs of the community, etc. However, the long-range plan provides guidance in the operation of the needed services of the community.

Additional Considerations

This section summarizes additional considerations with regard to domestic water service within the unincorporated areas of Tulare County.

County Service Areas

In addition to the water systems that are operated by special districts that are separate governing bodies from the County, the County operates some small systems through County Service Area governance. There are two County Service Areas, designated as CSA No. 1 and CSA No. 2. CSA No. 1 includes seven zones of benefit (3 of which have water systems under the jurisdiction of the County). The 3 zones of benefit include Delft Colony, Traver, and Yettem. These water systems are isolated individual isolated systems and rely upon groundwater for potable water deliveries. These water systems are currently un-metered, and customers are billed under a flat rate structure. The Seville community is included in the Yettem water zone of benefit; however, it is served by a private mutual water company.

Tulare County Service Area No. 2 includes one zone of benefit known as the Wells Tract. Wells Tract water system is operated under the jurisdiction of Tulare County. Wells Tract receives water deliveries from the City of Woodlake water system through a contract entered into by the City of Woodlake and the County. Wells Tract development is assessed taxes and fees through the County. Wells Tract water system is currently billed under a flat rate structure.

Assembly Bill 2572 (Metering Requirements)

As previously discussed, AB 2572 (passed in 2004) requires, with certain exceptions, all urban water suppliers to install water meters on all municipal and industrial water service connections that are located in its service area on or before January 1, 2025, (and must bill its customers under a metered rate structure within established time periods). Urban water suppliers that receive water from the Federal Central Valley Project are required to install water meters on all

service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, on or before January 1, 2013, and must bill under a metered rate structure no later than March 13, 2013.

As defined in Section 10617 of the California Water Code, an "urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. At this time, many of the special districts that provide water for municipal uses do not meet the requirements of an "urban water supplier".

Under AB 2572, a water purveyor that becomes an "urban water supplier" on or after January 1, 2005, would be required to install water meters on all municipal and industrial water service connections within 10 years of becoming an urban water supplier. In addition, the purveyor would be required to charge each customer for which a meter has been installed, based on the actual volume of water delivered, as measured by the water meter, within 5 years of becoming an urban water supplier.

While most of the domestic water purveyors within Tulare County do not meet the definition of "urban water supplier" and will likely not meet the definition within the time horizon of the General Plan, many benefits are realized through the implementation of a metered rate structure. Hence, water purveyors should be encouraged to install water meters and implement volumetric pricing.

Water furnished or used without any method of determination of the quantities of water used by the person to whom the water is furnished has caused, and will continue to cause, waste and unreasonable use of water, and that this waste and unreasonable use should be identified, isolated, and eliminated. Water metering and volumetric pricing are among the most efficient conservation tools providing information on how much water is being used and pricing to encourage conservation.

Without water meters, it is impossible for homeowners and businesses to know how much water they are using, thereby inhibiting conservation, punishing those who conserve, and rewarding those who waste water. Existing law requires the installation of a water meter as a condition of water service provided pursuant to a connection installed on or after January 1, 1992, but the continuing widespread absence of water meters and the lack of volumetric pricing

could result in the inefficient use of water for municipal and industrial uses.

Some of the domestic water purveyor's within the County have installed water meters, and implemented volumetric pricing. After implementation of volumetric pricing, districts encountered an immediate decrease in water demand, typically ranging between 20% and 30%. The decrease in water demand has also led to a decrease in operating expenses resulting from energy savings and in some cases reducing operation and maintenance costs by extending the useful life of system equipment.

"Can't Serve" Special Districts

The Tulare County Resource Management Agency maintains a list of special districts that provide sewer and/or water service that cannot currently meet the demand of new development projects. The list provided by Tulare County RMA (last updated April 30, 2007) indicates that following water and/or sewer districts are either under a temporary cease and desist order by the Regional Water Control Board prohibiting any new connections, or have other limitations for water and sewer connections.

- Alpaugh Joint Powers Authority Water District;
- Cutler Public Utility District;
- Delft Colony Zone of Benefit (County RMA);
- Earlimart Pubic Utility District;
- El Rancho Zone of Benefit (County RMA);
- Orosi Public Utility District;
- Pixley Public Utility District;
- Pratt Mutual Water Company;
- Richgrove Public Utility District;
- Seville Zone of Benefit (County RMA);
- Seville Water Company;
- Springville Public Utility District;
- Tooleville Zone of Benefit (County RMA);
- Traver Zone of Benefit (County RMA); and
- Wells Tract Zone of Benefit (County RMA).

In order to determine if a local utility district will be able to serve a proposed development project, a "Will Serve Letter" is required to be submitted with the building permit application. This requirement establishes whether or not a permit can proceed early in the application process and avoid application denials several weeks into the permit approval process.

Additional Reports & Water Information

Additional information regarding water resources within Tulare County, including water contracts, agricultural deliveries, groundwater recharge, major watersheds, and project development considerations can be found in the report entitled "*Water Resources General Plan Update County of Tulare*" prepared by Keller & Wegley Engineering.

7.3 Sanitary Sewer Infrastructure

Introduction

The purpose of this section is to summarize existing information regarding Tulare County's wastewater collection and treatment facilities. This section provides an overview of current treatment capacities, current flows, treatment processes, reclamation policies, current number of connections to system, and the general condition of the infrastructure. Sanitary sewer information is generally reported in terms of each individual district providing the service. A general overview, including a spreadsheet summarizing the current treatment facilities within each unincorporated community within the county is provided at the beginning of the section.

Methodology

Current sanitary sewer infrastructure within Tulare County is described in terms of each agency's providing service, as many of the sanitary sewer systems are isolated and serve only individual small communities within the County. There are a multitude of sanitary sewer service providers in Tulare County including CSDs, PUDs, sanitary districts, sewer maintenance districts, and County Service Areas (through zones of benefit). Many of the Districts are self governing and are not subject to County control. The County must coordinate its plans for growth and development with these districts in order to assure that services can be provided on a timely basis to areas

planned for development, including areas within designated Urban Development Boundaries (UDBs).

Data reported in this section includes the following:

- Number of connections to system;
- Existing (2006) average dry weather flow at WWTF;
- Maximum treatment capacities (as permitted by the RWQCB);
- Treatment processes (including reclamation); and
- Age and current condition of collection system;

The data reported in this section of the report was collected from a number of sources including but not limited to special districts that provide sanitary sewer collection and/or treatment (including special district websites), the Tulare County Resource Management Agency, the California Regional Water Quality Control Board (Central Valley Region), and the U.S. Census Bureau.

Key Terms

- **ADWF.** Average dry weather flow, or flow during dry seasons, with limited or no inflow and infiltration.
- **Backup.** Wastewater that enters into basements and other low-lying areas during a moderate to intense rainfall event. Similar to overflow, backup is normally a result of excess storm water and groundwater entering into the sanitary sewer or a blockage in the public or private sewer system.
- **Base Flow.** The component of wastewater that originates from domestic users such as residential, commercial, and institutional discharges.
- **Cleanout.** Outside access point on a property owner's service lateral that allows for cleaning in the event of a blockage.
- **Dry Weather Infiltration.** Groundwater that enters into the sanitary sewer system during the driest period of the year when the groundwater table is lowest in elevation.
- **Excessive I/I.** Measured inflow and infiltration within a sanitary sewer system that is considered to be more expensive

to transport and treat at the municipality's wastewater treatment plant than to eliminate through rehabilitation.

- **Inflow.** Surface storm water that enters into the sanitary sewer through direct sources such as vented manhole covers, downspouts, area drains, and uncapped cleanouts.

- **Interceptor.** Sanitary sewer interceptors are those lines that convey sewage from neighborhood to neighborhood in route to the wastewater treatment plant. Pipe diameters are generally larger than lines placed within residential developments.

- **I/I.** An abbreviation for infiltration and inflow into a sanitary sewer system.

- **Lift Station.** A pumping facility that conveys wastewater flow from an area that would not naturally drain to the wastewater treatment plant, or into the gravity sewer system for delivery and treatment.

- **Manhole.** Manholes are used at designated intervals in a sewer line as a means of access for inspection or cleaning.

- **Non-Excessive I/I.** Measured inflow and infiltration within a sanitary sewer system that is considered more expensive to eliminate through rehabilitation than to transport and treat at the municipality's wastewater treatment facilities.

- **Service Line.** Facilities owned and maintained by property owners that conveys waste from a structure to the public system.

- **Surcharge.** A condition in which the wastewater flow rate in a sewer system exceeds the capacity of the sewer lines to the extent that raw sewage begins to rise within manholes.

- **Wet-Weather Infiltration.** Peak infiltration that is measured 6 to 12 hours after a measured storm event, excluding base flow and dry weather infiltration.

- **WWTF.** Abbreviation for wastewater treatment facility.

Regulatory Setting

Key organizations that regulate the wastewater industry in California include the EPA and the State Water Resources Control Board (SWRCB). These agencies are responsible for carrying out and enforcing environmental laws enacted by Congress. Local government agencies are responsible for establishing and implementing specific design criteria related to sanitary sewer systems.

U.S. Environmental Protection Agency. The EPA Office of Wastewater Management (OWM) supports the Federal Water Pollution Control Act (Clean Water Act) by promoting effective and responsible water use, treatment, disposal and management, and by encouraging the protection and restoration of watersheds. The OWM is responsible for directing the National Pollutant Discharge Elimination System (NPDES) permit, pretreatment, and municipal bio-solids management (including beneficial use) programs under the Clean Water Act. The OWM is also home to the Clean Water State Revolving Fund, the largest water quality funding source, focused on funding wastewater treatment systems, non-point source projects and estuary protection.

State Water Resources Control Board (SWRCB). The SWRCB, in coordination with nine Regional Water Quality Control Boards (RWQCB), performs functions related to water quality, including issuance of wastewater discharge permits and other programs on storm water runoff, and underground and above ground storage tanks.

Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000. The Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000 requires California Local Agency Formation Commission's (LAFCO) to conduct municipal service reviews (MSR) for specified public agencies under their jurisdiction. One aspect of a municipal service review is to evaluate an agency's ability to provide public services within its ultimate service area. A MSR is required before an agency can update its sphere of influence.

Small Community Wastewater Grant Program. The small community wastewater grant program (SCWG), funded by propositions 40 and 50, provides grant assistance for the construction of publicly owned wastewater treatment and collection facilities. Grants are available for small communities with financial hardships. Communities must comply with population restrictions (maximum population of 20,000

people) and annual median household income provisions (maximum of $37,994) to qualify for funding under the SCWG Program.

Funding through the SCWG Program is provided only to local public agencies. Priority is given to those agencies who seek to install or repair sewer systems in communities that lack adequate sewer systems and to assist the expansion of systems in communities with population growth pressures. The SCWG Program Guidelines were adopted by the State Water Resources Control Board on June 17, 2004. In 2004, the SWRCB developed the initial Statewide Competitive Project List (CPL) to determine which projects will be able to compete for SCWG funding. The current CPL will be amended to include new potential projects to facilitate timely expenditure of SCWG funds. Projects on the current CPL will remain on the list. Agency's interested in seeking funding through this program should contact the RWQCB Grant Coordinator to be considered for placement on the CPL.

Clean Water Act (CWA). The CWA is the cornerstone of surface water quality protection in the United States (this act does not deal directly with ground water or with water quantity issues). The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.

Existing Conditions

Most of the sanitary sewer systems within the unincorporated areas of Tulare County serve individual small communities, and in some cases communities effectively share wastewater treatment facilities. Sanitary sewer service within the county is generally operated and managed by special districts including CSDs, PUDs, sanitary districts, sewer maintenance districts, and County Service Areas (through zones of benefit). Some agencies provide sewer collection service only, and contract with surrounding agencies for wastewater treatment. Many of the Districts (except for County Service Areas) are self governing and are not subject to County control. Although these districts are not subject to County control, the County must coordinate its plans for growth and development with these districts in order to assure that services can be provided on a timely basis to areas planned for development, including areas within designated Urban Development Boundaries (UDBs). Some of the unincorporated urban areas within Tulare County are lacking sanitary sewer infrastructure, and are

served by individual or community septic systems; these communities/urban areas are listed below.

- Allensworth;
- Alpaugh;
- Alpine Village – Sequoia Crest;
- Ducor;
- East Tulare Villa;
- Lindcove;
- Monson;
- Plainview;
- Ponderosa;
- Three Rivers;
- Teviston;
- Waukena;
- West Goshen; and
- Other unincorporated areas not listed in Table 7-2.

The Three Rivers CSD provides various services to its residents with regard to septic system maintenance and inspection. Some of the specific services provided by the Three Rivers CSD include the following:

- Septic system inspections and certification for transfers of property;
- Voluntary septic system inspection at owners request;
- Investigate and take appropriate action on complaints regarding septic problems; and
- Provide homeowners with information about how a septic system works, including a homeowners guide.

In the remaining communities that are on septic systems, property owners are generally responsible for maintenance and improvements to individual or community septic systems.

Most unincorporated communities within Tulare County, with the exception of those listed above, have sanitary sewer infrastructure in place; however, in many cases the facilities are several years old and

are in need of rehabilitation and/or reconstruction to meet current standards.

Table 7-2 provides an overall summary of the special districts that provide sanitary sewer service within Tulare County. The table outlines the agency providing service, services provided, contracted treatment agency (if applicable), permitted capacity (as set forth by Waste Discharge Requirements issued by the RWQCB), ADWF, percent capacity currently utilized, treatment level, and effluent disposal method.

A brief description of each community's sanitary sewer system identified in the above table is provided below in order to supplement the information presented in the table and to present a discussion of more specific issues pertaining to each community's sewage system.

Cutler-Orosi Joint Powers Wastewater Authority

The Cutler-Orosi Joint Powers Wastewater Authority operates a WWTF that serves the communities of Cutler, Orosi, East Orosi, Sultana, Seville, and Yettem. Construction of the WWTF, completed in 1983, was funded 75% from a cost grant from the EPA, 12.5% from a cost grant from the State Water Resources Control Board, and 12.5% from proceeds of revenue bonds sales.

The WWTF operates under the provisions of Waste Discharge Requirements (WDR) Order No. R5-2006-0092 issued by the RWQCB. Order No. R5-2006-0092 prescribes that the monthly average discharge shall not exceed 2.0 MGD. The current ADWF at the WWTF is 1.40 MGD, while the historical high flow recorded at the WWTF was 1.89 MGD. In September 2006, the RWQCB rescinded a Cease and Desist Order after improvements to the WWTF were completed and a registered civil engineer submitted written certification that the WWTF would operate satisfactorily to a flow of 2.0 MGD.

The Cutler PUD and Orosi PUD are allocated capacity at the WWTF in terms of equivalent single family dwellings (ESDs) through an agreement between the two districts. Current allocations are 1,255 and 2,162 ESDs for the Cutler PUD and Orosi PUD, respectively. Other communities served by the WWTF are allocated capacity in terms of maximum month ADWF. ADWF capacities for the East Orosi and Seville communities are currently 0.050 and 0.060 MGD, respectively. ADWF capacity allocations for the Sultana and Yettem communities are unknown.

Table 7-2 Summary of Sanitary Sewer Service System Providers

Service Provider	Services Provided	Contracted Treatment Agency	Permitted Capacity (MGD)	ADWF (MGD)	% Capacity	Treatment Level	Effluent Disposal
Cutler PUD	Collection & Treatment	-	See Note 1	See Note 1	See Note 1	Secondary	Ag Irrigation
Earlimart PUD	Collection & Treatment	-	0.800	0.800	100%	Advanced Primary	Disposal Ponds
East Orosi CSD	Collection Only	Cutler-Orosi JPWA	0.060	0.053	88%	Secondary	Ag Irrigation
Goshen CSD	Collection Only	City of Visalia	0.500	0.315	63%	Secondary	Ag Irrigation
Ivanhoe PUD	Collection & Treatment	-	0.560	0.360	64%	Secondary	Pasture Irrigation
Lemon Cove SD	Collection & Treatment	-	0.020	0.012	60%	Primary	Disposal Ponds
London CSD	Collection & Treatment	-	0.300	0.200	67%	Secondary	Disposal Ponds
Orosi PUD	Collection & Treatment	-	See Note 1	See Note 1	See Note 1	Secondary	Ag Irrigation
Pixley PUD	Collection & Treatment	-	0.290	0.298	103%	Primary	Disposal Ponds
Poplar CSD	Collection & Treatment	-	0.310	0.220	71%	Advanced Primary	Ag Irrigation
Porter Vista PUD	Collection Only	City of Porterville	See Note 2	See Note 2	See Note 2	Secondary	Ag Irrigation
Richgrove CSD	Collection & Treatment	-	0.220	0.250	114%	Primary	Ag Irrigation
Springville PUD	Collection & Treatment	-	0.060	0.056	93%	Secondary	Disposal Ponds
Strathmore PUD	Collection & Treatment	-	0.400	0.150	38%	Primary	Ag Irrigation
Sultana CSD	Collection Only	Cutler-Orosi JPWA	See Note 1	See Note 1	See Note 1	Secondary	Ag Irrigation
Terra Bella SMD	Collection & Treatment	-	0.300	0.280	93%	Advanced Primary	Ag Irrigation
Tipton CSD	Collection & Treatment	-	0.400	0.190	48%	Secondary	Ag Irrigation
Woodville PUD	Collection & Treatment	-	0.330	0.120	36%	Secondary	Disposal Ponds
CSA #1 - Delft Colony	Collection & Treatment	-	0.057	0.045	79%	Advanced Primary	Disposal Ponds
CSA #1 - El Rancho	Collection Only	City of Lindsay	0.012	0.012	100%	Secondary	Disposal Ponds
CSA #1 - Seville	Collection Only	Cutler-Orosi JPWA	0.050	0.048	96%	Secondary	Ag Irrigation
CSA #1 - Tonyville	Collection Only	City of Lindsay	0.060	0.028	47%	Secondary	Disposal Ponds
CSA #1 - Tooleville	Collection & Treatment	-	0.035	0.028	80%	Advanced Primary	Disposal Ponds
CSA #1 - Traver	Collection & Treatment	-	0.088	0.070	80%	Advanced Primary	Disposal Ponds
CSA #2 - Wells Tract	Collection Only	City of Woodlake	0.030	0.022	73%	Primary	Pasture Irrigation
CSA #1 - Yettem	Collection Only	Cutler-Orosi JPWA	0.042	0.015	36%	Secondary	Ag Irrigation

1) The Cutler PUD and Orosi PUD are allocated capacity in terms of Equivalent Single Family Dwellings (ESDs). Current allocations are as follows: Cutler PUD=1,255 ESDs, Orosi PUD=2,162 ESDs. East Orosi, Seville, and Yettem have contracted capacities of 0.060, 0.050, 0.042 MGD, respectively. The contracted capacity for the community of Sultana is unknown.

2) The contracted capacity for the Porter Vista PUD is unknown. The ADWF from the Porter Vista PUD system is estimated at 0.400 MGD.

3) Permitted capacities were obtained from WDR Orders issued by the RWQCB and other available data. Current Average Dry Weather Flows (ADWF) were obtained from the Wastewater User Charge Survey Report F.Y. 2005-06 prepared by the State Water Resources Control Board (SWRCB) and other available data.

According to Cutler PUD and Orosi PUD staff, their sewer collection systems are very old and pipe leaks and breaks cause significant problems including groundwater inflow/infiltration and cross contamination with groundwater. During dry months, the sewer collection system experiences ex-filtration and during winter months the collection system experiences inflow/infiltration of storm water. The Orosi PUD is implementing a phased sewer collection system rehabilitation/replacement project, and has awarded a contract for the construction of the Phase 1 improvements. The Cutler-Orosi JPWA will be able to more accurately predict the remaining capacity at the WWTF once repairs are made to leaking pipes throughout the collection systems that discharge to the WWTF.

The Cutler PUD, Orosi PUD, and other Districts that discharge to the Cutler-Orosi Joint WWTF are currently under a sewer connection moratorium, and have waiting lists for additional sewer connections.

The Tulare County Redevelopment Agency (TCRA) is working with the Cutler PUD and Orosi PUD to correct deficiencies that would increase the capacity of the treatment facility. The TCRA, on behalf of the Cutler-Orosi JPWA submitted an application for Federal Assistance to construct improvements at the Cutler-Orosi WWTF. The United States Department of Agriculture (USDA) awarded $2.9 million to TCRA to begin improvements to the WWTF. The improvements will modernize the facility and add capacity to bring the serviceable operational limits to 2.4 MGD.

Earlimart Public Utility District

The Earlimart PUD operates a sanitary sewer collection, treatment, and disposal system that support's 1,485 connections, including 1,424 residential connections, 57 commercial connections, and 4 school connections.

The District operates a WWTF under the provisions of WDR Order No. 98-140 issued by the RWQCB. Order No. 98-140 prescribes that the monthly average discharge shall not exceed 0.8 MGD. The District indicated that recent improvements to the plant including the construction of additional oxidation ponds have brought the plants capacity up to 1.24 MGD. As prescribed by Order No. 98-140, when a California registered civil engineer has certified that the WWTF can reliably treat 1.24 MGD, the monthly average discharge shall not exceed 1.24 MGD. The District currently complies with the requirements

specified in Order No. 98-140. Assuming the plant has been certified to reliably treat 1.24 MGD, it is operating at 65% of its capacity.

The District has indicated that the daily flow during summer months is higher than during winter months indicating that there is no significant inflow/infiltration into the collection system. This is an indication that the collection system is operating adequately. Although there is excess capacity at the WWTF, the District indicated that the plant was constructed in 1956 and needs upgrading (including electrical upgrades).

Based upon *Waste Discharge Requirements (WDR) Order No. 98-140* (Regional Water Quality Control Board), the district indicated that currently all wastewater evaporates and percolates from the retention ponds. As flow increases, the district plans to recycle the wastewater on 140 acres of District owned land that would be converted into pastureland.

East Orosi Community Services District

The East Orosi CSD provides sewer collection service to its residents. The sewer is transported to the Cutler-Orosi wastewater treatment plant through a series of collection pipes and pump stations. The East Orosi CSD is currently having a sewer system study prepared to determine the feasibility of re-plumbing the hookups to the system. Prior to the installation of a sanitary sewer collection system, district residents were on septic systems. When sanitary sewer collection lines were installed, they were connected directly into septic tanks, which allowed the sewage to flow into the collection system from the septic tanks, thus eliminating flow through the leach lines. East Orosi contracts with the Cutler-Orosi JPWA for treatment of wastewater.

The Cutler-Orosi JPWA indicated that East Orosi is currently at maximum wastewater treatment capacity. For this reason, the East Orosi CSD is not currently allowing any new hookups to their wastewater collection system. The collection system currently supports 106 residential connections, 1 commercial connection (local store), and 1 church connection.

Without treatment plant improvements to increase capacity, the district's capabilities of supporting future growth would be limited. The district also indicated that it cannot currently afford to increase its treatment capacity at the facility.

Another factor limiting East Orosi's sewer capacity is the fact the community is the located the farthest from the treatment facility. This means that any collection lines or pumping stations down stream of the community would limit the capacity of all upstream collection lines. This is a significant limiting factor that the district has little control over, especially if dealing with overcapacity facilities that fall outside of the district boundary.

Goshen Community Services District

The Goshen CSD is responsible for the planning and construction of a sewage collection system. The main sewer system for the Goshen community is comprised of a collection system that was constructed in the mid to late 1990s. The Goshen CSD has a current Wastewater Service Agreement with the City of Visalia for treatment of the District's wastewater.

Connection from the District's sewer system to the City of Visalia's sewer system is through a 24-inch gravity sewer under Camp Drive. The 24-inch line connects to the existing City SR 198-Airport lift station. The District constructed the 24-inch line as a part of the Goshen Sewer Project, although the line is part of the City's Master Planned Sewer System. After the line was placed in operation, the City assumed responsibility for maintenance of the line as a part of the City conveyance system. The 24-inch line is planned to provide full capacity for the ultimate build-out of the Goshen UDB.

The District's wastewater collection system dumps into a lift station (owned and operated by the District) near the intersection of Avenue 305 and Effie Drive, which in turn pumps the wastewater into the 24-inch line in Camp Drive. The sewer lift station operates with two pumps, and has a design capacity of 500,000 gallons per day (GPD). The Wastewater Service Agreement between City of Visalia and the Goshen CSD allows for a current contracted average daily discharge to the City's treatment plant of 335,000 GPD. The Wastewater Service Agreement provides for the purchase of additional capacity to be charged on a percentage increase basis.

The District is working towards the adoption of a Sewer System Master Plan that will assist the District in expanding its collection system in line with development trends and the needs of the community.

Ivanhoe Public Utility District

Ivanhoe PUD operates a sanitary sewer collection, treatment and disposal system that supports 1,114 single and multi-family residential connections. It is estimated that there are approximately 1,200 total connections to the system.

The District operates a WWTF under the provisions of WDR Order No. 98-090 issued by the RWQCB. Order No. 98-090 prescribes that the monthly average daily discharge shall not exceed 0.56 MGD. With a current ADWF of 0.36, the plant is currently operating at 64% of its capacity.

Based upon a review of monthly monitoring reports submitted to the RWQCB, the District's wastewater inflows are typically higher during summer months than during winter months indicating that there is no significant inflow/infiltration into the collection system during the winter months. This is an indication that the collection system is in adequate operating condition.

Lemon Cove Sanitary District

The Lemon Cove Sanitary District operates a sanitary sewer collection, treatment and disposal system that support's approximately 50+ connections. A single 185 foot wide, 300 foot long, 4.5 foot deep bentonite sealed oxidation pond was constructed and planned disposal was by discharge to approximately 40 acres of adjacent pasture for non-milking cattle. The oxidation pond was later divided into two cells. The District has not discharged to the pasture since the facility was constructed because the flow has not exceeded the evaporation and percolation capacity of the treatment pond.

The District's WWTF is operated under the provisions of WDR Order No. 94-348, issued by the RWQCB. Order No. 94-348 prescribes that the monthly average dry weather discharge flow shall not exceed 20,000 GPD. With a current ADWF of 12,000 GPD, the plant is operating at 60% of its capacity. The District would need to expand the capacity of its WWTF to support any significant development projects within the community's urban development boundary.

London Community Services District

The London CSD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 430 connections.

The District's WWTF is operated under the provisions of WDR Order No. 96-172 issued by the RWQCB. Order No. 96-172 prescribes that the monthly average discharge flow shall not exceed 0.3 MGD. According to WWTF records and the District Engineer, the average dry weather flow at the WWTF is 0.20 MGD. According to the district's engineer, improvements completed in 2000 with USDA Rural Development funding increased the plant's capacity to 0.50 MGD. Approximately 13.1 acres of District-owned peach orchards were converted to evaporation/percolation ponds as a part of the project.

The district has historically had capacity problems at the WWTF. In the early 1990s, un-disinfected effluent spilled into King Ditch (which runs along the eastside of the facility). On another occasion, the effluent overflowed into and ponded in, the open field north of the facility. An engineering investigation report in 1993 revealed that the maximum capacity of the facility was limited by effluent disposal capacities of 0.31 MGD in the summer and 0.22 MGD in winter. The report also found the two pumps serving the influent lift station operating at capacity. At the direction of the District's Engineer, two additional disposal ponds were constructed north of the facility and the air diffusion system was rebuilt.

Orosi Public Utility District

Refer to discussion under "Cuter-Orosi Joint Powers Wastewater Authority".

Pixley Public Utility District

The Pixley PUD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 800 connections, including 25 commercial connections. Raw sewage is transported to a WWTF which is located just west of the Pixley airport, which is owned and operated by the District.

The District's WWTF is operated under the provisions of WDR Order No. 5-00-096 issued by the RWQCB. Treated effluent is stored in evaporation/percolation ponds and/or applied on 43 acres of pastureland that is owned and operated by the District. Non-milking

cattle graze on the pastureland. Order No. 5-00-096 prescribes that the monthly average daily discharge shall not exceed 0.29 MGD. With an ADWF of 0.298 MGD, it is concluded that the WWTF is currently operating above its permitted capacity. The WWTF is currently operating under a Cease and Desist Order.

The *Wastewater Treatment Facility Upgrade and Expansion Project – Project Feasibility Report* (Provost & Pritchard, February 2005) outlines a major reconstruction proposal for the District's WWTF. The improved WWTF would be capable of treating 0.5 MGD. The District has applied for USDA grant and loan funding to implement the improvement plan. The project is currently listed as a Class B project on the statewide competitive projects list.

Poplar Community Services District

The Poplar CSD operates a sanitary sewer collection, treatment and disposal system that supports approximately 640 connections. Raw sewage is collected and transported to a WWTF located southwest of the community.

The District's WWTF is operated under the provisions of WDR Order No. 98-214 issued by the RWQCB. Order No. 98-214 prescribes that the monthly average discharge flow shall not exceed 0.31 MGD. With a current ADWF of 0.22 MGD, the plant is operating at 71% of its capacity. The District's WWTF is currently operating in full compliance with Order No. 98-214 issued by the RWQCB. Developments that have recently been approved within the existing District Boundary will use the remaining capacity at the WWTF. Based upon this realization, the District would need to expand the capacity of its WWTF to support additional growth associated with the build-out of the General Plan.

The Poplar CSD recycles its wastewater by irrigating 41-acres of alfalfa owned by the District. The land used for wastewater reclamation will increase in the near future as the District recently purchased additional acreage for this purpose. The District's wastewater reclamation activities promote water conservation, groundwater recharge, and demonstrate the District's desire to conserve its potable water sources.

Porter Vista Public Utility District

The Porter Vista PUD operates a sanitary sewer collection system that transports raw sewage to the City of Porterville WWTF. Current flows

from the Porter Vista PUD are estimated at 0.40 MGD. The City of Porterville WWTF is currently operating under a Cease and Desist Order. The City is currently implementing improvements that would bring the WWTF into compliance with RWQCB requirements.

Richgrove Community Services District

Richgrove CSD operates a sanitary sewer collection, treatment and disposal system that support's approximately 523 connections. Raw sewage is collected and transported to a WWTF located northeast of the community.

The District's WWTF is operated under the provisions of WDR Order No. 83-088 issued by the RWQCB. Order No. 83-088 prescribes that the average daily dry weather discharge shall not exceed 0.22 MGD. With an ADWF of 0.25 MGD, it is concluded that the WWTF is currently operating above its permitted capacity, indicating that additional sewer connections cannot be supported at this time.

The District's wastewater collection and treatment facilities were constructed in 1984 and were funded by a USDA loan and grant package. The sanitary sewer collection and treatment facilities were built in order to correct sewage problems that were causing groundwater pollution and threatened health hazards. Since the District's collection system was constructed in 1984, it is likely that the system remains in good operating condition.

The District is in the process of evaluating wastewater treatment options to bring the plant into compliance regarding flow to the plant, and to address other WWTF related issues. Recently completed plans have identified improvements to bring the WWTF into compliance with the RWQCB, and increase capacity. The District is currently working to secure funding to implement planned improvements to the WWTF.

Springville Public Utility District

The Springville PUD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 400 total connections, 375 which are currently active. Raw sewage is collected and transported to a wastewater treatment facility (WWTF) located southeast of the community adjacent to and west of the Tule River.

The District's WWTF is operated under the provisions of WDR Order No. 96-195 issued by the RWQCB. Order No. 96-195 prescribes that the monthly average dry weather discharge shall not exceed 0.06 MGD. With a current ADWF of 0.056 MGD, the WWTF is operating at 93% of its capacity. The RWQCB issued a Cease and Desist Order to the Springville PUD in 1996 and required the District to find a way to reclaim treated effluent from its WWTF.

The District imposed a sewer connection moratorium back in 1980 due to the limited capacity of its WWTF, which effectively ended most new development within its boundaries, including the commercial and residential town center of Springville along Highway 190. To date, the Springville PUD has been unable to comply with the requirements of the Cease and Desist Order due to funding shortfalls and other setbacks. The Cease and Desist Order is still in effect as of the preparation of this background report.

In June 1998, the District developed a project that relied on irrigation as the primary means of effluent disposal. The District customers approved, through a Proposition 218 process, increased sewer fees to address United States Department of Agriculture – Rural Development (USDA-RD) loan repayment and increased maintenance cost requirements associated with the project. In March 1999, the intended recipient of the recycled water terminated its participation in the project leaving the District without a mechanism for disposal of the treated effluent.

Currently, a new proponent has been retained to accept the treated effluent that will be used for agricultural irrigation purposes. The current project cost reflects a significant increase that is primarily due to the increase in pipeline length and additional costs for the storage of a portion of the effluent. The pipeline that is required to deliver the effluent to the disposal property is about 3 times the length of the previously proposed transmission pipeline. The District had secured approximately $1.18 million in USDA-RD funding that was to be used for the 1998 project. The District intends on securing additional USDA-RD funding that will satisfy the increased construction costs of the new project. Construction of the proposed project is estimated to take about one year from start to finish.

Based upon correspondence from the District, it is estimated that the currently proposed project could support an additional 185 connections with allocations being based on capacity. District staff has indicated that there is currently a waiting list with 131 requests for sewer connections.

The District has issued permits to a few residents within the District Boundary to place septic tanks on the property with the provision that they would connect to the District's sewer system once additional capacity becomes available. Other residences will be allowed to stay with septic tanks as the Springville PUD does not have sewer lines available in all areas of the District, such as Rio Vista Drive.

Strathmore Public Utility District

The Strathmore PUD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 480 connections. Raw sewage is collected in a series of collection pipes ranging in size from 6 to 12 inches (including Vitrified Clay Pipe and Cast Iron Pipe) and then transported to a WWTF that is owned and operated by the Strathmore PUD.

The District's WWTF is operated under the provisions of WDR Order No. 85-024 issued by the RWQCB. Order No. 85-024 prescribes that the 30-day average daily dry weather discharge shall not exceed 0.40 MGD. With a current ADWF of 0.15 MGD, the WWTF is operating at 38% of its capacity.

Sultana Community Services District

Wastewater from the Sultana community is treated at the Cutler-Orosi WWTF. As previously discussed, the Cutler-Orosi JPWA owns and operates the facility, which is currently near maximum capacity. Sultana is located northwest of the treatment facility, meaning there are no downstream collection lines from other communities that could potentially limit their own collection systems capacity. Sultana's ability to expand its current sewer collection system is limited by the capacity of the WWTF, including the financial limitations of purchasing additional contract capacity at the facility.

According to the Wastewater User Charge Survey Report, published by the State Water Resources Control Board, the Sultana CSD estimates an ADWF of 85,000 from the community. The contracted capacity allocated to the Sultana CSD by the Culter-Orosi JPWA is unknown.

Terra Bella Sewer Maintenance District (TBSMD)

The Terra Bella Sewer Maintenance District operates a sanitary sewer collection, treatment, and disposal system. Raw sewage is collected and transported to a WWTF located north of the community.

The District's WWTF is operated under the provisions of WDR Order No. 95-029 issued by the RWQCB. Order No. 95-029 prescribes that the monthly average discharge flow shall not exceed 0.30 MGD. With a current ADWF of 0.28 MGD, the WWTF is operating at 93% of its capacity. This indicates that, at this time, there is very little to no capacity available for additional connections to the District's sewer system. Additional capacity will be needed in order to accommodate projected General Plan growth.

Tipton Community Services District

The Tipton CSD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 554 connections including 496 residential connections and 58 commercial connections. Raw sewage is collected in a series of collection pipes ranging in size from 4 to 12 inches and then transported to a WWTF that is owned and operated by the Tipton CSD.

The District's WWTF is operated under the provisions of WDR Order No. 85-170 issued by the RWQCB. Order No. 85-170 states that the estimated design capacity of the plant is 0.48 MGD, but prescribes that the monthly average daily discharge shall not exceed 0.40 MGD. With a current ADWF of 0.19 MGD, the WWTF is operating at 48% of its capacity.

Woodville Public Utility District

The Woodville PUD operates a sanitary sewer collection, treatment, and disposal system that supports approximately 480 connections. Raw sewage is collected and transported to a WWTF located southwest of the community.

The District's WWTF is operated under the provisions of WDR Order No. 86-108 issued by the RWQCB. Order No. 86-108 prescribes that the monthly average daily dry weather discharge flow shall not exceed 0.33 MGD. With a current ADWF of 0.12 MGD, the WWTF is operating at 36% of its capacity.

County Service Area No. 1

County Service Area No. 1 (CSA #1) provides domestic water service and sanitary sewer service to residents in the unincorporated areas of Tulare County that are not governed by an independent special district. The county's sewer infrastructure is divided into zones of benefit for rate structuring and functional purposes. The following seven zones of benefit within CSA #1 have been established for sanitary sewer infrastructure and contain a total service population of approximately 3,300 residents.

- El Rancho Sewer;
- Delft Colony Sewer;
- Seville Sewer;
- Tonyville Sewer;
- Tooleville Sewer;
- Traver Sewer; and
- Yettem Sewer.

El Rancho is an unincorporated Tulare County community of approximately 125 persons, located northeast of the Lindsay city limits. The El Rancho zone of benefit is bounded by East Fir Street to the north, Avenue 234 to the south, the Visalia Electric railroad tracks to the west, and North Strathmore Avenue to the east. The El Rancho sewer system is a collection system only that transports raw sewage to the City of Lindsay treatment and disposal facility. Currently, the average dry weather flow from the El Rancho collection system is 12,000 GPD. In 1998, a zone change to Agricultural Residential (AR) within the El Rancho zone of benefit was denied on the basis that sewer flows exceeded the maximum capacity agreed upon between the county and the City of Lindsay. On this basis, the current El Rancho sewer collection system is identified as being at full capacity, and unable to support any new connections, until further capacity improvements and/or negotiations can be completed.

The Delft Colony is an unincorporated community of approximately 500 persons. It is located about 4 miles southwest of the City of Dinuba. The Delft Colony sewer system includes a series of collection pipes that transport the wastewater to a treatment and disposal facility located approximately 500 feet south of the Delft Colony service area. The treatment facility consists of a bar rack/comminatory, aerated facultative

lagoons, and recirculation with final disposal to evaporation/percolation ponds. The current average dry weather flow into the plant is approximately 45,000 GPD, and the design capacity of the plant is 57,200 GPD.

Seville is an unincorporated community of approximately 1,000 persons and is located southeast of Cutler. The Seville zone of benefit is an island within the Yettem zone of benefit and is generally bounded by SR 201 to the north, Inyo Avenue to the south, Road 152 to the west, and Road 156/irrigation canal to the east. The Seville sewer system is a collection system only that transports an average dry weather flow of approximately 48,000 GPD to the Cutler-Orosi treatment and disposal facility. The Cutler-Orosi Joint Powers Wastewater Authority is contracted with Tulare County to treat a maximum flow of approximately 50,000 GPD from the Seville zone of benefit.

Tonyville is an unincorporated community of approximately 150 persons that is located north of the Lindsay city limits. The Tonyville zone of benefit is bounded by the Visalia Electric railroad tracks to the northeast, Avenue 252 to the south, and Road 216 to the west. The Tonyville sewer system is a collection system only that transports an average dry weather flow of approximately 28,000 GPD to the City of Lindsay wastewater treatment and disposal facility. The City of Lindsay is contracted with the county to treat a maximum flow of approximately 60,000 GPD from the Tonyville zone of benefit.

Tooleville is an unincorporated community of approximately 300 persons, and is located about 1 ½ miles east of the City of Exeter. The Tooleville sewer system includes a series of collection pipes that transport the wastewater to a 20-acre treatment and disposal site adjoining the southern boundary of the Tooleville service area. The treatment and disposal ponds are set back approximately 300 feet from the service area boundary. The treatment facility consists of a bar rack/comminutor, aerated facultative lagoons, recirculation, with final disposal to evaporation/percolation ponds. The current average dry weather flow into the plant is approximately 28,000 GPD and the design capacity of the plant is 35,000 GPD.

The Traver sewer system includes a series of collection pipes that transport the wastewater to a treatment and disposal facility located approximately 2,000 feet east of the Traver service area. The treatment facility consists of a bar rack/comminutor, aerated facultative lagoons, and recirculation with final disposal to evaporation/percolation ponds.

The current average dry weather flow into the plant is approximately 70,000 GPD, and the design capacity of the plant is 88,000 GPD.

The Yettem zone of benefit covers a wide area southeast of Cutler, and is generally bounded by Avenue 400 to the north, Avenue 376 to the south, Loper Ditch to the west, and Road 162/Friant Kern Canal to the east. The Yettem sewer system is a collection system only, that transports an average dry weather flow of approximately 15,000 GPD to the Cutler-Orosi treatment and disposal facility. The Cutler-Orosi Joint Powers Wastewater Authority is contracted with Tulare County to treat a maximum flow of approximately 42,000 GPD from the Yettem zone of benefit.

The sewer infrastructure for zones of benefit within County Service Area #1 is summarized in Table 7-3.

Table 7-3. County Service Area #1 Zones of Benefit Sewer Infrastructure Summary

Zone of Benefit	Treatment Facility	Current ADWF (GPD)	Treatment Capacity (GPD)	Contracted Capacity (GPD)
El Rancho	City of Lindsay	12,000	N/A	12,000
Delft Colony	Delft Colony	45,000	57,200	N/A
Seville	Cutler-Orosi	48,000	N/A	50,000
Tonyville	City of Lindsay	28,000	N/A	60,000
Tooleville	Tooleville	28,000	35,000	N/A
Traver	Traver	70,000	88,000	N/A
Yettem	Cutler-Orosi	15,000	N/A	42,000

GPD = Gallons per Day
N/A = Not Applicable
ADWF = Average Dry Weather Flow

County Service Area No. 2

County Service Area No. 2 (CSA #2) provides sanitary sewer service to residents in the Wells Tract zone of benefit. The Wells Tract zone of benefit community has approximately 200 residents and is located east of the City of Woodlake. The Wells Tract zone of benefit, which is consistent with the CSA #2 district boundary, is generally bounded by Avenue 346 to the north, Avenue 344 to the south, Road 220 to the east, and Webb Street to the west.

The Wells Tract sewer system is a collection system only that transports an average dry weather flow of approximately 22,000 GPD to the City of Woodlake treatment and disposal facility. The City of Woodlake is contracted with Tulare County to treat a maximum flow of approximately 30,000 GPD from the Wells Tract zone of benefit.

7.4 Storm Drainage Infrastructure

The purpose of this section is to summarize existing information regarding Tulare County's drainage facilities, specifically focusing on the County's current storm drainage planning/implementation strategies. Tulare County is the lead agency in providing storm drain infrastructure within the unincorporated areas of the county. Many of the unincorporated small communities have no underground drainage infrastructure, leaving only surface drainage which is more subject to flooding, and/or not properly functioning due to little or nonexistent facility maintenance. Surface draining also poses a potential threat to wildlife, farm animals, and groundwater supplies. This is because there is limited ability to treat the water before it flows into a basin, or other surface waters, such as a creek, irrigation ditch, or river. Surface runoff can pick up contaminants from paved surfaces including but not limited to oil, antifreeze, and rubber. Surface runoff is often treated to reduce the risk of contamination.

Methodology

Since the level of storm drainage infrastructure varies significantly throughout the unincorporated areas of the County, and due to the time intensive efforts of evaluating the storm drain infrastructure of each community (at a General Plan level), this background report focuses on the current planning efforts of the County as a whole, and identifies specific projects currently being undertaken by the County that would improve storm water drainage infrastructure within unincorporated areas.

Key Terms

- **APWA.** American Public Works Association
- **Basin.** A hydrologic unit consisting of a part of the surface of the earth covered by a drainage system consisting of a surface stream or body of impounded surface water plus all tributaries.
- **Best Management Practices (BMPs).** Activities or structural improvements that help reduce the quantity and improve the quality of storm water runoff. BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

- **Boom.** A floating device used to contain oil on a body of water.
- **Catch Basin.** An entryway to the storm drain system, usually located at street corners.
- **Culvert.** A short, closed (covered) conduit or pipe that passes storm water runoff under an embankment, usually a roadway.
- **CWA.** Clean Water Act
- **Detention Pond.** A storm water system that delays the downstream progress of storm water runoff in a controlled manner. This is typically accomplished using temporary storage areas and a metered outlet device. (As opposed to a less common retention pond)
- **Erosion.** When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.
- **Flood.** A temporary rise in flow or stage of any watercourse or Storm water conveyance system that results in storm water runoff exceeding its normal flow boundaries and inundating adjacent, normally dry areas.
- **Flood Control.** The specific regulations and practices that reduce or prevent the damage caused by storm water runoff.
- **Flood Plain.** Any land area susceptible to inundation by storm water from any source.
- **General Permit.** A permit issued under the NPDES program to cover a certain class or category of storm water discharges. These permits reduce the administrative burden of permitting storm water discharges.
- **Infiltration.** The penetration of water through the ground surface into subsurface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections, or manhole wells.
- **Non-Point Source (NPS) Pollutants.** Pollutants from many diffuse sources. Rainfall or snowmelt moving over and through

the ground causes NPS pollution. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water.

- **NPDES.** "National Pollutant Discharge Elimination System"—the name of the surface water quality program authorized by Congress as part of the 1987 Clean Water Act. This is EPA's program to control the discharge of pollutants to waters of the United States.

- **Oil and Grease Traps.** Devices that collect oil and grease, removing them from water flows.

- **Oil Sheen.** A thin, glistening layer of oil on the surface of water.

- **Oil/Water Separator.** A device installed (usually at the entrance to a drain) that removes oil and grease from water entering the drain.

- **Outfall.** The point where wastewater or drainage discharges from a sewer pipe, ditch, or other conveyance to a receiving body of water.

- **Point Source Pollutant.** Pollutants from a single, identifiable source such as a factory, refinery, or place of business.

- **Pollutant Loading.** The total quantity of pollutants in storm water runoff. TDML (Total Daily Maximum Loading) is the limiting of pollutant loading into a body of water, such as a lake or river.

- **Recharge.** Re-supplying of water to the aquifer. Recharge generally comes from snowmelt and storm water runoff.

- **Retention Pond.** A process that halts the downstream progress of storm water runoff. This is typically accomplished using total containment involving the creation of storage areas that use infiltration devices, such as dry wells, to dispose of stored storm water via percolation over a specified period of time. (As opposed to a more common Detention Pond.)

- **Runoff.** Drainage or flood discharge that leaves an area as surface flow or as pipeline flow. Has reached a channel or pipeline by either surface or subsurface routes.

- **Storm Water.** Precipitation that accumulates in natural and/or constructed storage and storm water systems during and immediately following a storm event.

- **Storm Water Facilities.** Systems such as watercourses, constructed channels, storm drains, culverts, and detention/ retention facilities that are used for the conveyance and/or storage of storm water runoff.

- **Storm Water Management.** Functions associated with planning, designing, constructing, maintaining, financing, and regulating the facilities (both constructed and natural) that collect, store, control, and/or convey storm water.

- **Storm Water System.** The entire assemblage of storm water facilities located within a watershed.

- **Surface Water.** Water that remains on the surface of the ground, including rivers, lakes, reservoirs, streams, wetlands, impoundments, seas, estuaries, etc.

- **Swale.** A low laying or depressed, at least seasonally wet stretch of land. Often lined with grass (grassy swale) and used as a conveyance for storm water.

- **Urban Runoff.** Storm water from urban areas that tends to contain heavy concentrations of pollutants from vehicles and industry.

- **Watercourse.** A lake, stream, creek, channel, storm water conveyance system, or other topographic feature, over which storm waters flow at least periodically.

- **Watershed.** The geographical area that drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

- **Wetlands.** Land with a wet, spongy soil, where the water table is at or above the land surface for at least part of the year. Wetlands are characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include swamps, bogs, fens, marshes, and estuaries.

Regulatory Setting

Key organizations that regulate the storm water industry in California include EPA and SWRCB. These agencies are responsible for carrying out and enforcing environmental laws enacted by Congress. The need to protect our environment has resulted in a number of laws and subsequent regulations and programs. In the following paragraphs, various federal and state programs are discussed in relationship to the control of pollutants in storm water. Local government agencies are responsible for establishing and implementing specific design criteria related to storm drain systems.

Local Regulations (Tulare County Ordinance Code). Acquisition of land for and construction of storm drainage facilities in the unincorporated area is subject to County review for consistency with the Tulare County General Plan under Section 65402 of the Government Code. The Tulare County Ordinance Code provides the regulatory framework for implementing the County General Plan policies and programs. The Tulare County Code includes provisions covering well permitting and construction, water conservation and landscape water usages, storm-water quality management, and the design and construction of on site wastewater disposal systems, such as septic tank and leach field systems.

Current standards pertaining to the development of storm drainage systems, as prescribed by the existing County Ordinance Code; are identified as follows; (a) If it is not feasible to provide for an adequate system of drainage outside of a subdivision, a ponding lot or lots shall be required within the subdivision to provide for drainage of surface and storm waters generated in the subdivision or flowing across the subdivision. The ponding lot or lots shall be located adjacent to the probable route of any drainage facility that might be constructed in the future in order to facilitate connection to such drainage facility when it is constructed; (b) The area of the ponding lot or lots shall be established on the basis of one subdivision lot for each twenty lots in the subdivision if the subdivision lots average one half acre or less in area, and one lot or each thirty lots in the subdivision if the subdivision lots average more than one half acre in area. In determining the number of subdivision lots to be dedicated as a ponding lot or lots, the above computations shall be adjusted to the nearest full subdivision lot. The subdivision lot or lots provided shall have an area equal to or greater than the average area of all the lots in the subdivision; (c) Ponding lots shall have one and one half feet of freeboard, a maximum water depth of 3 feet and a water surface elevation of one half foot below the grate flow line of the lowest

catch basin in the system. Ponding lots shall be constructed in accordance with the improvement standards referred to in section 7-01-2025; (d) the sub-divider shall convey an easement to the County for the use of said ponding lot or lots, or he may convey fee title to the County if he prefers.

State and Federal Regulations. Storm water regulations are an outgrowth of the 1972 Clean Water Act and 1987 Water Quality Act, which established new standards and schedules for industrial and municipal storm water. Known as the National Pollutant Discharge Elimination System (NPDES), this national permitting program controls the discharge of pollutants from any point source to waters of the United States. In 1990, the U.S. EPA established regulations for permitting storm water discharges from industrial sites (including construction sites that disturb five acres or more) and from municipal separate storm sewer systems (MS4s) serving a population of 100,000 or more. These regulations, known as the Phase I regulations, require operators of medium and large MS4s to obtain storm water permits. In December 1999, U.S. EPA established additional regulations, known as Phase II, requiring permits for storm water discharges from small MS4s and from construction sites disturbing between one and five acres of land. Designated MS4s within the County are permitted under the Phase II requirements.

Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The State Water Resources Control Board (SWRCB) elected to adopt a statewide general permit for Small MS4s in order to efficiently regulate numerous storm water discharges under a single permit. The SWRCB adopted general permit Water Quality Order No. 2003-0005-DWQ for the discharge of storm water from small MS4s to provide permit coverage for smaller municipalities, including non-traditional small MS4s (i.e., military bases, public campuses, and prison and hospital complexes).

The MS4 permits require the discharge to develop and implement a Storm Water Management Plan/Program (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The general permit requires regulated Small MS4s to develop and implement a SWMP that describes Best Management Practices (BMPs), measurable goals, and timetables for implementation in the following six program areas.

- Public Education – Educate the public in its permitted jurisdiction about the importance of the storm water program and the public's role in the program;

- Public Participation – Comply with all State and local notice requirements when implementing a public involvement/participation program;

- Illicit Discharge Detection and Elimination – Adopt and enforce ordinances or take equivalent measures that prohibit illicit discharges, and implement a program to detect illicit discharges;

- Construction Site Storm Water Runoff Control – Develop a program to control the discharge of pollutants from construction sites greater than or equal to one acre in size within its permitted jurisdiction. The program must include inspections of construction sites and enforcement actions against violators; and

- Post Construction Storm Water Management – Require long term post-construction BMPs that protect water quality and control runoff flow, to be incorporated into development and significant redevelopment projects. Post construction programs are most efficient when they stress (1) low impact design; (2) source controls; and (3) treatment controls.

Existing Conditions

Storm drainage systems exist in various urban areas throughout Tulare County. Storm drainage infrastructure projects in the unincorporated areas the County are generally constructed through redevelopment projects, and/or in conjunction with transportation improvement and site development projects (i.e., residential subdivisions). Localized storm drainage systems in unincorporated areas discharge to various surface waters including streams, rivers, ditches, other surface water courses, and ponding basins. Storm drain infrastructure in smaller communities generally consists of underground and surface collection facilities that transport the water to local retention ponds and/or local streams. The most common method of accommodating storm water runoff in smaller communities throughout the County is to construct retention basins that serve individual subdivisions. Generally, new subdivisions within the County are required to provide land for storm drain infrastructure purposes, which consist of 5-7 foot deep retention ponds with the area depending on the size of development. Drainage infrastructure is typically installed within County right of way, and is

operated and maintained by the Tulare County Resource Management Agency (TCRMA).

The provision of ongoing storm water management is currently being accomplished through requirements set forth in the County Ordinance Code. In addition, efforts of the TCRMA to get a Storm Water Management Plan adopted and approved by the SWRCB will improve the County's ability to monitor and improve storm water quality.

Since the level of storm drainage infrastructure varies significantly throughout the unincorporated areas of the County, and due to the time intensive efforts of evaluating the storm drain infrastructure of each community (at a General Plan level), this background report focuses on the current planning efforts of the County as a whole. The report identifies the current storm drainage system development strategy within the County, and what current strategies have led to, and a possible shifting of strategies that could result in more community-wide and/or regional storm water facilities that promote mixed use recreational/storm water facilities.

The largest storm drain system within unincorporated Tulare County is the Cutler-Orosi system. In this system, runoff is collected through a series of pipes and pump stations, the majority of which is transported and discharged to Sand Creek. A portion of the Cutler-Orosi storm drain system connects to a state storm drain system that runs along S.R. 63. It should be noted that development that occurred prior to 1972 generally does not have storm drainage infrastructure installed, as is the case for most of the unincorporated areas of the County. This has led to a need to improve such areas that lack drainage through redevelopment funding or other sources of available funding.

Storm drainage infrastructure within smaller unincorporated communities generally consists of underground and surface collection facilities that transport the runoff to local (on-site) retention ponds and/or local streams. The County Ordinance Code requires that local retention facilities be located adjacent to the probable route of any future (master planned) drainage facility that might be constructed in order to facilitate efficient connection to such drainage facility when it is constructed. However, only recently has storm drainage master planning been accomplished in some communities, which will eventually lead to more community-wide facilities, and the abandonment (and potential reuse) of local retention facilities.

The use of individual, on-site storm water controls for each development is the typical approach in most communities for controlling storm water quantity and quality. The developer finances the design and construction of these controls, while ongoing maintenance and operation is the responsibility of the County through a dedicated easement or fee title. A potential alternative approach is to install a single (or a few if necessary) strategically located regional (community-wide) storm water controls within a particular sub-watershed rather than require on-site controls. Community-wide storm water controls are facilities designed to manage storm water runoff from multiple projects and/or properties through a local jurisdiction-sponsored program, where the individual properties may assist in the financing of the facility, and the requirement for on-site controls is either eliminated or reduced. A summary of some the advantages and disadvantages of community-wide storm water controls is provided in Table 7-4.

Table 7-4 Advantages and Disadvantages of Regional (Community-Wide) Storm Water Management

Measure of Effectiveness	Advantages	Disadvantages
Performance	Community-wide facility may allow more space intensive, but superior performing technology such as constructed wetlands or bio-swales.	If soil permits, infiltration technologies can perform best if decentralized throughout the basin – performance relies on sound maintenance practices.
Planning	Municipality has an opportunity to strategically locate investments to address priority water body or known water quality issues.	The municipality must take on the responsibility of determining where to site a facility based on priorities and opportunities. Large regional facilities may be difficult to site in urban areas.
Funding	Partnering may open up additional revenue sources to fund more effective regional facility.	Partnering may complicate facility financing and not fully fund the facility.
Maintenance	The municipality allocates staff to maintenance of a single (or few) public facilities, rather than several on-site facilities. Less mobilization required and increased assurance of maintenance over time.	Would require plan (agreement) to defer existing maintenance obligations of on-site facilities that would be abandoned as the result of a community-wide storm drainage system.
Community	In facility sitting and design, municipality can assist in implementing community development plans for open space, aquatic health, and recreation.	Community disagreement about use of public resources and sitting. Issues would need to be considered at the community plan level.

As outlined above, major advantages of community-wide drainage facilities include more efficient and cost effective maintenance, less mobilization, and they are more conducive to recreational facilities. Given the pros and cons outlined above, community-wide drainage strategies are not advantageous in all circumstances. In general, if a community-wide facility can offer environmental, cost or community benefits that outweigh the disadvantages, then a regional approach should be considered.

Municipalities play an important role in the shaping of communities through general and community planning processes. Community plans

or other long term development plans typically specify areas targeted for future higher density development and other areas designated as green space to provide parks and protect environmental resources. Municipalities can often integrate open space goals with regional drainage facility design to meet multiple goals in limited space.

To successfully implement storm water management on a community-wide basis, a municipality must possess both (1) the authority to plan for and regulate development – typical of a local government, and (2) authority and responsibility for the quality and quantity of storm drainage, including compliance with any NPDES municipal storm water permit – typical of storm drain utility provider. Tulare County has this confluence of authority and responsibility. Several funding options may be available for funding of community-wide drainage facilities. The County might opt to build and fund regional drainage facilities using general municipal revenue or drainage-specific funds. Below is a summary of potential funding mechanisms.

- Use general municipal revenue, not associated with drainage rates or development options;
- Use general drainage utility rates. Costs could be spread over a larger service base;
- Create differential drainage utility rates reflecting the drainage service provided in geographical areas. Higher fees could be targeted to areas receiving or needing more intensive service; and
- Create drainage utility connection fees for new users of a community-wide facility. After a facility is built using municipal authority and funds, drainage utility fees are charged to new users of the community-wide facility.

The following list identifies some the recent accomplishments of Tulare County in terms of improving storm water management in unincorporated areas primarily through Redevelopment Agency funding.

- In Cutler-Orosi, curb, gutter, and sidewalk design and construction was completed for the entire S.R. 63 alignment through the communities;

- A master plan for storm water drainage, air quality improvement, and recreation project was funded by a $35,000 CDBG Technical Assistance grant, including a biological study and some design work. Design work and construction of the storm water project was partially funded by CMAQ and USDA Rural Utility Services and Community Facilities. The project will be phased in 3 parts due to funding limitations but additional funds are being sought;

- A perpetually full storm water drainage basin was pumped and 11 ponding basins were cleared and disked, eliminating public nuisances in the Earlimart community;

- The Earlimart PUD has agreed to a joint powers storm water authority with the Richgrove CSD and the Poplar CSD to share resources, operations, maintenance and emergency response, pending a successful community-wide election approving the establishment of an assessment district;

- In the Goshen community, the Tulare County Redevelopment Agency completed a storm water drainage, air quality improvement and recreation project with a new ponding basin near the intersection of Betty Drive and Camp Drive. The ponding basin will be developed into a park. The park/ponding basin will also contain a baseball diamond and a football/soccer field;

- In the Pixley community, the Tulare County Redevelopment Agency completed an assessment of the existing downtown storm water system locating potential problems and developing potential solutions. Proposed improvements will alleviate existing safety hazards by reducing dust pollution and by eliminating an unfenced collection/retention facility in the community; and

- A master storm water drainage plan was completed for the Poplar-Cotton Center community.

- In the Richgrove community, a multi-year storm water drainage, air quality improvement, and recreation project is being implemented. Pipelines, drainage inlets, catch basins, dual purpose storm water basin/recreation park and associated facilities are being funded with loans of $1.6 million from the

USDA Community Facility and Rural Development programs, and a 2005 CDBG Public Works grant.

Tulare County can continue to strengthen its storm water management practices through the establishment of additional assessment districts or zones of benefit; continuing to work with the development community on the funding of infrastructure improvements on a community-wide level; identifying potential multi-use storm water/recreational sites through the community planning process; and continuing to aggressively pursue outside funding sources for the implementation of infrastructure improvements.

7.5 Solid and Hazardous Waste

Introduction

This section describes the general characteristics of the hazardous and solid waste facilities and service providers for the county.

Method

The information presented in this section is based on published reports and information provided by Tulare County.

Key Terms

- **Household Hazardous Waste.** Any unwanted or discarded materials that are disposed of in a separate waste facility (not a municipal solid waste facility) because of their potentially toxic composition. These include, but are not limited to: paints; waste motor oil; non-commercial pesticides; aerosols; wood preservatives; and solvents.
- **Industrial Waste.** Process water discharged from industrial uses.
- **Municipal Waste.** Wastewater (sewage) flows produced by commercial and domestic types of uses.
- **Solid Waste.** Unwanted or discarded material that is not a liquid or gas. This includes organic uses; paper products; metals; glass; plastics; cloth; brick; rock; soil; leather; rubber; yard wastes; and wood, but not including: sewage and hazardous materials. Organic wastes and paper products comprise about 75 percent of the typical urban solid waste stream.

- **Solid Waste Generation Rates.** Generation rates used to determine the amount of solid waste in tons per year, generated by different land use types (residential, industrial and commercial).

Regulatory Setting

This section provides for the assessment of solid waste services in the county.

Existing Conditions

Solid Waste Facilities

Solid waste produced in Tulare County in 1999 was estimated to be 230,000 tons. The average estimated solid waste generation rates for residential, commercial, and industrial land uses in 1999 are as follows:

- **Residential.** 81,532 tons/year;
- **Commercial.** 116,086 tons/year; and
- **Industrial**. 36,575 tons/year.

Solid waste collection in Tulare County is divided into sections. These sections are determined by the Board of Supervisors with only one license for each section issued. Currently there are eight sections that require a weekly pickup. The incorporated cities in Tulare County oversee solid waste collection within their city limits. Private companies offer solid waste collection services in other unincorporated areas of the county. Those companies currently are:

- Miramonte Sanitation;
- Pena Disposal, Inc.;
- Three Rivers Disposal;
- Allied Disposal;
- USA Waste (Waste Management);
- South Tulare-Richgrove; and
- Tule Trash.

Tulare County operates three active solid waste disposal facilities, or landfills: Visalia, Woodville, and Teapot Dome. These landfills serve all of Tulare County as well as parts of surrounding counties. Similarly, a small amount of solid waste from Tulare County is transported to

surrounding county landfills. In addition, there are seven transfer stations located throughout the isolated rural areas of the county for the convenience of those residents who live outside of waste collection service areas. Figure 7-2 shows the locations of the landfills and transfer stations.

Teapot Dome (21063 Avenue 128, Porterville). The Teapot Dome disposal site is located on Avenue 128 east of Road 208. This site is attended and open to the public. It serves the City of Porterville and unincorporated areas of southern Tulare, and northern Kern Counties. The approximate amount of waste disposed at Teapot Dome in 2003 was estimated to be 63,000 tons.

Visalia (22466 Road 80, Visalia). The Visalia disposal site is located on the east side of Road 80 just north of Avenue 332. The site is attended and open to the public. It serves the Cities of Visalia, Farmersville, Dinuba, Exeter, Tulare, Woodlake, Fresno, and unincorporated areas of northern Tulare and southern Fresno Counties. The approximate amount of waste disposed at Visalia in 2003 was estimated to be 120,000 tons.

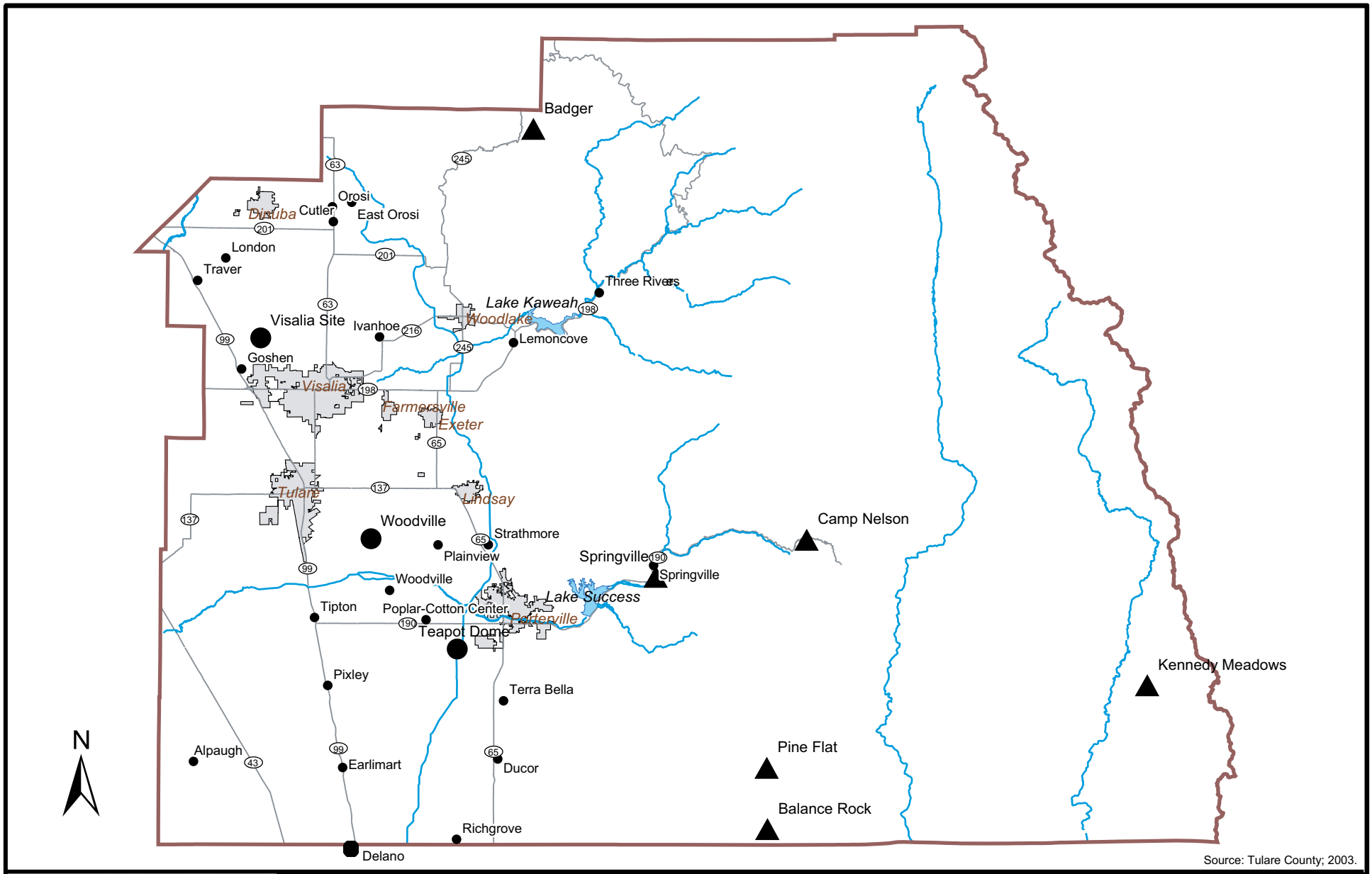
Woodville (19800 Road 152, Woodville). The Woodville disposal site is located on the east side of Road 152 south of Avenue 200. This site is attended and open to the public. It serves the Cities of Tulare,

Exeter, Farmersville, Lindsay, Visalia, Woodlake, and unincorporated areas of central Tulare County. The approximate amount of waste disposed at Woodville in 2003 was estimated to be 68,000 tons.

Transfer Stations

The county also operates seven transfer stations that are located in rural areas for the convenience of the people who live near them. The transfer stations do not accept large volumes of waste. The county transports solid waste to the three landfills from the following transfer stations:

- Badger Transfer Station, east of Badger;
- Balance Rock Transfer Station, north of Balance Rock;
- Camp Nelson Transfer Station, northeast of Camp Nelson;
- Earlimart Transfer Station, north of Earlimart;
- Kennedy Meadows Transfer Station, in the southeast region of the county;
- Pine Flat Transfer Station, north of Pine Flat; and,
- Springville Transfer Station, south of Springville.


Badger
Orosi
Cutler
East Orosi
Dinuba
London
Traver
Three Rivers
Lake Kaweah
Woodlake
Visalia Site
Ivanhoe
Lemoncove
Goshen
Visalia
Farmersville
Exeter
Tulare
Lindsay
Woodville
Strathmore
Plainview
Camp Nelson
Springville
Springville
Woodville
Lake Success
Tipton
Poplar-Cotton Center
Porterville
Teapot Dome
Kennedy Meadows
Pixley
Terra Bella
Alpaugh
Earlimart
Ducor
Pine Flat
Balance Rock
Richgrove
Delano
N
Source: Tulare County; 2003.
Tulare County General Plan Update
0 3.5 7 14 Miles
Major Roads
Rivers
Lakes
County Boundary
City Limits
Landfill
Transfer Station
Communities
FIGURE 7-2
Solid Waste Facilities

Recycling Programs

In Tulare County, three jurisdictions have curbside recyclable collection and five have green waste collection service.

Tulare County landfills accept wood and green waste and tires for recycling purposes in addition to solid waste. In addition, the county maintains a list of active recycling sites for wood and green waste, glass, cans, paper, waste oil, concrete, asphalt, brick, ceramic tile and porcelain, iron & metal, usable furniture, clothing, house wares, appliances, and computer & television monitors.

Household Hazardous Waste Facilities

Household hazardous waste such as paint, waste motor oil, non-commercial pesticides, aerosols, wood preservatives, and solvents are collected through a public service program that provides education and services related to the reduction and collection of household hazardous waste. This Health and Human Services Agency Division provides services to all county residents through 50 or more weekly collection events held at the permanent collection facility in Visalia. The collection site for Tulare County is located at the Visalia City Yard, 335 N. Cain Street in Visalia. The locations, amounts, and other information on hazardous waste production and facilities is provided in Section 10.5.

7.6 Natural Gas and Electric Service

Introduction

This section describes the general characteristics of the natural gas and electrical services available to the county.

Methods

The information presented in this section is based on information provided by Southern California Edison, The Gas Company, and Pacific Gas & Electric.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of natural gas and electric services in the county.

Existing Conditions

Southern California Edison provides electric service to the majority of Tulare County, including the majority of the San Joaquin Valley and the foothills. Natural gas service is primarily provided by The Gas Company (formerly Southern California Gas Company). Pacific Gas & Electric also serves northern Tulare County's electric needs on limited basis. The electrical facilities network includes both overhead and underground lines, with new development required to install underground service lines. All utility providers indicate that additional service should be available to new development, depending on the necessary load of the services requested.

7.7 Law Enforcement

Introduction

The purpose of this section is to summarize existing information regarding Tulare County law enforcement services and facilities.

Methods

The Tulare County Sheriff's Department provided the information for this section.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section assesses the law enforcement protection services in the county.

Existing Conditions

The Tulare County Sheriff's Department currently has 448 sworn officers serving its unincorporated population (145,128), and generates a level of

service ratio of 3.2 officers per 1,000 residents. The ratio is above the accepted standard of 2.0 officers per 1,000 residents set by the Federal Bureau of Investigation. The Sheriff's Department also has 186 non-sworn clerical and support staff amounting to a total Sheriffs Department staff personnel of 633 employees.

Law enforcement protection for the unincorporated county is divided into 22 areas with four stations. Table 7-4 shows the name and location of each station with the number of service areas that each station serves. As shown in the table, the Porterville substation serves the largest number of areas with 10 patrols, followed by the headquarters in Visalia with six, and Cutler-Orosi and Pixley, each with three areas.

Table 7-5. Sheriffs Department Patrol/Offices, Tulare County, 2004

Number of Beat/Patrols	Station/Office	Address
3	Cutler-Orosi Substation	414 Road 128, Orosi, CA 93647
6	Headquarters Patrol	2404 W Buffel Ave., Visalia, CA 93291
3	Pixley Substation	161 N. Pine Street, Pixley, CA 93256
10	Porterville Substation	379 N Third Street, Porterville, CA 93257

Source: Tulare County Sheriff's Department; 2004

The Tulare County Sheriff's Department also operates four detention/corrections facilities. These are listed in Table 7-5 with their locations, average inmate populations, and the maximum inmate capacity. As shown in the table, over 90 percent of the available jail space is taken. In the case of the Men's Correctional Facility the available capacity is currently full. However there is unused capacity at the pre-trial facility and efforts are underway to find a user for that facility.

Table 7-6. Detention/ Correction Facilities in Tulare County

Facility	Address/Location	Average Inmate Population	Maximum Inmate Capacity	Existing Occupancy
Bob Wiley Detention Facility	36712 Road 112, Visalia, CA 93291	655	695	94.2%
Day Reporting Center	36000 Road 112, Visalia, CA 93291	601	-	-
Main Jail	2404 W Burrel Ave., Visalia, CA 93291	245	264	92.8%
Men's Correctional Facility	36168 Road 112, Visalia, CA 93291	302	302	100.0%

Source: Tulare County Sheriffs Department; 2004

7.8 Fire Protection

Introduction

The purpose of this section is to summarize existing information regarding Tulare County fire protection services.

Methods

The Tulare County Fire Department, the California Department of Forestry, and the Tulare County Geographic Information System provided the information for this section.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of fire protection services in the county.

Existing Conditions

The California Department of Forestry and Fire Protection/Tulare County Fire Department (CDFFP/TCFD) serve 145,128 of Tulare County's population. As Table 7-6 shows, dispatchers reported 14,022 responses in 2002, averaging 38.4 calls a day. Fire occurrence data generated by the department indicate a direct relationship between high use areas of the county and fire occurrence. The population increase in the mountain areas have caused increased wildland urban interface problems as well. Structures are being built throughout wildland areas wherein vegetation fires can spread rapidly. Providing adequate fire protection to those structures has become a major undertaking.

The CDFFP/TCFD uses the 2003 Tulare Unit's Fire Management Plan to guide fire protection and prevention throughout the county.

Table 7-7. TCFD Service Calls (2002), Tulare County

Service Type	Number of Calls (2002)	Percent of Total
Fires	2,812	20.1
Public Assists	476	3.4
Medical Aid	7,353	52.4
Fire Menace Standby	449	3.2
Dispatch Incidents	1,142	8.1
Other Agency Assists	1,025	7.3
Ambulance	375	2.7
Smoke Check	390	2.8
Total	14,022	100.0

Source: Tulare County Fire Department

Service Response. As stated above, the Tulare County Fire Department responded to 14,022 calls for service in 2002. Table 7-6 organizes the total response calls by type and percentage. As the table shows, a majority of the calls were for medical emergencies (52 percent) followed by fire calls (20 percent). The remaining calls ranged from dispatch incidents (8.1 percent) to assisting other agencies (7.3 percent) to public assistance (3.4 percent).

In order to properly serve the county, the department must continually train its staff to respond to and provide emergency services as quickly as possible. The department uses an "attack" time protocol of less than 10 minutes to respond to 90 percent of the calls on the valley floor and less than 15 minutes on 75 percent of calls in the foothill and mountain areas.

Branch Operations. The Tulare County Fire Department operates conducts its operations from 35 stations throughout the county. Each station is located in one of eight battalions. The entire department is operated from the Fire Department Administration Building located at 1968 South Lovers Lane in Visalia. The Tulare County Fire Department differentiates between regular fire stations and forest fire stations. A forest fire station, while a regular fire station is generally located on the valley floor or in an unincorporated community.

- **Fire Prevention Services and Programs.** The Tulare County Fire Department operates many programs to educate the public on fire related issues through education, engineering and enforcement.

- The Hazard Abatement Officer issues notices to property owners whose properties pose an imminent threat to public health, and/or safety.

- The Fire Protection Planning element enforces the Uniform Fire Code by conducting industrial and commercial occupancy inspections, and by providing plan review for new construction and remodeling projects.
- Fire Prevention delivers the Fire Department safety message via public service announcements of seasonal fire danger.
- Public presentations are conducted at the Porterville and Tulare County Fair, in addition, depart staff present to schools.

7.9 Schools

Introduction

This section describes the general characteristics of Tulare County's school facilities.

Methods

The data presented in this section is based on data collected from the Tulare County Office of Education, the school districts that encompass the study area, and data from the California Department of Education website.

Key Terms

- **Alternative Schools.** These types of schools include continuation schools and schools that provide independent study, site based instruction, and instructional support to home schooled students.

Regulatory Setting

This section provides for the assessment of school facilities in the County.

Existing Conditions

A total of 48 school districts provide education throughout Tulare County, see Figure 7-3. Of the 48 school districts, seven are unified districts providing educational services for kindergarten through 12th grade. The remaining 41 districts consist of 36 elementary school

districts and four high school districts. Many districts have only one school.

Total enrolment in Tulare County public schools has increased from about 80,000 to 88,300 students during a nine-year span from 1993 to 2002. On average, the growth rate has remained steady with annual increases approximating two percent.

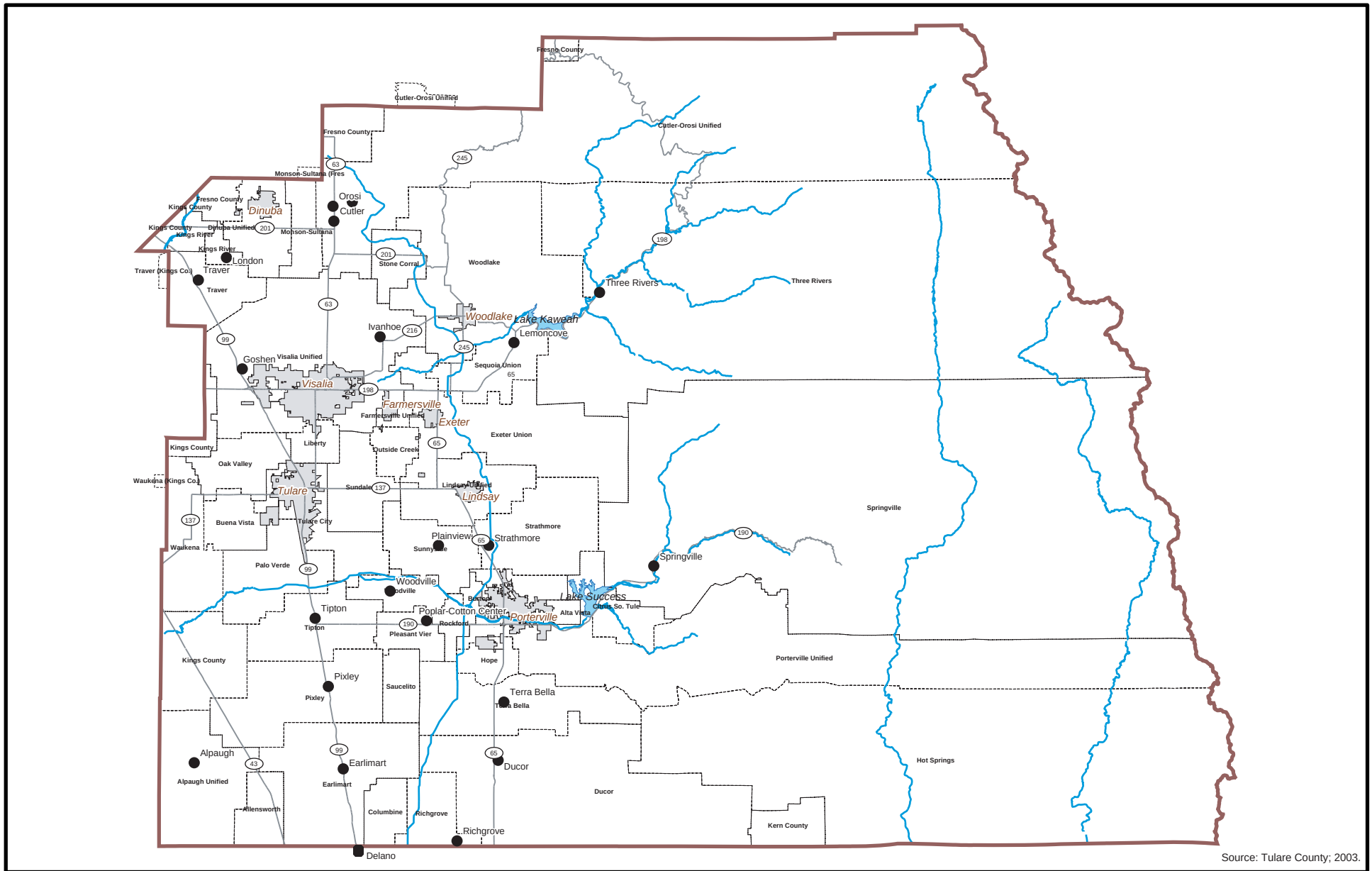
A survey requesting information on existing school conditions, future expansion/construction plans and the districts' ability to meet expected growth was submitted to the districts. The result of the survey is organized by each district.

Elementary School Districts – Grades K-8

Allensworth Elementary School District. The Allensworth Elementary School District serves grades K-8 in the central region of Tulare County. The District, which has grown by an average of two to three students per year since 1993, has one school. The school operates on a traditional schedule with six teachers and has a maximum student capacity of 129. The District is in the process (as of 2003) of constructing a multi-purpose room, three classrooms, an office, kitchen, restrooms and playground for the elementary school.

Alta-Vista School District. The Alta Vista Elementary School District serves grades K-8 in the southwestern region of Tulare County. The district, which has expanded by an average of 12 percent since 1993, has one school with an average daily attendance of 471 students. The school operates on a traditional schedule with 23 teachers and a maximum student capacity of 516. The City of Porterville has annexed a portion of the school district and has zoned three areas for future housing projects. The district has developed plans, approved by the

State Office of School Architects, for a new library. The future library construction will result in the old library being retrofitted as a classroom. Plans for a new classroom wing (3 classrooms) are being submitted to the State Office of School Architects in January 2004. With board approval, it is anticipated that construction for the new library will be completed by September 2004. Construction of the new classroom wing is pending approval of state funding for this project.



Source: Tulare County; 2003.

Tulare County General Plan Update

0 3.75 7.5 15 Miles

Major Roads
Rivers
Lakes
County Boundary
City Limits
Communities
School District

FIGURE 7-3

School Districts Serving Tulare County

Buena Vista Elementary School District. The Buena Vista Elementary School District serves grades K-8 in the western region of Tulare County. The district, which has grown by 150 students since 1993, has one school with an average daily attendance of 165 students. The school operates on a traditional schedule with nine teachers and a maximum student capacity of 210. The district does not have any plans for expansion or construction in the foreseeable future and expects to meet the needs of the surrounding community.

Burton Elementary School District. The Burton Elementary School District serves grades K-8 in the southwestern part of Tulare County. The School District operates on a traditional schedule with 120 teachers. The campuses are currently operating at maximum capacity with an average combined daily attendance of 2,192 students. The district, which has grown by an average of 4.1 percent per year since 1993, has five schools:

- William R. Buckley Elementary serving grades K-4;
- Burton Elementary serving grades K-4;
- Burton Middle School serving grades 7-8;
- Jim Maples Academy serving grades 5-6; and
- Oak Grove Elementary serving grades K-4.

District administrators expect to see growth continue at or above its historic rate and anticipate the need for additional school sites to accommodate this need. A sixth campus is pending funding from the Office of Public School Construction and is expected to begin construction in the summer of 2004. Work has also begun to identify a prospective site and funding sources for a seventh campus to meet future growth.

Citrus South Tule Elementary School District. The Citrus South Tule Elementary School District serves grades K-6 in the central region of Tulare County. The district has one school with an average daily attendance of 51 students.

Columbine Elementary School District. The Columbine Elementary School District serves grades K-8 in the southern region of Tulare County. The district, which has grown by an average of three percent per year since 1993, has one school with an average daily attendance of 183 students. The school operates on a traditional schedule, with nine

teachers and a maximum student capacity of 245. There are no plans for any construction or facility improvements.

Ducor Elementary School District. The Ducor Elementary School District serves grades K-8 in the southern region of Tulare County. The district, which has had a decline in student enrollment since 1993, has one school with an average daily attendance of 210 students. The school operates on a traditional schedule, with nine teachers and a maximum student capacity of 275. There are no plans for expansion or construction in the foreseeable future, and the district has not identified any restraints to meeting projected needs generated by surrounding growth.

Earlimart Elementary School District. The Earlimart Elementary School District serves grades K-8 in the southwestern region of Tulare County. The School District operates on a traditional schedule with 81 teachers. Students graduating from Earlimart Middle School attend Delano High School. There is a maximum student capacity of 1,975, and an average daily attendance of 1,624 students. The district, which has increased by an average of 12.2 percent per year since 1993, has three schools:

- Earlimart Elementary serving grades K-3;
- Alila serving grades 4-5; and
- Earlimart Middle School serving grades 6-8.

Future plans for the District include the expenditure of $5.5 million in new construction eligibility from the state and approximately $1.2 million for modernization eligibility from the state. As of 2003, plans to utilize the funds were under way. Without state funding and facility construction, it is expected that classrooms would quickly become overcrowded.

Exeter Elementary School District. Exeter Elementary School District serves grades Pre-K-8 in the eastern region of Tulare County. The school district operates on both a modified traditional schedule and a rotating block schedule with 103 teachers. There is a maximum student capacity of 2,157, and an average daily attendance of 1,832 students. The district, which has declined in student enrollment since its 1996 reorganization, has four schools:

- Lincoln Elementary serving grades PreK-2;
- Rocky Hill Elementary serving grades 3-5;

- Wilson Middle School serving grades 6-8;
- Exeter Elementary Community Day serving grades 4-8.

District administrators are confident that future growth can be met with State Match funding on new construction. A multi-purpose room is planned for construction at Wilson Middle School in 2005 and a new middle school is planned for construction in 2012.

Hope Elementary School District. The Hope Elementary School District serves grades K-8 in the central region of Tulare County. The district, which has increased by an average of 14 percent per year since 1993, has one school with an average daily attendance of 105 students. The school operates on a traditional schedule, with five teachers and a maximum student capacity of 175. Graduating eighth graders attend Porterville High School, Monache High School, and Granite Hills High School. There are no plans for growth in the foreseeable future, since the district currently expects to meet the future needs of the community.

Hot Springs Elementary School District. The Hot Springs Elementary School District serves grades K-8 in the southeastern region of Tulare County. The District operates on traditional-modified schedules with four teachers. There is a maximum student capacity of 50 and an average daily attendance of 31 students. No plans for future expansions are expected during the next ten years and the district expects to meet future growth. The district, which has grown by 25 students since 1993, has the following two schools:

- Hot Springs Elementary serving grades K-8; and
- Johnsondale Elementary serving grades K-8

Kings River Union Elementary School District. The Kings River Union Elementary School District serves grades K-8 in the northwestern region of Tulare County. The district, which has decreased in population since 1993, has one school with an average daily attendance of 503 students. The school operates on a traditional schedule, with 25 full-time teachers and four part-time teachers. District administrators do not have any plans for new construction or expansion and do not foresee any constraints to the school's ability to meet area growth.

Liberty Elementary School District. The Liberty Elementary School District serves grades K-8 in the western region of Tulare County. The district has one school with an average daily attendance of 221 students. The school operates on a traditional schedule, with 12 teachers. The

district contracts with the Visalia Unified School District for food service. The district recently (2003) doubled its cafeteria and district officials recognize the school is in need of major repair and renovation throughout all structures.

Monson-Sultana Joint Union Elementary School District. The Monson-Sultana Joint Union Elementary School District serves grades K-8 in the northwestern region of Tulare County. The district, which has grown in enrollment by an average of 11.5 percent per year since 1993, has one school with an average daily attendance of 410 students. The school operates on a traditional schedule, with 21 teachers and a maximum student capacity of 450. Currently (2003) a multi-purpose cafeteria is under construction and the district will be applying for modernization funds to renovate the old cafeteria into a library and computer lab.

Oak Valley Union Elementary School District. The Oak Valley Union Elementary School District serves grades K-8 in the western region of Tulare County. The district, which has grown by about 10 students per year since 1993, has one school with an average daily attendance of 430 students. The school operates on a traditional schedule, with 21 teachers and a maximum student capacity of 470. The district is currently (2004) constructing a new cafeteria/multi-purpose building and plans to modernize other school facilities in the future.

Outside Creek Elementary School District. The Outside Creek Elementary School District serves grades K-8 in the central region of Tulare County. The district, which has grown by 126 students since 1993, has one school with an average daily attendance of 120 students. The school operates on a traditional schedule, with five teachers and a maximum student capacity of 135. The district does not foresee any constraints in its current facilities to provide for expected area growth and does not have plans to construct additional facilities.

Palo Verde Union Elementary School District. The Palo Verde Union Elementary School District serves grades PreK-8 in the western region of Tulare County. The district, which has grown by an average of eight students per year since 1993, has one school (23 classrooms) with an average daily attendance of 546 students. The school operates on a traditional schedule, with 21 teachers and a maximum student capacity of 650. The district does not foresee any limits to their ability to provide educational services unless a drastic decline in student population occurs (at which point the majority of the federal and state financial aid would be reallocated to growing districts). Future plans for the district include the replacement of the existing auditorium and cafeteria with a

new multi-purpose room. However, the timeframe for the project is unknown as of 2004.

Pixley Union School District. The Pixley Elementary School District serves grades K-8 in the southwestern region of Tulare County. The District has one school with an average daily attendance of 815 students. The school operates on a traditional schedule, with 49 teachers.

Pleasant View Elementary School District. The Pleasant View Elementary School District serves grades K-8 in the central region of Tulare County. The district, which has increased its enrollment by an average of 10.9 percent per year since 1993, has one school with an average daily attendance of 487 students. The school operates on a traditional schedule, with 24 teachers and a maximum student capacity of 750. District officials note that the student's dependence on the bus service is a main cause of difficulty at the school. The district is considering a plan to either modernize and expand the existing school or build a new school, most likely in the community of Poplar.

Richgrove Elementary School District. The Richgrove Elementary School District serves grades K-8 in the southwestern region of Tulare County. The School District operates with 42 teachers. There is an average daily attendance of 743 students. The district has one elementary school and one middle school:

- Richgrove Elementary serving grades K-5; and
- Richgrove Junior High serving grades 6-8.

Rockford Elementary School District. The Rockford Elementary School District serves grades K-8 in the central region of Tulare County. The district has one school with an average daily attendance of 365 students.

Saucelito Elementary School District. The Saucelito Elementary School District serves grades K-8 in the southwestern region of Tulare County. The district, which has expanded its enrollment by 107 students since 1993, has one school with an average daily attendance of 115 students. The school operates on a traditional schedule, with 18 teachers and a maximum student capacity of 108. Students graduating from the school attend Porterville High School. There are no plans for expansion or construction in the foreseeable future and the district expects to meet the needs of future community growth.

Sequoia Union Elementary School District. The Sequoia Union Elementary School District serves grades K-8 in the central region of

Tulare County. The district, which has not expanded its enrollment in the past ten years, has one school with an average daily attendance of 304 students. The school operates on a traditional schedules, with 16 teachers and a maximum student capacity of 370. Most of the students who graduate from Sequoia Union attend Exeter High School. The district does not have any plans for expansion or construction and expects to meet the demands of future growth with its existing facilities.

Springville Union Elementary School District. The Springville Elementary School District serves grades K-8 in the eastern region of Tulare County. The district, which has grown from 384 to 456 students from 1993 to 2003, has one school with an average daily attendance of 425 students. The school operates on a traditional schedule, with 22 teachers and a maximum student capacity of 480. Graduating students attend Porterville High School. Future plans for Springville Union include the addition of three classrooms and the construction of a new middle school.

Stone Corral Elementary School District. The Stone Corral Elementary School District serves grades K-8 in the northwestern region of Tulare County. The district has one school with an average daily attendance of 114 students. The school operates with six teachers.

Strathmore Union Elementary School District. The Strathmore Elementary School District serves grades K-8 in the central region of Tulare County. The district operates with 37 teachers. There is an average daily attendance of 702 students. The district has one elementary school and one middle school:

- Strathmore Elementary serving grades K-5; and
- Strathmore Middle serving grades K-8.

Sundale Union Elementary School District. The Sundale Elementary School District serves grades K-8 in the central region of Tulare County. The district, which has grown by an average of five percent per year since 1993, has one school with an average daily attendance of 570 students. The school operates on a traditional schedule, with 30 teachers and a maximum student capacity of 1,300. Graduating students attend Tulare Union and Tulare Western High Schools. Future plans for existing facilities include the addition of a wing during the 2004-2005 year.

Sunnyside Union Elementary School District. The Sunnyside Union Elementary School District serves grades K-8 in the central region of

Tulare County. The district, which has seen its enrollment decline by 125 students since 1993, has one school with an average daily attendance of 426 students. The school operates on a traditional schedule, with 25 teachers and a maximum student capacity of approximately 550. The district has plans to construct a new multi-purpose facility that would include a cafeteria and gym, but has not determined a specific timeframe for this project.

Terra Bella Union School District. The Terra Bella Elementary School District serves grades K-8 in the southern region of Tulare County. The district operates with 43 teachers. There is an average daily attendance of 783 students. The district has one elementary school and one middle school:

- Terra Bella Elementary serving grades K-5; and
- Carl F. Smith Middle School serving grades 6-8.

Three Rivers Union Elementary School District. The Three Rivers Union Elementary School District serves grades K-8 in the eastern region of Tulare County. The district has one school with an average daily attendance of 218 students. The school operates with 11 teachers.

Tipton Elementary School District. The Tipton Elementary School District serves grades K-8 in the western region of Tulare County. The district has one school with an average daily attendance of 520 students. The school operates with 25 teachers.

Traver Elementary School District. The Traver Elementary School District serves grades K-8 in the northwestern region of Tulare County. The district, whose enrollment has fluctuated between 200 and 250 students since 1993, has one school with an average daily attendance of 228 students. The school operates on a traditional schedule, with 13 teachers and a maximum student capacity of 250. Students attend Kingsburg High School in Fresno County upon graduation. The district is currently (2003) building four new classrooms and anticipates issuing a Proposition 39 Bond to voters to construct a multi-purpose building. Constraints in meeting future demand are not expected.

Tulare City Elementary School District. The Tulare City Elementary School District serves grades PreK-8 in the western region of Tulare County. The district operates with 385 teachers. There is an average daily attendance of 7,139 students. The district has nine elementary schools and four middle schools as listed below.

Waukena Joint Union Elementary School District. The Waukena Joint Union Elementary School District serves grades K-8 in the western region of Tulare County. The district has one elementary school and an average daily attendance of 220 students. The school operates with 11 teachers

Woodlake Union Elementary School District. The Woodlake Union Elementary School District serves grades Pre K-8 in the central region of Tulare County. The district operates on a traditional schedule with 82 teachers. There is a maximum student capacity of 2,000 and an average daily attendance of 1,474 students. There are no immediate plans to expand or construct additional facilities. If the student population increases by 300, additional schools will be considered along with the reconfiguration of existing facilities. The district has one preschool, two elementary schools, and one middle school:

- Lulu Blair Kress serving grades PreK;
- Castle Rock serving grades 3-5;
- Francis J. White Learning Center serving grades K-2; and
- Woodlake Valley Middle School serving grades 6-8.

Woodville Union Elementary School District. The Woodville Union Elementary School District serves grades K-8 in the central region of Tulare County. There is one school in the District with an average daily attendance of 603 students (2003). The District has had a fluctuating enrollment since 1993 ranging from 660 to 590 students. The School operates on a traditional schedule, with 32 teachers and a maximum student capacity of 630. The School is in the process of modernizing it facilities with an expected finish date during 2004.

High School Districts

Allensworth High School District The Allensworth High School District serves grades 9-12 in the southwestern region of Tulare County. The district has one school with an average daily attendance of 20 students. The school operates with six teachers.

Exeter Union High School District. The Exeter Union High School District serves grades 9-12 in the eastern region of Tulare County. The district operates on both a compressed block schedule at one school. The district, which has increased its enrollment by one to two percent per

year since 1993, has a maximum student capacity of 1,500, and an average daily attendance of 1,001. District administrators do not anticipate any constraints to the school's ability to meet future area growth. A multi-purpose room is planned for continuation education in 2010.

Strathmore Union High School District. The Strathmore Union High School District serves grades 9-12 in the central region of Tulare County. The district operates on a traditional schedule with 22 teachers. There is a maximum student capacity of 750 and an average daily attendance of 443 students. The district, which has grown by 400 students since 1993, has two high schools:

- Frazier High (Continuation) serving grades 9-12; and
- Strathmore High serving grades 9-12.

A majority of the students who attend high school in the district are products of Strathmore Middle School and Sunnyside Elementary School. The district does not identify any impediments on its current service facilities nor does it expect future growth in the area to cause any burden on the existing facilities. There are no plans for future construction.

Tulare Joint Union High School District. The Tulare Joint Union High School District serves grades 9-12 in the western region of Tulare County. The district, which has expanded its enrollment by an average of 1.9 percent per year since 1993, has two high schools, two continuation schools, one independent study, and one adult school with a district average daily attendance of 4,200 students. The district operates on traditional and block schedules, with 170 teachers and a maximum student capacity of 1,785 for Tulare Union, 2,063 for Tulare Western, and 150 for Tulare Tech Prep. All elementary schools located in the City of Tulare act as feeder schools for the district including:

- Oak Valley Elementary School;
- Waukena Elementary School;
- Buena Vista Elementary School;
- Palo Verde Elementary School;
- Tipton Elementary School;

- Pixley Elementary School;
- Sundale Elementary School;
- Liberty Elementary School;
- Tulare Christian School; and
- St. Aloysius School.

Future plans for the district involve the construction of a new high school in August of 2008 to accommodate 1,500 to 1,600 students. While under construction, it is estimated that an additional 25 portable classrooms will be needed to meet student capacity in the District.

Woodlake Union High School District. The Woodlake Union High School District serves grades 9-12 in the central region of Tulare County. The district operates on a traditional schedule with 33 teachers. There is a maximum student capacity of 800 and an average daily attendance of 825 students. The district has two high schools:

- Bravo Lake High (Continuation) serving grades 9-12; and
- Woodlake Union High serving grades 9-12.

Woodlake Union High School generated its base enrollment from the Three Rivers Union School District, Stone Corral School District, and Woodlake Union School District. Future construction is not planned for the district, but additional relocatable classrooms may be added as needed. If the district should increase by 100 students, an additional classroom wing would be needed.

Unified School Districts

Unified school districts administer elementary, intermediate and high schools with in their boundaries. The seven unified school districts in Tulare County are described below.

Alpaugh Unified School District. The Alpaugh Unified School District serves grades K-12 in the southwestern region of Tulare County. The district operates three schools with an average daily attendance of 293 students. The school operates with 16 teachers.

Cutler-Orosi Unified School District. The Cutler-Orosi Unified School District serves grades K-12/Adult in the northern region of Tulare

County. The district has five elementary schools, two high schools, two continuation high schools, and one adult school with a district average daily attendance of 3,784 students. The district operates with 205 teachers.

Dinuba Unified School District. The Dinuba Unified School District serves grades K-12/Adult in the northern region of Tulare County. The district, which has grown by 767 students since 1993, has six elementary schools, two high schools, and one adult school with a district average daily attendance of 5,300 students and a maximum student capacity of 4,100. The following list includes the schools within the district and the grades each serves:

- Grand View Elementary serving grades K-6;
- Jefferson Elementary serving grades K-6;
- Lincoln Elementary serving grades K-6;
- Roosevelt Elementary serving grades K-6;
- Washington Intermediate serving grades 7-8;
- Wilson Elementary serving grades K-6;
- Dinuba High serving grades 9-12;
- Sierra Vista serving grades 9-12; and
- Dinuba Adult serving adult education.

Schools within the district operate on traditional schedules, with a total of 255 teachers. In 2002, a $14.9 million bond was passed to construct and improve school facilities within the district over a 15-year period. The purpose of the projects is to accommodate for growth and modernize existing facilities.

Farmersville Unified School District. The Farmersville Unified School District serves grades K-12 in the central region of Tulare County. The district operates on a modified traditional schedule, with 117 teachers and a maximum student capacity of about 3,060. The district has gained between 75 and 100 students since 1993 and has an average daily attendance of 2,188 students. There are three elementary schools, one high school and one continuation school:

- J.E. Hester serving K-2 grades;

- George L. Snowden serving 3-5 grades;
- Farmersville Junior High serving 6-8 grades
- Farmersville High serving 9-12 grades; and
- Deep Creek Academy serving continuation students.

Future plans for Farmersville Unified include the completion of Freedom Elementary in the Spring of 2004. The area of greatest need has been identified at Deep Creek Academy.

Lindsay Unified School District. The Lindsay Unified School District serves grades K-12 in the central region of Tulare County. The district operates on a traditional schedule, with 186 teachers and a maximum student capacity of 3,586. The district, which has grown by an average of 40 students per year since 1993, has four elementary schools, one high school, one continuation school and an average daily attendance of 3,555 students. These schools are as follows:

- Steve Gervey Junior High serving grades 7-8;
- Jefferson Elementary serving grades K-6;
- Lincoln Elementary serving grades K-6;
- Washington Elementary serving grades K-6;
- J.J. Cairns Continuation serving grades 9-12; and
- Landsay High serving grades 9-12.

Construction and facility improvements in the district include the recent (2003) completion of four science classrooms, the construction of a multiuse/gym, and the planned construction of a new high school by 2007.

Porterville Unified School District. The Porterville Unified School District serves grades K-12/Adult in the eastern region of Tulare County. The District has 9 elementary schools, two middle schools, five high schools, one continuation high school, and one adult school with a district average daily attendance of 12,487 students. The district operates with 621 teachers.

Visalia Unified School District. The Visalia Unified School District serves grades PreK-12/Adult in the eastern region of Tulare County. The

district, which has grown by 1,469 students since 1993, has 20 elementary schools, five middle schools, four high schools, two continuation/alternative schools, one school for the disabled, and one adult school. The average daily attendance in the district is 25,223 students. The schools operate on traditional schedules, with 1,153 teachers.

Future plans at Visalia Unified include rehabilitation, demolition, and new construction to update school facilities and increase student capacity. According to the district, future area growth will require extensive facilities improvements in excess of $24 million to accommodate new students.

Colleges

College of the Sequoias. The College of the Sequoias provides a general education curriculum. Located in central Visalia, the college has an average attendance of 8,600 full-time students, 10,300 total enrollment, and has grown by about 400 students per year since 1993. The school operates on the semester system, with a maximum student capacity of 13,000. Service relationships include direct facility use by CSU Fresno. Future plans include the construction of a Learning Center, Science Building, Gym, and Agricultural Research Center. The college does not see any constraints on its ability to serve its projected student capacity, if bond funding is approved. Two recent bonds failed to receive enough votes for funding.

Porterville College. Porterville College provides a general education college course curriculum. Located in central Porterville, the college has an average attendance of 3,028 full-time students with a capacity of 4,000 full-time and a total enrollment of 6,500 students. The school operates on the semester system and has had an average growth rate of about eight percent per year since 1993. Porterville College has program relationships with Bakersfield College, the University of La Verne, College of the Sequoias, and California State University Fresno. Immediate facility expansion includes the completion of a 10,000-square foot Health Careers building, the remodel and addition of 16,000 square feet to the library, and the remodel and addition of 3,000 square feet to the Fitness Center. Long range plans include over $50 million in additional facilities construction with the use of the recently passed General Obligation (GO) facility bond (Spring 2003).

County Operated Schools

The Tulare County Office of Education (TCOE) also operates additional special needs schools throughout the county. These schools provide education opportunities for adults, troubled youth, vocational education, and other specialized groups. TCOE operates the following court, community, charter, and special education schools:

- Juvenile Detention Facility Court School;
- Landsay Community School;
- Mid-County Community School;
- Eleanor Roosevelt Community Learning Center;
- Success Community School;
- Superior Community School;
- Youth Facility Court School;
- Tulare County Organization for Vocational Education;
- La Sierra Charter High School (Visalia);
- La Sierra Charter High School (Porterville);
- La Sierra West (TAPP);
- L.B. Hill Learning Center;
- Maple Learning Complex;
- Occupational Training Program; and
- Yettem Learning Center.

Border County Public Schools

The following schools and districts are located in neighboring counties. These are included because their service district boundaries cross into Tulare County, providing service to Tulare County residents.

Clay Joint Elementary School District. The Clay Joint Elementary School District is located in Fresno County and extends across the

northwestern border of Tulare County. The district, which has increased by about six students per year over the past ten years, has an average daily attendance of 225 students. Only one school is currently in the district. This school has 11 teachers and a maximum student capacity of 225 students. The school operates on a traditional schedule. District administrators identify both available land and overcrowding as potential constraints to the districts ability to meet future growth.

Corcoran School District. The Corcoran School District is located in Kings County and extends across the southwestern border of Tulare County. The district, which has increased by about 100 students over the past ten years, has an average daily attendance of 3,159 students. District administrators do not see any constraints to the district's ability to meet area growth and does not have plans for any new construction.

Delta View Joint Union School District. The Delta View Joint Union School District is located in Kings County and extends across the western border of Tulare County. The district has increased by only two students since 1993 for a total student population of 100. The district maintains only one school on a traditional schedule with a maximum enrollment capacity of 115. There are five teachers at the school. District administrators identify funding and their current facilities as constraints to meet future area growth. No plans for construction are currently being reviewed.

Linns Valley Poso Flat School District. The Linns Valley Poso Flat School District is located in Kern County and extends across the southeastern foothill and mountain areas of Tulare County. The district, which has declined in its student body enrollment over the past ten years, has one elementary school with an average daily attendance of 38 students. The district operates on a traditional schedule, with two teachers and a maximum student capacity of 120. District administrators do not see any constraints to the district's ability to meet area growth and do not have plans for any new construction.

Non-Public Schools

There are 27 private schools listed with the Department of Education in Tulare County. Most of these schools are operated by religious organizations. Over half (14) of the private schools in Tulare County are located in Visalia, with the others located in Exeter, Delano, Tulare, Porterville, Woodlake, Strathmore, Springville, Goshen, and Orosi.

7.10 Communications

Introduction

This section describes the general characteristics of the communication systems for the county.

Methodology

The information provided in this section has been obtained from Tulare County Department and communications service providers.

Key Terms

- **Cellular Telephone.** A mobile telephone operated through a cellular radio network.
- **Digital Subscriber Line (DSL).** Internet technology that uses existing 2-wire copper telephone wiring to deliver high-speed data services at speeds greater than basic internet dial-up.
- **Easement.** A limited right to make use of a property owned by another; for example, a right of way across the property.
- **Fiber Optics.** Fiber optics is the technology of transferring information, for example, in communications or computer technology, through numerous thin, flexible glass or plastic tubes (optical fibers) using modulated light waves. Information is transmitted in the form of coded pulses.
- **Internet.** A network that links computer networks all over the world by satellite and telephone, connecting users with service networks such as e-mail and the World Wide Web.

Regulatory Setting

This section provides for the assessment of communications services in the county.

Existing Conditions

A total of five telephone companies provide services in Tulare County: AT&T, Ducor, SBC, Sprint, and Verizon. These companies provide long distance calling, wireless services, Internet access, and other business solutions to residential and commercial consumers. The main impact

communications services have on the county is the service availability. Hard lines must be allowed rights-of-way and the continued growth of cellular telephones will require improved service areas and more cell towers. In addition, fiber optic cable has been installed in the urban areas of the county, mainly within incorporated cities. Newly emerging technologies, such as wireless internet, will play a role in the advancing information industries that will continue to grow.

7.11 Court Services

Introduction

This section describes the general characteristics of the court service systems for the county and provides an assessment of these services.

Methods

The information provided in this section has been obtained from the Tulare County Superior Court.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for assessment of Court services in the county.

Existing Conditions

In response to the Trial Court Facilities Act of 2002 (SB 1732), the authority and responsibility of the planning, construction, and acquisition of trial court facilities is now administered by the Judicial Council of California. As of June 30, 2007, County-owned court facilities were transitioned to the State of California.

As noted, court services within Tulare County are run by the State of California. Existing courthouses within the entire County include four courthouses within cities (Dinuba, Porterville, Tulare, and Visalia) and one facility in the unincorporated County (Juvenile Justice Facility)

Table 7-8. Tulare County Courts

Courthouse	Address	Phone
Juvenile Justice Facility	11200 Ave 368, Room 201, Visalia	559 713-3157
Dinuba	640 S. Alta Avenue, Dinuba	559 591-5815
Porterville	87 East Morton, Porterville	559 782-4710
Tulare	425 East Kern P.O. Box 1136, Tulare	559 685-2550
Visalia	County Civic Center (221 Mooney Blvd.), Visalia	559 733-6348

7.12 Library Services

Introduction

This section describes the general characteristics of library facilities and services for the county.

Methods

The information provided in this section has been obtained from the Tulare County Public Library System.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of library services in the county.

Existing Conditions

The Tulare County Public Library System is comprised of interdependent branches, grouped by services, geography and usage patterns to provide efficient and economical services to the residents of the county. At present, there are 14 regional libraries and one main branch. Table 7-9 shows the locations and service hours of the libraries in Tulare County.

Table 7-9. Tulare County Libraries

Branch	Address	Service Hours (2003)
Alpaugh	3816 Avenue 54 Alpaugh, CA 93201-0069	Tuesday: 10 am - 1pm, 2 pm - 6 pm Wednesday: 10 am - 1 pm, 2 pm – 6 pm
Dinuba	150 South I Street Dinuba, CA 93618-2399	Tuesday: 11 am - 5 pm, 6 pm - 8 pm Wednesday: 9 am - 1 pm, 2 pm - 6 pm Thursday: 11 am - 5 pm, 6 pm - 8 pm Friday: 9 am - 1 pm, 2 pm -6 pm
Earlimart	780 East Washington Earlimart, CA 93219-2153	Tuesday: 10 am -1 pm, 2 pm - 6 pm Wednesday: 10 am - 1 pm, 2 pm - 6 pm Thursday: 10 am - 1 pm, 2 pm - 6 pm Friday: 10 am - 1, 2 pm - 6 pm
Exeter	230 East Chestnut Exeter, CA 93221-1712	Tuesday: 11 am -5 pm; 6 pm - 8 pm Wednesday: 11 pm - 5 pm, 6 pm - 8 pm Thursday: 9 am - 1 pm; 2 pm - 6 pm Friday: 9 am - 1 pm; 2 pm - 6pm
Ivanhoe	15964 Heather Ivanhoe, CA 93235-1253	Wednesday: 10 am - 1 pm, 2 pm - 6 pm Thursday: 10 am - 1 pm, 2 pm - 6 pm
Lindsay	165 North Gale Hill Street Lindsay, CA 93247-2507	Tuesday: 11 pm - 5 pm; 6 pm - 8 pm Wednesday: 9 am - 1 pm; 2 pm - 6 pm Thursday: 11 am - 5 pm; 6 pm - 8 pm Friday: 9 am - 1 pm; 2 pm - 6 pm
Cutler-Orosi	12646 Avenue 416 Orosi, CA 93647-2018	Wednesday: 9 am - 1 pm, 2 pm - 6 pm Thursday: 9 am - 1 pm, 2 pm - 6 pm Friday: 9 am -1 pm, 2 pm - 6 pm
Pixley	300 North School Pixley, CA 93256-1011	Tuesday: 9:30 am - 8 pm Wednesday : 9:30am - 5 pm Thursday: 9:30 am - 8 pm Friday: 9:30 am - 3:30 pm Saturday: 10 am - 2 pm
Springville	35800 Highway 190 Springville, CA 93265-0257	Thursday: 11 am - 5 pm , 6 pm - 8 pm Friday: 9 am - 1 pm , 2 pm - 6 pm Saturday: 9 am - 1 pm, 2 pm - 5 pm
Strathmore	19646 Road 230 Strathmore, CA 93267-0595	Tuesday: 9 am - 1 pm, 2 pm - 6 pm Wednesday: 9 am - 1 pm, 2 pm - 6 pm
Terra Bella	23825 Avenue 92 Terra Bella, CA 93270-0442	Monday – Friday: 8:30 am - 2:30 pm
Three Rivers	42052 Eggers Drive 216 Three Rivers, CA 93271-0216	Wednesday: 10 pm - 1 pm, 2 pm - 6 pm Thursday: 12 pm - 1 pm, 6 pm - 8 pm Friday: 10 am - 1 pm, 2 pm - 6 pm
Tipton	301 East Woods Avenue Tipton, CA 93272-0039	Thursday: 9 am - 1 pm, 2 pm - 6 pm Friday: 9 am - 1 pm, 2 pm - 6 pm
Visalia	Main Branch 200 West Oak Avenue Visalia, CA 93291-4993	Tuesday: 9 am - 8 pm Wednesday: 9 am - 8 pm Thursday: 9 am - 8 pm Friday: 12 pm - 6 pm Saturday: 9 am - 5 pm
Woodlake	400 West Whitney Woodlake, CA 93286-1298	Wednesday: 9 am - 1 pm, 2 pm - 6 pm Thursday: 9 am - 1 pm, 2 pm - 6 pm Friday: 9 am - 1 pm, 2 pm - 6 pm

Library hours current as of February 2010.

7.13 Hospital and Ambulance Services

Introduction

This section describes the general characteristics of the hospital and ambulance facilities services for the county.

Methods

The information provided in this section has been obtained from the State of California Emergency Medical Services Authority, Kaweah Delta Hospital, Sierra View Hospital, and Tulare District Hospital.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of hospital and ambulance services in the county.

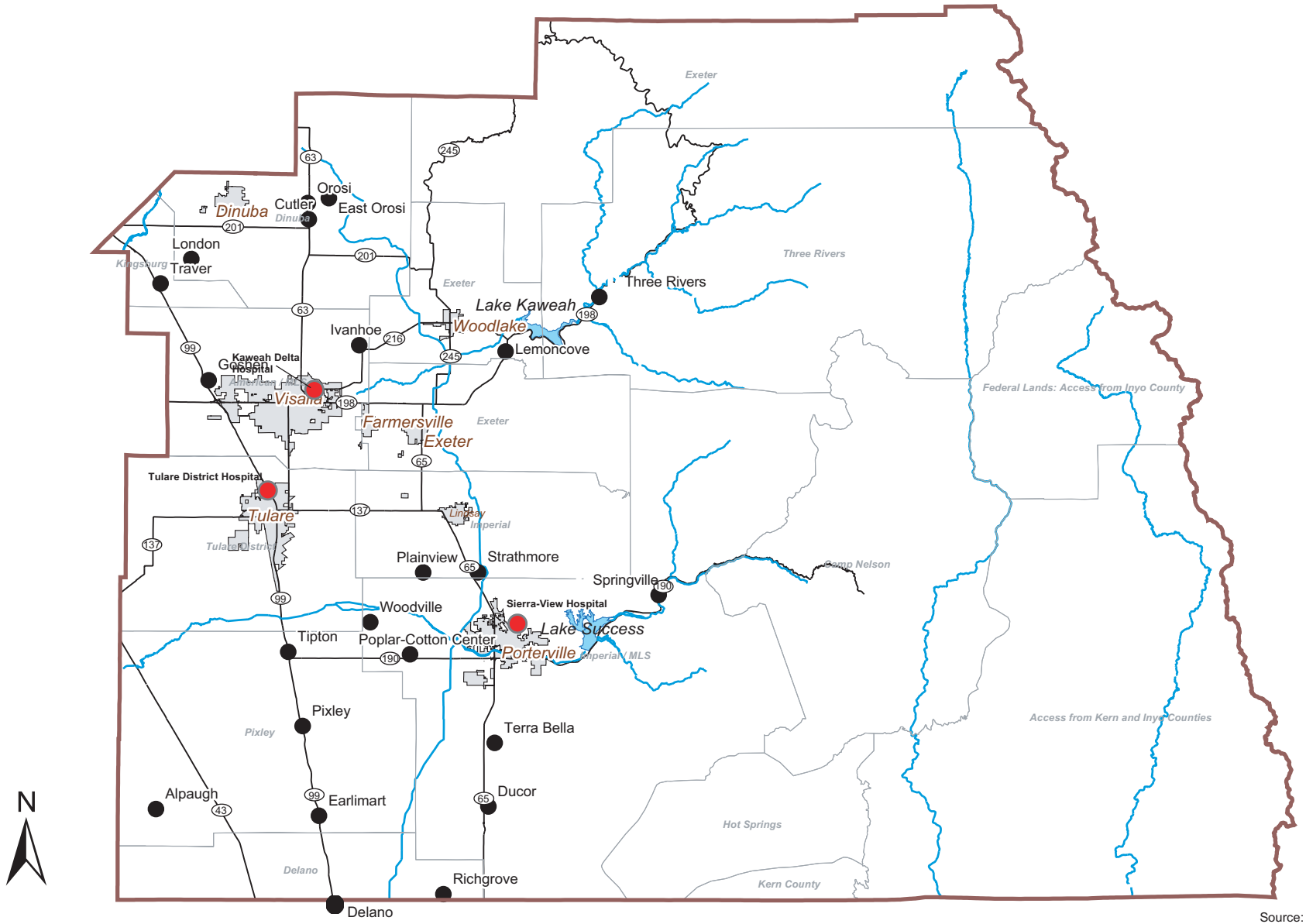
Existing Conditions

Tulare County receives emergency medical services from three hospitals. Table 7-10 shows the three existing hospitals in Tulare County. The first and largest, Kaweah Delta, is located in the City of Visalia. This hospital serves an average of 60,000 patients per year with 504 licensed beds. Sierra View, located in the City of Porterville, served about 8,000 patients in 2002 with total patient service of 157 beds. Finally, Tulare District Hospital, located in the City of Tulare, served over 5,600 patients in 2002. Figure 7-4 shows the locations of the three hospitals and ambulance districts in the county.

Table 7-10. Tulare County Hospitals

Hospital	Location	Number of Licensed Beds	Average Number of Patients Served
Kaweah Delta	400 W. Mineral King, Visalia	504	60,000
Sierra-View	465 W. Putnam Ave. Porterville	157	8,000
Tulare District	869 Cherry Street, Tulare	112	5,600

Source: Kaweah Delta Hospital, Sierra View Hospital, and Tulare District Hospital



Source: Tulare County; 2003.

FIGURE 7-4

Emergency Medical Services

Tulare County is served by nine emergency medical service providers, seven private companies and two public agencies. Service is provided throughout the county from 11 locations and a total of 48 ambulances. Table 7-11 lists the names, locations, units, and auspice for ambulance service providers in Tulare County.

Table 7-11. Tulare County Ambulance Districts

Name	Street	Location	Units	Auspice
American Ambulance	2017 East Noble	Visalia	5	Private
California Hot Springs Ambulance	Rte. 4 Box 681	Calif. Hot Springs	1	Private
Camp Nelson Vol. Ambulance	1500 "A" Nelson Dr.	Camp Nelson	2	Private
Dinuba Fire Dept.	496 E. Tulare St.	Dinuba	4	Public
Exeter District Ambulance	215 Crespi, No. 2	Exeter	3	Public
Imperial Ambulance	22 Cottage	Porterville	6	Private
Imperial Ambulance	22 North Cottage	Porterville	6	Private
LifeStar Ambulance	140 N West St.	Tulare	7	Private
LifeStar Ambulance	140 N West St.	Tulare	6	Private
Mobile Life Support/AMR	1232 E. Mineral King Ave.	Visalia	7	Private
Three Rivers Ambulance	P.O. Box 253	Three Rivers	1	Private

Source: State of California Emergency Medical Services Authority
http://www.emsa.ca.gov/Data_inf/tulare2001.asp

7.14 Social Services

Introduction

This section describes the general characteristics of the social service systems for the county.

Methods

The information provided in this section has been obtained from the Tulare County Health and Human Services Agency.

Key Terms

There are no key terms for this section.

Regulatory Setting

This section provides for the assessment of social services in the county.

Existing Conditions

The Tulare County Health and Human Services Agency (HHSA) provides social services to residents in need of assistance throughout Tulare County. The agency serves adults and children's health through public health, mental health, community, emergency medical attention, and family services. These social, health, and human services are offered through programs designed to meet the needs of a diverse population. In addition, HHSA has service and program relationships with county, school, state, local, and other organizations.

Approximately 130,000 people are served by the agency each year at 58 locations throughout the county. In addition to the facilities administered by the agency, over 220 private, public and non-profit agencies and groups provide contractual services ranging from primary care to animal control.

The benefiting demographic sectors of these services include:

- Children (0 to 17 years old) 40,500 per year;
- Adults (18 to 64) 64,500 per year; and
- Seniors (65 and older) 25,000 per year.

Tulare County Health and Human Services Agency reported that a county population increase of 2.3 percent annually is projected to occur over the next 20 years. In addition, the report anticipates an increase in the HHSA workforce of 3.5 percent or 1,300 employees to meet the projected need. The report expects to require a need for 446,437 additional square feet of service space by the year 2020 to meet its service needs. Table 7-12 further apportions the projected service space need by the county.

Potential constraints to the ability to serve additional county residents, as a result of new area development, will likely result in overused facilities in need of repair. Currently (2003) some structures, both leased and county-owned, used do not comply with state or federal access or safety requirements. In addition, many facilities are unable to meet space requirements.

Table 7-12. Tulare County Health and Human Services, Facilities Space Needs

City	Year 2000 (Sq/Ft)	Year 2010 (Sq/Ft)	Year 2020 (Sq/Ft)
Dinuba	36,389	50,610	66,730
Farmersville	11,265	10,650	13,950
Lindsay	20,093	29460	39,070
Porterville	66,936	83,130	109,680
Tulare	92,021	133,270	176,650
Visalia	218,985	368,630	489,550
Woodlake	720	720	960
Total	446,409	676,470	896,590

Source: Daniel C. Smith and Associates/Kitchell, 2001

To meet the needs of the county, HHSA has adopted a service consolidation strategy to enhance its response to current (2003) and future population and workforce growth. Consolidation of services is being implemented to improve accessibility, efficiency, reduce overcrowding, and lower costs. HHSA plans to improve service by developing one-stop facilities where multiple services are available. These facilities are planned to be located in Dinuba, Porterville, Tulare, and Visalia.

8. SAFETY

8.1 Introduction

This chapter of the Background Report will identify hazards currently affecting Tulare County as well as those that may affect the county in the future. This chapter has been divided into the following five sections:

- Geologic and Seismic Hazards (Section 8.2);
- Flood Hazards (Section 8.3);
- Fire Hazards (Section 8.4);
- Human-Made Hazards (Section 8.5);
- Noise (Section 8.6); and
- Climate Change (Section 8.7).

8.2 Geologic and Seismic Hazards

Introduction

This section provides an overview of the general topographical, geologic, and seismic conditions that characterize Tulare County. Specific topics addressed under this section include a description of the regulations that affect geology and seismicity, the locations of active and potentially active faults and associated seismic hazards, and a listing of all geologic hazards unique to Tulare County.

Methods

Information for this section was collected from the United States Geological Survey, California Department of Conservation - Division of Mines and Geology, and Tulare County staff.

Key Terms

The following key terms are used throughout this section to describe geologic and seismic hazards and the framework that regulates them.

- **Alquist-Priolo Fault Zone.** The Alquist-Priolo Earthquake Fault Zoning Act, passed in 1972, requires the State Geologist to identify zones of special study around active faults.
- **Fault.** A fault is a fracture in the Earth's crust that is accompanied by displacement between the two sides of the fault. An active fault is defined as a fracture that has shifted in the last 10,000 to 12,000 years (Holocene Period). A potentially active fault is one that has been active in the past 1.6 million years (Quaternary Period). A sufficiently active fault is one that shows evidence of Holocene displacement on one or more of its segments or branches (Hart, 1997).
- **Liquefaction.** Liquefaction in soils and sediments occurs during earthquake events, when soil material is transformed from a solid state to a liquid state, generated by an increase in pressure between pore space and soil particles. Earthquake-induced liquefaction typically occurs in low-lying areas with soils or sediments composed of unconsolidated, saturated, clay-free sands and silts, but it can also occur in dry, granular soils or saturated soils with partial clay content.
- **Magnitude.** Earthquake magnitude is measured by the Richter scale, indicated as a series of Arabic numbers with no theoretical maximum magnitude. The greater the energy released from the fault rupture, the higher the magnitude of the earthquake. Magnitude increases logarithmically in the Richter scale; thus, an earthquake of magnitude 7.0 is thirty times stronger than one of magnitude 6.0. Earthquake energy is most intense at the point of fault slippage, the epicenter, which occurs because the energy radiates from that point in a circular wave pattern. Like a pebble thrown in a pond, the increasing distance from an earthquake's epicenter translates to reduced groundshaking.

Regulatory Setting

Government Code Section 65302(g) discusses the significant issues that a General Plan must address in its Safety Element. Among these issues are the potential for seismically induced surface rupture, groundshaking, ground failure, tsunami, seiche, slope instability, and subsidence. Seismic and geologic hazards must be considered in determining design and building standards, and the location of future development, in order to minimize or mitigate the risk of injury, death and property damage which could result from natural and man-made hazards.

State Regulations

- **Alquist-Priolo Earthquake Fault Zoning Act.** The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations are conducted in order to demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

- **Seismic Hazards Mapping Act (1991).** The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure/hazards caused by earthquakes. This act requires the State Geologist to delineate seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

- **California Building Code.** The California Building Code is another name for the body of regulations known as the California Code of Regulations (C.C.R.), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

  Published by the International Conference of Building Officials, the Uniform Building Code is a widely adopted model building code in the United States. The California Building Code incorporates by reference the Uniform Building Code with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions.

- **California Health and Safety Code.** California Health and Safety Code Section 1250 defines essential facilities as those structures which are necessary for emergency operations subsequent to a natural disaster. These facilities include hospitals and other medical facilities having surgery and emergency treatment areas, fire and police stations, tanks or other structures containing water or other fire-suppression materials, emergency vehicle shelters and garages, structures and equipment in emergency-preparedness centers, standby power-generating equipment for essential facilities, and structures and equipment in government communication centers and other facilities required for emergency response. These facilities are subject to more stringent design and construction standards, as prescribed in Title 24, Chapter 23 of the Code of California Regulations, thus minimizing potential damage. Chapter 23 also applies to skilled nursing facilities, public schools and state-owned or state-leased essential services buildings regulated by the Office of Statewide Health Planning and Development and the Office of the State Architect, Structural Safety Section.
- **California Department of Transportation (Caltrans).** Caltrans has developed roadway design standards including those for seismic safety. Consideration of earthquake hazards in roadway design is detailed in the Highway Design Manual published by Caltrans (2006). Modifications to local highways and roads would be required to adhere to Caltrans engineering standards to minimize settlement.

Existing Conditions

Tulare County is divided into two major physiographic and geologic provinces: the Sierra Nevada Mountains and the Central Valley. The Sierra Nevada Physiographic Province, in the eastern portion of the county, is underlain by metamorphic and igneous rock. It consists mainly of homogeneous granitic rocks, with several islands of older metamorphic rock. The central and western parts of the county are part of the Central Valley Province, underlain by marine and non-marine sedimentary rocks. It is basically a flat, alluvial plain, with soil consisting of material deposited by the uplifting of the mountains.

The foothill area of the county is essentially a transition zone, containing old alluvial soils that have been dissected by the west-flowing rivers and streams that carry runoff from the Sierra Nevada Mountains. This gently rolling topography is punctured in many areas by outcropping soft

bedrock. The native mountain soils are generally quite dense and compact.

Seismicity

Seismicity varies greatly between the two major geologic provinces represented in Tulare County. The Central Valley is an area of relatively low tectonic activity bordered by mountain ranges on either side. The Sierra Nevada Mountains, partially located within Tulare County, are the result of movement of tectonic plates which resulted in the creation of the mountain range. The Coast Range on the west side of the Central Valley is also a result of these forces, and the continued uplifting of Pacific and North American tectonic plates continues to elevate these ranges. The remaining seismic hazards in Tulare County generally result from movement along faults associated with the creation of these ranges.

Earthquakes are typically measured in terms of magnitude and intensity. The most commonly known measurement is the Richter Scale, a logarithmic scale which measures the strength of a quake. The Modified Mercalli Intensity Scale measures the intensity of an earthquake as a function of the following factors:

- Magnitude and location of the epicenter;
- Geologic characteristics;
- Groundwater characteristics;
- Duration and characteristic of the ground motion; and
- Structural characteristics of a building.

Faults

Faults are the indications of past seismic activity. It is assumed that those that have been active most recently are the most likely to be active in the future. Recent seismic activity is measured in a geologic timescale. Geologically recent is defined as having occurred within the last two million years (the Quaternary Period). All faults believed to have been active during Quaternary time are considered "potentially active."

Although a number of faults have been located along the western edge of the Sierra Nevada Mountains, none are known to be active. The Owens Valley Fault Group poses the greatest seismic threat. The center of the fault zone is thought to be able to produce a maximum probable earthquake of 7.0 on the Richter Scale at a recurrence interval of 125

years, while the central area is thought to be capable of producing an earthquake of 8.25 magnitude every 300 to 10,000 years.

In 1973, five counties within the Southern San Joaquin Valley undertook the preparation of the Five County Seismic Safety Element to assess seismic hazards. The Element identifies areas of potential seismic activity, including Doyle Springs and most of the Moorehouse subareas, as being in the Sierra 1 (S1) Zone (eastern Sierra Nevada). All of the subareas east of and including Sequoia Crest, Pierpoint, and Roger's Camp lie within the Sierra 2 (S2) Zone (eastern Sierra Nevada, south of Owens Valley fault). In general, zones C1, S1, and V1 are safer than zones C2, S2, and V2.

Hazards due to groundshaking are considered to be "minimal" in the S1 Zone and "minimal" to "moderate" in the S2 and S2S Zones. Development occurring within the S1 Seismic Zone must conform to the Uniform Building Code-Zone II; while development within the S2 Zone must conform to Uniform Building Code-Zone III. There are three faults within the region that have been, and will be, principal sources of potential seismic activity within Tulare County. These faults are described below:

- **San Andreas Fault.** The San Andreas Fault is located approximately 40 miles west of the Tulare County boundary. This fault has a long history of activity, and is thus the primary focus in determining seismic activity within the county. Seismic activity along the fault varies along its span from the Gulf of California to Cape Mendocino. Just west to Tulare County lays the "Central California Active Area," section of the San Andreas Fault where many earthquakes have originated.
- **Owens Valley Fault Group.** The Owens Valley Fault Group is a complex system containing both active and potentially active faults, located on the eastern base of the Sierra Nevada Mountains. The Group is located within Tulare and Inyo Counties and has historically been the source of seismic activity within Tulare County.
- **Clovis Fault.** The Clovis Fault is considered to be active within the Quaternary Period (within the past two million years), although there is no historic evidence of its activity, and is therefore classified as "potentially active." This fault lies approximately six miles south of the Madera County boundary in Fresno County. Activity along this fault could potentially generate more seismic activity in Tulare County than the San

Andreas or Owens Valley fault systems. In particular, a strong earthquake on the Fault could affect northern Tulare County. However, because of the lack of historic activity along the Clovis Fault, inadequate evidence exists for assessing maximum earthquake impacts.

Groundshaking

Groundshaking is the primary seismic hazard in Tulare County because of the county's seismic setting and its record of historical activity. Thus, emphasis focuses on the analysis of expected levels of groundshaking, which is directly related to the magnitude of a quake and the distance from a quake's epicenter. Magnitude is a measure of the amount of energy released in an earthquake, with higher magnitudes causing increased groundshaking over longer periods of time, thereby affecting a larger area. Groundshaking intensity, which is often a more useful measure of earthquake effects than magnitude, is a qualitative measure of the effects felt by the population.

The common way to describe ground motion during an earthquake is with the motion parameters of acceleration and velocity in addition to the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA), which is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared.

The San Joaquin Valley portion of Tulare County is located on alluvial deposits, which tend to experience greater groundshaking intensities than areas located on hard rock. Therefore, structures located in this area will tend to suffer greater damage from groundshaking than those located in the foothill and mountain areas. However, existing alluvium valleys and weathered or decomposed zones are scattered throughout the mountainous portions of the county which could also experience stronger intensities than the surrounding solid rock areas. The geologic characteristics of an area can therefore be a greater hazard than its distance to the epicenter of the quake.

The Five County Seismic Safety Element projects that with the maximum probable earthquake of a magnitude 8 to 8.5 centered along the San Andreas Fault, "relatively low levels of shaking should be expected in the eastern and central parts of the San Joaquin Valley." The eastern portion of the county is composed of four "Sierran Zones," the boundaries of which are determined by the predicted effects of the maximum probable earthquake on the Owens Valley Fault. Since the

mountains are underlain primarily by granitic rock, these zones tend to experience very low levels of groundshaking. However, most of the people residing in these zones do not live on the hard rock. Instead, residences tend to be built in alluvial valleys or the weathered and decomposed zones in the meadows or foothills. These areas will experience stronger groundshaking intensities. Characteristics within the microzones may vary greatly; thus, groundshaking potential in the Sierran zones is more accurately analyzed on a site-by-site basis.

Older buildings constructed before current building codes were in effect, and even newer buildings constructed before earthquake resistance provisions were included in the current building codes, are most likely to suffer damage in an earthquake. Most of Tulare County's buildings are no more than one or two stories in height and are of wood frame construction, which is considered the most structurally resistant to earthquake damage. Older masonry buildings (without earthquake-resistance reinforcement) are the most susceptible to structural failure, which causes the greatest loss of life. The State of California has identified unreinforced masonry buildings (URMs) as a safety issue during earthquakes. In high risk areas (Bay Area), inventories and programs to mitigate this issue are required. Because Tulare County is not a high risk area, state law only recommends that programs to retrofit URMs are adopted by jurisdictions.

The susceptibility of a structure to damage from earthquake groundshaking is also related to the foundation material underlying the structure. A foundation of rock or very firm material intensifies short period motions, which affect the low, rigid buildings more than those that are tall and flexible. A deep layer of water-logged soft alluvium may cushion low, rigid buildings, but accentuate the motion in tall buildings. The amplified motion resulting form softer alluvium soils can also severely damage older masonry buildings.

Liquefaction

Liquefaction is a process whereby soil is temporarily transformed to a fluid form during intense and prolonged groundshaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are low to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction. Scientific studies have shown that the ground acceleration must approach 0.3g before

liquefaction occurs in a sandy soil with relative densities typical of the San Joaquin alluvial deposits.

Liquefaction during major earthquakes has caused severe damage to structures on level ground as a result of settling, tilting, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation, such as that which occurred along the coastline near Seward, Alaska during the 1964 earthquake. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

No specific countywide assessments to identify liquefaction hazards have been performed in Tulare County. Areas where groundwater is less than 30 feet below the surface occur primarily in the San Joaquin Valley portion of the County. However, soil types in the area are not conducive to liquefaction because they are either too coarse or too high in clay content. Areas subject to 0.3g acceleration or greater are located in a small section of the Sierra Nevada Mountains along the Tulare-Inyo County boundary. However, the depth to groundwater in such areas is greater than in the valley, which would minimize liquefaction potential as well. Detailed geotechnical engineering investigations would be necessary to more accurately evaluate liquefaction potential in specific areas and to identify and map the areal extent of locations subject to liquefaction.

Settlement

Settlement can occur in poorly consolidated soils during groundshaking. During settlement, the soil materials are physically rearranged by the shaking and result in reduced stabling alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils, or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to groundshaking is not available. Fluctuating groundwater levels also may have changed the local soil characteristics. Sufficient subsurface data is lacking to conclude that settlement would occur during a large earthquake; however, the data is sufficient to indicate that the potential exists in Tulare County.

Other Geologic Hazards

Landslides. Landslides are a primary geologic hazard and are influenced by four factors:

- Strength of rock and resistance to failure, which is a function of rock type (or geologic formation);
- Geologic structure or orientation of a surface along which slippage could occur;
- Water (can add weight to a potentially unstable mass or influence strength of a potential failure surface); and,
- Topography (amount of slope in combination with gravitation forces).

Tulare County has three geologic environments: the valley, foothills, and mountains. The range in topography between these three areas presents a range of landslide hazards. As of June 2009, the California Geological Survey had not developed landslide hazard identification maps for Tulare County. However, it is reasonable to assume that certain areas in Tulare County are more prone to landslides than others. Such areas can be found in foothill and mountain areas where fractured and steep slopes are present (as in the Sierra Nevada Mountains), where less consolidated or weathered soils overlie bedrock, or where inadequate ground cover accelerates erosion. Erosion and slumping of soils can also occur along bluffs along the Kaweah, Kings, and Tule Rivers.

Other areas where steep slopes are present are not heavily populated and most are located in federal or state lands. Roadways such as SR 198 and SR 190 in eastern Tulare County could be affected by landslides in the event of an earthquake or heavy rain. California Geological Survey geologists determined that catastrophic failure was unlikely, but long-term road maintenance could be compromised due to undercutting of the slope by the creeks below the roads. There is no risk of large landslides in the valley area of the county due to its relatively flat topography. There is, however, the potential for small slides and slumping along the steep banks of rivers or creeks.

Subsidence. Subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, oil, or natural gas. Soils that are particularly subject to subsidence include those with high silt or clay content. Subsidence caused by groundwater withdrawal generally presents a more serious problem, since it can affect large areas. Oil and gas withdrawal, on the other hand, tends to affect smaller,

localized areas. Some areas of the Central Valley have subsided more than 20 feet during the past 50 years.

Seiche. A seiche is a standing wave produced in a body of water such as a reservoir, lake, or harbor, by wind, atmospheric changes, or earthquakes. Seiches have the potential to damage shoreline structures, dams, and levees. Studies of true seismic seiches are limited, but the largest recorded seiche was 1.2 feet during the 1964 Alaska earthquake. Since this is less than wave heights that could be expected from wind-induced waves, earthquake-induced seiches are not considered a risk in Tulare County. In addition, the effects from a seiche would be similar to the flood hazard for a particular area, and the risk of occurrence is perceived as considerably less than the risk of flooding.

Volcanic Hazards. The nearest volcanoes lie to the northeast of Tulare County in Mono County, in the Mammoth Lakes/Long Valley area. The most serious effect on Tulare County of an eruption in the Mammoth Lakes, area according to the California Geological Survey, would be ash deposition. Such an occurrence is highly unlikely, for two reasons. First, ash deposition in the county would be dependent upon an improbable northeast wind configuration. Second, and most importantly, although some of these volcanoes were active as recently as 800 years ago, they are generally not considered by geologists to be active. In the past decade, however, there has been renewed interest in the area by geologists, as a result of new patterns of earthquakes and uplifting of the earths' crust; it was hypothesized by some that the area may be entering a new period of activity. A volcanic eruption during the winter could result in snowmelt and lead to flooding.

The state has formulated a contingency plan, the "Long Valley Caldera Response Plan," designed to notify the public in the event of an earthquake in the Long Valley area (outside of Tulare County).

8.3 Flood Hazards

Introduction

This section discusses flood hazards in Tulare County. Details on the storm drainage system within Tulare County can be found in Section 7.4, Stormwater Drainage.

Methods

Information for this section was developed using information from U.S. Army Corps of Engineers, Tulare County flood control staff, and FEMA floodplain maps.

Key Terms

The following key terms are used throughout this section to describe flood hazards and the framework that regulates them.

- **Exceedance Probability.** The probability that a precipitation or runoff event of a specified size will be achieved or exceeded in any one year.
- **Frequency.** How often an event will occur expressed by the return period or by exceedance probability.
- **Floodplain.** Land adjacent to a stream, slough or river that is subject to flooding or inundation from a storm event. FEMA defines the floodplain to be the area inundated by the 100-year flood.
- **Floodplain Management.** The implementation of policies and programs to protect floodplains and maintain their flood control function.
- **Levee.** A dike or embankment constructed to confine flow to a stream channel and to provide protection to adjacent land. A levee designed to provide 100-year flood protection must meet FEMA standards.
- **Level of Protection.** The amount of protection that a drainage or flood control measure provides.
- **One Hundred Year (100-year) Runoff.** The storm runoff that has a one percent (1%) chance of occurring in any given year.
- **Five Hundred Year (500-**year) Runoff. The storm runoff that has a .2 percent chance of occurring in any given year.
- **Return Period.** The long-term average number of years between occurrences of an event being equaled or exceeded.

Regulatory Setting

Federal Regulations

- **Federal Emergency Management Agency (FEMA).** FEMA is the federal agency that oversees floodplains and manages the

nation's flood insurance program. FEMA's regulations govern the delineation of floodplains and establish requirements for floodplain management.

Local Regulations

- **Tulare County Code – Chapter 27, Flood Damage Prevention.** The county's flood damage prevention codes are intended to promote public health, safety, and general welfare in addition to minimizing public and private losses due to flood conditions. The county code includes a number of provisions to protect against flooding. Some of these provisions include requiring uses vulnerable to floods be protected against flood damage at the time of initial construction, controlling the alteration of natural flood plains, and preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Existing Conditions

The east side of Tulare County is drained primarily by the Kings, Kaweah, and Tule Rivers. Small streams, which are usually dry, except during winter and spring runoff, drain the foothills of the Tulare County.

Flooding is a natural occurrence in the Central Valley because it is a natural drainage basin for thousands of watershed acres of Sierra Nevada and Coast Range foothills and mountains. Two kinds of flooding can occur in the Central Valley: general rainfall floods occurring in the late fall and winter in the foothills and on the valley floor; and snowmelt floods occurring in the late spring and early summer. Most floods are produced by extended periods of precipitation during the winter months. Floods can also occur when large amounts of water (due to snowmelt) enter storage reservoirs, causing an increase in the amount of water that is released.

Tulare County has a long history of flooding, but minimum definitive data is available for specific floods, particularly on the smaller streams. Historical records indicate that nine significant flood events occurred in Fresno County between the 1840s and 1900, with the most recent large-scale flood occurring in 1969. As recently as 1997 and 1998, areas in the mountains, including the communities of Three Rivers and Springville, sustained flooding as heavy rains swelled creeks over their banks. Similarly, the City of Lindsay and the community of Earlimart sustained flooding in their vicinities during this same period.

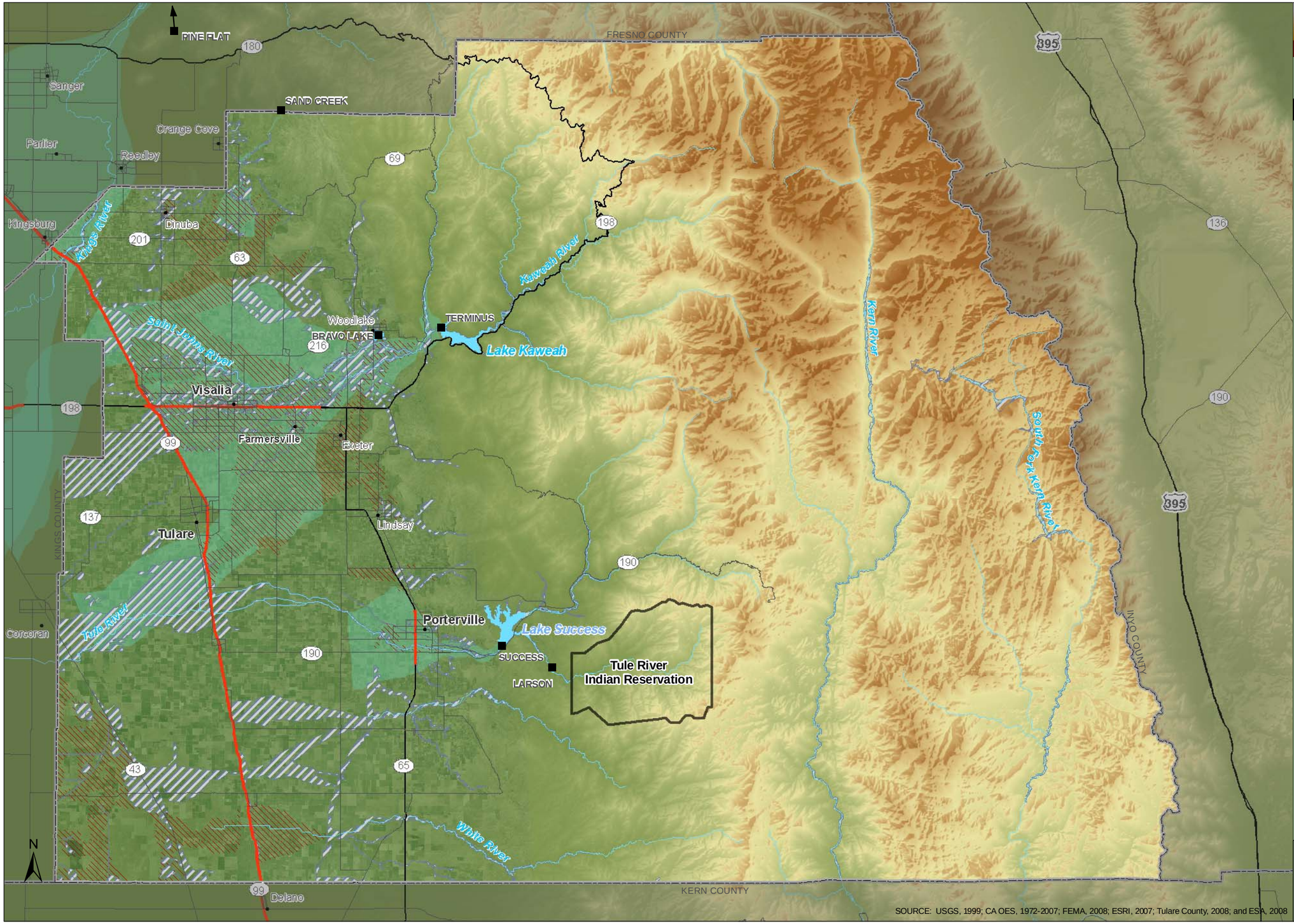
100-Year Flood Hazard

Official floodplain maps are maintained by the Federal Emergency Management Agency (FEMA). FEMA determines areas subject to flood hazards and designates these areas by relative risk of flooding on a map for each community, known as the Flood Insurance Rate Map (FIRM). A 100-year flood is considered for purposes of land use planning and protection of property and human safety. The boundaries of the 100-year floodplain are delineated by FEMA on the basis of hydrology, topography, and modeling of flow during predicted rainstorms. The analysis of predicted flooding does not account for the effects of continued land subsidence or the rise in sea level associated with the greenhouse effect.

The 100-year flood is defined as the flood event that has a one percent chance of occurring in any given year. It is important to note that the delineation of areas within the 100-year floodplain represents a statistical probability for the long-term average occurrence of flooding. Actually, flooding can occur in a 100-year floodplain more or less frequently than once in a hundred years. Smaller floods have an even greater chance of occurring in any year and pose hazards as well. Areas that are sporadically flooded only become inundated as a result of more uncommon and extreme precipitation/runoff events.

The flood carrying capacity in rivers and streams has decreased as trees, vegetation, and structures (e.g., bridges, trestles, buildings) have increased along the Kaweah, Kings, and Tule Rivers. Unsecured and uprooted material can be carried down a river, clogging channels and piling up against trestles and bridge abutments that can, in turn, give way or collapse, increasing blockage and flooding potential. Flooding can force waters out of the river channel and above its ordinary floodplain. Confined floodplains can result in significantly higher water elevations and higher flow rates during high runoff and flood events.

Updated channel analyses have not been performed to determine the amount of obstruction posed by vegetation and development in the Kaweah, Kings, or Tule River channels. As such, FEMA maps depicting the 100-year floodplain for the rivers probably do not reflect the true extent and risk of flooding hazards in Tulare County. Figure 8-1 shows areas of the county that fall within FEMA-designated 100-year flood zones. 100-year flood zones are located throughout the western portion of the county from a number of streams and St. Johns River, White River, and Tule River.



Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Hazards

- Dams
- Dam Failure Inundation Zone
- FEMA 100 Year Flood Zone

Hazards

- FEMA 500 Year FLood Zone
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- Lakes
- County Boundary

SOURCE: USGS, 1999; CA OES, 1972-2007; FEMA, 2008; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Figure 8-1

Flood Hazards

500-Year Flood Hazard

The 500-year flood hazard area is also established by FEMA in the same manner as the 100-year flood hazard area. However, the 500-year flood is defined as the flood event that has a .2 percent chance of occurring in any given year. Like the 100-year floodplain, it is important to note that the delineation of areas within the 500-year floodplain zone represents a statistical probability for the long-term average occurrence of flooding. Actually, flooding can occur in a 500-year floodplain more or less frequently than once every five hundred years. Smaller floods (i.e., a 100-year event) have an even greater chance of occurring in any year and pose hazards as well. Areas that are sporadically flooded only become inundated as a result of more uncommon and extreme precipitation/runoff events. Like 100-year flood zones, 500-year flood zones are located throughout the western portion of the County due to the location of the above mentioned streams and rivers (see Figure 8-1).

Dam Failure Inundation

Two major dams could cause substantial flooding in Tulare County in the event of a failure: Terminus Dam on Lake Kaweah and Success Dam on Lake Success. In addition, there are many smaller dams throughout the county that would cause localized flooding in the event of their failing. However, a comprehensive analysis of the potential for dam failure and possible downstream effects for these upstream dams has not been undertaken. Figure 8-1 shows areas of the county that could be subject to dam inundation in the event of dam failure. The inundation area below Terminus Dam extends to portions of the Woodlake area, Farmersville, Visalia, Ivanhoe, and Goshen. The inundation area below Success Dam covers the city of Porterville. Orosi and Cutler are located within the inundation area of Sand Creek dam.

Dam failure can result from numerous natural or human activities, such as earthquakes, erosion, improper siting, rapidly rising flood waters, and structural and design flaws. Flooding due to dam failure can cause loss of life, damage to property, and other ensuing hazards. Damage to electric-generating facilities and transmission lines associated with hydro-electric dams could also affect life support systems in communities outside the immediate hazard area.

8.4 Fire Hazards

Introduction

Both urban and wildland fire hazards exist in Tulare County, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. Wildland fires affect grass, forest, and brushlands, as well as any structures on these lands. Such fires can result from either human-made or natural causes. The type and amount of fuel, topography, and climate are the primary factors influencing the degree of fire risk. Vegetation fires comprised the majority of fires in Tulare County according to the California Department of Forestry and Fire Protection (CDF). Most of the fires are caused by human activities involving motor vehicles and equipment, arson, and debris burning.

Methods

Information in this section was provided by the Tulare County Fire Department, the California Department of Forestry, and Tulare County staff.

Key Terms

- **Fire Prevention and Suppression.** Public protection classifications are designated by the Insurance Services Office (ISO). The ISO bases its classifications on a number of factors, including fire department location, equipment, staffing, water supply, and communications abilities. Ratings range from 1 to 10, with 1 being the best possible fire protection, and 10 being the worst.
- **State Responsibility Area (SRA).** These are areas classified by the State Board of Forestry and Fire Protection as being the primary financial responsibility of the State for preventing and suppressing fires. These lands include: lands covered wholly or in part by timber, brush, undergrowth or grass, whether of commercial value or not; lands that protect the soil from erosion, retard run-off of water, or accelerated percolation; lands used principally for range or forage purposes; lands not owned by the Federal Government; and lands not incorporated. Lands are removed from SRA when housing densities average more than three units per acre over an area of 250 acres.

Regulatory Setting

State Regulations

- **Public Resources Code Section 4290.** Public Resources Code Section 4290 sets minimum fire safety standards for development in State Responsibility Areas. These minimum fire safety standards identify:
  - Road standards for fire equipment access.
  - Standards for signs identifying streets, roads, and buildings.
  - Minimum private water supply reserves for emergency fire use.
  - Standards for fuel breaks and greenbelts.

Local Regulations

- **Fire Construction Standards.** Tulare County established the Fire-Safe Regulations and Road Standards (Ordinance No. 542), which address requirements for signage and building addresses, zoning, water, parcel map, the subdivision ordinance, and road standards to comply with the Public Resources Code 4290. The ordinance includes the following requirements, which are implemented by the county Resource Management Agency and the Tulare County Fire Department during plan review of new projects:
  - Emergency access shall be ensured by minimum 18-foot road widths with surface accommodating conventional vehicles and 40,000-pound loads, grades not exceeding 16 percent, curve radii of at least 50 feet, dead ends meeting maximum length requirements with turnouts and turnarounds, and roadway structures and gate entrances that do not obstruct clear passage of authorized vehicles.
  - Signing and building numbering shall facilitate locating a fire and avoiding delays in response time by being sufficiently visible, nonduplicative, and indicative of location and any traffic access limitations.
  - Emergency water sources shall be available and accessible in adequate quantities to combat wildfire with labeled hydrants meeting uniform specifications.
  - Fuel modification shall be practiced to reduce the intensity of a wildfire by reducing the volume and density of flammable

vegetation adjacent to structures and in the general vicinity of development.

Existing Conditions

The following information provides the existing conditions of fire hazards in Tulare County. The following section describes urban fire hazards, wildland fire hazards, fire prevention measures, and construction standards in Tulare County.

The ISO ratings in the incorporated areas of Tulare County range from 5 to 8 with unincorporated areas receiving an average rating of 8. Response times in addition to more information regarding fire protection services for Tulare County are described in more detail in Chapter 7, Public Services and Utilities.

Urban Fire Hazards

Urban fires primarily involve the uncontrolled burning of residential, commercial, and industrial structures due to human-made causes. Factors that exacerbate urban structural fires include substandard building construction, highly flammable materials, delay in response time, and inadequate fire protection services.

The Tulare County Fire Department currently reviews development plans and building permits for compliance with the Uniform Building Code. Until recently, minimal enforcement of structural fire codes (for example, building codes requiring interior sprinkler systems and fire-safe building materials) has taken place. As a result, many of the structures in Tulare County that were built prior to 1987 may be substandard in terms of fire safety. There is not an existing program for retrofitting such structures (with the exception of those structures that legally require inspection, such as institutional buildings).

Wildland Fire Hazards

Throughout California, communities are increasingly concerned about wildfire safety as increased development occurs in the foothills and mountain areas, and subsequent fire control measures have affected the natural cycle of the ecosystem. Suppression of natural fires allows the understory to become dense, creating the potential for larger and more intense wildland fires. Wind, steepness of terrain, and naturally volatile or hot-burning vegetation contribute to wildland fire hazard potential. The threat of wildland fires also increases as the terrain in the county becomes increasingly steep in the foothills and mountains. Where

human access exists in wildland areas, such as the Sierra Nevada Mountains and foothills, the risk of fire increases because of a greater chance for human carelessness and historic and current fire management practices. Human activities such as smoking, debris burning, and equipment operation are the major causes of wildland fires.

Although the total number of fires in the oak savannah portions of the lower Sierra foothills may have increased with five-acre lot subdivision activity, the size and duration of fires appears to have been reduced in this area due to firebreaks created by driveways and roads, reduced fuels and "checkerboard" fuel patterns through individual safe area vegetation clearance (PRC 4291); increased vigilance fostering early fire reporting; and early intervention (fire suppression) efforts by individuals and fire companies.

On the other hand, the creation of residential parcels in this area has compounded the potential for property damage from fires and has significantly complicated firefighting responsibilities in the area. Wildland firefighting strategies have become similar to municipal firefighting efforts. Foothill and mountain subdivisions have also virtually eliminated prescribed burning as a means of fire suppression.

Fire Hazard Severity

According to Fire and Resource Assessment Program (FRAP) Fire Threat data, Fire Threat is a combination of two factors:

1. Fire frequency, or the likelihood of a given area burning, and
2. Potential fire behavior (hazard). These two factors are combined to create the following threat classes:
    - Little or No Threat
    - Moderate
    - High
    - Very High
    - Extreme

Within the county, over 1,029,130 acres (33% of the total area) are classified as "Very High" fire threat and approximately 454,680 acres (15% of the total area) are classified as "High" fire threat. The portion of the county that transitions from the valley floor into the foothills and mountains is characterized by high to very high threat of wildland fires. Steeper terrain in these areas increases the threat of wildland fires. These

areas are shown on Figure 8-2. The western portion of the county has little or no threat of wildland fires (CDF, 2006).

Fire Prevention and Suppression

Since July 1, 2007, Tulare County fire protection has been provided by the Tulare County Fire Department. Prior to July 1, 2007 fire protection was provided by the California Department of Forestry (CDF). CDF is also responsible for providing fire protection to the State Responsibility Area (SRAs). SRAs are areas in which the State Board of Forestry has determined that the state has the financial responsibility for fire prevention and suppression. In the Sequoia National Forest, the U.S. Forest Service is the responsible fire agency.

The Tulare County Fire Department's Capital Improvement Plan (CIP, 1991) addresses current and future fire protection needs in the county, establishes priorities, sets level of service standards based on land uses, and establishes a long-range plan for fire prevention and protection. According to the CIP, conditions of the county's 16 fire stations, operated by CDF and Tulare County, range "from excellent to poor," with many of the facilities identified as inadequate for housing fire equipment. In addition, response times in the county have increased due to rapid growth without a correspondent growth in fire protection facilities and staffing. Therefore, as the county continues to grow, the risks of injury, loss of life, and property damage will also increase. The CIP identifies the lack of funding as the main obstacle to improving fire protection. The Fire Department is currently preparing an updated CIP to present to the Board of Supervisors for approval. In the future, the Fire Department plans to update the CIP every three to five years.

The Tulare County Fire Department has 28 stations that are situated throughout the County in the most densely populated areas. The Fire Department currently has minimal staffing to meet the requirements set forth under NFPA 1720-1721 for a rural area. This consists of one full-time person per station per shift with either intern firefighters (from a local community college, etc.) or paid on-call firefighters. However, while this is sufficient to meet the basic needs of the County in an emergency, this level of staffing often results in an elevated fire loss value when compared with other departments with more staff. In addition to more staff, some of the Department's facilities need repairs, replacements, or relocations. Currently, relocations are planned for the South Visalia and Alpaugh fire stations. Additional fire stations in need of relocation include West Olive, Tulare, and Dinuba fire stations (Mendoza, 2009).

Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Fire Threat

- High
- Very High
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- Lakes
- County Boundary

FRESNO COUNTY
KINGS COUNTY
INYO COUNTY
KERN COUNTY
Sanger
Orange Cove
Parlier
Reedley
Kingsburg
Dinuba
Kings River
Saint Johns River
Woodlake
Lake Kaweah
Kaweah River
Visalia
Farmersville
Exeter
Tulare
Lindsay
Porterville
Lake Success
Tule River Indian Reservation
Tule River
Corcoran
White River
Delano
Kern River
South Fork Kern River
180
69
198
201
63
216
99
137
190
65
43
136
395
N

SOURCE: USGS, 1999; CDF, 2005; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Figure 8-2

Fire Threat

8.5 Human-Made Hazards

Introduction

The primary human-made hazard concerns for Tulare County include hazards associated with accidents, fire, crime, airports, and the potential exposure to hazardous materials. This section focuses on those hazards associated with the potential use, exposure, or release of hazardous materials. Additional public safety concerns (e.g., fire, accidents, law enforcement response times, etc.) are discussed in Chapter 7, Public Services and Utilities. This section provides an overview of federal, state, and local hazardous material and hazardous waste regulations and describes existing airfields and known hazardous materials in Tulare County.

Methods

The information contained in this section was obtained from various sources, including Tulare County staff. Additional information was obtained from state agencies (e.g., Central Valley Regional Quality Control Board [CVRWQCB]) that monitor or compile information related to the locations of hazardous waste generators, hazardous materials treatment, storage and disposal facilities, underground storage tank locations, landfills, and contaminated sites. The Comprehensive Airport Land Use Plan and the Hazardous Waste Management Plan were also used.

Key Terms

The following key terms are used throughout this section to describe human-made hazard conditions and the framework that regulates them.

- **Airport Land Use Commission (ALUC).** The purpose of the ALUC is to provide for the orderly development of areas surrounding public airports. It is also intended to minimize the public's exposure to excessive noise and safety hazards and to ensure that the approaches to public airports remain clear of structures that could pose an aviation safety hazard.
- **Comprehensive Airport Land Use Plan (CALUP).** Assists in the preservation, continued development and expansion of existing airports in a manner consistent with the latest California Airport Land Use Planning Handbook. In addition, the plan protects the public health, safety and welfare by identifying land use

measures to be implemented in order to minimize the public's exposure to excessive noise and safety hazards within areas surrounding public airports.

- **Cortese List.** A list of hazardous materials and waste sites that is updated each year by the Department of Toxic Substance Control, State Department of Health Services, State Water Resources Control Board, and California Integrated Waste Management Board. This list is distributed to all cities and counties by the Secretary for Environmental Protection.
- **Hazardous Materials.** A hazardous material is defined by the California Code of Regulations (CCR) as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10). According to Title 22 of the CCR, hazardous materials are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3).
- **Hazardous Wastes.** Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. According to Title 22 of the CCR, hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3).

Regulatory Setting

The storage, use, and handling of hazardous materials by industries and businesses are subject to various federal and state regulations. A brief overview of these regulations follows.

Federal Regulations

The principal federal legislation is the Resource Conservation and Recovery Act (RCRA), which is administered by the United States Environmental Protection Agency (EPA). RCRA places reporting, permitting, and operational control requirements on those who generate, treat, store, or dispose of hazardous waste. The federal Hazardous Materials Transport Act, administered by the U.S. Department of

Transportation, requires detailed manifesting and reporting of hazardous materials shipped on the U.S. highway system; it also contains packaging requirements for shipped materials. The Clean Water Act, also administered by the EPA, controls the discharge of hazardous materials or hazardous waste to waters of the U.S. or to local wastewater treatment plants. Additional regulations governing hazardous wastes and materials are discussed below.

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).** CERCLA, commonly referred to as Superfund, was enacted on December 11, 1980. The purpose of CERCLA was to provide authorities with the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. Additionally, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also provides for the National Priorities List, a list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action.
- **The Superfund Amendments and Reauthorization Act (SARA).** SARA amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund to $8.5 billion, expanded EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required EPA to revise the Hazard Ranking System to ensure that the system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the National Priorities List (NPL).
- **Resource Conservation and Recovery Act of 1976 (RCRA).** RCRA is the nation's hazardous waste control law. It defines hazardous waste, provides for a cradle-to-grave tracking system

and imposes stringent requirements on treatment, storage and disposal facilities. RCRA requires environmentally sound closure of hazardous waste management units at treatment, storage, and disposal facilities. The EPA is the principal agency responsible for the administration of RCRA, SARA, and CERCLA.

- **Occupational Safety and Health Administration (OSHA).** Through the enactment of this act, OSHA was obligated to prepare and enforce occupational health and safety regulations with the goal of providing employees a safe working environment. OSHA regulations apply to the work place and cover activities ranging from confined space entry to toxic chemical exposure. OSHA regulates workplace exposure to hazardous chemicals and activities by promulgating regulations specifying work place procedures and equipment.
- **U.S. Department of Transportation (DOT).** The DOT regulates the interstate transport of hazardous materials and waste through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA, discussed previously.

State Regulations

At the state level, existing legislation allows state agencies to accept the delegation of federal responsibility for hazardous materials and hazardous waste management. The Porter-Cologne Water Quality Control Act allows the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) to accept responsibility for the implementation of the Clean Water Act. The Hazardous Waste Control Act of 1977, and recent amendments to its implementation regulations, provides the Department of Health Services (DHS) with the lead role in administering the RCRA program. The Hazardous Substances Highway Spill Containment Act provides the California Highway Patrol (CHP) with the authority to respond to spills of hazardous materials on the state's highway system.

- **Hazardous Substance Account Act (1984), California Health and Safety Code Section 25300 ET SEQ (HSAA).** This act, known as the California Superfund, has three purposes: 1) to respond to releases of hazardous substances; 2) to compensate for damages caused by such releases; and 3) to pay the state's 10

percent share in CERCLA cleanups. Contaminated sites that fail to score above a certain threshold level in the EPA's ranking system may be placed on the California Superfund list of hazardous wastes requiring cleanup.

- **California Environmental Protection Agency (CAL/EPA).** The Cal/EPA was created in 1991 to enhance coordination of State environmental programs, reduce administrative duplication, and address the most substantial environmental/ health risks. Cal/EPA unifies the State's environmental authority under a single accountable, Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: Air Resources Board, Integrated Waste Management Board, Department of Pesticide Regulation, State Water Resources Control Board, Department of Toxic Substances Control, and Office of Environmental Health Hazard Assessment.
- **Department of Toxic Substance Control (DTSC).** Cal/EPA has regulatory responsibility under Title 22 of the California Code of Regulations (CCR) for administration of the state and federal Superfund programs for the management and cleanup of hazardous materials. The DTSC is responsible for regulating hazardous waste facilities and overseeing the cleanup of hazardous waste sites in California. The Hazardous Waste Management Program (HWMP) regulates hazardous waste through its permitting, enforcement and Unified Program activities. HWMP maintains the EPA authorization to implement the RCRA program in California, and develops regulations, policies, guidance and technical assistance/ training to assure the safe storage, treatment, transportation and disposal of hazardous wastes. The State Regulatory Programs Division of DTSC oversees the technical implementation of the state's Unified Program, which is a consolidation of six environmental programs at the local level, and conducts triennial reviews of Unified Program agencies to ensure that their programs are consistent statewide and conform to standards.
- **State Water Resources Control Board.** Acting through the RWQCB, the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, RWQCB is authorized to supervise the cleanup of hazardous waste sites referred by local agencies in those situations where water quality may be affected.

Depending on the nature of contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, RWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by the DTSC or referred for evaluation by the RWQCB. In general, contamination affecting soil and groundwater is handled by the RWQCB and the contamination of soils is handled by the DTSC.

- **California Air Resources Board.** The Air Resources Board's (ARB / Board) statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987) supplements the AB 1807 program, by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

  Under AB 1807, the ARB is required to use certain criteria in prioritizing the identification and control of air toxics. In selecting substances for review, the ARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" [Health and Safety Code section 39666(f)]. AB 1807 also requires the ARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds. This report includes available information on each of the above factors required under the mandates of the AB 1807 program.

- **California Occupational Safety and Health Administration (Cal/OSHA).** Cal/OSHA and the Federal OSHA are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. Pursuant to the Occupational Safety and Health Act of 1970, Federal OSHA has adopted numerous regulations pertaining to worker safety, contained in the Code of Federal Regulations Title 29 (29 CFR). These regulations set standards for safe workplaces and work practices, including standards relating to hazardous material handling. Cal/OSHA assumes primary responsibility for developing and enforcing state workplace safety regulations. Because California has a federally approved OSHA program, it is required to adopt

regulations that are at least as stringent as those identified in 29 CFR. Cal/OSHA standards are generally more stringent than federal regulations.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and the preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets (MSDS) be available to employees and that employee information and training programs be documented.

- **Hazardous Materials Transport.** California law requires that Hazardous Waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance, which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. Additional requirements can be found in Title 22 CCR, Chapter 13.

  State agencies tasked with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the CHP and Caltrans. Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads. The CHP only designates state and federal roadways as hazardous materials truck routes. The CHP classifies hazardous materials into three categories: explosives, poisons that can be inhaled, and radioactive material.

- **Universal Waste Rule, Title 22, California Code of Regulations, Section 66273.1 et seq.** Universal wastes are hazardous wastes that are generated by a wide variety of people. Examples include

cathode ray tubes (CRTs; including televisions and computer monitors), consumer (non-automotive) batteries, fluorescent tubes and other mercury-containing lamps, and consumer electronics. Universal waste rules allow common, low-hazard wastes to be managed under less stringent requirements than other hazardous wastes. California's Universal Waste Rule became effective on February 8, 2002. Since that time, several other common wastes have been added to the list of universal wastes. These include mercury wastes, consumer electronic devices and CRTs. Other wastes may be added to the list over time. In general, universal wastes may not be discarded in ordinary solid waste landfills.

- **Treated Wood Waste (TWW)**. Treated wood waste is waste wood that was once treated with a chemical preservative to protect the wood from insects, microorganisms, fungi, and other environmental conditions that can lead to wood decay. Other common surface applied coatings such as paint, varnish, and oil stain, are not considered wood preservatives and wood covered with paint, varnish and oil stain are not TWW. Prior to 2005, TWW was exempt from hazardous waste regulation if disposed of in a lined municipal landfill. From January 2005 through June 2007, the State authorized interim management standards, which provided a conditional exemption to TWW from regulation as a hazardous waste. As of July 1, 2007, the DTSC is implementing final alternative management standards for TWW. The final management standards eliminate the conditional exemption (with the result that TWW is now regulated as a hazardous waste, although under less stringent "alternative" standards) and establish additional recordkeeping and reporting requirements.

Local Regulations

At the local level, existing plans and agencies guide and regulate the production, disposal, and transport of hazardous materials and hazardous waste management.

- **Tulare County Health and Human Services Agency, Environmental Health Division.** The Unified Hazardous Waste and Hazardous Management Regulatory Program (SB 1082, 1993) is a state and local effort to consolidate, coordinate, and make consistent existing programs regulating hazardous waste and hazardous materials management. Cal/EPA adopted implementing regulations for the Unified Program (CCR, Title

27, Division 1, Subdivision 4, Chapter 1) in January 1996. The Unified Program is implemented at the local level by a Certified Unified Program Agency (CUPA).

The Tulare County Health and Human Services Agency (TCHHSA), Environmental Health Division (EHD) is the CUPA for all cities and unincorporated areas within Tulare County. The CUPA was created by the California legislature to minimize the number of inspections and different fees for businesses. The EHD was certified as the county CUPA in December 1996. As the CUPA, the EHD operates the following programs in the county:

- Aboveground Storage Tank (AST) Program Spill Control and Countermeasure Plan and requirements;
- California Accidental Release Prevention (CalARP) Program;
- Hazardous Materials Release Response Plans & Inventory (Business Plan);
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (Tiered Permit);
- Underground Storage Tank (UST) Program; and
- Hazardous Material Inventory Requirements of Article 80 of the Uniform Fire Code.

The EHD performs annual inspections of UST facilities and triennial inspections of participants in the Business Plan Program and CalARP.

The EHD provides the management and record keeping of hazardous materials and underground storage tank (UST) sites for Tulare County, including cities and unincorporated areas. Through the Hazardous Materials Program, the EHD inspects businesses for compliance with the Hazardous Waste Control Act. Hazardous waste is subject to storage time limits, disposal requirements and labeling requirements on containers.

The EHD also issues permits to businesses that handle quantities of hazardous materials/ waste greater than or equal to 55 gallons, 500 pounds, or 200 cubic feet of a compressed gas at any time. Businesses who handle these quantities of hazardous materials/wastes are required to submit a Hazardous Materials Management Plan (HMMP) to the EHD. The HMMP includes an inventory of hazardous materials and hazardous wastes, as well

as an emergency response to incidents involving those hazardous materials and wastes.

Above-ground storage tanks over 660 gallons that contain petroleum products are inspected by the EHD and are required to prepare a Spill Prevention Control and Countermeasures Plan (SPCCP). The SPCCP is kept on-site and is subject to inspection by the SWRCB. The SPCCP includes a requirement to prepare a response to a release of hazardous materials from above-ground storage tanks and to prevent a release. The SPCCP also identifies the requirement for secondary containment and mitigation measures.

Under a contract with the SWRCB, the EHD conducts the Local Oversight Program, which provides oversight of corrective action at leaking underground fuel tank (LUFT) sites throughout Tulare County.

- **Tulare County Comprehensive Airport Land Use Plan.** The Tulare County Airport Land Use Commission adopted a Comprehensive Airport Land Use Plan for the nine public-use airports in Tulare County in June 1992. The airport planning areas are divided into six traffic compatibility zones, which are determined by their location in relation to runways, approach/departure patterns, and common airport traffic (overflight zones). Each zone has identified acceptable and unacceptable uses, which are determined by the safety, noise, overflight, and airspace impacts associated with each particular zone.
- **Tulare County Hazardous Waste Management Plan.** Tulare County has prepared a Hazardous Waste Management Plan (HWMP) in accordance with California Health and Safety Code Section 24135 et seq. The Tulare County HWMP, which was developed in May 1989, identifies hazardous waste generators within the county, amounts and types of waste produced, and projected waste generation. In addition, the plan identifies the need for any potential future locations of treatment, storage, and disposal (TSD) facilities and includes policies and potential impacts for the management of hazardous waste within the county. The major goal of the HWMP is to reduce the need for new hazardous waste facilities by reducing waste at its source through recycling, reduced use of hazardous materials, and public education. Subsequent to the formation of the California Environmental Protection Agency (CalEPA) in 1991, County

Hazardous Waste Management Plans are now submitted to the CalEPA's Department of Toxic Substances Control.

- **Tulare County Multi-Hazard Functional Plan.** Tulare County has prepared a Multi-Hazard Functional Plan to serve as the county's emergency response plan. The plan addresses responses to various emergency incidents, responsibilities of various agencies, and sources of outside assistance.

Existing Conditions

While many hazards exist in the county, two important human-made hazards are produced by airports and hazardous waste. Safety measures that diminish the risk of harm related to these dangers involve assessing the conditions and providing procedures to mitigate the risks. The following discussion describes the current conditions of human-made hazards in Tulare County.

Airport Safety

Airport safety issues are associated with flight hazards and airport hazards associated with surrounding land uses. Flight hazards can be physical (e.g., tall structures that would obstruct airspace), visual (such as glare caused by lights or reflective surfaces), or electronic (interference with aircraft instruments or communication systems). As urban areas grow, there is an increased need for airport operations. Such increased activity generates an increased risk of aircraft crash hazards.

With proper land use planning, aircraft safety risks are reduced, primarily by avoiding incompatible land uses. The formation of airport land use commissions (ALUCs) was mandated in 1968 for all counties containing at least one public use airport (Public Utilities Code Section 21670 et seq.). The commissioners represent the county, its cities, and the public. Legislation passed in 1982 established a direct link between ALUCs comprehensive plans and land use plans and regulations prepared by cities and counties (Public Utilities Code Section 21676). In accordance with this legislation, ALUCs must review the general and specific plans of local jurisdictions for consistency with the county's airport Comprehensive Land Use Plan (CLUP). Primary and secondary review areas must be identified for each facility. Projects proposed within the geographic boundaries of the primary review area are referred to the ALUC for review and evaluation. Within the secondary review area, only those projects involving a structure or other object with a height that would exceed that permitted under adopted zoning would be referred to the ALUC for review.

Air safety zones, which are established at the end of each runway, are intended to restrict the type and intensity of activities that occur in each zone. The State Airport Land Use Planning Handbook allows jurisdictional flexibility in determining air safety zones. Restrictions correspond to the probability of an accident in each zone, based on data generated by the Federal Aviation Administration (FAA). Each zone has certain acceptable and unacceptable land uses, which are determined by safety, noise, and airspace issues relative to runways, departure patterns, and overflight (common aircraft traffic). For example, residential, commercial, industrial, institutional, and parks are considered incompatible land uses within clear zones. However, golf courses and agricultural land uses, provided there are no structures, would be considered compatible. Certain types of residential, commercial, and institutional land uses are not allowed within the approach safety zone.

The most difficult ALUC planning responsibility may be the determination of land use measures around airports that are appropriate (considering the risk level involved), without unnecessarily restricting the ability to allow reasonable development of private land. Land areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained pilots. Despite stringent laws, accidents are going to occur. For this reason, airport safety areas are needed to minimize the number of people who may be exposed to air crash hazards.

When land use controls combine with safety areas, the risks to both people on the ground and aircraft utilizing the airport is decreased. The risk to persons on the ground being harmed by a falling plane is small. However, an air crash is a high consequence event. Therefore, when a crash does occur it can be catastrophic. These considerations have led to the adoption of safety standards which determine acceptable land uses (assuming a crash will occur) rather than attempting to estimate accident probabilities. While the majority of Tulare County airports have not experienced a serious aircraft accident, aircraft accidents are possible.

Airport Safety Zones for height restrictions are established by FAR, Part 77, for the purpose of protecting navigable airspace. These same zones are adopted by the Tulare County ALUC to determine safety zones and compatible land uses in the vicinity of all Tulare County public use airports. Tulare County contains the following public use airports:

- Alta Airport (closed);
- Eckert Field;

- Porterville Municipal Airport;
- Sequoia Field;
- Thunderhawk Field;
- Tulare Municipal Airport (Mefford Field);
- Visalia Municipal Airport (VMA); and
- Woodlake Municipal Airport.

The land use controls for these airports are described in detail in Chapter 3, Land Use and Population. The general operation of these airports is discussed in detail in Chapter 5, Transportation and Circulation.

Hazardous Waste

Hazardous wastes generated by residents and businesses in the county contribute to environmental and human health hazards. Proper waste management and disposal practices can minimize public concern over toxicity and the contamination of soils, water, and air. This section describes how hazardous waste is managed in Tulare County, including generation, transportation, disposal, treatment, storage, disposal facilities, and contaminated sites.

Hazardous Waste Generators

In 2007, the DTSC Hazardous Waste Tracking System (HWTS) manifest data reports that approximately 5,925 tons of hazardous waste was transported from all categories of generators in Tulare County. As of November 2008, hazardous waste data available for 2008 indicated that approximately 7,160 tons of hazardous waste was generated in the county (DTSC, 2008a). Tulare County contains several categories of hazardous waste generators: Resource Conservation and Recovery Act (RCRA) Large Quantity Hazardous Waste Generator (LQG) and two tiers of hazardous waste generators developed by the Tulare County CUPA, which are identified by the CUPA as within Program Element 2254 and Program Element 2258. These are further discussed below.

A RCRA LQG is defined as a generator of more than 1,000 kilograms (kg) of RCRA-designated hazardous waste per month. In 2007, there were eight RCRA LQGs and there are five projected for 2008. The number of these entities varies from month to month because designation is based on the generation of more than 1,000 kg of hazardous waste in a month. Table 8-1 contains a current list of regularly identified RCRA LQGs.

Table 8-1. RCRA Large Quantity Generators

Facility Name	Location
Moore Wallace North America, Inc.	7801 Avenue 304, Visalia
Voltage Multipliers Inc.	8711 W. Roosevelt Avenue, Visalia
KAWNEER/ALCOA	7200 Doe Avenue, Visalia
Sunkist Growers Inc. Tipton	11407 Avenue 114, Tipton
Western Farm Service	3201 Avenue 54, Alpaugh

Source: Martens, 2008b.

The Tulare County CUPA has two tiers of hazardous waste generators, which are referred to as Program Element 2254 and Program Element 2258:

- PE 2254: Generators of 0 to 100 kg of hazardous waste per month, and
- PE 2258: Generators greater than 100 kg of hazardous waste per month.

As of November 2008, there were 411 facilities within the PE 2254 category and 206 facilities within the PE 2258 category. The highest concentrations of these facilities are located in Porterville, Tulare, and Visalia (Martens, 2008a).

Hazardous Waste Treatment Facilities

Facilities that generate hazardous waste and treat that waste on-site are designated as a tiered permit facility. There are seven tiered permit facilities conducting onsite hazardous waste treatment in Tulare County. The five highest-volume hazardous waste types treated are:

1. Aqueous solution with metals;
2. Unspecified aqueous solution;
3. Metal sludge;
4. Waste oil and mixed oil; and
5. Liquids with chromium^{6+} greater than 500 mg/L (Martens, 2008a).

Treatment of hazardous waste from off-site sources generally requires authorization or a permit from the DTSC. The county does not have any permitted facilities for the treatment of hazardous waste from off-site sources. Any hazardous waste generated in the county is shipped to treatment, storage, and disposal facilities located outside the county (Martens, 2008b).

Hazardous Waste Exports

Title 13 California Code of Regulations, Division 2, Chapter 6, Article 1; 2.5; and 2.7 designate transportation routes for specified explosives, bulk inhalation hazards, and radioactive materials. State Routes 43, 63, 65, 99, 198, 201, and 245 are designated as transportation routes of explosives subject to Division 14 (commencing with Section 31600) of the Vehicle Code. Designated Safe Stopping Locations for shipments of explosives are located at the following locations:

- **Tulare.** Lyn's Cafe, 1066 East Rankin Avenue. Food, gasoline, diesel: 24 hours. Use the Avenue 200 exit from SR-99. Park on west side of SR-99.
- **Pixley.** U.S.A. Truck Stop, 451 North Park Road. Fuel: 24 hours. Use Court Street exit from SR-99.
- **Earlimart.** Mart Fuel Stop. Food, gas, diesel: 24 hours.

There are no designated routes within Tulare County for the transportation of inhalation hazards in bulk packaging pursuant to Division 14.3 (commencing with Section 32100) of the Vehicle Code) or radioactive materials subject to Section 3300 of the Vehicle Code, respectively.

Contaminated and Impaired Sites

Tulare County contains over 200 sites that are listed by the State Water Resources Control Board as contaminated and either undergoing cleanup, assessment, or is being monitored. Additionally, the county has nine sites that are listed on the state's Cortese list and two Superfund sites. Each of these types of contaminated sites is discussed further below.

Leaking Underground Storage Tanks (LUSTs). The SWRCB maintains an inventory of Leaking Underground Storage Tanks (LUST) in Tulare County in Geotracker, an online, searchable database. A review of the database identified a total of 136 active cases in Tulare County. The database also identifies a total of 355 cases that have been closed, and 9 that have been referred to the RWQCB. Most of these tanks are leaking gasoline while a few tanks are leaking diesel fuel. There are a couple of sites that are listed for leaking hazardous substances other than gasoline and diesel (SWRCB, 2008a). The Local Oversight Program operated by the county CUPA oversees the cleanup and abatement of leaking fuel tanks.

Table 8-2 identifies a number of active LUST sites for cities and communities in the county. The sites listed as undergoing assessment are being evaluated for suspected leaks, the extent of contamination, and how the spill will be cleaned up, or remediated. The sites listed as undergoing remediation already have a remediation plan and are in the process of removing contaminated soil or cleaning up contaminated groundwater. Verification monitoring occurs after remediation activities are completed to ensure remediation goals have been achieved.

Table 8-2. LUST Sites in Tulare County

City/Community	Site Assessment	Remediation	Verification Monitoring
Cutler		3	
Dinuba	3	5	
Ducor	1		
Earlimart		2	
Exeter	2	4	2
Farmersville	2	1	
Goshen		1	
Ivanhoe		1	
Kingsburg		1	
Lemon Cove		1	
Lindsay	4	6	2
Orosi	6	3	
Pixley	2	3	
Poplar		1	
Porterville	9	1	4
Richgrove		1	
Sequoia National Park	1		
Seville	1	1	
Springville	2		1
Strathmore	4	3	
Terra Bella	2	3	1
Three Rivers	2		
Tipton	1	1	
Traver		1	
Tulare	6	2	2
Visalia	10	7	2
Waukena	1	1	
Woodlake	1	8	
Woodville	1		
Total	**61**	**61**	**14**

Source: SWRCB, 2008a.

Site Cleanup Program. The RWQCB oversees investigation and cleanup of sites with soil and groundwater pollution. These sites are part of the Site Cleanup Program, which falls under the Spills, Leaks, Investigation, and Cleanups (SLIC) Program. There are 61 active cleanup sites within Tulare County. Open sites are those that have been identified as having some hazardous contamination and are undergoing investigation. Site assessment, remediation, and verification monitoring categories are

described above under "Leaking Underground Storage Tanks". The county contains a range of types of sites with a number of different contaminants that a listed in the Site Cleanup Program. Some of these sites include landfills, dry cleaners, maintenance yards, and facilities that use, mix, and/or store agricultural chemicals. Contaminants at these sites also include a variety of substances, including petroleum, benzene, volatile organic compounds (VOCs), and perchloroethylene (PCE). Table 8-3 provides the number of these facilities and their general locations throughout the county.

Table 8-3. Site Cleanup Program Locations in Tulare County

City/Community	Open	Site Assessment	Remediation	Verification Monitoring
Alpaugh		1		
Balance Rock	1			
Cutler			1	
Delano (just inside the county)		1		
Dinuba		3	1	
Earlimart	1			
Exeter		2		1
Goshen		3		
Lindsay		5		
Lindsay/Exeter	1			
Monson	1			
Pixley		2		
Porterville	1	5	1	
Terra Bella		1		
Tonyville	1			
Traver		1		
Tulare	2	5		
Visalia	7	5	2	
Woodlake	1	3		
Woodville	1			
Total	**17**	**37**	**5**	**1**

Source: SWRCB, 2008b.

Cortese List of Contaminated Sites. The Cortese List is a list of hazardous waste and material sites that is compiled by a number of state agencies, including DTSC and the State Department of Public Health. In Tulare County, pesticide manufacturing/processing, storage, applicator facilities, and industrial manufacturing and processing comprise most of the sites where soil or groundwater contamination has occurred. As of 2008, nine sites in the county were listed on the California Department of Substances Control Hazardous Waste and Substances Site List compiled pursuant to Government Code Section 65962.5 (See Table 8-4, Hazardous Waste Substances Site List).

Table 8-4. Hazardous Waste and Substances Site List (Cortese List), Tulare County, 2008

City	Address	ZIP	Site Name
Dinuba	216 S. O St.	93618	So Cal Gas/Dinuba Mgp
Orosi	13133 Avenue 416	93647	Parmenter And Bryan
Pixley	1494 South Airport Drive	93256	Harmon Field
Porterville	167 West Poplar Avenue	93257	Beckman Instruments, Porterville Plant
Visalia	2530 West Goshen	93219	Kaweah Crop Duster-Green Acres Airport
Visalia	300 North Tipton Street	93277	So Cal Gas/Visalia Mgp
Visalia	432 Ben Maddox Way	93277	Edison/Visalia Pole Yard
Visalia	6941 and 6707 West Goshen Avenue	93291	Goshen Avenue and Shirk Road Site
Visalia	Central City Area	93277	Visalia Dry Cleaner Investigation

Source: California Department of Toxic Substance Control, 2008b.

Superfund Sites. Tulare County contains two sites that are on the EPA's Superfund Site list. These two sites are the Beckman Instruments (Porterville Plant) and Southern California Edison Co. (Visalia Poleyard).

The Beckman Instruments (Porterville Plant) site covers about 500 acres and is located at 167 W. Poplar Avenue in Porterville. The company has manufactured printed circuit boards and electronic instrument parts at the facility since 1968. Disposal of wastes from 1974 until 1983 resulted in groundwater contamination and soil contamination in the area of the plant. Groundwater was contaminated with VOCs and the soil was contaminated with lead. Numerous residences and Porterville College are located near the site. Downtown Porterville is located about 2,000 feet north of the site. A municipal water supply well lies about 500 feet northwest of the facility. Cleanup activities began in 1983 with removal of discharge pond liquids, liners, and surface soils. Groundwater monitoring wells were installed and affected residents were provided with alternative water supplies. Soil cleanup has been completed and all the components for the groundwater cleanup have been constructed and are operating. The site is now undergoing monitored natural attenuation[1] (EPA, 2008a).

The Southern California Edison Co. (Visalia Poleyard) site covers 20 acres and is located at 432 Ben Maddox Way in Visalia. This site was

[1] Monitored Natural Attenuation. Natural attenuation relies on natural processes to clean up or attenuate pollution in soil and groundwater. Natural attenuation occurs at most polluted sites. However, the right conditions must exist underground to clean sites properly. If not, cleanup will not be quick enough or complete enough. Scientists monitor these conditions to make sure natural attenuation is working.

operated as a utility pole treatment yard from the 1920s until 1980. Wood preservatives were used and stored on site during operations. Leaking tanks and stored treated poles contaminated groundwater and soil. The closest residence is ¼ mile away. Approximately 60,000 people live within six miles of the site. A number of drinking water wells are located within three miles of the site. All facilities and contaminated soil have been removed. The contaminated groundwater is being treated and discharged to the City of Visalia Water Treatment Plant. A pilot steam injection/vapor extraction system was utilized to remove contaminated groundwater, which contained creosote, diesel oil, and other hydrocarbons. All cleanup activities are completed and a covenant to restrict use of the property was completed in May 2007 (EPA, 2008b).

Landfill and Disposal Site Locations

The California Integrated Waste Management Board (CIWMB) is responsible for protecting the public's health and safety and the environment through management of the solid waste generated in California. The CIWMB works in partnership with local government, industry, and the public to reduce waste disposal and ensure environmentally safe landfills. The CIWMB maintains a Solid Waste Information System (SWIS) Database that contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites. Table 8-5 presents the facilities listed by the CIWMB that are in the county. Solid waste collection and facilities operations are further discussed in Section 7.5, Solid and Hazardous Waste.

Table 8-5. Solid Waste Facilities and Transfer Stations in Tulare County

Facility Name	Address/Location	Facility Type
Teapot Dome Disposal Site	Avenue 128 and Road 208, Porterville	Solid Waste Landfill
Woodville Disposal Site	Road 152 and Ave 198, Tulare	Solid Waste Landfill
Visalia Disposal Site	Road 80 and Avenue 332, Visalia	Solid Waste Landfill
Badger Transfer Station	Road 260 and Avenue 468, Badger	Small Volume Transfer Station
Camp Nelson Transfer Site	1/4 mile north of Camp Nelson	Limited Volume Transfer Operation
Pine Flat Transfer Station	1/4 mile south of Pine Flat, California Hot Springs	Limited Volume Transfer Operation
Springville Transfer Station	Avenue 122 and Road 338, Springville	Small Volume Transfer Station
Tulare County Compost And Biomass	24487 Road 140, Tulare	Composting Facility (Green Waste)
Tulare County Recycling Complex	24487 Road 140, Visalia	Large Volume Transfer/Proc Facility
Wood Industries Company	7715 Avenue 296, Visalia	Composting Facility (Green Waste)
Kennedy Meadows Transfer Station	Goman Road West Of M-152 Station, Johnsondale	Limited Volume Transfer Operation
Balance Rock Transfer Station	Balance Rock Landfill	Limited Volume Transfer Operation
Earlimart Transfer Station	7012 Road 136, Earlimart	Medium Volume Transfer/Proc Fac
Pena's Recycling And Transfer	12056 Avenue 408, Orosi	Composting Facility (Mixed) and

		Medium Vol CDI Debris Proc. Fac.
New Era Farm Service #1	Hoffman Dairy Ave 216 & Rd 140, Tulare	Composting Operation (Ag)
New Era Farm Service #2	Jim Nance Dairy 6440 Ave 160, Tulare	Composting Operation (Ag) and Composting Facility (Animal)
Sunset Material Recovery Facility	1707 East Goshen Road, Visalia	Medium Volume Transfer/Proc Fac
PENA's Disposal CDI Processing Fac.	12056 Avenue 408, Orosi	Medium Vol CDI Debris Proc. Fac.
Pena`s Disposal Green Materials Proc. Op	12056 Avenue 408, Orosi	Chipping and Grinding Activity Fac./ Op.
City of Porterville Limited Volume ST	555 North Propect Street, Porterville	Limited Volume Transfer Operation
Oakview Dairy	6626 Avenue 228, Tulare	Composting Operation (Ag)

Source: CIWMB, 2008.

Household Hazardous Waste

The Tulare County Resource Management Agency Solid Waste Division operates a Household Hazardous Waste program. Under this program, residents in the county can safely dispose of hazardous materials, such as pesticides, household cleaners, and paint products. Additionally, residents can utilize this program to dispose of used motor oil and universal wastes, which includes consumer batteries, CRTs (e.g., televisions and computer monitors), fluorescent tubes and other mercury-containing lamps, and consumer electronics (Tulare County Resource Management Agency, Solid Waste Division, 2008).

Most Saturdays, the county operates a Permanent Household Hazardous Waste Collection Facility (HWCF) located in Visalia. The county also hosts mobile collection events throughout the year. In 2007, there were 13 mobile one-day collection events in the county. At the one-day collection events of the HWCF, the county collected over 227,700 pounds of household hazardous waste in 2007 (Martens, 2008a).

Used Oil

Used oil can be disposed of by residences at the HWCF or at a number of used motor oil collection locations throughout the county. These locations are generally auto repair shops and auto parts stores. In 2007, 246 tons of used motor oil was collected (Martens, 2008a).

Universal and Electronic Waste

In 2007, over 91,700 pounds of universal and e-waste were collected in Tulare County (Martens, 2008a).

Hazardous Material Emergency Response.

Tulare County has prepared a Multi-Hazard Functional Plan to serve as the county's emergency response plan. The plan addresses responses to various emergency incidents, responsibilities of various agencies, and

sources of outside assistance. The following types of emergencies are addressed in the Multi-Hazard Functional Plan:

- Earthquakes;
- Dam Failure;
- Flood;
- Wildfire;
- War Emergency;
- Hazardous Materials Incident;
- Aircraft Crash; and
- Volcanic Eruption.

In the event of a disaster, certain facilities are critical to serve as evacuation centers, provide vital services, and provide for emergency response. Existing critical facilities in Tulare County include hospitals, county dispatch facilities, electrical, gas, and telecommunication facilities, water storage and treatment systems, wastewater treatment systems, schools, and other government facilities. This plan also addresses evacuation routes, which include all freeways, highways, and arterials that are located outside of the 100-year flood plain.

8.6 Noise

In technical terms, sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Simply, sound is what we hear. Noise is defined as unwanted sound. As sounds reach undesirable unacceptable levels, this is referred to as noise.

To develop goals and policies related to noise abatement in the updated General Plan, it is important to understand how sound, and noise are measured and compared, and to understand what sound levels occur in the county today. To do so, this section provides an overview of how noise is characterized (measured), describes existing regulations that affect noise issues, and discusses current noise conditions found in Tulare County.

Methods

The methods used to assess noise are described throughout this section. Descriptions of the standards or desired noise levels for land uses within the county are drawn from the Quad-Knopf General Plan Background

Report Update (2001). Estimates of roadway noise have been updated based on recent data regarding average daily traffic volumes. Discussions of other noise sources were compiled by Quad-Knopf, based on measurements by Brown-Buntin Associates.

Key Terms

- **Ambient Noise.** The total noise associated with a given environment and usually comprising sounds from many sources, both near and far.
- **Attenuation.** Reduction in the level of sound resulting from absorption by the topography, the atmosphere, distance, barriers, and other factors.
- **A-weighted decibel (dBA).** A unit of measurement for noise based on a frequency weighting system that approximates the frequency response of the human ear.
- **Community Noise Equivalent Level (CNEL).** Used to characterize average sound levels over a 24-hour period, with weighting factors included for evening and nighttime sound levels. L_{eq} values (equivalent sound levels measured over a 1-hour period - see below) for the evening period (7:00 p.m. to 10:00 p.m.) are increased by 5 dB, while L_{eq} values for the nighttime period (10:00 p.m. to 7:00 a.m.) are increased by 10 dB. For a given set of sound measurements, the CNEL value will usually be no more than 1 dB higher than the L_{dn} value (see below). In practice, CNEL and L_{dn} are often used interchangeably.
- **Decibel (dBA).** A unit of measurement describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure (which is 20 micronewtons per square meter).
- **Day-Night Average Sound Level (L_{dn}).** Average sound exposure over a 24-hour period. L_{dn} values are calculated from hourly L_{eq} values, with the L_{eq} values for the nighttime period (10:00 p.m. to 7:00 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.
- **Equivalent Sound Level (L_{eq}).** The level of a steady-state sound that, in a stated time period and at a stated location, has the same sound energy as the time-varying sound (approximately equal to the average sound level). The equivalent sound level measured over a 1-hour period is called the hourly L_{eq} or L_{eq} (h).

- **L_{max} and L_{min}.** The maximum and minimum sound levels, respectively, recorded during a measurement period. When a sound meter is set to the "slow" response setting, as is typical for most community noise measurements, the L_{max} and L_{min} values are the maximum and minimum levels recorded typically for 1-second periods.
- **Percentile-Exceeded Sound Level (L_x).** The sound level exceeded during a given percentage of a measurement period. Examples include L_{10}, L_{50}, and L_{90}. L_{10} is the A-weighted sound level that is exceeded 10% of the measurement period, L_{50} is the level exceeded 50% of the period, and so on. L_{50} is the median sound level measured during the measurement period. L_{90}, the sound level exceeded 90% of the time, excludes high localized sound levels produced by nearby sources such as single car passages or bird chirps. L_{90} is often used to represent the background sound level. L_{50} is also used to provide a less conservative assessment of the background sound level.
- **Sensitive Receptors.** Sensitive receptors are defined to include residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses.

Regulatory Setting

Various noise guidelines and standards have been promulgated on the federal, state, and local levels. Relevant guidelines are discussed below.

Federal Regulations

The Federal Highway Administration (FHWA) has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772). These noise criteria are based on Leq (h) and are summarized in Table 8-6.

Table 8-6. FHWA Noise Abatement Criteria

Activity Category	Design Noise Levels (Leq [h] [dBA])	Description of Activity Category
	Leq (h) (dBA)	
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas
C	72 (exterior)	Developed lands
D	---	Undeveloped lands
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Federal Highway Administration, 1982.

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an L_{eq} of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA L_{dn} as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L_{dn}, have generally agreed on the 65 dBA L_{dn} level as being appropriate for residential uses. At 65 dBA L_{dn} activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) "to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes."

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA L_{dn} or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn} - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA L_{dn} area and 10 dBA of attenuation in a 70 to 75 dBA L_{dn} area.
- Exceeding 75 dBA L_{dn} - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a *goal* of 45 dBA L_{dn} is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques and materials, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are *not* related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the USEPA. Noise exposure of this type is dependant on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

State Regulations

The California Department of Transportation has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans, 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

The Governor's Office of Planning and Research (OPR) has developed guidelines for the preparation of general plans (OPR, 2003). These include land use compatibility guidelines for noise exposure.

Local Regulations

Before it was eliminated, the California Department of Health Services (DHS) Office of Noise Control studied the correlation of noise levels and their effects on various land uses. Land use and noise compatibility criteria for the county have been developed from the California Office of Noise Control Land Use Compatibility Matrix for Community Noise Exposure. Maximum acceptable noise levels for various land uses are shown in Table 8-7.

Table 8-7. Maximum Acceptable Ambient Noise Exposure for Various Land Uses

Land Use	Suggested Maximum Ldn
Residential – low density	60
Residential – high density	65
Transient lodging	65
Schools, libraries, churches, hospitals	65
Playgrounds, parks	65
Commercial	70
Industrial	75

The Tulare County Noise Element of the General Plan (1988) also gives guidance on techniques for noise control.

Characteristics of Sound

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale (i.e., dB scale) is used to keep sound intensity numbers at a convenient and manageable level.

Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting" written as dBA. The human ear can detect changes in sound levels of approximately 3 dBA under normal conditions. Changes of 1 to 3 dBA are typically noticeable under controlled conditions, while changes of less than 1 dBA are only discernable under controlled, extremely quiet conditions. A change of 5 dBA is typically noticeable to

the general public in an outdoor environment. Table 8-8 summarizes typical A-weighted sound levels from a variety of sources.

Table 8-8. Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock Band
Jet Fly-Over at 300 meters (1000 feet)		
	— 100 —	
Gas Lawn Mower at 1 meter (3 feet)		
	— 90 —	
Diesel Truck at 15 meters (50 feet)		Food Blender at 1 meter (3 feet)
at 80 kilometers/hour (50 miles/hour)	— 80 —	Garbage Disposal at 1 meter (3 feet)
Noisy Urban Area, Daytime		
Gas Lawn Mower, 30 meters (100 feet)	— 70 —	Vacuum Cleaner at 3 meters (10 feet)
Commercial Area		Normal Speech at 1 meter (3 feet)
Heavy Traffic at 90 meters (300 feet)	— 60 —	
		Large Business Office
Quiet Urban Daytime	— 50 —	Dishwasher Next Room
Quiet Urban Nighttime	— 40 —	Theater, Large Conference
Quiet Suburban Nighttime		Room (Background)
	— 30 —	Library
Quiet Rural Nighttime		Bedroom at Night, Concert hall
	— 20 —	
		Broadcast/Recording Studio
	— 10 —	
Lowest Threshold of Human Hearing	— 0 —	Lowest Threshold of Human Hearing

Source: California Department of Transportation 1998a.

Environmental noise fluctuates over time. While some noise fluctuations are minor, others can be substantial. Some noise levels occur in regular patterns, others are random. Several noise descriptors have been developed to describe time-varying noise levels, and are listed above in the "Key Terms" section.

Calculating Attenuation

Noise may be generated from a point source, such as a piece of construction equipment, or from a line source, such as a road containing moving vehicles. Because of spreading losses, noise attenuates (decreases) with distance. The typical atmospheric attenuation rate for point source noise is 6 dBA per doubling of the distance as predicted by the equation:

$$\text{dBA Reduction} = 20 \text{ Log } [D2/Dr]$$

Where: D2 = measured distance
Dr = reference distance

Noise from a line source will also attenuate with distance, but the rate of attenuation is a function of the shape of the source, distance and the type of terrain over which the noise passes. Hard sites, such as developed areas with paving, attenuate noise at a rate of 3 dBA per doubling of the distance as predicted by the equation:

dBA Reduction = 10 Log[D2/Dr]

Soft sites, such as undeveloped areas, open space, and vegetated areas attenuate line-source noise at a rate of 4.5 dBA per doubling of the distance, as predicted by the equation:

Attenuated dBA = 15 Log [D2/Dr]

True hard sites are fairly rare, particularly in rural areas. Accordingly, soft site attenuation is typically assumed for planning level analyses in rural areas.

Objects such as walls, topography, and buildings, which block the line-of-sight between a source and a receptor, will attenuate the noise source. If a receptor is located behind the object, but has a view of the source, the wall will do little to reduce the noise. Additionally, a receptor located on the same side of the barrier as the noise source may experience an increase in the perceived noise level as the wall or barrier may reflect noise back to the receptor, possibly increasing the noise.

Noise Contours

The interpretation of noise contours is a generalization, not an exact science. The measurements by sophisticated instruments are affected by many variables in a particular area, and noise sources themselves vary from day to day. However, these individual effects are generalized so that a noise contour describes the impact that can generally be expected. Noise contour lines themselves are not precise boundaries of noise levels. A contour line denoting a 65 dBA limit, for example, does not imply that residents on one side of the line are seriously affected, while on the other side of the line tolerable conditions exist. Rather, the area between 75 dBA and 65 dBA indicates that residents within this vicinity may experience a high level of noise and potential interference with daily functions.

Effects of Noise

High noise levels can interfere with a broad range of human activities in a way that degrades public health and welfare. Such activities may include:

- Speech communication in conversation and teaching;
- Telephone communication;

- Listening to television and radio;
- Listening to music;
- Concentration during mental and physical activities; and
- Relaxation; and
- Sleep.

Interference with listening situations can be determined in terms of the level of the environmental noise and its characteristics. The amount of interference in non-listening situations is often dependent upon factors other than the physical characteristics of the noise. These may include attitude toward the source of an identifiable noise, familiarity with the noise, characteristics of the exposed individual, and the intrusiveness of the noise.

Hearing loss, total or partial, and either permanent or temporary, is a well-established effect of noise on human health. The primary measure of hearing loss is the hearing threshold level, the level of a tone that can just be detected by an individual. As a person is exposed to increased noise levels, that person may experience a shift in the threshold at which sound can be detected. Exposure to very high noise levels for lengthy periods of time can generate threshold shifts, which can be temporary or permanent. In general, A-weighted sound levels must exceed 60-80 decibels before a person will experience temporary threshold shifts. The greater the intensity level above 60-80 decibels and the longer the exposure, the greater length of the temporary threshold shift.

Traffic Noise

Roadways and traffic noise are the dominant source of ambient noise in the county. The noise generated from vehicles using roads within the county is governed primarily by the number of vehicles, type of vehicles (mix of automobiles, trucks, and other large vehicles), and speed. Sound32 is Caltrans' computer implementation of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Sound32 and traffic information provided in Chapter 5 "Transportation and Circulation" of this report were used to develop baseline traffic noise contours for major roads in the county. Table 8-9 summarizes the daily traffic volumes, the predicted Ldn noise level at 100 feet from the roadway centerline, and the distance from the roadway centerline to the 60-, 65-, and 70- dB-Ldn contours. The contour levels correspond to the land use compatibility levels used by Tulare County and specified in Table 8-8. Since these calculated contours do not take into account shielding caused by local buildings, walls, or topographical features, the distances should be

considered to be worst-case estimates of noise exposure along roadways in the county.

Railroad Operations Noise

Tulare County railroad operations consist of high speed mainline operations on the Burlington Northern-Santa Fe Railroad (formerly Atchison, Topeka and Santa Fe) in the southwest corner of the county and on the Union Pacific Railroad (formerly Southern Pacific Transportation Company) along SR 99. Lower speeds occur on various branch lines located throughout the county on the San Joaquin Valley Railroad.

Noise levels from mainline operations within Tulare County were quantified using the analytical methods developed in 1973 by Wyle Laboratories (Swing, 1973). The Wyle methodology calculates noise exposure based upon reference noise level data for various types of trains under different operating conditions, distance from the tracks, speed and the characteristics of the track the trains are passing over.

In order to provide a comparison of the noise levels predicted by the Wyle methodology to those actually occurring in Tulare County, and to document single-event noise levels, noise level measurements were conducted at various locations near or away from grade crossings. The reference measurement distance was 100 feet from the center of the tracks. Specific noise level data are described in the following sections which also provide a description of operations for each railroad.

Railroads have the right to continue normal operations even though development may come close to the tracks.

Burlington Northern-Santa Fe Railroad

Mainline operations on the Burlington Northern-Santa Fe Railroad in Tulare County affect the small communities of Angiola and Allensworth and rural residential uses located near the tracks in the southwest corner of the county. Maximum speed is 70 mph for freights and 79 mph for passenger trains. Freight trains may occur at any time during the day or night and passenger trains generally operate during the daytime (7:00 a.m. - 10:00 p.m.) hours. According to the Wyle methodology, the above-described type and frequency of operations will result in present noise exposures of 65 and 60 dB Ldn at approximately 345 and 650 feet, respectively, from the center of the tracks, and at approximately 420 and 820 feet, respectively, from the center of the tracks for projected future operations. Noise levels in the vicinity of grade crossings are somewhat higher than this due to the use of the warning horn.

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
Existing									
State Routes									
SR 63	SR 137 to Ave 264	17,400	93%	69.7	65.2	48	103	222	479
	Ave 264 to Ave 272	24,300	93%	71.2	66.7	60	129	278	599
	Ave 272 to Ave 280	26,500	93%	71.5	67.0	63	137	294	634
	Ave 280 to Ave 288	36,000	93%	72.9	68.4	78	168	361	778
	Ave 288 to Ave 292 (Tul. Av., Vis.)	34,500	93%	70.2	65.7	52	111	239	516
	Tul Av. Vis to Min. King Bl.	34,500	93%	70.2	65.7	52	111	239	516
	(break through the City of Visalia)								
	Houston Av. To Ave 328	14,700	93%	70.1	65.6	51	109	236	507
	Ave 328 to Ave 352	6,900	93%	67.0	62.5	31	68	146	315
	Ave 352 to Ave 384	7,300	93%	67.6	63.1	35	74	160	345
	Ave 384 to Ave 400	9,400	93%	67.5	63.0	34	74	159	343
	Ave 400 to Emerald Dr.	8,300	93%	67.0	62.5	32	68	147	316
	Em. Dr. to Ave 416	13,000	93%	69.0	64.4	43	92	198	426
	Ave 416 to Ave 422	7,200	93%	66.4	61.9	29	62	133	287
	Ave 422 to Ave 432	2,500	93%	61.8	57.3	14	31	66	142
	Ave 432 to Ave 460	1,800	93%	60.4	55.9	11	25	53	114
	Ave 460 to Fresno CL	1,950	93%	62.8	58.3	17	36	77	167
SR 65	So Co Line to Ave 56	7,700	93%	69.7	65.2	48	102	221	475
	Ave 56 to Ave 95	9,100	93%	70.1	65.6	51	110	237	511
	Ave 95 to Ave 112	10,500	93%	70.8	66.2	56	121	261	562
	Ave 112 to SR 190	13,900	93%	72.3	67.8	71	154	331	714
	SR 190 Olive St (Av 152)	22,500	93%	74.5	70.0	100	216	465	1,001
	Olive St to Linda Vista Av	19,000	93%	73.6	69.1	87	187	403	868
	Linda Vista to Ave 228	19,300	93%	71.9	67.4	67	145	313	674
	Ave 228 to Rd 207 (Oak Av)	16,100	93%	71.2	66.6	60	129	277	598
	Rd 207 to SR 137	17,600	93%	72.4	67.9	73	156	337	726
	SR 137 to D St (Exeter)	7,800	93%	69.6	65.1	47	101	219	471
	D St to Pine St (Exeter)	13,400	93%	69.5	65.0	46	99	214	461
	Pine St to SR 198	12,500	93%	70.9	66.4	58	124	268	578
SR 99	Co Line to Ave 24	44,000	81%	82.8	78.2	354	763	1,643	3,541
	Ave 24 to Ave 48	41,000	81%	82.4	77.9	338	728	1,568	3,378
	Ave 48 to Ave 76	38,500	81%	82.2	77.7	324	698	1,503	3,239

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
	Ave 76 to Ave 96	38,500	81%	82.2	77.7	324	698	1,503	3,239
	Ave 96 to Ave 100 (Court)	38,500	81%	82.2	77.7	324	698	1,503	3,239
	Ave 100 to Ave 104	42,500	81%	82.6	78.1	346	745	1,606	3,460
	Ave 104 to Ave 120	41,000	81%	82.4	77.9	338	728	1,568	3,378
	Ave 120 to SR 190	40,500	81%	82.4	77.9	335	721	1,553	3,347
	SR 190 to Ave 152 (Olive)	41,000	81%	82.3	77.8	333	717	1,545	3,328
	Ave 152 to Ave 184	42,500	81%	82.5	78.0	341	734	1,582	3,409
	Ave 184 to Ave 200	43,000	81%	82.6	78.0	344	740	1,595	3,435
SR 99 (Cont.)	Ave 200 to Airport	44,000	81%	82.7	78.1	349	752	1,619	3,489
	Airport to Ave 216 (Paige)	41,000	81%	82.3	77.8	333	717	1,545	3,328
	Ave 216 to Bardsley	41,000	81%	82.3	77.8	333	717	1,545	3,328
	Bardsley to SR 137	46,000	81%	83.0	78.5	367	791	1,703	3,670
	SR 137 to Prosperity Av	47,500	81%	83.0	78.5	370	797	1,717	3,699
	Prosp Av to Ave 264	42,500	81%	82.6	78.1	346	745	1,606	3,460
	Ave 264 to Ave 280	43,000	81%	82.7	78.1	349	751	1,618	3,487
	Ave 280 to SR 198	45,000	81%	82.8	78.3	359	774	1,668	3,594
	SR 198 to Ave 308 (Goshen)	50,000	81%	83.3	78.8	386	831	1,790	3,856
	Ave 308 to Merritt Dr	51,000	81%	83.4	78.9	391	842	1,813	3,907
	Merritt Dr to Ave 384	49,000	81%	83.2	78.7	380	820	1,766	3,804
	Ave 384 to Mendocino Av	49,500	81%	83.3	78.7	383	825	1,778	3,830
	Mend. Ave to Co line	49,500	81%	83.3	78.7	383	825	1,778	3,830
SR 137	Kings Co. Line - Road 68	3,350	82%	68.1	63.6	38	81	175	376
	Road 68 – West	5,600	82%	70.4	65.9	53	114	246	530
	West - J Street	12,900	82%	72.5	67.9	73	157	338	729
	J Street – Kern	7,400	82%	68.3	63.8	39	83	180	388
	Kern – Blackstone	19,200	82%	74.3	69.8	97	210	452	974
	Blackstone - SR 63	11,300	82%	72.0	67.5	68	147	317	684
	SR63 - SR 65	11,000	82%	74.5	70.0	100	215	463	997
SR 190	SR 99 – Newcomb	5,600	85%	72.7	68.2	75	162	350	754
	Newcomb - Road 265	17,300	85%	75.2	70.6	110	238	513	1,105
	Road 265 - Seq. NP	7,000	85%	69.6	65.1	47	101	218	470
SR 198	Kings Co. Line - SR 99	17,300	87%	75.2	70.7	112	241	518	1,117
	SR 99 – Akers	39,000	87%	78.4	73.9	182	393	846	1,823
	Akers - SR 63 (south)	45,500	87%	78.3	73.8	179	387	833	1,794
	SR 63 (south) - Road 168	20,000	87%	74.6	70.1	102	220	473	1,020
	Road 168 - Spruce (SR 65)	17,400	87%	74.0	69.5	93	200	431	929

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
	Spruce - SR 216	8,500	87%	70.9	66.4	58	124	268	576
	SR 216 - North Fork	3,250	87%	66.2	61.7	28	60	129	278
	North Fork - Mineral King	3,750	87%	66.8	62.3	31	66	142	305
	Mineral King - Seq. NP	1,650	87%	63.2	58.7	18	38	82	177
SR 201	Fresno Co. Line - SR 63	6,200	93%	68.7	64.1	41	88	189	407
	SR 63 - SR 245	4,850	93%	68.9	64.4	42	91	195	421
SR 216	SR198 (Visalia) – Houston	26,000	93%	68.7	64.2	41	89	191	412
	Houston - Road 144	11,300	93%	65.1	60.6	24	51	110	237
	Road 144 - Road 158	4,350	93%	63.5	59.0	18	40	86	185
	Road. 158 - Avenue. 344	4,000	93%	66.6	62.1	30	64	139	299
	Road 196 – Castlerock	4,550	93%	67.2	62.7	33	70	151	326
	Castlerock - SR198 (Lemon Cove)	1,800	93%	65.6	61.1	25	55	118	254
SR 245	Fresno Co. Line - SR 201	680	93%	58.6	54.1	9	19	40	87
	SR 201 - Avenue 352 (Cajon)	2,050	93%	64.1	59.5	20	43	93	201
	Avenue 352 - Woodlake S. Limits	3,250	93%	66.1	61.5	27	59	127	273
	Woodlake S. Limits - SR198	5,800	93%	68.6	64.1	40	86	186	401
Principal Arterials									
Avenue 54	Kings Co. Line - SR 43	600	91%	56.5	52.0	6	14	29	63
Avenue 56	SR 43 - SR 99	5,105	91%	65.8	61.3	26	57	123	264
Avenue 56	SR 99 - Road 192	1,750	91%	61.2	56.7	13	28	60	129
Avenue 56	Road 192- SR 65	810	91%	57.8	53.3	8	17	36	77
Avenue 56/M56	SR 65 - Old Stage Road	1,230	91%	59.7	55.1	10	22	47	102
Avenue 56/M56	Old Stage Road - Sequoia NF	900	91%	58.3	53.8	8	18	39	83
Avenue 96	Road 96 - SR 99	1,250	91%	59.7	55.2	10	22	48	103
Avenue 96	SR 99 - Road 192	1,800	91%	61.3	56.8	13	28	61	132
Avenue 96	Road 192- SR 65	2,800	91%	63.2	58.7	18	38	82	177
Avenue 96	SR 65 - M109	1,180	91%	59.5	55.0	10	21	46	99
Avenue 152	SR 99 - Road 192	3,150	91%	63.7	59.2	19	41	89	191
Avenue 152	Road 192- Road 222	4,800	91%	65.6	61.1	25	55	118	253
Avenue 152 (Olive)	Road 222 - SR 65	4,750	91%	65.5	61.0	25	54	117	252
Avenue 152 (Olive)	SR 65 - Road 252	18,200	91%	71.4	66.8	62	133	286	616
Avenue 184	SR 137 - Road 96	3,550	91%	64.3	59.7	21	45	96	207
Avenue 196	Road 196 - SR 65	1,800	90%	61.5	57.0	14	29	63	136
Avenue 196	SR 65 - Road 236	4,990	90%	66.0	61.4	27	58	125	269

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
Avenue 196	Road 236 - SR 190	2,100	90%	62.2	57.7	15	32	70	151
Hermosa	SR 65 – Mirage	1,750	91%	60.2	55.7	11	24	52	112
Avenue 216	Road 84-K Street.	1,540	90%	61.8	57.3	14	30	66	141
Avenue 216	K Street.-SR 99	7,600	90%	68.7	64.2	41	88	190	410
Avenue 232	Kings Co. Line - Road 92	3,560	88%	64.9	60.4	23	49	106	228
Avenue 232 (Tulare Avenue)	Road 92 - (West St.) - I Street	3,020	88%	64.2	59.6	20	44	95	204
Avenue 256	SR 99 - Road 216	2,210	91%	62.2	57.7	15	33	70	151
Avenue 280 (Caldwell)	Kings Co. Line - SR 99	8,820	91%	68.2	63.7	38	82	176	380
Avenue 280	SR 99 – Akers	8,700	91%	68.2	63.6	38	81	175	377
Avenue 280 (Caldwell)	Akers – Shady	10,050	91%	68.8	64.3	41	89	193	415
Avenue 280 (Caldwell)	Shady – Fairway	10,000	91%	68.8	64.2	41	89	192	413
Avenue 280 (Caldwell)	Fairway - Lovers Lane	9,700	91%	68.6	64.1	41	87	188	405
Avenue 280	Lovers Lane – Virginia	10,000	91%	68.8	64.2	41	89	192	413
Avenue 280	Virginia - Farmersville Blvd.	8,700	91%	68.2	63.6	38	81	175	377
Avenue 280	Farmersville Blvd. – Brundage	4,540	91%	63.2	58.7	18	38	82	176
Avenue 280	Brundage - Beverly Place	11,600	91%	67.3	62.8	33	71	153	329
Avenue 280	Beverly Place – Filbert	13,800	91%	68.0	63.5	37	80	172	370
Avenue 280	G Street – Kaweah	5,900	91%	64.3	59.8	21	45	97	210
Pine Street	G Street – Kaweah	3,240	91%	61.7	57.2	14	30	65	141
Avenue 304	SR 99 - Road 76	3,100	89%	65.0	60.5	23	50	108	232
Avenue 304 (Goshen)	Road 76 - Road 80	6,980	89%	68.5	64.0	40	86	185	399
Avenue 304 (Goshen)	Road 80 – Shirk	8,130	89%	69.2	64.7	44	95	205	442
Avenue 304 (Goshen)	Shirk – Giddings	9,400	89%	6.4	1.9	0	0	0	0
Avenue 304 (Murray)	Giddings – Locust	12,500	89%	69.2	64.7	44	95	205	441
Avenue 312 (Riggin)	Road 80 - SR 63	2,400	89%	63.0	58.5	17	37	79	170
Avenue 328	SR 99 - SR 63	2,130	92%	61.8	57.3	14	31	66	142
Avenue 328	SR 63 - Road 132	4,870	92%	65.4	60.9	25	53	115	247
Avenue 328	Road 132 - SR 216	5,020	92%	65.5	61.0	25	54	117	252
Avenue 384	SR 99 - Road 80	2,960	89%	64.8	60.3	23	49	105	225
Avenue 384	Road 80 - SR 63	3,530	89%	65.6	61.1	25	55	118	253
Avenue 416	Fresno Co. Line - Road 72	9,830	90%	68.9	64.4	42	91	196	422
Avenue 416 (El Monte)	Road 72 – Euclid	7,900	90%	67.9	63.4	36	79	169	365
Avenue 416 (El Monte)	Euclid – Nichols	8,400	90%	66.1	61.6	27	59	127	274
Avenue 416 (El Monte)	Nichols – Perry	5,800	90%	64.5	60.0	21	46	100	214
Avenue 416 (El Monte)	Perry - Road 92	15,100	90%	70.8	66.2	56	121	261	562

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
Avenue 416	Road 92 - Road 120	7,760	90%	67.9	63.4	36	78	167	361
Avenue 416	Road 120 - SR 63	8,000	90%	68.0	63.5	37	79	171	368
Avenue 416/Boyd Dr	SR 63 - SR 245	850	90%	58.3	53.7	8	18	38	83
Road 56	Avenue 384 - Fresno Co. Line	3,871	88%	66.2	61.6	28	60	129	277
Road 68	SR 99 - SR 198	4,000	88%	65.4	60.9	25	53	114	246
Road 68	SR 198 - SR 137	1,828	88%	62.0	57.5	15	31	68	146
Road 80	Avenue 384 – Goshen	7,700	89%	68.0	63.5	37	80	172	370
Road 80 (Plaza)	Goshen - Neeley Street	15,600	89%	71.1	66.6	59	128	275	592
Road 80 (Plaza)	Neeley Street - SR 198	12,610	89%	70.2	65.7	51	111	239	514
Road 92	Avenue 320 - Avenue 280	8,600	83%	69.6	65.0	47	101	217	467
Road 92	Avenue. 280 - SR 198	4,460	83%	66.7	62.2	30	65	140	302
Road 92	SR 198 - Avenue 320	8,400	83%	69.5	64.9	46	99	214	460
Road 96	SR 137 - Avenue 96	1,660	89%	61.4	56.9	13	29	62	133
Road 108 (Demaree)	Avenue 328 – Goshen	2,050	91%	61.9	57.4	14	31	67	144
Road 108 (Demaree)	Goshen - SR 198	3,650	91%	62.3	57.7	15	33	71	152
Road 108 (Demaree)	SR 198 – Walnut	3,890	91%	62.5	58.0	16	34	74	159
Road 108 (Demaree)	Walnut – Caldwell	15,800	91%	68.6	64.1	40	87	188	405
Road 108	Caldwell – Cartmill	11,920	91%	69.5	65.0	46	100	216	465
Road 108 (Hillman)	Cartmill – Leland	8,900	91%	68.3	63.7	38	82	178	382
Road 108 (Hillman)	Leland – Prosperity	9,300	91%	68.4	63.9	39	85	183	394
Road 132	SR 201 - Avenue 328	3,640	92%	64.1	59.6	20	44	95	204
Road 132	Avenue 328 - Street John's Pkwy	5,700	92%	66.1	61.6	27	59	127	275
Road 132 (Ben Maddox)	Street. John's Pkwy – Houston	11,340	92%	69.1	64.6	43	94	202	434
Road 132 (Ben Maddox)	Houston - SR 198	18,660	92%	71.2	66.7	61	130	281	606
Road 140	SR 216 - SR 198	17,900	89%	69.6	65.1	47	101	218	469
Road 140 (Lovers Lane)	SR 198 – Caldwell	6,800	89%	65.4	60.9	25	53	114	246
Road 140	Caldwell - Avenue 272	7,900	89%	66.0	61.5	27	59	126	272
Road 140	Caldwell - SR 137	8,650	89%	66.4	61.9	29	62	134	289
Road 152	SR 137 - Avenue 192	3,800	89%	65.0	60.5	23	50	107	231
Road 152	Avenue 192 - SR 190	2,010	89%	62.2	57.7	15	33	70	151
Road 152	SR 190 - Avenue 96	1,700	89%	61.5	57.0	14	29	63	135
Road 160	Avenue 56 - Kern Co. Line	1,600	89%	61.2	56.7	13	28	60	130
Road 164 (Farmersville Blvd)	SR 198 – Walnut	7,650	89%	68.0	63.5	37	79	171	368
Road 164 (Farmersville	Walnut - Visalia Road	7,290	89%	67.8	63.3	36	77	166	357

Table 8-9. Traffic and Noise Level Data, State Routes and Major Roads, Tulare County, California

Roadway & Timeframe	Location	ADT	% Day	Ldn (dBA) @ 50 Feet	Ldn (dBA) @ 100 Feet	From Roadway Centerline			
						Distance (feet) to 70 Ldn Contour	Distance (feet) to 65 Ldn Contour	Distance (feet) to 60 Ldn Contour	Distance (feet) to 55 Ldn Contour
Blvd)									
Road 164 / Road 168	Visalia Road - SR 137	5,470	89%	66.6	62.0	29	63	137	295
Road 192	Avenue 196 - Avenue 152	1,516	90%	60.8	56.3	12	26	56	121
Road 192	Avenue 152 - Avenue 56	2,450	90%	62.9	58.3	17	36	78	167
Road 196	SR 216 - SR 198	3,970	91%	64.7	60.2	22	48	104	223
Road 204	SR 198 - SR 65	8,030	87%	68.6	64.1	40	87	187	403
Road 216/ Avenue 272	Avenue 232 - M296	1,000	89%	59.2	54.7	9	20	44	95
Mooney Blvd	SR 137 - Laspina in Tulare	5,570	93%	65.8	61.2	26	56	121	261
Main Street (Porterville)	SR 190 – Olive	11,100	94%	66.4	61.9	29	62	133	287
Main Street	Olive – Morton	8,670	94%	65.3	60.8	24	52	113	244
Main Street	Morton – Henderson	7,980	94%	65.0	60.4	23	50	107	231
Main Street	Henderson – Grand	6,800	94%	64.3	59.7	21	45	96	207
Mirage	Hermosa – Lindmore	3,000	89%	61.8	57.3	14	31	66	142
Diagonal 242 (Orangebelt)	Avenue 220 - Avenue 196	4,850	89%	66.0	61.5	27	59	126	272
Diagonal 242 (Orangebelt)	Avenue 196 - Avenue 194	5,800	89%	66.8	62.3	31	66	142	306
Diagonal 242 (Orangebelt)	Avenue 194 – Grand	4,750	89%	65.9	61.4	27	58	124	268
Road 256/Diagonal 252/Plano	Avenue 196 - SR 190	3,590	89%	64.7	60.2	22	48	103	222
Road 264	Avenue 95 - Avenue 56	170	89%	51.5	47.0	3	6	14	29
Reservation Road	Worth Road - Tule R. Res. Border	2,300	89%	62.8	58.3	17	36	77	165
Plano/Avenue 116/M109	SR 190 - Avenue 56	10,000	89%	69.2	64.7	44	95	204	440
Yokohl Valley Road	State Rote 198 - Balch Park	470	89%	55.9	51.4	6	12	27	57
Avenue 304	Kings Co. Line - SR 99	6,000	89%	67.0	62.4	31	67	145	313

Union Pacific Railroad

Mainline operations on the Union Pacific Railroad in Tulare County affect the City of Tulare and a number of small communities and rural residential uses. According to the Trainmaster's office in Fresno, there are more than 20 freight train operations per day in the Tulare County Area. Passenger trains presently do not operate on Union Pacific tracks in Tulare County. Train speeds on the mainline are generally 45-65 mph and train movements may occur at any time during the night or day. According to the Wyle methodology, the above-described type and frequency of operation results in noise exposures of 65 and 60 dB Ldn at approximately 335 and 660 feet, respectively, from the center of the tracks for present operations, and at approximately 440 and 800 feet, respectively, from the center of the tracks for estimated future operations. Noise levels in the vicinity of grade crossings are somewhat higher than this due to the use of the warning horn.

Branch line operations on the Union Pacific Railroad in western Tulare County only affect small communities and rural residential uses within the county. Branch line operations presently occur 3 times per week. Their movements may occur at any time of the day or night. Speeds are restricted to a maximum of 40 mph. Measurements conducted on Union Pacific branch line operations in the Visalia area resulted in maximum levels at 100 feet ranging from 92-105 dBA with the use of the horn. SEL's at the same distance ranged from 99.8 to 106.7 dB.

Tracks also go from Visalia to Huron. These tracks have been recently improved and potentially could have passenger service connecting Hanford and Visalia, which in turn would serve as a link to provide access to future high-speed rail service.

San Joaquin Valley Railroad

The San Joaquin Valley Railroad (SJVR), headquartered in Exeter, California, is a collection of Class I branch lines. The SJVR began service on January 2, 1992 with 50 miles of track, 25 customers and 20 employees. Today, SJVR operates over 312 miles of track, with 75 employees and 240 customers. The SJVR runs between Fresno and Bakersfield, California. No information is available on cumulative noise exposure, although, the SJVR could have significant short-term impacts near grade crossings during individual train movements.

Airport Noise

Airport noise data was based on the Noise Element of the Tulare County General Plan, adopted February 1988. The seven (7) public use airports in Tulare County were evaluated to determine where existing or potential future noise-related land use conflicts may occur. The evaluations included interviews with airport management or fixed base operators (FBO's), a field survey of airport facilities, operations and surrounding land uses, and noise monitoring to document noise levels from individual aircraft operations. Noise exposure contours in terms of CNEL were prepared for the airports in instances where the number and type of operations would be expected to result in a 60 dB CNEL contour extending beyond the airport property. Noise contour maps for these airports were prepared based upon annual average operations.

The Integrated Noise Model (INM), developed by the Federal Aviation Administration, calculates aircraft noise exposure by mathematically combining aircraft noise levels and airport operational factors at a series of points within a Cartesian coordinate system which defines the location of airport runways and aircraft flight tracks. All IFR and VFR flight tracks, reportedly used with any regularity, were considered in the noise modeling process. User inputs to the INM include the following:

- Runway configuration;
- Aircraft flight track definition;
- Aircraft stage length (where applicable);
- Aircraft approach profiles; and
- Aircraft traffic volume and fleet mix.

The INM database contains aircraft performance and noise level data that is representative of most of the commercial and general aviation aircraft fleet and some of the military aircraft fleet. The smaller general aviation aircraft types are grouped by the INM data base into a composite single engine propeller class (COMSEP) and a composite twin engine propeller class (COMTEP).

The 60 dB CNEL contour for annual average operations at most Tulare County airports is located relatively close to the runway due to relatively low numbers of operations and an aircraft fleet consisting primarily of smaller propeller aircraft. However, it should be noted that maximum noise levels from individual operations by high performance single and twin engine aircraft, aerial application aircraft, fire suppression aircraft and some corporate jets may be expected to result in significant short

term noise impacts for persons located near the approach, departure or local training patterns of an airport.

Visalia Municipal Airport

The Visalia Municipal Airport is the only airport in Tulare County that has scheduled airline service. The airport is classified as a "General Transport" facility and consists of a single 6,559' x 150' runway with a NW-SE (30-12) orientation. There are six Fixed Base Operators (FBOs) engaged in instruction, charter service and aircraft maintenance and service at the airport and 142 based aircraft. Commuter airline service is presently provided by Great Lakes Airlines.

The majority of aircraft operations (approximately 90%) occur to the northwest on Runway 30. Aircraft operations by time of day are broken down into approximately 75% during the day (7:00 a.m. - 7:00 p.m.), approximately 15% during the evening (7:00 p.m. - 10:00 p.m.) and approximately 10% during the nighttime hours (10:00 p.m. - 7:00 a.m.). Noise contours previously prepared for the airport were done in terms of the Composite Noise Rating (CNR) scale as part of the previous Master Plan (1973). The 60 and 65 dB CNEL contours for existing operations were prepared using the FAA's Integrated Noise Model (INM-Version 3.8) with inputs based upon aircraft activity information with aircraft assigned to the flight paths most frequently flown by pilots using the airport facility. At the present time, off-airport land uses in the Visalia Municipal Airport environs are generally compatible with airport uses.

Since operations at the airport are expected to increase in the future, and there is the possibility of more frequent use by larger air carrier and corporate jet aircraft, it is important that proposed developments of noise sensitive land uses in the vicinity of the airport be carefully considered by the City of Visalia and the County of Tulare.

Porterville Municipal Airport

Porterville Municipal Airport is owned by the City of Porterville. The primary runway (30-12) is 6,000 feet long. A 4,000-foot cross-wind runway (25-7) is designated as abandoned by the City of Porterville Airport Master Plan. Flight schools and aircraft charter FBO's and a California Department of Forestry (CDF) and Fire Prevention operation are located at the airport. During the fire season 3 to 6 fire suppression aircraft may be based at the field. In addition to operations provided by based aircraft, transient corporate jets commonly use the field. On a typical busy day 5 or 6 of these jets may use the field. Approximately

70% of airport operations occur on Runway 30. About 75% of operations at the airport occur during the daytime hours (7:00 a.m. - 7:00 p.m.), 20% during the evening hours (7:00 p.m. - 10:00 p.m.) and 5% during the nighttime hours (10:00 p.m. - 7:00 a.m.). A standard left hand pattern is used on runway 30-12. Land uses adjacent to the airport include agricultural, commercial, industrial and recreational uses. Based on reported operational information, 60 and 65 dB CNEL contours were prepared for existing annual average operations at the airport.

Tulare Municipal Airport (Mefford Field)

Mefford Field is owned and managed by the City of Tulare. The one runway at the airport is 3,900 feet long. It is estimated that about 70% of airport operations occur to the northwest on Runway 31. It is also estimated that about 70% of aircraft use the airport during the daytime hours (7:00 a.m. to 7:00 p.m.), 25% during the evening hours (7:00 p.m. to 10:00 p.m.) and 5% during the nighttime hours (10:00 p.m. to 7:00 a.m.) Land uses located to the east of the airport include the Tulare Country Club and golf course. The Elk Bayou Park is located south of the airport. Commercial uses border the north and west sides of the airport along SR 99. The 1972 Master Plan for the airport included a noise contour map in terms of the Noise Exposure Forecast (NEF) scale. 60 and 65 dB CNEL contours were prepared for airport operations.

Woodlake Airport

The Woodlake Airport is owned and managed by the City of Woodlake. The one runway at the airport is 3,355 feet long. It is estimated that departing and landing aircraft use Runway 25, 90% of the time and Runway 7 the remainder of the time. Most aircraft use a standard left hand pattern in departing or landing at the airport. About 95% of aircraft operations occur during the daytime hours. The airport is generally surrounded by agricultural land uses with the exception of some residential uses to the east along the river.

Sequoia Field

Sequoia Field is owned by the county of Tulare and managed by one of the fixed-base operators. The single airport runway is 3,020 feet long by 60 feet wide. Operations occur between 7:00 a.m. and 7:00 p.m. approximately 70% of the time, between 7:00 p.m. and 10:00 p.m. approximately 10% of the time, and between 10:00 p.m. and 7:00 a.m. approximately 20% of the time. Maximum noise levels from such departures and also from departures by aerial application aircraft could be expected to result in significant short-term noise impacts in areas

located near the airport. Land uses in the vicinity of the airport include agricultural uses, scattered residential uses, and a Tulare County detention facility. Several homes are located near established flight corridors in the vicinity of the airport (west of Rd. 112). Local pilots attempt to avoid existing homes, but future development could result in noise-related land use conflicts, especially if airport operations increase significantly in the future.

Eckert Field

Eckert Field is privately owned and managed, but is open for public use. The one runway at the airport is 2,050 feet long including the overrun. The airport owner estimates that there are approximately 7,000 annual operations at the airfield. About 90% or more of general aviation aircraft operations occur during the daytime hours. A standard left hand pattern is used by most pilots at the airport. Eckert Field is surrounded by citrus groves.

Thunderhawk Field

Thunderhawk Field is a privately owned and maintained facility. The field contains a single runway that is 2,400 feet long and 50 feet wide. Surrounding land uses are mostly agricultural, with the exception of some scattered residential uses. Due to the number and type of aircraft at the facility, the 60 dB CNEL noise contour does not extend beyond the airport property.

Stationary Noise Sources

Noise is an inevitable part of many industrial, commercial, and agricultural processes, even when the best available noise control technology is applied. Noise production within an industrial, commercial or agricultural facility is controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise emissions from such operations have a potential to exceed locally acceptable standards at noise-sensitive land uses.

From a land use planning perspective, noise control issues focus upon two objectives: to prevent the introduction of new noise generating uses in a noise sensitive area, and to prevent encroachment of noise sensitive uses upon existing noise generating facilities. The first objective can be achieved by applying noise performance standards to proposed new noise generating uses. The second objective can be met by requiring that new noise-sensitive uses in proximity to existing noise generating

facilities include mitigation measures to ensure compliance with noise performance standards.

The spread of noise is dependent on atmospheric conditions. Atmospheric turbulence, temperature, humidity, and other conditions, which change from day to night and season to season, will result in noise level fluctuations. This phenomenon is most apparent at distances greater than a few hundred feet from a noise source. Since many noise-sensitive receiver locations in Tulare County are ½ mile or more from noise sources, it is probable that noise level measurements conducted in different seasons and under different atmospheric conditions will produce different results.

The following descriptions of existing industrial and other major noise sources in Tulare County are intended to be representative of the relative noise impacts of such uses, and to identify specific noise sources which should be considered in the review of development proposals in their environs. This is not a comprehensive listing of all noise generating uses, but rather an overview of the major ones.

Manufacturing Plants

Gang Nail Truss Company. This business manufactures trusses for the building trade and is located at the corner of Goshen Avenue and Shirk Road in Visalia. The plant typically operates from 8:00 a.m. to 10:00 p.m. The major noise producing equipment at the plant are nail machines and component cutter saws. Noise levels measured from the nail machine on October 29, 1986 ranged from 65-70 dBA at 50 feet.

Noise levels from the saw at 100 feet ranged from 69-71 dBA. Since the saw and nail machine operate intermittently, the 60 dB L_{dn} noise contour would be expected to be confined to within the company property. Surrounding land uses are industrial.

Ruiz Food Products, Inc. Ruiz Food Products, Inc. is located at 501 S. Alta Avenue in Dinuba. The firm processes Mexican-style foods. The main noise producing equipment at the plant are an ammonia compressor on the south side of the facility, a refrigeration compressor on the north-east corner of the building and refrigerated truck trailers (reefers) on the west end of the building. The plant operates 18 hours a day, but plant equipment runs 24 hours a day. At the former Tulare plant, noise measurements on September 12, 1985, at a distance of 25 feet from the ammonia compressor produced a constant level of 84 dBA. Measurements on October 15, 1986, at 50 feet from the refrigeration

compressor produced a level of 67-68 dBA, and at 50 feet from the reefers, the level was a constant 73 dBA. Based upon these levels and the reported hours of operation, the generalized 60 dB L_{dn} contour would be located approximately 250 feet from the plant. Residential land uses are located to the east of the plant, and commercial uses to the south of the plant.

Advanced Food Products. Advanced Food Products, formerly, Real Fresh, Inc., is located at 1211 E. Noble in Visalia and prepares sterilized food products. The plant operates Monday through Friday, 24 hours a day. The main noise sources in the plant are boilers and the conveyor system. Noise level measurements at a distance of approximately 100 feet east of the plant on October 31, 1985 resulted in levels of about 62-63 dBA. At the closest residential interface to the plant, about 300 feet to the west, the measured noise level ranged from 52-53 dBA.

Dairyman's Land O' Lakes Cooperative Creamery. Located at 400 south "M" Street in Tulare, Dairyman's Cooperative Creamery processes fresh milk into a number of dairy products. The major noise producing equipment, which operate almost constantly, are boilers, blowers, evaporators, cooling towers, compressors, fans, product elevators and a natural gas-fired cogeneration engine. Two diesel engines that are used as standby electrical generators are tested each week. The plant operates 24 hours a day, 7 days a week, 365 days a year.

Additionally, about 120-140 trucks enter and leave the plant daily. Noise levels on three sides of the plant were measured on January 6, 1987. On the north side of the plant, about 160 feet from cooling towers, evaporators and the cogeneration engine, the noise level was a steady 64 dBA. On the east property line of the plant, noise from air conditioning compressors was a steady 57 dBA. On the south side of the plant, adjacent to the County Fairgrounds, the level was 61-62 dBA. The noise source at this location was steam from a still evaporator.

Mixed residential and commercial land uses abut the plant on its north and east sides, and the County Fairgrounds are south of the plant. Commercial and industrial land uses are located to the west of the plant. The City of Tulare should carefully review proposals that could result in the placement of noise sensitive land uses near the creamery.

Sequoia Walnut Growers Association. On October 15, 1986, noise level data was collected at the Sequoia Walnut Growers Association facility at Ben Maddox Road and Goshen Avenue in Visalia. The dominant noise sources at the Sequoia Walnut Growers Association plant are a metal

conveyor belt and escaping steam. At a distance of 100 feet from the north side of the building, noise levels ranged from 68-69 dBA. The plant operates from 8:00 a.m. to 5:00 p.m. for approximately 6 weeks a year. The plant is currently surrounded by industrial uses.

Visalia Citrus Packers. The Visalia Citrus Packaging Group facility is located at the corner of Race and Tipton Streets in the City of Visalia. The plant generally packs oranges from 8:00 a.m. to 5:00 p.m. May through November. Shipping and receiving generally occurs 24 hours a day. Noise sources associated with the business are forklifts, slow moving and idling, and a refrigeration unit located on the east side of the fruit receiving building. The equipment located within the building is not audible on the outside. At a residential location on Tipton Street opposite the fruit receiving building, noise levels from propane fork lifts moving bins of fruit ranged from 62-72 dBA. At a distance of 50 feet from an idling truck, the noise level was a constant 71 dBA.

The refrigeration unit was not operating at the time. Based on the reported operating hours and noise levels recorded on January 16, 1987, it is not expected that the 60 dB Ldn contour would extend beyond the property boundary. When the refrigeration unit on the east side of the fruit receiving building operates, which is reported to occur about 30 days a year, noise impacts on the east side of the plant are likely to be greater than observed during the survey.

Kaweah Citrus Association. Kaweah Citrus Association is a citrus packing house located southwest of Lemon Cove on Road 236. The packing house operates approximately 10 months out of the year (November through September) from 7:00 a.m. to 5:00 a.m. 5-6 days per week. Major noise sources outside the building are refrigeration equipment and compressors associated with the cold storage facility, bin dumping equipment, forklift movements around the plant and truck loading activities. Truck loading occurs between 7:00 a.m. and midnight. All processing and packing equipment is located inside the building. Measurements conducted on January 12, 1987 indicated that noise levels from refrigeration units and compressors on the south side of the cold storage building are approximately 66-68 dBA at 100 feet. At approximately 300 feet from the bin dumping area, noise levels from the open door of the packing house and from bin dumping and stacking activities ranged from 54-55 dBA. At 100 feet from an idling diesel truck in the loading area, the noise level was 60 dBA. Based upon the above-described hours of operation and noise level data, the 60 dB L_{dn} contour is confined to the property with the exception of the south and east side of the building where the contour extends across the railroad tracks to a

distance of approximately 475 feet from the center of the location of the refrigeration equipment.

The packing house is presently surrounded by agriculture and a few scattered residential land uses.

Sierra View Hospital, Porterville. The Sierra View Hospital is located at the intersection of Putnam Avenue and Jaye Street in the City of Porterville. According to the Director of Plant Operations, the primary noise sources associated with the hospital are air conditioning equipment located on the southern end of the hospital and sirens from approaching ambulances. According to hospital policy, ambulances turn off sirens one block from the hospital. Noise measurements of the air conditioning system were made at the southern property line of the hospital on January 6, 1987. Based on these measurements, the 60 dB Ldn contour is not expected to extend beyond the hospital property line. Since heavier loads are imposed on the air conditioning system in the summer, higher noise levels may result from that equipment during that time.

Tulare County Landfill, Road 80, Visalia. Noise monitoring of a solid waste landfill operated by the Tulare County Public Works Department near Road 80 and Avenue 328 was conducted January 6, 1987. More than 1100 refuse trucks use the landfill each month. According to the County Public Works Department, this is the largest landfill in the county. The chief noise sources associated with the landfill are trucks and automobiles entering and leaving the landfill, and the heavy equipment used to manage and cover the refuse. The dominant noise sources were an Ingersoll-Rand Model 750 Landfill compactor and a Caterpillar D-7 dozer, which were operating on the working face of the landfill. At a distance of about 300 feet from this equipment, noise levels ranged from 63-68 dBA. Noise from refuse trucks and other vehicles in the landfill was not perceptible while this equipment was operating.

The posted operating hours of the landfill are 8:00 a.m. to 4:00 p.m., 7 days a week, year-round. Assuming that most of the heavy equipment activity takes place near the central part of the landfill, it is not expected that the 60 dB L_{dn} contour would extend beyond its boundaries.

Electric Pumps on Water Wells. Noise level measurements of two water wells powered by 50 horsepower electric motors were conducted by BBA on October 14, 1986. The wells were located on East and West Ash Avenues in the City of Farmersville. At a distance of 25 feet from the well at East Ash Avenue the noise level was a steady 57 dBA. When air

was being released from the pressure tank the combined noise level from the motor and air release was 69 dBA. At a distance of approximately 60 feet from the well on West Ash Avenue the noise level was 57 dBA. According to the City of Farmersville Public Works Department, the pump operates an average of 20 minutes per hour throughout the year. The distance to the 60 dB L_{dn} contour for the East and West Ash Avenue pumps is 83 and 41 feet, respectively.

Electric Storm Water Lift Pumps. Noise levels from the 5 horsepower storm water lift pump located on the corner of Front Street and Linnel Avenue in the City of Farmersville, were measured on October 14, 1986. At a distance of 25 feet from the pump, the level was 69 dBA. Since the pump runs sporadically, cumulative noise exposure as defined by L_{dn} for this source would be insignificant for persons located closer than approximately 100 feet from the pump. However, noise levels would be potentially annoying in these areas while the pump is operating.

Outdoor Recreational Complexes. Noise levels have been found to vary significantly depending on what activities are taking place during the game. Maximum noise levels have ranged from 65 to 70 dBA at a distance of approximately 200 feet from a softball diamond due to yelling and clapping by players and spectators.

Due to the sporadic nature of activities at most outdoor recreational complexes, cumulative noise exposure as defined by L_{dn} is usually insignificant. However, the potential for annoyance does exist depending on the time of day (typically the evening hours) such facilities are used. Steps should be taken to avoid the development of nearby noise sensitive land uses without appropriate receiver based mitigation.

Sand and Gravel Extraction and Processing

Kaweah River Rock Company, Inc. The Kaweah River Rock sand and gravel extraction and processing operation is located southeast of Woodlake. The plant generally operates 18 hours per day, 5 days per week. The plant occasionally operates 24-hours per day and on Saturdays. Excavation equipment consists of backhoes, graders, loaders, a drag line and off-road haul trucks. At any one time, it is common to have the drag line, backhoe or one of the loaders working in conjunction with the off-road haul trucks.

Noise levels at 700 feet from such an excavation operation using a CAT992A loader and 2 CAT 769B trucks on January 12, 1987, ranged from 47.5 to 66.5 dBA with an L_{eq} of 61 dBA. At 1,200 feet, the same

operation generated noise levels of 46-61 dBA with an L_{eq} of 55 dBA. The processing area of the operation contains 3 crushing and/or screening plants that are used to produce certain products. On January 12, 1986, the processing plant containing one jaw crusher, one cone crusher and four screens were in operation. At 200 feet, the plant produced noise levels of approximately 77 dBA. The CAT 988B loader working around the processing plant generated noise levels of 75-80 dBA at 150 feet.

Agricultural Operations

Wind Machines. Wind machines are found throughout the citrus-growing areas of Tulare County and in some areas where tree fruit, nuts and vegetables are grown. The machines are generally operated during the late night and early morning hours during the colder nights of the year, although they are test-run at other times. There are a number of different types of wind machines. Most of them have the engine on the ground (referred to as "ground power") although some have the engine (or electric motor) on top of the tower. Blades are generally 14 to 20 feet in diameter. Engines may use gasoline, diesel or propane. Noise measurements were conducted for a typical ground power wind machine with an internal combustion engine and for a typical electric wind machine with the motor on top of the tower. The ground power wind machine was a National Frost 391 GP with a gasoline fueled 391 cu./in. Ford V-8 engine and an 18' 6" blade. Measurements were conducted at 50 feet and 350 feet from the base of the tower. At 50 feet, noise levels were dominated by the unmuffled engine, and were a constant 91-92 dBA regardless of the position of the blade. At 350 feet, noise levels were caused by a combination of the engine and the blade, and ranged from 61 to 71 dBA depending upon the orientation of the blade. The highest levels occurred when the blade was facing the microphone.

According to the wind machine owner, this particular machine is typical of approximately 90 percent of the wind machines in the area. The electric wind machine had a 75 horsepower motor mounted on top of the tower and a blade of approximately 14 feet in diameter. At 50 feet, noise levels were dominated by the blade and ranged from 73 to 87 dBA depending upon blade orientation. At 350 feet, noise levels were also dominated by the blade and ranged from 56 to 67 dBA.

During periods of wind machine use, there may be many machines in simultaneous operation. The average number of wind machines for a properly-protected orchard is one for each ten acres.

Diesel Engines on Wells. Diesel or gasoline pumps produce noise levels of approximately 75-85 dBA at 50 feet if properly muffled. Unmuffled engines can be significantly louder. Cumulative noise exposure as defined by L_{dn} would depend on how many hours a day the engine is operated. For an engine which produced 80 dBA at 50 feet, the distance to the 60 dB L_{dn} contour would be approximately 1000 feet if the pump operated 24 hours per day. For this reason, such stationary diesel or gasoline powered engines may be a significant source of noise on agricultural wells if there are nearby noise sensitive land uses.

Aerial Application Aircraft (Crop Dusters). Aerial application aircraft are frequently used to spray crops or to spread seed or fertilizers. There are many types of fixed or rotary wing aircraft used for aerial application including aircraft with reciprocating, radial and turbine engines and 2 or 3 bladed propellers. Horsepower ratings generally range from 300 to 1200. Most of the noise impacts generated by aerial application aircraft occur as the result of propeller noise and the low altitude that the aircraft typically fly. Noise level measurements in Tulare County and elsewhere have shown that the noisiest designs are the medium to high horsepower engines with two-bladed propellers. Most of the highest horsepower engines utilize a three-bladed propeller, which is significantly quieter due to lower tip speed. Measurements conducted east of Pixley on October 17, 1986, of a Piper Brave (400 hp/ 3-bladed propeller) indicated that noise levels from this aircraft while applying cotton defoliant ranged from 85-88 dBA at about 600 feet to 97-100 dBA at 50 feet.

Measurements on January 16, 1987 at the Tulare Municipal Airport indicated that maximum noise levels from an 800 hp Turbine Thrush with a 3-bladed propeller range from 90-95 dBA at approximately 100 feet overhead. As noted in the sections addressing individual airports in this document, single event maximum noise levels for aerial application aircraft can be very significant in areas near airports where these aircraft are frequently operated.

Miscellaneous Farming Operations. Farming operations are common throughout Tulare County with the exception of some mountainous areas and heavily developed areas within larger communities. Some of the more common noise sources associated with farming operations include tractors, harvesting equipment and spray equipment. In order to document noise levels generated by such equipment, noise levels were measured at various locations throughout the county. Examples of measured levels include a cotton picker operating at roughly 500 feet away, which produced a noise level of 58 dBA. A larger diesel-powered

wheel tractor pulling a 20-foot disk generated levels of 72-75 dBA at approximately 150 feet. An International 574 diesel-powered wheel tractor (smaller than the above) pulling a furrowing appliance generated levels of 69-79 dBA at approximately 50 feet. Also measured were a Randall weed sprayer with a National one cylinder diesel engine which produced 74-75 dBA at 50 feet, an FMC Bean 267 engine-driven speed sprayer (345C.i.V8) which produced 92-97 dBA at 50 feet depending upon orientation, and an Aerofan 391 speed sprayer which generated 74-76 dBA at 100-300 feet.

The above-described levels do not include all types of farm equipment, but do present a range of levels that may be expected. A good general rule-of-thumb is that a diesel engine will produce noise levels of 75-85 dBA at approximately 50 feet. Although farming operations occasionally generate significant noise levels, such levels generally do not last more than a few hours at a given location unless a stationary piece of equipment such as a pump master (or engine) is involved. For this reason, significant cumulative noise exposure as defined by L_{dn} would not generally be expected to result from typical farming operations within Tulare County.

Special Interest Noise Sources

Fast Food Loudspeakers. Noise levels from several fast food loudspeakers were measured on October 14, 1986. An attempt was made to position the sound level meter microphone directly in front of the speakers. Unavoidably, the noise level data included idling automobile engines. Table 8-10 provides a range of the noise levels measured during the survey.

Table 8-10. Fast Food Loudspeaker Noise Data

Location *	Noise Level
McDonalds, Mooney Blvd. – Visalia	60-62 dBA
Wendy's, Mooney Blvd. - Visalia	72-77 dBA
Kentucky Fried Chicken, Prosperity Ave. – Tulare	62-65 dBA
Burger King, Prosperity Ave. – Tulare	61-63 dBA

* Measured at 25 feet from loudspeaker
Source: Brown-Buntin Associates Inc. (1986).

Truck Stops. The truck stop surveyed is located east of SR 99 about 1/2 mile south of Merritt Drive in Traver. It consists of a 7-bay service station, laundromat, shower and restaurant. Noise level measurements approximately 100 feet from three idling and slowly moving trucks in the service station ranged from 61-67 dBA with a L_{eq} of 63.3 dB. It should

be noted that since most truck stops are located close to busy freeways, the predominant noise source as measured at or near the truck stop will be produced by freeway traffic, not by trucks within the truck stop.

Wood Cutting. Noise generated by wood cutting activities is primarily caused by chainsaws. Noise may also be generated by wood splitting machines which are hydraulic rams powered by a small gasoline engine similar to what is typically found on a lawn mower. Noise levels generated by typical wood cutting activities were evaluated by measuring noise levels from a chainsaw which was being used to cut sections of wood approximately 10 inches in diameter. At 25 feet, the saw produced noise levels ranging from 85 to 92 dBA depending upon orientation of the saw and load on the engine.

At 50 feet, the saw produced noise levels of 75 to 84 dBA depending upon the same factors. It should be noted that the frequency content of the noise generated by most chainsaws is quite annoying to most persons due to the sensitivity of the ear to the range of sound that is produced by such saws.

Kennels. The Humane Society animal shelter located at Frontage Road 99 and Avenue 280 was selected as a site representative of a kennel. Noise level measurements around the shelter were conducted on October 14, 1986. Since the shelter is enclosed, some measurements were taken directly in front of opened doors to simulate an unenclosed kennel. At a distance of 50 feet from the kennel, noise levels from barking dogs ranged from 55-68 dBA with doors closed, and 65-79 dBA in front of open doors. As defined by Leq, the noise level at 50 feet from the enclosed building was 63.8 dBA and 71.4 dBA in front of the open doors.

Community Noise Survey

A community noise survey was conducted to document noise exposure in areas of the county containing noise-sensitive land uses. The following noise sensitive land uses have been identified within the county: all residential uses, schools, and long-term care medical facilities, such as hospitals, nursing homes, etc. A total of 70 monitoring sites were chosen as shown in Table 8-11.

Table 8-11. Summary of Community Noise Survey Data

Site #	Location/Community	Level, dBA						Estimated L_{dn}*
		L_D	L_N	L_{max}	Source	L_{min}	Source	
1	Sierra School - Badger	42 dB	23 dB	72 dB	truck	20 dB	wind	40 dB
2	Brent & Lindara - Dinuba	51 dB	44 dB	64 dB	children	36 dB	traffic	50 dB
3**	673 Newton - Dinuba	48 dB	42 dB	72 dB	aircraft	29 dB	traffic	50 dB
4	Ventura St. & College Ave - Dinuba	49 dB	39 dB	61 dB	traffic	37 dB	fans	49 dB
5	Vassar Ave. & Greene Ave - Dinuba	49 dB	45 dB	65 dB	traffic	37 dB	industry	52 dB
6	Lee Rd. & Ave. 467 - Cutler	49 dB	41 dB	63 dB	auto	35 dB	pump	50 dB
7	Kate Rd. & Ave 378 - Linden	53 dB	39 dB	69 dB	traffic	35 dB	pump	52 dB
8	St. Mary's Church, Ave 384 - Yettm	53 dB	36 dB	60 dB	traffic	32 dB	pump	51 dB
9**	37650 Millwood - Elderwood	49 dB	44 dB	79 dB	dog	25 dB	traffic	52 dB
10	Rd. 156 on Ave. 340 - Rural Ivanhoe	46 dB	30 dB	56 dB	traffic	27 dB	pump	45 dB
11	Redwood & Crestwood - Woodlake	46 dB	33 dB	63 dB	traffic	31 dB	traffic	45 dB
12	Cypress & Sequoia - Woodlake	53 dB	38 dB	69 dB	school bus	35 dB	traffic	52 dB
13	Miller Brown Comm. Park - Woodlake	50 dB	37 dB	64 dB	truck	32 dB	traffic	49 dB
14	Palm St. @ Ropes Ave. - Woodlake	52 dB	38 dB	64 dB	traffic	35 dB	traffic	51 dB
15	Eggers Dr., Library - Three Rivers	37 dB	32 dB	46 dB	bird	31 dB	water	40 dB
16**	42695 Sierra Dr. - Three Rivers	59 dB	59 dB	59 dB	river	59 dB	river	65 dB
17	Summie Ave & Rd. 244 - Lemon Cove	46 dB	34 dB	55 dB	traffic	30 dB	insects	45 dB
18	Hawthorne Rd. & Ave. 330 - Ivanhoe	52 dB	40 dB	71 dB	truck	37 dB	fans	51 dB
19	N. Visalia Community Center	54 dB	45 dB	65 dB	traffic	41 dB	traffic	54 dB
20	Golden West High School - Visalia	51 dB	36 dB	60 dB	aircraft	35 dB	traffic	50 dB
21	Turner & Center - Visalia	55 dB	41 dB	61 dB	truck	39 dB	auto	55 dB
22**	607 Woodland - Visalia	47 dB	40 dB	64 dB	traffic	28 dB	traffic	48 dB
23	Jefferson Park - Visalia	52 dB	40 dB	62 dB	traffic	28 dB	traffic	51 dB
24	Willow Glen School - Visalia	57 dB	41 dB	69 dB	truck	37 dB	traffic	56 dB
25	326 E. Monte Vista - Visalia	46 dB	34 dB	53 dB	traffic	33 dB	industry	45 dB
26	Victor St. & Jackie St. - Visalia	49 dB	40 dB	67 dB	traffic	37 dB	traffic	49 dB
27	Rd. 68 & Fig Ave. - Goshen	61 dB	57 dB	73 dB	traffic	55 dB	Fwy 99	64 dB
28	Hester Near Rose Ave. Farmersville	52 dB	41 dB	63 dB	traffic	40 dB	traffic	52 dB
29	N. End, Brundage Ave. - Farmersville	62 dB	41 dB	62 dB	skill saw	35 dB	dogs	60 dB
30	Jennings Park - Farmersville	49 dB	40 dB	64 dB	bus	37 dB	traffic	49 dB
31	Ventura & Fresno St. - Farmersville	55 dB	40 dB	65 dB	truck	37 dB	traffic	54 dB
32	W. End, Betsy Place - Exeter	47 dB	38 dB	60 dB	dog	31 dB	traffic	47 dB
33	Exeter High School - Exeter	58 dB	47 dB	73 dB	truck	43 dB	traffic	58 dB
34	Exeter Park - Exeter	55 dB	42 dB	71 dB	truck	37 dB	traffic	54 dB
35	Quince Ave & Davis St. - Exeter	50 dB	37 dB	64 dB	traffic	32 dB	traffic	49 dB
36**	18425 Ave. 264 - Exeter	55 dB	41 dB	73 dB	traffic	25 dB	traffic	54 dB
37	W. End, Washington Ave. - Tulare	47 dB	59 dB	62 dB	traffic	56 dB	Fwy 99	65 dB
38	Live Oak Park - Tulare	47 dB	54 dB	58 dB	traffic	51 dB	Fwy	60 dB
39**	798 Mahaleb - Tulare	49 dB	46 dB	86 dB	dog	26 dB	traffic	53 dB

Table 8-11. Summary of Community Noise Survey Data

Site #	Location/Community	Level, dBA						Estimated L_{dn}*
		L_D	L_N	L_{max}	Source	L_{min}	Source	
40	1040 Sycamore - Tulare	51 dB	50 dB	70 dB	dogs	40 dB	birds	57 dB
41	Mulcahy School - Tulare	54 dB	52 dB	65 dB	leaf blower	49 dB	traffic	59 dB
42	Hemlock St. & Aspen Ave. - Tulare	55 dB	58 dB	63 dB	truck	52 dB	Fwy 99	64 dB
43	Orange Ave. & Alameda St. - Lindsay	49 dB	42 dB	59 dB	traffic	42 dB	unknown	50 dB
44	Lindsay Hospital - Lindsay	46 dB	35 dB	59 dB	traffic	33 dB	fans	46 dB
45	Stanford Ave. & Samoa St. - Lindsay	45 dB	30 dB	60 dB	traffic	30 dB	traffic	44 dB
46	474 Central Ave. - Lindsay	52 dB	46 dB	60 dB	traffic	44 dB	olive plant	54 dB
47	Strathmore High School - Strathmore	56 dB	44 dB	69 dB	traffic	39 dB	equipment	55 dB
48	Rd. 292 S. of Ave. 176 - Strathmore	34 dB	26 dB	48 dB	birds	24 dB	substation	35 dB
49	Adams Rd. & Klindera Ave. - Tipton	54 dB	56 dB	62 dB	dog	47 dB	traffic	62 dB
50	S. end of Rd. 190 - Poplar	48 dB	48 dB	65 dB	rooster	38 dB	rooster	54 dB
51	LDS Church - Porterville	51 dB	47 dB	60 dB	truck	44 dB	traffic	54 dB
52	W. end, Sandra Lane - Porterville	49 dB	48 dB	55 dB	dogs	39 dB	traffic	48 dB
53	W. end, Olivewood - Porterville	54 dB	43 dB	65 dB	truck	39 dB	traffic	54 dB
54	Alley, Lindale & Lotas - Porterville	50 dB	46 dB	65 dB	auto	43 dB	traffic	53 dB
55	Olive Street School - Porterville	53 dB	50 dB	60 dB	voices	45 dB	dogs	57 dB
56**	173 Williams - Porterville	55 dB	46 dB	80 dB	dogs	29 dB	traffic	55 dB
57	West of Fire State - Springville	53 dB	38 dB	62 dB	traffic	37 dB	water	51 dB
58	La Colina @ Pleasant Oak - Springville	51 dB	33 dB	68 dB	motorcycle	31 dB	water	49 dB
59	Balch Park (lower lake) - Tulare Co.	31 dB	22 dB	53 dB	traffic	22 dB	unknown	31 dB
60**	Camp Nelson Realty, Camp Nelson	40 dB	32 dB	67 dB	traffic	25 dB	water	41 dB
61	Tamarach Dr. & Aspen Dr. - Ponderosa	42 dB	20 dB	55 dB	traffic	19 dB	unknown	40 dB
62**	Pixley Fire Station - Pixley	55 dB	57 dB	84 dB	truck	37 dB	Fwy 99	64 dB
63	Rd. 104 @ Ave. 72 - Earlimart/Pixley	47 dB	30 dB	55 dB	cotton picker	25 dB	unknown	46 dB
64**	Alpaugh Irrigation District - Alpaugh	53 dB	43 dB	80 dB	traffic	25 dB	traffic	53 dB
65	Earlimart Comm. Park - Earlimart	53 dB	54 dB	62 dB	auto	51 dB	traffic	60 dB
66	First Presbyterian Ch. - Terra Bella	52 dB	46 dB	59 dB	traffic	43 dB	traffic	54 dB
67	Olive Norwood School - Richgrove	49 dB	47 dB	58 dB	voices	43 dB	traffic	54 dB
68	Near town entrance - Johnsondale	36 dB	32 dB	50 dB	traffic	29 dB	water	39 dB
69	R.V. Park - Calif. Hot Springs	48 dB	43 dB	68 dB	logging truck	40 dB	running water	51 dB
70	Fire Station - Panorama Heights	28 dB	21 dB	40 dB	barking dogs	18 dB	insects	29 dB

LD = Average Leq of two 15-minute samples obtained between 7:00 a.m. and 10:00 p.m. except for sites marked with a ** where 24-hour monitoring was conducted.
LN = Leq for one 15-minute sample obtained between 10:00 p.m. and 7:00 a.m. except for sites marked with a ** where 24-hour monitoring was conducted.
* Ldn estimated from LD and LN

Source: Tulare County Planning and Development Department, 1988a.

A combination of short-term and continuous noise monitoring was used to document existing noise levels at these locations. Noise monitoring equipment used for short-term monitoring consisted of Bruel & Kjaer (B&K) Type 2218 and 2230 precision sound level meters equipped with Type 4165 and 4155'/x" microphones, respectively. Equipment used for continuous monitoring consisted of Larson-Davis Laboratories Model 820 environmental noise monitors equipped with B&K Type 4176 microphones. All measurement equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I sound level meters.

During the short term monitoring programs, noise levels were measured for approximately 15 minutes during each of the two periods of the day and 5 minutes during the night so that reasonable estimates of Ldn at the monitoring sites could be predicted.

The data collected during the short-term sampling program included the average noise level (Leq), maximum noise level (Lmax), minimum noise level (Lmin) and a description of noise sources that were audible at the monitoring sites. Continuous noise monitoring was conducted at 10 out of the 70 community noise survey sites to document fluctuations in noise levels over a typical 24-hour period.

Noise level data collected during continuous monitoring included the hourly Leq and Lmax and the statistical distribution of noise levels over each hour of the sample period. The community noise survey results indicate that typical noise levels in noise-sensitive areas of the unincorporated areas of Tulare County are in the range of 29-65 dB Ldn. As would be expected, the quietest areas are those that are removed from major transportation-related noise sources and industrial or stationary noise sources.

8.7 Climate Change

Introduction

In addition to the air quality concerns (identified in Chapter 6 "Air Quality and Climate Change") and water supply issues (identified in Chapter 10 "Natural Resources" associated with increases in greenhouse gases (GHGs), changing weather patterns associated with global climate change could also affect regional water supplies and the severity or intensity of existing flooding and/or wildland fire hazards in the County. Although these topics have previously been described (see Section 8.3

"Flood Hazards" and Section 8.4 "Fire Hazards") in this chapter, this section explores the relationship between global climate change and these public safety issues.

A complete list of key terms and a regulatory section related to climate change and GHGs is provided in Chapter 6, "Air Quality and Climate Change"

Methods

The information included in this section was obtained from various sources, including the California Climate Action Team. Additional information is based on printed reports and monitoring data from the California Climate Change Center, Department of Water Resources, California Energy Commission, and a few other sources. Most of the studies conducted on climate change issues are preliminary, incorporate several assumptions, and reflect a limited number of climate change scenarios.

Key Terms

The following key terms are used throughout this section to describe climate change and its related effects.

- **Anthropogenic.** Derived from human activities.
- **Evapotranspiration.** The sum of evaporation and plant transpiration. Potential evapotranspiration is the amount of water that could be evaporated or transpired at a given temperature and humidity, if there was plenty of water available. Actual evapotranspiration can not be any greater than precipitation, and will usually be less because some water will run off in rivers and flow to the oceans. If potential evapotranspiration is greater than actual precipitation, then soils are extremely dry at least a major part of the year.
- **General Circulation Models (GCM).** A global, three-dimensional computer model of the climate system which can be used to simulate human-induced climate change. GCMs are highly complex and they represent the effects of such factors as reflective and absorptive properties of atmospheric water vapor, greenhouse gas concentrations, clouds, annual and daily solar heating, ocean temperatures and ice boundaries. The most recent GCMs include global representations of the atmosphere, oceans, and land surface.

- **Greenhouse Effect.** The effect produced as greenhouse gases allow incoming solar radiation to pass through the Earth's atmosphere, but prevent most of the outgoing infrared radiation from the surface and lower atmosphere from escaping into outer space. This process occurs naturally and has kept the Earth's temperature about 59 degrees Fahrenheit warmer than it would otherwise be. Current life on Earth could not be sustained without the natural greenhouse effect.

Climate Change Overview

The scientific community has reached a consensus that climate change is occurring. According to the International Panel on Climate Change (IPCC), "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level" (IPCC, 2007). Regional climate changes, particularly temperature increases and changing precipitation patterns, will affect natural systems world wide, with impacts on food production, ecosystem biodiversity, and human health.

According to the IPCC, it is very likely that human-generated greenhouse gas (GHG) emissions, which have increased considerably since the mid-20th century, are a primary cause of climate change. Human activities have created marked increases in atmospheric concentrations of CO_2, methane, and nitrous oxide since 1750, levels of which now far exceed atmospheric concentrations from the past several thousand years. Land use changes, burning of fossil fuels, and agricultural practices all contribute to these increasing concentrations.

Water Resources

Potential Changes to California's Water Resources

The following section summarizes current scientific literature related to the effects of global climate change on water resources in California's Central Valley and the potential effects to precipitation, runoff, flooding, and sea level rise. Section 10.2 of the Background Report contains a complete discussion of water resources in Tulare County. Water supply and infrastructure for Tulare County is discussed in Section 7.2 of the Background Report. A complete discussion of flood hazards in Tulare County is included in Section 8.3 of the Background Report.

From a statewide perspective, global climate change could affect California's environmental resources through potential, though uncertain, changes related to future air temperatures and precipitation and their resulting impacts on water temperatures, reservoir operations, sea levels and stream runoff (Kiparsky and Gleick, 2003). Such changes could threaten California's economy, public health and environment (California Energy Commission, 2003).

Modeling of Climate Change Impacts on Water Resources

General Circulation Models (GCMs) are the first tool used to assess possible regional impacts of climate change. These models are large in scale, and develop large-scale scenarios of changing climate parameters, and typically compare scenarios with different GHG concentrations in the atmosphere. Because they are global in nature, GCMs cannot readily be used to examine regional effects. Because many policy decisions concerning water and other resources are made at a local level, much effort has been put into increasing the resolution of the models to help assess regional impacts of climate change. These local models can incorporate information concerning a specific watershed. After deciding which parameters to incorporate in a given model and their weighting, researchers further refine the model by comparing the historical climate records with the results obtained by the model when run over that same period (Kiparksy and Gleick, 2003).

Hydrologic models are often coupled with GCMs to represent climate change impacts on the hydrologic cycle. Hydrologic models incorporate many parameters reflecting soil conditions, snow pack levels and topography in order to represent this complex cycle, and can produce output that is useful for local planners interested in water quality and supply (Kiparsky and Gleick, 2003). However, downscaling GCMs to a hydrologic scale can result in greater uncertainties and difficulties than use of GCMs alone. One of the key difficulties of downscaling global climate information to hydrologic scales is a lack of data within the global length scales that are needed to understand processes that are sensitive to climate change at a finer scale.

It is important to note that these models cannot offer specific predictions of the future climate. They produce potential scenarios that incorporate many assumptions about the natural variables (such as runoff volume or sea level) that are affected by climate change. Models are, nonetheless, useful for assessing potential possible future conditions (Kiparsky and Gleick, 2003).

Despite modeling related difficulties and uncertainties, there is broad consensus among current models that global climate change could potentially alter the hydrologic cycle in many important ways. For instance, it is generally agreed that higher temperatures will lead to changes in snowfall and snowmelt dynamics in watersheds with substantial snow (Kiparsky and Gleick, 2003). One of the most common projections of potential impacts of climate change is that warming will decrease the volumes and persistence of snowpacks in the western United States. Studies suggest this reduction in snowpack and shift in stream-flow seasonality could have dramatic impacts on future water availability (Barnett, 2005).

In recent years, evidence that global climate change will impact California's water resources has continued to accumulate. Over 150 peer-reviewed scientific articles on climate and water in California have been published, and many more are in preparation. These studies span a wide range of topics, from improvements in downscaling of general circulation models to understanding how reservoir operations might be adapted to changing conditions (Kiparsky and Gleick, 2003).

There are, however, still many gaps and unknowns. In some cases, uncertainties are the result of models' inability to reproduce today's climate, casting doubt on predictions of future climate (Barnett, 2005). In other cases, uncertainties are a result of the difficulties associated with projecting regional impacts. High-spatial resolution models are required to quantitatively estimate potential future water problems (Barnett, 2005). Scientists are only beginning to develop such high-spatial resolution models. These models carry a whole set of problems on top of the problems associated with GCMs used to develop large-scale scenarios (Barnett, 2005). In addition, current models are unable to fully assess the potential impacts of climate change on California's water system, because none of the existing models have the ability to accept input from climate change impact studies pertaining to the Central Valley (CEC, 2003).

In summary, global climate change will influence many interconnected phenomenon, which in turn, will affect the rate of climate change itself. Faced with this complex system, climatologists make decisions about how to simplify the phenomenon, such as assuming a fixed rate of temperature change or a particular level of aerosol production and/or a prediction of cloud formation. These assumptions allow the models to apply to particular aspects of the changing ecosystem and particular regions given an educated guess about how the future will be. Rather than try to be predictive, the models represent possible scenarios that

come with a set of presuppositions. Even when results are quantified, the results are meaningless unless viewed in the light of those presuppositions. For these reasons, a range of models must be examined when attempting to assess the potential effects of global climate change and the resulting analysis is most appropriately qualitative.

Water Supply

Global climate change is expected to impact California's water supply through a diminishing Sierra snowpack. Although much uncertainty remains with respect to the effects of global climate change on California's water supplies, it is expected that increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control instead of using the water for supply conservation, as is the standard practice. This change in water management could, in turn, lead to more frequent water shortages during high water demand periods (Brekke, 2004). Many regional studies have shown that only small changes in inflows into reservoirs could result in large changes in the reliability of water yields from those reservoirs (Kiparsky and Gleick, 2003; Cayan et al., 2006).

State Water Project and Central Valley Operations

A report prepared by DWR (2006) in response to Executive Order S-3-05 represents the most current complete analysis of changes to SWP and CVP operations that would be likely to occur as a result of climate change. Contained in the report is an analysis of the potential impacts of climate change on SWP and CVP operations and deliveries and on Delta water quality and water levels. The analysis is based on runs of the CALSIM II and DSM II models, which are described in more detail in Section 4.2, Delta Hydrology and Water Quality. The specific CALSIM II and DSM II methodology used for the climate change analysis is detailed in the DWR report (DWR, 2006). Results discussed in the report include projections from 2035 through 2064 under four potential climate change scenarios compared to a base case scenario that does not assume climate change effects. Four potential climate change scenarios were included, based upon modeling output from two separate global climate models. Three of these scenarios included decreased average annual precipitation, while one included increased average annual precipitation. Results from the investigation are considered preliminary, incorporate several assumptions regarding the effects of climate change on California water resources, and reflect a limited number of climate change scenarios.

Results from the four modeled scenarios indicated effects to SWP and CVP operations (DWR, 2006). Resulting from shifts in seasonal and annual average runoff, the amount of water delivered by the SWP and CVP was reduced considerably. Deliveries by the CVP to South of Delta (SoD) contractors were also affected by the four climate change scenarios. Under the three drier scenarios, annual average CVP SoD deliveries were reduced by 6 to 10 percent, likely resulting from generally drier conditions and a shift towards reduced April-July runoff and increased winter season runoff under these scenarios. The wetter scenario still exhibited increased winter season runoff and decreased April-July runoff, but resulted in a 3 percent average annual increase in CVP SoD deliveries (DWR, 2006).

Tulare County receives some of its water supplies from the CVP and SWP. Surface water supplies in Tulare County from the CVP and SWP could potentially be reduced as a result of climate change effects.

Surface Water Quality

Water quality is affected by several variables, including runoff volume and timing, the physical characteristics of the watershed and water temperature. A combination of changes to these factors could affect several natural processes that serve to eliminate pollutants in water bodies. For example, an overall decrease in stream flows could concentrate pollutants and prevent contaminants from flushing from point sources (Kiparsky and Gleick, 2003).

Groundwater

Few scientific studies have been performed on the effects of global climate change on specific groundwater basins, groundwater quality or groundwater recharge characteristics (Kiparsky and Gleick, 2003). Warmer temperatures could increase the period where water enters the ground by reducing soil freeze. Conversely, warmer temperatures could also lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Reductions in spring runoff and higher evapotranspiration would likely reduce the amount of water available for recharge, but additional winter runoff could increase the amount of runoff available for recharge (Kiparsky and Gleick, 2003). Groundwater serves as a major source of water supply in Tulare County, which could result in serious implications for water supply in the county.

Sea Levels

Global climate change is expected to cause a 4 to 33-inch rise in sea level as a result of thermal expansion of ocean waters and melting of ice from land surfaces (California Climate Change Center, 2006a). Among the risks of sea level rise would be threats to levee integrity and tidal marshes and increased salinity in the Sacrament River Delta (DWR, 2006). Tulare County is not located on or near the coast and is similarly not located within close proximity to the Delta. Consequently, Tulare County would not be directly exposed to the effects of climate change on sea levels and water levels in the Delta.

Sudden Climate Change

Most global climate models project that anthropogenic climate change will be a continuous and fairly gradual process through the end of this century (DWR, 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even at warmer and dryer projections. Sudden and unexpected changes, however, could leave water managers unprepared, which, in extreme situations could have significant implications for California's water supplies.

Amount of Precipitation

Most precipitation events in California occur during the October through April rainy season with most of California's precipitation, in terms of amount of water, falling during November through March. An investigation completed by DWR indicated a statistically significant increasing trend in total precipitation in northern and central California since the late 1960s (DWR, 2006). A single investigation by Bardini and others (2001) showed a trend of potentially decreasing annual precipitation in California; however, this result is probably related to the specific subset of data that the Bardini study relied upon, wherein extremes at the beginning or end of time series data can substantially impact the identified trend (DWR, 2006). An investigation of rainfall during November through March from 1930 through 1997 indicated significant increases in California rainfall (distinct from snowfall) (Mote, 2005).

There is also evidence that the amount of precipitation that occurs on an annual basis is becoming more variable. That is, periods of both high and low rainfall are becoming more common. Specifically, a study performed by DWR (2006) indicates that present day variability in annual precipitation is about 75 percent greater than that of the early 20th century.

Snowpack and Snowmelt

In addition to potentially increased precipitation, snowpack and snowmelt may also be substantially affected by climate change. Because much of California's precipitation falls as snow in the Sierra Nevada and southern Cascades, the state's snowpack represents a significant reservoir of water that can support beneficial uses. Specifically, about 35 percent of the state's usable annual surface water supply is derived from the annual snowmelt (DWR, 2006). This snowmelt typically occurs from April through July, and provides natural water flow to streams and reservoirs after the annual rainy season has ended. Estimates by DWR further indicate that California's snowpack contributes, on average, approximately 14 million acre feet (MAF) per year of runoff to watersheds that flow into the Central Valley and Delta. For comparison, total reservoir capacity in the Central Valley is approximately 24.5 MAF per year (DWR, 2005).

As air temperatures increase due to climate change, the water stored in California's snowpack could be affected in two ways: first, increasing temperatures could result in earlier snowmelt. Several investigations of current and potential future snowfall trends in California illustrate these effects. Modeling of the portion of the California snowpack that feeds Delta watersheds has been performed (Knowles and Cayan, 2004). The study estimated that, by 2060, California's snowpack would be reduced substantially, especially within northern and eastern areas of the Sacramento River watershed. A recent study estimated trends in snowpack, river runoff, and air temperatures in California and Oregon (Scripps Institute of Oceanography, 2007). Consistent with other studies, this investigation also indicated a substantial reduction in snowpack in California, concurrent with an increase in winter rainfall.

Runoff

Runoff needs to be considered in terms of annual and peak runoff volumes. Annual runoff is measured during the annual water year (October 1 through September 30), and includes river flows derived from precipitation events, snowmelt, and river base flow. Peak runoff is typically measured for individual storm events. Like annual runoff, peak runoff results from precipitation events, snowmelt, and river base flow. However, most of the water mass present during a peak runoff event is typically derived from concurrent precipitation and/or snowmelt.

As discussed above, precipitation across California appears to have increased over the past century, and individual water years have become more variable in terms of the amount of precipitation that occurs. It

follows, then, that similar trends would be seen for runoff. A study by DWR (2006) compares pre- and post-1955 annual average water year unimpaired runoff[2] for 24 watersheds across northern, central, and southern California. Data indicate an annual increase in runoff of up to 27 percent for 21 of the 24 watersheds, with an overall average increase of 9 percent. The remaining 3 watersheds – the Mokelumne, Stanislaus, and American Rivers – indicated runoff reductions of -1 to -2 percent.

The study also addresses the amount of variability in runoff volumes among water years for the Sacramento and San Joaquin River watersheds. Results indicate a statistically significant increase in variability within the Sacramento River watershed, and a non-significant but increasing trend within the San Joaquin River watershed (DWR, 2006). Thus, the annual amount of runoff in the Sacramento River is becoming increasingly variable, and annual runoff in the San Joaquin may follow a similar trend.

In relation to snowpack, winter storms provide snow to higher elevations that have historically melted from April through July. This process effectively stores water in California's snowpack until the spring snowmelt, when the water flows downstream and into major rivers and reservoirs, providing a significant portion of the water supply for the dry summer and autumn periods. April through July runoff in both the Sacramento and San Joaquin rivers shows a decreasing trend over the last century, indicating that in both watersheds, an increasing percentage of runoff is occurring earlier in the year, when many reservoirs are managed primarily for flood control and not for water supply (DWR, 2006).

These changes in the timing of precipitation and runoff, and in the amount of water stored in California's snowpack, have significant implications for the management of water resources in the state. These effects are discussed in greater detail below.

Flooding

As discussed above, it is anticipated that climate change will have a substantial effect on the timing and magnitude of snowfall, rainfall, and snowmelt events in California. Large annual variations in winter rainfall and runoff, which are normal in California, create uncertainty surrounding potential changes in flooding as a result of climate change.

[2] Unimpaired Runoff refers to the runoff water that occurs within a river above major regulating impoundments (e.g., major dams).

Still, using more than a century of historical data and global and local-scale climate modeling efforts, a few generalities have emerged.

In terms of flooding, a peak flow analysis of three Delta tributaries was completed (DWR, 2006). The Feather, American, and Tuolumne rivers were selected for their century-long, three-day peak flow records. The investigation divided in half a century-long dataset to compare pre- and post- 1955 data. Results indicated that the 100-year three-day peak flows have more than doubled in the American (111 percent increase) and Tuolumne (102 percent increase) rivers, and increased by 51 percent on the Feather River. Comparing the pre- to post-1955 periods, only one major flood event occurred prior to 1955 on the three rivers, while four occurred during the post-1955 period. Thus, annual peak three-day mean discharges in Central Valley watersheds are becoming larger and more variable. Independent climate modeling efforts predict that these trends towards more variable river flows and more frequent flooding events will continue into the future, as a result of climate change (Dettinger et al, 2004; Miller et al, 2003).

Implications for Tulare County

The effects of climate change have serious implications for snowmelt and runoff. Increasing snowmelt from rising temperatures coupled with increasing precipitation in the form of rain and less falling as snow in the mountains could result in greater flows in mountain streams and rivers. Additionally, increasing variability in storm events could affect flood control measures, such as levees and reservoirs.

Tulare County contains a number of rivers and waterways. The Kern River flows north to south through the Sierra Nevada Mountains in northeast Tulare County. The headwaters for the Kaweah and Tule Rivers are located in the Sierra Nevada Mountains. These rivers flow west into the Tulare Lake Basin. A number of mountain streams flow into the Kaweah and Tule Rivers and their respective reservoirs, Lake Kaweah and Lake Success. Lake Kaweah and Lake Success both serve as flood control structures. Kaweah and Tule Rivers, their tributaries, and Lake Kaweah and Lake Success could be subject to increased frequency or severity of flooding from upstream areas as a result of increased snowmelt and runoff. A number of communities are located near these waterbodies, including Three Rivers, Woodlake, Lemoncove, Springville, and Porterville, and could be exposed to increased flooding associated with the effects of climate change.

Wildland Fire Hazards

A number of preliminary studies have analyzed the potential for climate change effects to affect wildland fire hazards. These studies indicate that there is a potential for significant increases in the number of fires escaping initial attack, particularly in areas in which the fuel matrix is dominated by grass and brush. These studies indicate that subtle shifts in fire behavior of the sort that might be induced by the climate changes anticipated for the next century are of sufficient magnitude to result in an increase in the number of fires in areas where brush fuels dominate (California Climate Change Center, 2006b). It is expected that increases in temperatures and changes in precipitation as a result of climate change would have the most effects on wildland fire regimes. At this time, these are only preliminary general assumptions regarding the effects of climate change on wildland fire hazards.

9. BIOLOGICAL, ARCHAEOLOGICAL, AND HISTORICAL RESOURCES

9.1 Introduction

This chapter of the Background Report summarizes the biological, archaeological and historical resources within Tulare County. Methodologies for developing these sections, key terms related to their discussion, and local, state and federal regulations that pertain to these topics will be addressed.

The chapter is divided into the following sections:

- Biological Resources (Section 9.2); and
- Archaeological and Historical Resources (Section 9.3).

9.2 Biological Resources

Introduction

The Planning Area to address the biological resources of Tulare County is considered to be the extent of the county boundaries. However, many of the ecosystems and habitats that exist in Tulare County also extend outside the county. Therefore, this discussion of biological resources will include ecosystems and habitats that extend beyond the boundaries of Tulare County.

This section describes the biological resources in the county from both qualitative and quantitative perspectives. The results of this assessment will be used in the development of policy guidance that not only protects biological resources in the county, but also describes the affected biological resources environment for inclusion in the environmental impact report for the General Plan update to comply with CEQA.

Methods

ESA biologists reviewed pertinent literature, and utilized secondary source database queries to identify biological resources within the county. The primary sources of data referenced for this section included the following:

- California Natural Diversity Data Base (CNDDB) – GIS Database, California Department of Fish and Game, October 2008 (CDFG 2008a);

- University of California, Santa Barbara (UCSB) California GAP Analysis Project website http://www.biogeog.ucsb.edu/projects/gap/gap_home.html (UCSB 2008);

- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants website http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi/Home (CNPS 2008);

- U.S. Fish and Wildlife Service - Sacramento Fish and Wildlife - Service Online Endangered Species Lists Website http://www.fws.gov/sacramento/es/spp_list.htm (List Created October 8, 2008) (USFWS 2008b);

- U.S. Forest Service (USFS) Ecological Subregions of California website http://www.fs.fed.us/r5/projects/ecoregions/ (USFS 2008);

- Sawyer, J. O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation.* California Native Plant Society. Sacramento, California.

- California Department of Fish and Game (CDFG) Habitat Conservation Planning Branch website www.dfg.ca.gov/hcpb/species (CDFG, 2008b);

- U.S. Fish and Wildlife Service Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS, 1998); and

- U.S. Geological Survey (USGS) Major Land Resources Area System (USGS, 2004)

Key Terms

- **Listed Species.** Listed species are recognized by federal, state, or other agencies in an effort to protect them or their habitat under the federal Endangered Species Act (1973) and the California Endangered Species Act (1984). These species are vulnerable to habitat loss or population decline because of their rarity. Some of these species receive specific protection that is defined by federal

or state endangered species legislation. Species that are considered "threatened" or "endangered" under the federal Endangered Species Act or the California Endangered Species Act receive the most legal protection under these laws. Other species have been "listed" on the basis of adopted policies and expertise of state resource agencies, local governmental agencies or organizations with acknowledged expertise to meet local conservation objectives. A "listed" species is a collective term in this report based on the species being identified by one or more of the following:

- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- Federally listed or proposed under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.);
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1B and List 2 status), as needing more information (List 3), and as having a limited distribution (List 4) (CNPS 2004).
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG) as a species of concern (USFWS), rare (CDFG), or of special concern (CDFG);
- Species listed or proposed under the California Endangered Species Act (14 CCR 670.5); and
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380).

- **Critical Habitat.** Critical habitat is the natural environment designated by the USFWS, as required, for the conservation of a federally listed species. These habitats are specifically protected

under the federal Endangered Species Act. (16 USC 1532, 50 CFR 424.02). The designation of a critical habitat is a formal process that involves the posting of a draft proposal in the federal register of the critical habitat designation, a public comment period, and a final determination.

- **Wetlands.** The federal government defines "wetlands" in Section 404 of the Clean Water Act as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b] and 40 CFR 230.3). Under normal circumstances, the definition of wetlands requires three wetland identification parameters be present: wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands may include freshwater marsh, seasonal wetlands, and vernal pool complexes that are adjacent to perennial waters of the U.S. The United States Army Corps of Engineers (ACOE) is the responsible agency for regulating wetlands under Section 404 of the Clean Water Act, while the Environmental Protection Agency (EPA) administers overall responsibility for this Act. A permit from the ACOE is required under Section 404 of the Clean Water Act for any action that affects wetlands (33 USC 1344 and EPA 2004).

- **Other Waters of the U.S.** "Other waters of the U.S." is also a term defined in Section 404 of the Clean Water Act that refers to those hydric features that are regulated by the CWA but are not wetlands (33 CFR 328.4). To be considered jurisdictional, these features must exhibit a defined bed and bank and an ordinary high water mark. The term "ordinary high water mark" refers to that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. Examples of other waters of the U.S. may include rivers, creeks, ponds, and lakes. A permit from the ACOE is required under Section 404 of the Clean Water Act for any action that affects other Waters of the U.S. (33 USC 1344 and EPA 2004).

- **Waters of the State.** This term is defined in the Porter-Cologne Act as "any surface or groundwater, including saline waters,

within the boundaries of the state" (California Water Code Section 13000 et seq.). Waters of the state includes all wetlands, including those not listed under the Clean Water Act, such as isolated wetlands. The Regional Water Quality Control Board enforces the Porter-Cologne Act and is charged with protecting Waters of the State.

- **Sensitive Natural Community.** A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, or is of special concern to local, state, or federal agencies. The California Environmental Quality Act (CEQA) identifies the elimination or substantial degradation of such communities as a significant impact (CERES 2004). Based on federal and state regulations, wetlands and critical habitat are examples of sensitive natural communities.

- **Native Fauna and Flora.** Native fauna and flora of California are animal and plant species that are indigenous to the state of California. California Environmental Review and Permitting Programs encourage the preservation, conservation and maintenance of wildlife resources under the jurisdiction and influence of the State, including the conservation, protection and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species.

Regulatory Setting

Federal Regulations

Clean Water Act-Section 404. Wetlands and other waters of the U.S. are subject to the jurisdiction of the ACOE and EPA under Section 404 of the Clean Water Act. Together, the EPA and the ACOE determine whether they have jurisdiction over the non-navigable tributaries that are not relatively permanent based on a fact-specific analysis to determine if there is a significant nexus. These non-navigable tributaries include wetlands adjacent to non-navigable tributaries that are not relatively permanent and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Wet areas that are not regulated by this Act do not have a hydrologic link to other waters of the U.S., either through surface or subsurface flow and include ditches that drain uplands, swales or other similar features. The ACOE has the authority to issue a permit for any discharge, fill, or

dredge of wetlands on a case-by-case basis, or by a general permit. General permits are handled through a Nationwide Permit (NWP) process. These permits allow specific activities that generally create minimal environmental effects. Projects that qualify under the NWP program must fulfill several general and specific conditions under each applicable NWP. If a proposed project cannot meet the conditions of each applicable NWP, an individual permit would likely be required from the ACOE (EPA 2004).

Federal Endangered Species Act. The USFWS administers the federal Endangered Species Act (16 USC Section 153 et seq.) and thereby has jurisdiction over federally listed threatened, endangered, and proposed species. Projects that may result in a "take" of a listed species or critical habitat must consult with the US Fish and Wildlife Service. "Take" is broadly defined as harassment, harm, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collection; any attempt to engage in such conduct; or destruction of habitat that prevents an endangered species from recovering (16 USC 1532, 50 CFR 17.3). Federal agencies that propose, fund, or must issue a permit for a project that may affect a listed species or critical habitat are required to consult with the USFWS under Section 7 of the Federal Endangered Species Act. If it is determined that a federally listed species or critical habitat may be adversely affected by the federal action, the USFWS will issue a "Biological Opinion" to the federal agency that describes minimization and avoidance measures that must be implemented as part of the federal action. Projects that do not have a federal nexus must apply for a take permit under Section 10 of the Act. Section 10 of the act requires that the project applicant prepare a habitat conservation plan as part of the permit application (16 USC 1539 and USFWS 1996).

Under Section 4 of the federal Endangered Species Act, a species can be removed, or delisted, from the list of threatened and endangered species. Delisting is a formal action made by the USFWS and is the result of a determined successful recovery of a species. This action requires posts in the federal registry and a public comment period before a final determination is made by the USFWS.

Habitat Conservation Plans. Habitat Conservation Plans (HCPs) are required for a non-federal entity that has requested a take permit of a federal listed species or critical habitat under Section 10 of the Endangered Species Act. HCPs are designed to offset harmful effects of a proposed project on federally listed species. These plans are utilized to achieve long-term biological and regulatory goals. Implementation of HCPs allows development and projects to occur while providing

conservation measures that protect federally listed species or their critical habitat and offset the incidental take of a proposed project. HCPs substantially reduce the burden of the Endangered Species Act on small landowners by providing efficient mechanisms for compliance with the ESA, thereby distributing the economic and logistic effects of compliance. A broad range of landowner activities can be legally protected under these plans (USFWS 1996). There are generally two types of HCPs, project specific HCPs which typically protect a few species and have a short duration and multi-species HCPs which typically cover the development of a larger area and have a long term duration.

Migratory Bird Treaty, Bald and Bald Golden Eagle Protection Act. The Migratory Bird Treaty Act (MBTA, 16 USC Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668) protect certain species of birds from direct "take". The MBTA protects migrant bird species from take by setting hunting limits and seasons and protecting occupied nests and eggs. The Bald Eagle Protection Act (16 USC Sections 668-668d) prohibits the take or commerce of any part of Bald and Golden Eagles. The US Fish and Wildlife Service administers both acts, and reviews federal agency actions that may affect species protected by the acts.

State Regulations

California Department of Fish and Game Code Sections. The CDFG regulates the modification of the bed, bank, or channel of a waterway under Sections 1601-1607 of the California Fish and Game Code. Also included are modifications that divert, obstruct, or change the natural flow of a waterway. Any party who proposes an activity that may modify a feature regulated by the Fish and Game Code must notify the California Department of Fish and Game before project construction. The California Department of Fish and Game will then decide whether to enter into a Streambed Alteration Agreement with the project applicant either under Section 1601 (for public entities) or Section 1603 (for private entities) of the Fish and Game Code (CDFG 2004b).

California Endangered Species Act. The CDFG administers the California Endangered Species Act of 1984 (Fish and Game Code Section 2080), which regulates the listing and "take" of endangered and threatened state-listed species. A "take" may be permitted by California Department of Fish and Game through implementing a management agreement. "Take" is defined by the California Endangered Species Act as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue,

catch, capture, or kill" a state-listed species (Fish and Game Code Sec. 86). Under state laws, the California Department of Fish and Game is empowered to review projects for their potential impacts to state-listed species and their habitats.

The California Department of Fish and Game maintains lists for Candidate-Endangered Species (SCE) and Candidate-Threatened Species (SCT). California candidate species are afforded the same level of protection as state-listed species. California also designates Species of Special Concern (CSC) that are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species, but may be added to official lists in the future. The CSC list is intended by the California Department of Fish and Game as a management tool for consideration in future land use decisions (Fish and Game Code Section 2080).

All state lead agencies must consult with CDFG under the California Endangered Species Act when a proposed project may affect state-listed species. CDFG would determine if a project under review would jeopardize or result in taking of a state-listed species, or destroy or adversely modify its essential habitat, also known as a "jeopardy finding." (Fish and Game Code Sec. 2090). For projects where CDFG has made a jeopardy finding, CDFG must specify reasonable and prudent alternatives to the proposed project to the state lead agency (Fish and Game Code Sec. 2090 et seq.).

Natural Communities Conservation Planning Act. The Natural Communities Conservation Planning Act allows a process for developing natural community conservation plans (NCCPs) under CDFG direction. NCCPs allow for regional protection of wildlife diversity, while allowing compatible development. CDFG may permit takings of state-listed species whose conservation and management are provided in a NCCP, once a NCCP is prepared (Fish and Game Code Secs. 2800 et seq.).

Federally and State-Protected Lands. Ownership of California's wildlands is divided primarily between federal, state, and private entities. State-owned land is managed under the leadership of the Departments of Fish and Game (DFG), Parks and Recreation, and Forestry and Fire Protection. Tulare County has protected lands in the form of wildlife refuges, national parks, and other lands that have large limitations on appropriate land uses. Some areas are created to protect special status species and their ecosystems.

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act regulates the discharge of waste into waters of the state. The Regional Water Quality Control Board (RWQCB) administers this regulation. Water Code Section 13260 requires "any person discharging, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge." A report of waste discharge ("RWD") is essentially an application for waste discharge requirements ("WDRs"). WDRs contain conditions imposed on a given discharge by the appropriate RWQCBs for the purpose of protecting the beneficial uses of the waters of the state. Upon receipt of a RWD, the RWQCB may issue WDRs imposing conditions on the proposed discharge, or it may waive the requirement for WDRs.

California Wetlands Conservation Policy. The California Wetlands Conservation Policy's goal is to establish a policy framework and strategy that will ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California. Additionally, the policy aims to reduce procedural complexity in the administration of State and Federal wetlands conservation programs and to encourage partnerships with a primary focus on landowner incentive programs and cooperative planning efforts. These objectives are achieved through three policy means: statewide policy initiatives, three geographically based regional strategies in which wetlands programs can be implemented, and creation of interagency wetlands task force to direct and coordinate administration and implementation of the policy. Leading agencies include the Resources Agency and Cal/EPA in cooperation with Business, Transportation and Housing Agency, Department of Flood and Agriculture, Trade and Commerce Agency, Governor's Office of Planning and Research, Department of Fish and Game, Department of Water Resources, and the State Water Resources Control Board.

Local Regulations and Policies

The unincorporated lands of Tulare County fall under the jurisdiction of the county. The Tulare County General Plan contains many regulations and policies to protect the biological resources within the county, such as the Tulare County Mitigation and Conservation Bank.

Existing Conditions

Tulare County exhibits a diverse ecosystems landscape created through the extensive amount of topographic relief (elevations range from approximately 200 to 14,000 feet above sea level). A broad-scale method

of classifying the landscape is by eco-region. This method is used by the U.S. Forest Service (USFS) and relates to the California Manual of Vegetation (Sawyer and Keeler-Wolf 1997) vegetation classification system and the U.S. Geological Survey (USGS) Major Land Resources Area system. The eco-region approach evaluates the land from a wide range of interrelated environmental variables including topography, soils, hydrology, flora, and fauna.

A total of three eco-region sections exist in Tulare County. These sections apportion the county in a north-south pattern. The majority of the western portion of the county comprises the Great Valley Section, the majority of the eastern portion of the county is in the Sierra Nevada Section, and a small section between these two sections comprises the Sierra Nevada Foothill Area (USFS 2008).

The natural vegetation of the Great Valley Section is predominately characterized by the purple needlegrass series, valley oak series, vernal pools and wetland communities, and blue oak series. Fauna associated with this section include mule deer (*Odocoileus hemionus*), black-tailed deer (*Odocoileus hemionus columbianus*), coyotes (*Canis latrans*), white-tailed jackrabbits (*Lepus townsendii*), kangaroo rats (*Dipodomys ingens*), kit fox (*Vulpes macrotis*), and muskrats (*Ondatra Zibethicus*). Birds include waterfowl, hawks, golden eagles (*Aquila chrysaetos*), owls, white-tailed kites (*Elanus leucurus*), herons, western meadowlark (*Sturnella neglecta*) and California quail (*Callipepla californica)* (USFS 2008).

The natural vegetation of the Sierra Nevada Section is predominately characterized by the mixed conifer series, ponderosa pine series, jeffrey pine series, white fir series, red fir series, lodgepole pine series, huckleberry oak series, western juniper series, aspen series, big sagebrush series, mixed subalpine forest series, mountain hemlock series, whitebark pine series, and giant sequoia series. Fauna associated with this section include black-tail and mule deer, black bear (*Ursus americanus*), mountain lion (*Puma* (=*Felis*)*concolor*), coyote, bobcat (*Lynx rufus*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), long-tailed weasels (*Mustela frenata*), skunks (*Mephitis mephitis*), badger (*Taxidea taxus*), mountain sheep (*Ovis canadensis*), yellow-bellied marmot (*Marmota flaviventris*), marten (*Martes Americana*), fisher (*Martes pennanti*), wolverine (*Gulo gulo*), and porcupine (*Erethizon dorsatum*). Birds include eagles, hawks, owls, woodpeckers, falcons, osprey (*Pandion haliaetus*), stellar's jay (*Cyanocitta stelleri*), herons, quail, belted kingfisher (*Ceryle alcyon*), goshawk (*Accipiter gentilis*), and blue grouse (*Dendragapus obscurus*) (Miles and Goudy 1997).

The natural vegetation of the Sierra Nevada Foothills Section is predominately characterized by the blue oak series, needlegrass grasslands, chamise series, mixed chaparral series, foothill pine series, and valley oak series. Fauna associated with this section include black-tailed and mule deer, coyotes, ground squirrels (*Spermophilus beecheyi*), cottontails (*Sylvilagus floridanus*), jack rabbits, and kangaroo rats. Common birds include turkey vultures (*Cathartes aura*), falcons, eagles, hawks, owls, quail, mourning dove (*Zenaida macroura*), mockingbird (*Minus polyglottos*), scrub jay (*Aphelocoma californica*), herons, ravens, western meadowlarks, finches, and sparrows (Miles and Goudy 1997).

Habitat types and ecosystems are often identified by general vegetation-types. There are 14 general habitat types in Tulare County. Table 9-1 identifies the habitat type and acreages of each, found in Tulare County. Figure 9-1 shows the various habitat types that exist in Tulare County.

Table 9-1. Habitat Types of Tulare County

Habitat Type	Acres (Approximate)	Percent of County
Alpine Habitat	1,130	0.04
Annual Grassland	339,600	10.97
Barren	183,680	5.93
Chaparral	153,790	4.97
Conifer Forest	835,150	26.97
Conifer Woodland	165,180	5.33
Desert Scrub	23,640	0.76
Hardwood Woodland	416,560	13.45
Open Water	10,680	0.34
Mixed Hardwood/Conifer Forest	92,340	2.98
Riparian	4,580	0.15
Urban	56,220	1.82
Vineyard/Cropland	795,340	25.68
Wetlands	18,750	0.61
Total Acreage	3,096,640	100.00

Note: Due to the scale of the analysis used to determine the quantities of habitats in Tulare County, vernal pools, which are a type of wetland, are not addressed in this table or in Figure 9-1. Please see the below text regarding wetlands for more information about vernal pools.

Source: CDF, 2002.

Tree Dominated Habitats

Conifer Forest

Conifer forests are composed of needle-leaved evergreen trees that create uniform canopy coverage, with little gaps in between tree crowns. This habitat covers approximately 835,150 acres within the Planning Area. Conifer forests typically have higher stand density and tree height

in lower elevations and low to medium stature trees at higher elevations. Trees on exposed slopes and windy ridges near tree line are greatly stunted and contorted. Shrubby vegetation and herbaceous ground cover are generally sparse or lacking, and litter accumulation is typically low. Fallen woody material persists for long periods of time in cold climates.

Conifer forests are dominated by a mixture of evergreen trees, including Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), mountain hemlock (*Tsuga mertensiana*), western white pine (*Pinus monticola*), lodgepole pine (*Pinus contorta*), whitebark pine (*Pinus albicaulis*), foxtail pine (*Pinus balfouriana*), bristlecone pine (*Pinus longaeva*), and limber pine (*Pinus flexilis*). Shrubs that compose the sparse understory include Parry Manzanita (*Arctostaphylos parryana*), squaw currant (*Ribes cereum*), purple mountain heather (*Phyllodoce breweri*), oceanspray (*Holodiscus discolor*), and big sagebrush (*Artemisia tridentata*). Moist sites may support willows, western huckleberry (*vaccinium membranaceum*), California huckleberry (*vaccinium ovatum*), Sierra bilberry (*Vaccinium cespitosum*), and alpine laurel (*Kalmia microphylla*). Grasses and herbs in the understory include western wheatgrass (*Pascopyrum smithii*), California brome (*Bromus carinatus*), several species of lupines, and flowering annuals. This habitat type is generally located in the Sierra Nevada, on the eastern side of the Planning Area.

Coniferous forests at high elevations support fewer species of amphibians, reptiles, birds, and mammals than other major forest types in California. The combination of harsher climate, shorter growing season, lower primary productivity, moisture stress, and lower production of insects and invertebrates that provide a food source to other vertebrates may explain low species diversity. However, some species have adapted to these conditions and find it suitable for breeding. Such species include the great gray owl (*Strix nebulosa*), pileated woodpecker (*Dryocopus pileatus*), marten, and wolverine.

Conifer Woodland

Conifer woodlands are composed of needle-leaved evergreen trees that form less dense canopy cover compared to conifer forests, allowing more sunlight to penetrate to the ground level. This habitat supports more shrubs and herbs in the understory due to higher levels of sunlight in gaps between trees. Within the Planning Area, this habitat covers approximately 165,180 acres.

Conifer woodland habitats are located at mid-to high elevations in the Sierra Nevada, on the eastern parts of the Planning Area. This habitat is typically found adjacent to coniferous forest and mixed hardwood/coniferous forest habitats. Conifer woodlands typically support similar plant and animal species as conifer forests, but in greater number due to more temperate temperatures and greater abundance of food.

Mixed Hardwood / Conifer Forest

Mixed hardwood-conifer forests include both conifers and hardwoods that form a closed forest. This habitat covers approximately 92,340 acres of the Planning Area. Typically, at least one-third of the trees must be conifer and at least one-third must be broad-leaved to be considered a mixed hardwood-conifer forest. The habitat often exhibits a mosaic-like pattern of small pure stands of conifers interspersed with small stands of broad-leaved trees. Species composition within this diverse habitat varies by geographical area. In the southern Sierra Nevada, common associates of this habitat include California black oak (*Quercus kelloggii*), black cottonwood (*Populus balsamifera ssp. trichocarpa*), canyon live oak (*Quercus chrysolepis*), Jeffrey pine (*Pinus jeffreyi*), Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), incense-cedar (*Calocedrus decurrens*), and localized areas of giant sequoia (*Sequoiadendron giganteum*). This habitat is transitional between dense coniferous forests and montane hardwood, mixed chaparral, or open woodlands and savannahs. It often merges with many other habitats at its upper and lower habitat limits.

Mixed hardwood-conifer forests provide habitat for a variety of wildlife species. Mature forests with cavities provide valuable nesting habitat for birds. Canopy cover and understory vegetation are variable, which makes the habitat suitable for numerous species. In wet areas, many amphibians are found in the detrital layer.

Hardwood Woodland

Hardwood woodland habitat covers approximately 416,560 acres of the Planning Area. This habitat extends from annual grassland habitats in low elevations to coniferous habitats in the Sierra Nevada mountain range. Hardwood woodland includes three types of woodlands at various elevations: montane hardwood at high elevations, blue oak woodland at mid elevations, and Valley oak woodland at low elevations.

Montane Hardwood is composed of a pronounced hardwood tree layer, and undeveloped shrub stratum, and a sparse herbaceous layer. The overstory of this habitat is comprised of canyon live oak, Douglas-fir, California black oak, Digger pine (*Pinus sabiniana*), and tanoak (*Lithocarpus densiflorus*). Understory vegetation includes Oregon-grape (*Mahonia aquifolium*), wood rose (*Rosa bymnocarpa*), manzanita, and poison-oak (*toxicodendron diversilobum*). This habitat is often surrounded by Montane Chaparral, Montane Hardwood-Conifer, Douglas-Fir, and Jeffrey Pine.

Those wildlife that utilize acorns for food are predominate in this habitat and include scrub jay, Steller's jay (*Cyanocitta stelleri*), acorn woodpecker (*Melanerpes formicivorus*), wild turkey (*Meleagris gallopavo*), mountain quail (*Oreortyx pictus*), mule deer, black bear (*Ursus americanus*), and California ground squirrel. Additionally, within the forest floor several amphibian and reptile species are present including ensatina (*Ensantina eschescholtzii*), western fence lizard, and California mountain kingsnake (*Lampropeltis zonata*).

Blue oak woodland is dominated by blue oak (*Quercus douglassii*), which comprises 85 to 100 percent of the canopy cover. In the Sierra Nevada, common associates include interior live oak (*Quercus wislizeni*), poison-oak (*Toxicodendron diversilobum*), California coffeeberry (*Rhamnus californica*), redberry (*Rhamnus* spp.), California buckeye (*Aesculus californica*), and manzanita species. The ground cover of this habitat is predominately comprised of annuals, consisting of brome grass (*Bromus* spp.), wild oats (*Avena* sp.), foxtail barley (*Hordeum murinum*), needlegrass, filaree, fiddleneck (*Amsinckia* spp.), and others. This habitat is typically found at elevations above Annual Grassland and below Blue Oak-Foothill Pine habitats but may be interspersed with those habitats as well.

Blue oak woodlands are important to many wildlife species in the Planning Area. Acorns are an important food source for acorn woodpeckers (*Melanerpes formicivorus*), western scrub jays (*Aphelocoma californica*), yellow-billed magpies (*Pica nuttali*), western gray squirrels (*Sciurus griseus*), and California ground squirrels (*Spermophilus beecheyi*). Other wildlife species that frequent this habitat include loggerhead shrike (*Lanius ludovicianus*), oak titmouse (*Baeolophus inornatus*), racer (*Coluber constrictor*), and the big brown bat (*Eptesicus fuscus*).

Valley oak woodland habitat is typically found at low elevations. This habitat is dominated almost exclusively by valley oaks (*Quercus lobata*). Tree associates include Hinds black walnut (*Juglans hindsii*), interior live oak (*quercus wislizenii*), box elder (*Acer negundo*), and blue oak (*Quercus douglasii*). Shrubs within the understory of this habitat type include

poison-oak, blue elder (*Sambucus cerulea*), California wild grape (*Vitis californica*), toyon (*Heteromeles arbutifolia*), California coffeeberry (*Rhamnus californica*), and California blackberry (*Rubus ursinus*). The ground cover consists of wild oats, bromes, barleys, ryegrass, and needlegrass. Valley oak woodlands habitat has declined over the years due to encroachment from urban and agricultural development. Presently, most valley oak woodlands are in mature stages of development, with little recruitment of young oaks. This habitat typically merges with annual grasslands and agricultural lands. In the foothills, this habitat intergrades with blue oak woodlands or blue oak-digger pine habitats. Near streams and waterways, this community intergrades with Valley-Foothill riparian vegetation.

Valley oak woodlands are important to a variety of wildlife species in the Planning Area. This habitat provides food and cover for numerous birds and mammals. Birds that use this habitat for breeding and feeding include red-shouldered hawks (*Buteo lineatus*), European starling (*Sturnus vulgaris*), California quail, plain titmouse (*Baeolophus inornatus*), scrub jay, rufous-sided towhee (*Pipilo erythrophthalmus*), Bewick's wren (*Thryomanes bewickii*), bushtit (*Psaltriparus minimus*), and acorn woodpecker (*Melanerpes formicivorus*).

Riparian

Riparian habitats typically occur adjacent to rivers, perennial or intermittent streams, seeps, and springs. Riparian habitats are composed of a narrow band of trees, shrubs, and herbs that are adapted to moist soil conditions. Riparian habitats within the Planning Area include montane riparian and valley foothill riparian, covering approximately 4,580 acres of the Planning Area.

Montane riparian habitat is variable and diverse, usually occurring as a narrow, dense grove of broad-leaved, winter deciduous trees up to 30 m (98 ft) tall. The understory is usually sparse. This habitat occurs at mid to high elevations. At high elevations, montane riparian habitat may not be well developed or may occur in the shrub stage only. In the Sierra Nevada, montane riparian habitat is composed of thinleaf alder (*Alnus incana*), aspen (*Populus sp.*), black cottonwood, dogwood (*Cornus sp.*), wild azalea (*rhododendron sp.*), willow (*Salix sp.*), and water birch (*Betula occidentalis*). This habitat intergrades with montane chaparral, montane hardwood, montane hardwood-conifer, lodgepole pine, red fir, and wet meadow habitats.

Wildlife uses montane riparian habitat for water, thermal cover, migration corridors, nesting, and feeding opportunities. The shape of

riparian zones highly influences habitat value; linear riparian habitat adjacent to streams maximizes the development of edge, thereby increasing productive habitat for wildlife.

Valley foothill riparian habitat has canopy cover of 20 to 80 percent of winter deciduous trees. Canopy height is approximately 30 m (98 ft), subcanopy layer of lianas (usually wild grape) cover the ground and trees to heights of 20 to 30 m (65 to 98 ft). Herbaceous vegetation typically covers one percent of the total cover, except in openings where more sunlight is available. Generally, the understory of Valley foothill riparian habitats is impenetrable due to fallen limbs, debris, and dense vines. Dominant species include cottonwood, California sycamore (*Platanus racemosa*), and Valley oak. Subcanopy trees include white alder (*Alnus rhombifolia*), boxelder, and Oregon ash (*Fraxinus latifolia*). Understory shrubs include wild grape, wild rose (*rosa californica*), California blackberry, blue elderberry (*Sambucus caerulea*), poison oak, buttonbush (*Cephalanthus occidentalis*), and willows. Herbs consist of sedges, rushes, grasses, miner's lettuce (*Claytonia perfoliata*), Douglas sagewort (*Artemisia douglasiana*), poison-hemlock (*Conium maculatum*), and hoary nettle (*Urtica dioica*).

Valley foothill riparian habitats provide food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for an abundance of wildlife within the Planning Area. This habitat supports on of the richest diversity of animals, including 50 species of amphibians, 147 species of birds, and 55 species of mammals.

Shrub-Dominated Habitats

Montane Chaparral and Mixed Chaparral

Montane chaparral and mixed chaparral habitats cover approximately 153,790 acres within the Planning Area. Montane habitat type usually occurs on rocky, granitic southern exposures and is characterized by drought-tolerant species. These species include huckleberry oak (*Quercus vacciniifolia*), Sierra chinquapin (*Chrysolepis sempervirens*), manzanita, ceanothus, bitter cherry (*Prunus emarginata*), and toyon. Montane Chaparral is adjacent to a wide variety of habitats including Montane Riparian, mixed chaparral, ponderosa pine, Jeffrey pine, red fir, and lodgepole pine. This habitat is found in the northeast sections of the Planning Area.

Montane chaparral provides habitat for a variety of wildlife species. Chaparral habitats are very important to rodent species. Deer are also strongly associated with chaparral habitats which provide summer foraging areas, cover, and fawning habitat. Rabbits and hares eat twigs, and leaves from chaparral during the fall and winter months when grasses are not available. Birds utilize the seeds, fruits, and insects that are present within this habitat; as well as using chaparral for singing, roosting, and nesting sites.

Mixed chaparral habitat type supports a wide variety of plant species. Composition changes with precipitation, aspect, and soil type. Species that are common in this habitat include several species of ceanothus and manzanita, chamise (*Adenostoma fasciculatum*), silk-tassel (*Garrya flavescens*), toyon, yerba-santa (*Eriodictyon californicum*), sumac (*Rhus laurina*), hollyleaf cherry (*Prunus ilicifolia*), and California fremontia (*Fremontodendron californicum*). Mixed Chaparral habitats occur in a matrix with Chamise-Redshank Chaparral, Annual Grassland, Blue Oak-Foothill Pine, and Ponderosa Pine. This habitat type is found primarily in the southeast portions of the Planning Area.

No wildlife species are restricted to this habitat, however many wildlife species utilize this habitat including Anna's hummingbird (*Calypte anna*), brush mouse (*Peromyscus boylii*), California quail (*Callipepla californica*), ring-necked snake (*Diadophis punctatus*), sage sparrow (*Amphispiza belli*), spotted towhee (*Pipilo maculatus*), and the wrentit (*Chamaea fasciata*).

Desert Scrub

Desert scrub habitats are typically open, scattered assemblages of broad-leaved evergreen or deciduous microphyll shrubs between 0.5 and 2 m (1.5 and 6.5 ft) tall, rarely exceeding 3 m (10 ft) in height. Desert scrub covers approximately 23,640 acres in the southeast corner of the Planning Area. Canopy cover of desert scrub habitats is generally less than 50 percent, with large areas of bare ground in between plants. The dominant plant species within this habitat is the creosotebush (*Larrea tridentata*). Other species found in desert scrub habitats include catclaw acacia (*Acacia greggii*), desert agave (*Agave deserti*), coastal bladderpod (*Isomeris arborea*), white brittlebush (*Encelia farinosa*), burrobush (*Ambrosia dumosa*), desert sand verbena (*Abronia villosa*), desert senna (*Cassia covesii*), Mojave yucca (*Yucca schidigera*), and others. This habitat occurs at relatively low elevations and transitions into Joshua Tree and Pinyon-Juniper habitats at higher elevations. Desert scrub borders Desert Wash, Desert Riparian, Palm Oasis, Desert Succulent shrub, and Alkali Scrub. Rainfall is an important factor in this community; as rainfall increases, creosotebush densities also increase.

Presence of water during the winter and spring months support growth of herbaceous plants and provide foraging areas and food for a variety of reptiles and rodents, including: couch's spadefoot toad (*Scaphiopus couchii*), desert tortoise (*Gopherus agassizii*), lizards, snakes, desert iguana (*Dispsosaurus dorsalis*), common kingsnake (*Lampropeltis getulus*), black-throated sparrow (*Amphispiza bilineata*), pocket mice, kangaroo rats, kit fox, coyote and bobcat (*Felis rufus*).

Herbaceous-Dominated Habitats

Alpine Habitat

Alpine habitats are comprised of wetland and upland habitats that cover approximately 1,130 acres within the Planning Area. Wetlands occurring in alpine habitats are freshwater wetlands that are seasonally flooded, semi-permanently flooded, permanently saturated, or seasonally saturated. They occur at the margins of channels, lakes, ponds, overflow areas, streams, and wet meadows. Wet meadows are the most commonly associated habitat type to alpine habitat. Dominant species within wet meadows include sedges, rushes, and tufted hairgrass (*Deschampsia cespitosa*). Upland habitats within alpine habitats typically occur above the forest line. These habitats include moist sods, steppes, patches of plants, individual plants, shrubs in rock crevices, and talus.

Alpine habitat is characterized by high winds, precipitation, cloud cover, fog, and low annual temperatures, resulting in a short growing season. Plants and animals that inhabit alpine habitat are adapted to extreme climate and isolation. These animals include the American pika, Belding's ground squirrel (*Spermophilus beldingi*), Yellow-bellied marmot, and Sierra Nevada Bighorn sheep (*Ovis canadensis sierrae*).

Annual Grassland

Annual grassland constitutes 339,600 acres of the Planning Area. Annual grassland habitat is dominated by introduced annual grasses and herbs in the ground layer. Common grasses include wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis ssp. rubens*), wild barley (*Hordeum murinum*), and foxtail fescue (*Vulpia myuros*). Common forbs include redstem filaree (*Erodium cicutarium*), broadleaf filaree (*Erodium botrys*), turkey mullein (*Eremocarpus setigerus*), clovers (*Trifolium sp.*), bur clover (*Medicago polymorpha*), popcorn flower (*Plagiobothrys sp.*). Annual grasslands also support native species such as California poppy (*Eschscholzia californica*), purple needlegrass (*Nassella pulchra*), and Idaho fescue (*Festuca*

idahoensis). Species composition within this habitat is highly dependent on precipitation, fall temperatures, light intensity (affected by shading from plants and litter), and differences in microtopography.

Annual grasslands provide foraging for a wide variety of wildlife species when special habitat features are present, such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and cover from predators. Reptiles that breed in Annual Grassland habitats include the western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus atrox*). Mammals typically found in annual grasslands include the black-tailed jackrabbit (*Lepus californicuc*), California ground squirrel, Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtis californicus*), badger, coyote, and the endangered San Joaquin kit fox (*Vulpes macrotis mutica*). Common birds known to breed in annual grasslands include the burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), horned lark (*Eremophila alpestris*), and western meadowlark. This habitat is also valuable foraging habitat for turkey vulture, northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), black-shouldered kite (*Elanus axillaris*), and prairie falcon (*Falco mexicanus*).

Wetlands

Wetland habitats are areas of land where water saturation is the dominant factor determining the nature of soil development and type of plant and animal communities existing on the site. Wetlands cover approximately 18,750 acres (see Table 9-1) within the Planning Area. The federal definition of wetlands includes "lands that are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands typically have three attributes: (1) at least periodically, the land supports hydrophytes (water-loving plants), (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year." Wetland types within the Planning Area include wet meadows, fresh emergent wetlands, and vernal pools.

Wet meadows consist of a layer of herbaceous plants that form a microstructure ranging between 2 or 3 cm (0.812 inch) to one meter or more tall (>3 ft). Wet meadows are composed of bentgrass (*Agrostis sp.*), sedge (*Carex sp.*), oatgrass (*Danthonia sp.*), rush (*Juncus sp.*), willow (*Salix sp.*), and spikerush (*Scirpus sp.*). Some important herb species found in wet meadows include Anderson aster (*Aster alpigenus var. andersonii*),

Jeffrey shootingstar (*Dodecatheon jeffreyi*), trailing Saint-Johnswort (*Hypericum humifusum*), hairy pepperwort (*Marsilea vestita*), primrose monkeyflower (*Mimulus primuloides*), western cowbane (*Oxypolis occidentalis*), and others. Willow and bilberry (*Vaccinium myrtillu*) are the only shrubs found in wet meadows in low abundance.

Wet meadows are generally too wet to provide suitable habitat for small mammals. Mule deer and elk may feed on forbs and palatable grasses in this habitat. Waterfowl such as mallard ducks visit streams flowing through wet meadows. Birds such as yellow-headed blackbird (*Xanthocephalus xanthocephalus*) and red-winged blackbirds (*Agelaius phoeniceus*) occasionally nest in wet meadows. The striped racer (*Masticophis lateralis lateralis (=Coluber lateralis)*) is a common snake of wet meadows. Wet meadows with perennial streams provide habitat for trout species.

Fresh emergent wetlands are characterized by erect, rooted herbaceous hydrophytes. Fresh emergent wetlands have variable vegetation composition and size structure, but all are saturated or flooded frequently enough to support anaerobic soil conditions. These wetlands are composed of big leaf sedge (*Carex amplifolia*), Baltic rush (*Juncus balticus*), redroot nutgrass (*Cyperus erythrorhizos*), saltgrass (*Distichlis spicata*), common cattail (*Typha latifolia*), tule (*Scirpus sp.*), river bulrush (*Schoenoplectus fluviatilis*), and arrowhead (*Sagittaria sp.*). Fresh emergent wetlands occur in association with terrestrial and aquatic habitats.

Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water to numerous birds, mammals, reptiles, and amphibians. Many species depend on this habitat for their entire life cycle. These wetlands also support special-status species such as the rare giant garter snake (*Thamnophis gigas*), Aleutian Canada goose (*Branta canadensis leucopareia*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinus*).

Vernal pools are seasonally flooded depressions in the landscape that are underlain by an impermeable layer of hardpan, claypan, or volcanic basalt. These pools are typically dry in the summer and inundated during parts of the winter. Vernal pools exist singly or in complexes of pools that occur in close proximity and are hydrologically connected. This wetland supports a specialized biota that includes a large number of threatened and endangered species. Plant species typically found in vernal pools include downingias, onions, goldfields, meadowfoam (*Limnanthes douglasii*), pincushions, monkeyflowers, owl clovers, coyote

thistle (*Eryngium vaseyi*) and others. Animal species found in vernal pools include tadpole shrimp (*Lepidurus packardii*), fairy shrimps (*Linderiella occidentalis, Branchinecta lindahli,* and other species), salamanders, vernal pool tadpole shrimp (*Lepidurus packardi*), and western spadefoot toad (*Spea hammondi*).

Aquatic Habitats

Open Water

Water comprises approximately 10,680 acres (see Table 9-1) of the Planning Area. Water habitat within the Planning Area is composed of lacustrine and riverine areas. Lacustrine includes lakes, reservoirs, ponds, and ponded areas along streams, while riverine includes rivers, canals, and streams. Water habitats typically provide foraging, cover, and breeding habitat for aquatic species such as pond turtle (*Emys marmorata*), amphibians, various waterfowl and fish-eating species such as belted kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), and bald eagle. Many species of insectivorous birds (swallows, swifts, flycatchers) hunt their prey over water. Common mammals found in riverine habitats include river otter (*Lontra canadensis*), mink (*Neovison vison*), muskrat, and beaver (*Castor canadensis*).

Developed Habitats

Urban

Land classified as urban areas encompasses approximately 56,220 acres of the total Planning Area. Wildlife species that use urban habitat is variable, depending on the density of development, the surrounding land use, and the types and availability of vegetation and other habitat features available for foraging, nesting, and cover. In general, however, wildlife habitat in urban areas consists of landscaped areas with a mix of both native and exotic ornamental plant species. Species using these areas are conditioned to a greater level of human activity than those in natural and less developed areas. Generally, the more developed an urban area (example: downtown) is, the less diversity of species occurring in that area will be.

Wildlife species typically found in urban habitat include American crow (*Corvus brachyrhynchos*), rock dove (*Columba livia*), American robin (*Turdus americana*), Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macrocoura*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and striped skunk (*Mephitis mephitis*).

Vineyard / Cropland

Agricultural habitat covers approximately 795,340 acres (see Table 9-1) of the Planning Area. Vegetation composition and structure in agricultural habitats are variable, depending on the type of crops grown and the time of year. For these reasons, habitat value for wildlife is also variable. In addition, the types and timing of operational activities of agricultural lands affects habitat suitability for wildlife. Tall and maintained crops such as vineyards will provide different habitat value and likely support different wildlife species than short crops with a lot of exposed bare ground between rows or pasture land.

Typical wildlife species that may use agricultural habitat include a variety of rodents – such as California ground squirrel and California vole (*Microtus californicus*) – and birds – such as red-winged blackbird, northern harrier, white-tailed kite, and yellow-billed magpie. Croplands provide food and water for these species, but do not generally provide long-term shelter due to the frequency of disturbance.

Non-Vegetated Habitats

Barren

Barren habitat is defined as any habitat with less than 2% total vegetation cover by herbaceous, desert, or non-wildland species and less than 10% cover by tree or shrub species. Barren habitat constitutes 183,680 acres (see Table 9-1) of the Planning Area. Structure and composition of this habitat is largely influenced by the region of the state and surrounding environment. In marine and estuarine environment, barren habitat includes rocky outcrops, sandy beaches, and mudflats. Along rivers, it includes vertical river banks and canyon walls. Barren habitats in desert environments are areas between widely spaced vegetation. Alpine barren habitats include exposed parent rock, glacial moraines, talus slopes, and any surface permanently covered by snow or ice. Urban environments have barren habitats in the form of pavement and buildings.

Barren habitats are found in juxtaposition with many of the other habitats described above. Because there is little or no vegetation found in areas characterized as barren habitat, the structure of the non-vegetated substrate becomes an important component in the classification of this type of habitat. Rock ledges provide nesting sites for cormorants, hawks, and falcons. Plovers, stilts, avocets, gulls, terns, nighthawks, and poorwills rely on open sandy ground or gravel for constructing small scrape nests. Bank swallows (*Riparia riparia*) use barren vertical cliffs of

friable soils along river corridors to dig holes for nesting and cover. Bats benefit from rocky, river canyon walls above open water by using it as foraging habitat. Horned lizards and fring-toed lizards use open sandy soil in the desert as a substrate for burrowing and egg-laying. Alpine habitats with talus slopes provide cover for ground-dwelling mammals such as pika and marmots.

Sensitive Natural Communities

A sensitive natural community is a rare vegetation type that provides important habitat opportunities for wildlife, is structurally complex, or which is of special concern to local, state, or federal agencies. Natural communities that are either known or believed to be of high priority for inventory are listed in the CNDDB. The following nine sensitive natural communities are found in Tulare County:

- Big Tree Forest;
- Central Valley Drainage Hardhead/Squawfish Stream;
- Great Valley Oak Riparian Forest;
- Northern Hardpan Vernal Pool;
- Southern Interior Cypress Forest;
- Sycamore Alluvial Woodland;
- Valley Sacaton Grassland;
- Valley Saltbush Scrub; and
- Valley Sink Scrub;

Critical Habitats

The Endangered Species Act (ESA) requires the federal government to designate "critical habitat" for any species it lists under the ESA. Critical habitat designations have been established for the following eight species in Tulare County and are identified in Figure 9-1:

- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Vernal pool tadpole shrimp (*Lepidurus packardi*)
- Little Kern golden trout (*Oncorhynchus aquabonita whitei*)
- California tiger salamander, central population (*Ambystoma californiense*)
- California condor (*Gymnogyps californianus*)

- Hoover's spurge (*Chamaesyce hooveri*)
- San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)
- Keck's checker-mallow (*Sidalcea keckii*)

Vernal Pool Fairy Shrimp and Tadpole Shrimp

On August 6, 2003, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for four vernal pool crustaceans, including the vernal pool fairy shrimp (*Branchinecta lynchi*) and the vernal pool tadpole shrimp (*Lepidurus packardi*). Critical habitat for vernal pool fairy shrimp in Tulare County is generally located south and southwest of the city of Tulare and northwest of the city of Visalia. Critical habitat for vernal pool tadpole shrimp is located northwest of the city of Visalia. The total land area designated as critical habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp in California and Oregon is 839,460 acres and 459,505, respectively acres for the vernal pool tadpole shrimp. The total area of critical habitat designated for vernal pool fairy shrimp and vernal pool tadpole shrimp within Tulare County is 24,285 acres and 7,579 acres, respectively. The final rule identified the following threats to the vernal pool fairy shrimp and vernal pool tadpole shrimp:

- Vernal pool species are threatened by invasion of nonnative species. Actions to reduce negative effects of nonnative invasion include managed grazing and prescribed burning.

- Alteration of natural hydrology threatens many vernal pool species, including the two mentioned above. Actions to restore vernal pool hydrology include the removal of dams and ditches, reconstruction or construction of berms or culverts, and modification of grazing regimes.

- Human degradation of vernal pools through activities such as off-road vehicle use, dumping, and vandalism threatens many vernal pool species, including the two mentioned above. Actions to reduce human degradation of vernal pool habitat include fencing, trail building, and posting signs.

Little Kern Golden Trout

On April 13, 1978, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the Little Kern golden trout (*Oncorhynchus aquabonita whitei*). Critical habitat for this species in Tulare County is generally located in the eastern portion of Tulare County, within the main channel and all stream tributaries of the Little Kern River above the barrier falls located on the river one mile below the mouth of Trout

Meadows Creek. The final rule identified the following threats to the Little Kern golden trout:

- Uncontrolled use of ORV's, improper road construction, careless logging activities, pollution from mining operations or overgrazing in large portions of the drainage basin could degrade water quality and threaten the survival of the Little Kern golden trout.

- Introduction of rainbow trout into the Little Kern River System in the 1930's has resulted in hybridization between the Little Kern golden trout and the introduced rainbow trout. Introduction of this species has reduced the number of pure populations of Little Kern golden trout.

California Tiger Salamander, Central Population

On August 23, 2005, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the central population of California tiger salamander (*Ambystoma californiense*). Critical habitat in Tulare County for this species is generally located north and northwest of the city of Visalia, and is also found throughout the Central Valley, Southern San Joaquin, East Bay, and Central Coast Regions (see Figure 9-1). A total of approximately 200,000 acres of critical habitat was designated for the central population of California tiger salamander throughout California. Tulare County contains approximately 5,200 acres of designated critical habitat for the central population of the California tiger salamander. The final rule identified the following threats to the California tiger salamander in the County:

- Activities that could disturb aquatic breeding habitats during the breeding season, such as heavy equipment operation, ground disturbance, maintenance projects (e.g., pipelines, roads, powerlines), off-road travel or recreation;

- Activities that impair the water quality of aquatic breeding habitat;

- Activities that create barriers impassable for salamanders or increase mortality in upland habitat between extant occurrences in breeding habitat; and

- Activities that disrupt vernal pool complexes' ability to support California tiger salamander breeding function (70 FR 49380).

California Condor

On September 24, 1976, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the California condor (*Gymnogyps californianus*). On September 22, 1977, a document of Final Correction and Augmentation of Critical Habitat Reorganization was issued. Critical habitat for this species in Tulare County is generally located between Highway 65, Highway 198, and the western boundary of the Sequoia National Forest. The total area designated as critical habitat for the California condor is approximately 152,000 acres. These regulatory decisions identified the following habitat requirements for the California condor in the County:

- The California condor requires substantial areas of open range, with adequate food, and limited development and disturbance to survive. Condor feeding, nesting, and roosting habitat are restricted to areas listed in the final rule.

Hoover's Spurge

On August 6, 2003, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the Hoover's spurge (*Chamaesyce hooveri*). Critical habitat for this species in Tulare County is generally located northwest and northeast of the city of Visalia. The total area designated as critical habitat for the Hoover's spurge is approximately 23,537 acres in Tulare County and 145,383 acres in California and Oregon. This area is important because it supports almost 20 percent of the known occurrences of Hoover's spurge. This species, along with other vernal pool species, are threatened by nonnative species, altered hydrology, and habitat degradation through human use. As discussed previously with vernal pool fairy shrimps and vernal pool tadpole shrimp, vernal pool species benefit greatly from conservation actions involving managed grazing and burning, removing or altering man-made structures to restore natural hydrology regimes, and providing means for humans to interact positively with vernal pools.

San Joaquin Valley Orcutt Grass

On August 6, 2003, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*). Critical habitat for this species in Tulare County is generally located northwest and northeast of the city of Visalia. The total area designated as critical habitat for this species is approximately 15,243 acres in Tulare County and 197,367 acres in California and Oregon. This species, along with other vernal pool species, are threatened by nonnative species, altered hydrology, and habitat degradation through human use. Actions to reduce negative effects of these impacts are

discussed above in the vernal pool fairy shrimp and vernal pool tadpole shrimp section.

Keck's Checker-Mallow

On March 18, 2003, U.S. Fish and Wildlife Service issued a final rule designating critical habitat for the Keck's checker-mallow (*Sidalcea keckii*). Critical habitat areas for this species are generally located south of the city of Porterville, in the Mine Hill area, and near the White River in Tulare County. The total area designated as critical habitat for the Keck's checker-mallow is approximately 575 acres in Tulare County. The final rule identified the following factors that impact the survival of Keck's checker-mallow:

- Historic loss of habitat that supports this species requires protection of current habitat and seed banks, as well as providing the opportunity for this species to expand its distribution by protecting currently suitable but unoccupied habitat.

Other Sensitive Habitat Areas

Tulare Lake Basin

The Tulare Lake Basin is located in Kern, Kings and Tulare Counties. Historically, Tulare Lake varied in size from 450 to 800 square miles and was known to become completely dry during drought years (Moore 1990). The historical seasonal flooding of Tulare Lake and four other smaller lakes created an interconnected patchwork of aquatic, wetland, riparian forest, and valley oak savannah habitats. These wetlands were utilized for wintering or as a migratory stop for waterfowl. Most of the historic Tulare Lake Basin has been converted to agricultural land uses. Portions of the Pixley National Wildlife Refuge (also see Section 4) are located within the historic Tulare Lake Bed. This 6,000-acre refuge is located in southwestern Tulare County and contains grassland and wetlands habitats. This refuge was established to restore and protect wetland habitat for waterfowl. Approximately 4,392 acres of the refuge provide habitat for three endangered species, the San Joaquin Kit Fox, the Blunt-Nosed Leopard Lizard, and the Tipton Kangaroo rat (USBR 2001).

Wetlands

Wetlands exist throughout Tulare County. Through the creation of protective regulations, both the federal and state government have demonstrated the importance of wetlands through the passage of the

Clean Water Act and the Porter-Cologne Water Quality Act. Wetlands provide habitat for many plants and animals. They are essential in preserving the quality of surface waters and in recharging groundwater aquifers. Through implementation of the California Wetlands Conservation Policy, CDFG has begun to coordinate wetland information for the state. Currently, their efforts have been focused on the Central Valley (CDFG 2008c). Figure 9-1 shows the presence of wetlands in Tulare County; although, a focused survey has not been completed of all wetlands in the county.

Tulare County contains a unique and threatened wetland-type known as vernal pools. Vernal pools are seasonally flooded depressions in the landscape that are underlain by subsurface soils that limit drainage. These pools are typically dry in the summer and inundated during parts of the winter. Depending on their depth and the quantities of rainfall, inundation can occur for a week to several months. The surrounding non-pool terrain that divides vernal pools typically exists in higher proportions than the areas that are actually inundated. Vernal pools exist singly or in complexes of pools that occur in close proximity and are hydrologically connected. This wetland supports a specialized biota that includes a large number of threatened and endangered species. Historically, vernal pools existed in native grassland prairie areas. Today, vernal pools exist in Tulare County in annual grassland and cultivated areas. It is estimated that 38,530 acres of vernal pools exist in Tulare County. Most of this wetland is not addressed in Figure 9-1 or Table 9-1 because the habitat types addressed in the figure and table are based on dominant vegetation and the size of an actual vernal pool area would not appear at the scale of the analysis conducted to determine the vegetation-types addressed in the figure and the table. Vernal pools are generally addressed as an ecosystem. Their ecosystem is considered one of the most threatened ecosystems in California. Because this ecosystem often occurs on relatively flat terrain, it is highly vulnerable to destruction from agriculture, heavy grazing, urbanization, brush clearing, and off-road vehicle use. The USFWS has designated critical habitat for several listed vernal pool species that typically protects large tracts of vernal pool areas.

Tulare County General Plan Update

0 2.5 5 Miles

LEGEND

Habitat

- Vineyard/Cropland
- Desert Scrub
- Alpine Habitat
- Annual Grassland
- Barren
- Hardwood Woodland
- Mixed Hardwood/Coniferous Forest
- Chaparral
- Wetland
- Coniferous Forest
- Coniferous Woodland
- Open Water
- Riparian
- Urban
- USFWS Critical Habitat
- Cities
- Limited Access Highway
- State or County Highway
- Rivers and Streams
- County Boundary

FRESNO COUNTY
KINGS COUNTY
KERN COUNTY
INYO COUNTY

Sanger
Orange Cove
Parlier
Reedley
Dinuba
Kingsburg
Woodlake
Visalia
Farmersville
Exeter
Tulare
Lindsay
Porterville
Corcoran
Delano

Kings River
Saint John River
Kaweah River
Kern River
South Fork Kern River
Tule River
White River

Lake Kaweah
Lake Success

California Tiger Salamander
California Tiger Salamander
Hoover's Spurge
San Joaquin Orcutt Grass
Vernal Pool Tadpole Shrimp
Vernal Pool Fairy Shrimp
Hoover's Spurge
Hoover's Spurge
San Joaquin Orcutt Grass
California Condor
Little Kern Golden Trout
Vernal Pool Fairy Shrimp
Keck's Checker-Mallow
Vernal Pool Fairy Shrimp
Keck's Checker-Mallow

Tule River
Indian Reservation

180 69 201 63 198 216 99 137 190 43 65 395 136

N

SOURCE: USGS, 1999; CDF, 2002; USFWS, 2008; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Figure 9-1
Habitat Types of
Tulare County

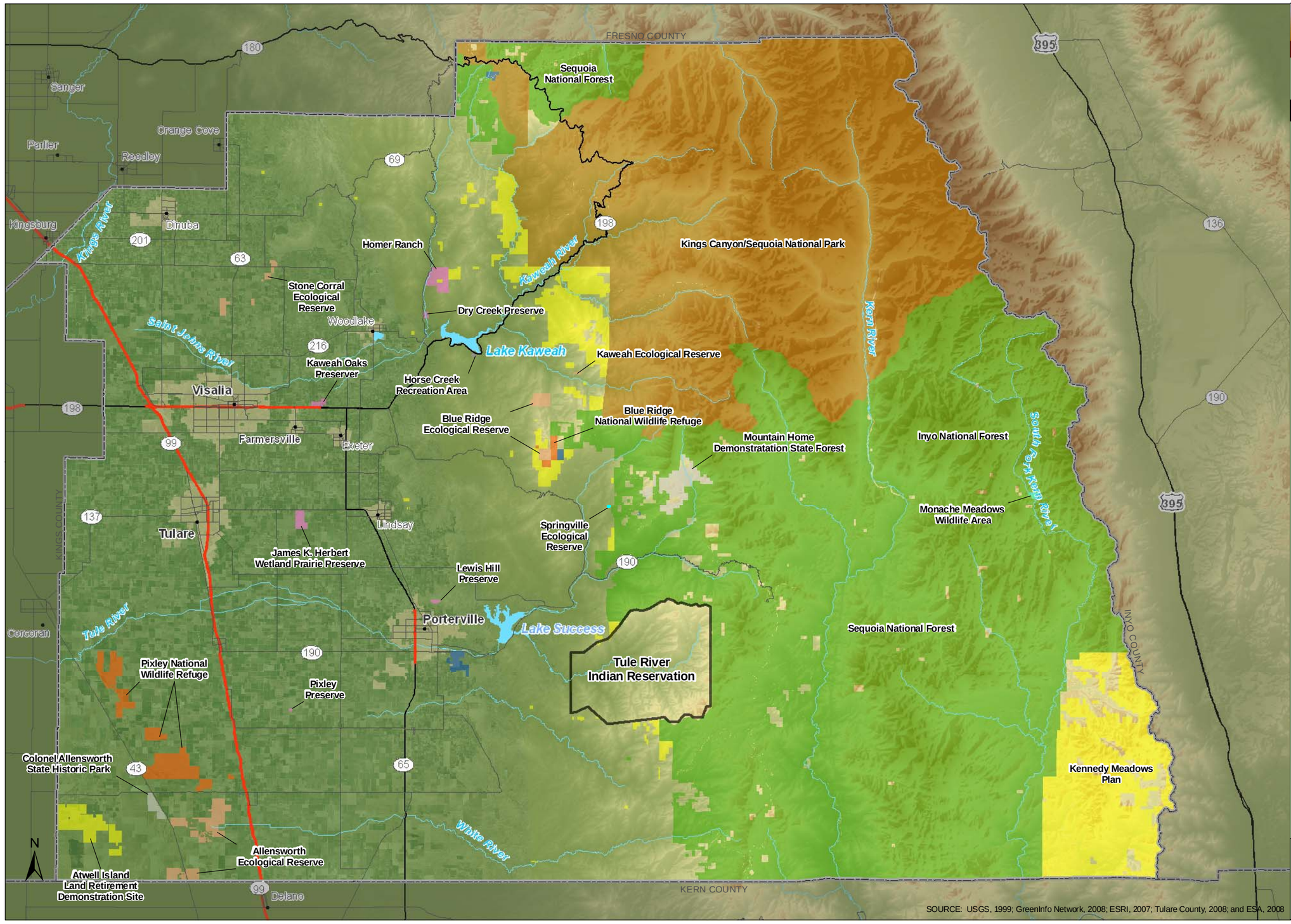


Figure 9-2
Protected Lands of Tulare County

Species Recovery Plan

The *Recovery Plan for Upland Species of the San Joaquin Valley*, released and adopted by the USFWS in 1998, is a conservation and recovery plan for federally listed species, candidate species, and species of concern. This recovery plan protects 34 species; 11 of which are federally listed as threatened or endangered, and 23 listed as candidate species or species of concern. Some of the species that are addressed in this recovery plan include California jewelflower (*Caulanthus californicus*), Kern mallow (*Eremalche kernensis*), giant kangaroo rat (*Dipodomys ingens*), blunt-nosed leopard lizard (*Gambelia silus*), and San Joaquin kit fox (*Vulpes macrotis mutica*). The ultimate objective of this plan is for the recovery and subsequent de-listing of the 11 endangered or threatened species and for the long-term conservation of the candidate species and species of concern. This plan provides an ecosystem approach to the conservation and recovery of these species. The strategy of the plan is to focus on the recovery of the natural communities and ecosystems where many of the upland species co-occur. One of the key elements of this plan contains economic and social consideration with recommendations to "reduce the [fiscal] cost recovery, impacts of recommended actions on the local economy, and the constraints placed on the citizens of the San Joaquin Valley." The recovery plan identifies the need to create a link between ecosystems near Highway 43 (SR 43) and Garces Highway (SR 155), in the western part of the county. The plan also identifies the Sierra Nevada foothills in Tulare County, at the east and southeast edge of the San Joaquin Valley, as an area to maintain its natural lands (USFWS 1998). This recovery plan illustrates how species habitats exist throughout a geographical and ecosystem area and are not determined by county boundaries.

Federally and State-Protected Lands

Within Tulare County, there exist lands which have large limitations on land uses, i.e. wildlife refuges, national parks, etc. These areas generally provide nursery sites, high quality habitat, corridors, and migratory stopping points for biological resources. Many of these areas are created to protect rare species and their ecosystems. Some of the larger sites are described below and depicted in Figure 9-2..

Blue Ridge Ecological Reserve.

This is a 3,200-acre reserve that is managed by the Bureau of Land Management (BLM). The Blue Ridge Critical Condor Habitat Zone, which has been designated by the USFWS, is contained within this reserve. The BLM manages this area for the protection of the designated critical condor habitat in cooperation with the USFWS and CDFG (BLM 2008).

Pixley National Wildlife Refuge.

This is a 6,190-acre reserve of native grassland, marsh habitat and vernal pool habitat in the former Tulare Basin that is owned and managed by the USFWS. This reserve provides habitat for the vernal pool fairy shrimp, San Joaquin kit fox, Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and the blunt-nosed leopard lizard and is a wintering area for migratory waterfowl (USFWS 2008a).

Sequoia and Kings Canyon National Parks.

These two parks comprise 863,740 total acres. Kings Canyon National Park is located to the north and Sequoia National Park is located to the south. They are both managed by the National Park Service. These parks exist in many different habitats that range in elevation from approximately 5,000 feet to over 14,000 feet (NPS 1999).

Sequoia National Forest and Sequoia National Monument.

The Sequoia National Forest is located at the southern most end of the Sierra Nevada in Central California. The monument protects 38 groves of the giant sequoia. Elevations range from 1,000 feet in the foothill region to peaks over 12,000 feet in the higher elevations. They are managed by the U.S. Forest Service and U.S. Department of Agriculture.

Other protected areas include the following:

- **Mineral King, Golden Trout, and Domelands Wilderness areas.**
- **Monache Meadows Wildlife Area.**
- **Mountain Home State Forest.**
- **Allensworth Ecological Reserve.**
- **.Yaudanchi Ecological Reserve.**
- **San Joaquin River Ecological Reserve.**
- **Springville Ecological Reserve.**
- **Kaweah Ecological Reserve.**
- **Stone Coral Ecological Reserve**

Habitat Conservation Plans

The Kern Water Bank Habitat Conservation Plan (KWBHCP) is the only approved multi-species habitat conservation plan (HCP) that exists in Tulare County.

The KWBHCP was approved by the USFWS on October 2, 1997 and protects a total of 22 federally listed species and 29 non-listed species. The HCP covers a 19,900-acrea area located in Tulare, Kern, and Kings Counties. The species protected in this HCP include the valley elderberry longhorn beetle (*Desmocerus californicas dimorphus*), California condor (*Gymnogyps californianus*), Conservancy fairy shrimp (*Branchinecta conservation*), San Joaquin kit fox, and western snowy plover(C*haradrius alexandrinus*) (USFWS 2004).

Conservation and Mitigation Banking

A conservation or mitigation bank is land that is managed for its natural resource values. This land is either privately or publicly owned. The bank operator sells habitat credits to developers who need to satisfy legal requirements for compensating environmental impacts of development projects. The bank operator is obligated to permanently protect the land. Conservation banks generally protect threatened and endangered species habitat and are approved by a wildlife agency such as CDFG or the USFWS. Mitigation banks are specifically for wetland restoration, creation, and enhancement undertaken to compensate for unavoidable wetland losses and are generally approved by the wildlife agencies and the ACOE (CDFG 2008e).

Listed Species and Sensitive Natural Communities

Listed species and sensitive natural communities need to be considered when identifying and evaluating biological resources. Table 9-2 documents the special status species listed by the USFWS, CDFG and California Native Plant Society (CNPS) for Tulare County. The California Natural Diversity Database (CNDDB) and the CNPS lists 182 documented occurrences (of California's approximately 1,843 listed species) in Tulare County (CNDDB 2008 and CNPS 2008).

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
INVERTEBRATES					
Andrena macswaini	An andrenid bee	None	None	N/A	Deep sandy soil
Branchinecta lynchi	vernal pool fairy shrimp	Threatened	None	N/A	Annual grassland, vernal pool and swale
Caecidotea sequoiae	Sequoia cave isopod	None	None	N/A	Aquatic habitats, preferably where fish are not present
Calicina cloughensis	Clough Cave harvestman	None	None	N/A	Mesic habitats but not where soil is inundated or periodically saturated with water
Chrysis tularensis	Tulare cuckoo wasp	None	None	N/A	Unknown
Cicindela tranquebarica ssp.	San Joaquin tiger beetle	None	None	N/A	Unknown
Cryptochia denningi	Denning's cryptic caddisfly	None	None	N/A	Probably small, cold, first and second order streams
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Threatened	None	N/A	Riparian and other habitats in association with blue elderberry (*sambucus mexicana*)
Helminthoglypta callistoderma	Kern shoulderband	None	None	N/A	Terrestrial
Lepidurus packardi	vernal pool tadpole shrimp	Endangered	None	N/A	Vernal pools and swales
Lytta hoppingi	Hopping's blister beetle	None	None	N/A	Foothills
Lytta moesta	moestan blister beetle	None	None	N/A	Flowers and foliage in grasslands
Lytta molesta	molestan blister beetle	None	None	N/A	Annual grasslands
Lytta morrisoni	Morrison's blister beetle	None	None	N/A	Valley and foothill grasslands
Talanites moodyae	Moody's gnaphosid spider	None	None	N/A	Terrestrial/unknown
FISH					
Oncorhynchus mykiss aguabonita	Volcano Creek golden trout	None	Special Concern	N/A	Riparian areas
Oncorhynchus mykiss (aquabonita) whitei	Little Kern golden trout	Threatened		N/A	Native to the Little Kern River in Tulare County. Also found in lake habitats.
AMPHIBIANS					
Ambystoma californiense	California tiger salamander, central population	Threatened	Special Concern	N/A	Riparian and Lake habitats
Batrachoseps regius	Kings River slender salamander	None	None	N/A	Drainage of the Kings River on the western slope of the Sierra Nevada
Batrachoseps robustus	Kern slender salamander	None	None	N/A	Chaparral, hardwood forest and mixed hardwood/conifer forest in the lower kern river canyon.
Batrachoseps simatus	Kern Canyon slender salamander	None	Threatened	N/A	Conifer forest
Hydromantes platycephalus	Mount Lyell salamander	None	Special Concern	N/A	Mixed hardwood/conifer forest, conifer forest
Rana aurora draytonii	California red-legged frog	Threatened	Special Concern	N/A	Marshes, springs, permanent and semipermanent natural ponds, ponded and backwater portions of streams,
Rana boylii	foothill yellow-legged frog	None	SC	N/A	Riparian habitats, tails/outlets of pools

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
Rana muscosa	mountain yellow-legged frog	Candidate	None	N/A	Riparian habitats adjacent to high elevation streams where fish are not present
Rana muscosa ssp.	Sierra Madre yellow-legged frog	Endangered	SC		High elevation wetlands and streams where fish are not present
REPTILES					
Actinemys marmorata	western pond turtle	None	SC	N/A	Ponds, sloughs, drainage ditches, wetlands and streams
Bufo canorus	Yosemite toad	Candidate	SC	N/A	Wet mountain meadows
Gambelia sila	blunt-nosed leopard lizard	Endangered	Endangered	N/A	Semiarid grasslands, alkali flats and washes
Masticophis flagellum ruddocki	San Joaquin whipsnake	None	SC	N/A	Open, dry, treeless areas
Phrynosoma coronatum (frontale population)	coast (California) horned lizard	None	SC	N/A	Sandy soil and low vegetation in valleys, foothills and semiarid regions
Spea hammondii	western spadefoot	None	SC	N/A	Annual grassland, hardwood forest
Thamnophis gigas	giant garter snake	Threatened	Threatened	N/A	Found in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields, and occasionally in slow-moving creeks
BIRDS					
Accipiter cooperii	Cooper's hawk	None	None	N/A	Riparian habitat and dense canopy deciduous and evergreen forests
Accipiter gentilis	northern goshawk	None	Special Concern	N/A	Old growth, open understory forests and aspen stands
Agelaius tricolor	tricolored blackbird	None	Special Concern	N/A	Annual grassland, chapparal
Aquila chrysaetos	golden eagle	None	None	N/A	Most open terrain
Ardea herodias	great blue heron	None	None	N/A	Wetlands
Athene cunicularia	burrowing owl	None	Special Concern	N/A	Annual grassland, desert scrub
Buteo swainsoni	Swainson's hawk	None	Threatened	N/A	Riparian habitat and hardwood and coniferous forest
Charadrius alexandrinus nivosus	western snowy plover	Threatened	Special Concern	N/A	Annual grassland (nesting)
Charadrius montanus	mountain plover	None	Special Concern	N/A	Open plains
Cypseloides niger	black swift	None	Special Concern	N/A	Damp cliffs in montane habitats
Dendragapus fuliginosus howardi	Mount Pinos sooty grouse	None	Special Concern	N/A	Edges and open canopy areas of forests
Empidonax traillii	willow flycatcher	None	Endangered	N/A	Willow and alder thickets in mountain meadows
Gymnogyps californianus	California condor	Endangered	Endangered	N/A	Coastal mountains of south central CA.
MAMMALS					
	Nelson's antelope squirrel	None	Threatened	N/A	Desert scrub
Antrozous pallidus	pallid bat	None	Special Concern	N/A	Desert scrub, annual grassland, conifer forests, hardwood forests, mixed conifer/hardwood forests
Chaetodipus californicus femoralis	Dulzura pocket mouse	None	Special Concern	N/A	Annual grassland and hardwood forest
Dipodomys lingens	giant kangaroo rat	Endangered	Endangered	N/A	Prefers open, gently sloping annual grasslands with friable soil and open sparse shrubs in an arid climate
Dipodomys nitratoides exilis	Fresno kangaroo rat	Endangered	Endangered	N/A	Primarily found in southwestern San Joaquin Valley at elevations up to 1800 ft in open, gently sloping annual grasslands with friable soils.

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
Dipodomys nitratoides nitratoides	Tipton kangaroo rat	Endangered	Endangered	N/A	Prefers open, gently sloping annual grasslands with friable soils.
Euderma maculatum	spotted bat	None	Special Concern	N/A	Varied/especially arid habitats
Eumops perotis californicus	western mastiff bat	None	Special Concern	N/A	Vertical rock crevices away from human activity
Gulo gulo	California wolverine	None	Threatened	N/A	Sierra Nevada/open habitat, above or at timberline
Lasiurus cinereus	hoary bat	None	None	N/A	Coniferous and deciduous forests
Martes americana sierrae	Sierra marten	None	None	N/A	Structurally complex, old growth coniferous and mixed hardwood northern forests
Martes pennanti (pacifica) DPS	Pacific fisher	Candidate	Special Concern	N/A	Coniferous forest and riparian habitats
Myotis ciliolabrum	western small-footed myotis	None	None	N/A	Deserts, semideserts and desert mountains
Myotis evotis	long-eared myotis	None	None	N/A	Mixed coniferous forests from humid coastal regions to montane forests
Myotis thysanodes	fringed myotis	None	None	N/A	Roosts in caves, mine tunnels and rock crevices.
Myotis volans	long-legged myotis	None	None	N/A	Coniferous and hardwood forests in montane habitats and oak or streamside woodlands
Myotis yumanensis	Yuma myotis	None	None	N/A	Variety of habitats near rivers, streams, lakes, and ponds, etc.
Ochotona princeps albata	Mt. Whitney pika	None	None	N/A	Rock outcroppings adjacent to vegetation in montane regions
Ovis canadensis sierrae	Sierra Nevada bighorn sheep	Endangered	Endangered	N/A	Eastern Sierra Nevada
Perognathus inornatus inornatus	San Joaquin pocket mouse	None	None	N/A	Central Valley; sandy, open habitats
Taxidea taxus	American badger	None	Special Concern	N/A	Dry, open grasslands, fields and pastures
Vulpes macrotis mutica	San Joaquin kit fox	Endangered	Threatened	N/A	California prairie and Sonoran grasslands in the vicinity of freshwater marshes and alkali sinks
Vulpes vulpes necator	Sierra Nevada red fox	None	Threatened	N/A	High elevation forests and grasslands of Sierra Nevada; avoid dense forests
PLANTS					
Calochortus striatus	alkali mariposa lily	None	None	List 1B.2	Chaparral, desert scrub, wet meadow
Streptanthus gracilis	alpine jewel-flower	None	None	List 1B.3	Conifer forest
Ribes menziesii var. ixoderme	aromatic canyon gooseberry	None	None	List 1B.2	Chaparral/Hardwood forest;
Arabis bodiensis	Bodie Hills rock cress	None	None	List 1B.3	Desert scrub, conifer forest, conifer woodland;
Atriplex depressa	brittlescale	None	None	List 1B.2	Desert scrub, wetlands, annual grassland
Mimulus pictus	calico monkeyflower	None	None	List 1B.2	Hardwood forest
Caulanthus californicus	California jewel-flower	Endangered	Endangered	List 1B.1	Desert scrub, annual grassland, conifer woodland
Phacelia nashiana	Charlotte's phacelia	None	None	List 1B.2	Desert scrub, conifer woodland
Lotus oblongifolius var. cupreus	copper-flowered bird's-foot trefoil	None	None	List 1B.3	Wet meadow, conifer forest
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	None	None	List 1B.1	Wetlands, annual grassland
Trifolium dedeckerae	DeDecker's clover	None	None	List 1B.3	Conifer forest, conifer woodland
Githopsis tenella	delicate bluecup	None	None	List 1B.3	Chaparral/Hardwood forest / mesic
Atriplex erecticaulis	Earlimart orache	None	None	List 1B.2	Annual grassland
Lupinus padre-crowleyi	Father Crowley's lupine	None	Rare	List 1B.2	Desert scrub, riparian, conifer forest

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
Ivesia campestris	field ivesia	None	None	List 1B.2	Wet meadow, conifer forest
Tuctoria greenei	Greene's tuctoria	Endangered	Rare	List 1B.1	Vernal pools, Annual Grassland
Fritillaria brandegeei	Greenhorn fritillary	None	None	List 1B.3	Conifer forest
Viola pinetorum ssp. grisea	grey-leaved violet	None	None	List 1B.3	Wet meadow, conifer forest
Erigeron aequifolius	Hall's daisy	None	None	List 1B.3	Conifer woodland, coniferous forest
Atriplex cordulata	heartscale	None	None	List 1B.2	Desert scrub, wet meadow, annual grassland
Astragalus hornii var. hornii	Horn's milk-vetch	None	None	List 1B.1	Meadows, seeps, playas and lake margins
Lupinus lepidus var. culbertsonii	Hockett Meadows lupine	None	None	List 1B.3	Wet meadow, conifer forest
Chamaesyce hooveri	Hoover's spurge	Threatened	None	List 1B.2	Vernal pools
Brodiaea insignis	Kaweah brodiaea	None	Endangered	List 1B.2	Hardwood forest, annual grassland
Erythronium pusaterii	Kaweah fawn lily	None	None	List 1B.3	Wet meadow, conifer forest
Mimulus norrisii	Kaweah monkeyflower	None	None	List 1B.3	Chaparral, conifer forest
Sidalcea keckii	Keck's checker-mallow	Endangered	None	List 1B.1	Hardwood forest, annual grassland
Erigeron inornatus var. keilii	Keil's daisy	None	None	List 1B.3	Conifer forest, wet meadow
Eremalche kernensis	Kern mallow	None	None	List 1B.1	Valley and foothill grassland
Cordylanthus eremicus ssp. kernensis	Kern Plateau bird's-beak	None	None	List 1B.3	Desert scrub, conifer woodland, conifer forest
Horkelia tularensis	Kern Plateau horkelia	None	None	List 1B.3	Conifer forest
Astragalus lentiginosus var. kernensis	Kern Plateau milk-vetch	None	None	List 1B.2	Wet meadow, conifer forest
Erigeron multiceps	Kern River daisy	None	None	List 1B.2	Wet meadow, conifer forest
Atriplex minuscula	lesser saltscale	None	None	List 1B.1	Desert scrub, annual grassland
Linanthus serrulatus	Madera linanthus	None	None	List 1B.2	Hardwood forest, conifer forest
Petrophyton caespitosum ssp. acuminatum	marble rockmat	None	None	List 1B.3	Conifer forest
Draba cruciata	Mineral King draba	None	None	List 1B.3	Conifer forest
Eriogonum nudum var. murinum	mouse buckwheat	None	None	List 1B.2	Chaparral, hardwood forest, annual grassland
Draba sharsmithii	Mt. Whitney draba	None	None	List 1B.3	Alpine habitat, conifer forest
Carlquistia muirii	Muir's tarplant	None	None	List 1B.3	Chaparral, conifer forest
Iris munzii	Munz's iris	None	None	List 1B.3	Hardwood forest
Phacelia novenmillensis	Nine Mile Canyon phacelia	None	None	List 1B.2	Hardwood forest, conifer woodland
Eriogonum wrightii var. olanchense	Olancha Peak buckwheat	None	None	List 1B.3	Alpine habitat, conifer forest
Galium angustifolium ssp. onycense	Onyx Peak bedstraw	None	None	List 1B.3	Pinyon and juniper woodland
Dudleya cymosa ssp. costafolia	Pierpoint Springs dudleya	None	None	List 1B.2	Chaparral, hardwood forest
Cupressus arizonica ssp. nevadensis	Piute cypress	None	None	List 1B.2	Conifer forest, chaparral, hardwood forest, conifer woodland
Navarretia setiloba	Piute Mountains navarretia	None	None	List 1B.1	Hardwood forest, conifer woodland, annual grassland
Oreonana purpurascens	purple mountain-parsley	None	None	List 1B.2	Conifer forest
Hulsea vestita ssp. pygmaea	pygmy hulsea	None	None	List 1B.3	Alpine habitat, conifer forest
Abronia alpina	Ramshaw Meadows abronia	Candidate	None	List 1B.1	Wetlands
Delphinium recurvatum	recurved larkspur	None	None	List 1B.2	Desert scrub, hardwood forest, annual grassland
Delphinium purpusii	rose-flowered larkspur	None	None	List 1B.3	Chaparral, cismontane, pinyon/juniper woodlands

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
Pseudobahia peirsonii	San Joaquin adobe sunburst	Threatened	Endangered	List 1B.1	Hardwood forest, annual grassland
Atriplex joaquiniana	San Joaquin spearscale	None	None	List 1B.2	Meadows, seeps, playas, and valley and foothill grasslands
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Threatened	Endangered	List 1B.1	Vernal pools
Monolopia congdonii	San Joaquin woolythreads	None	None	List 1B.2	Valley and foothill grasslands
Ribes tularense	Sequoia gooseberry	None	None	List 1B.3	Conifer forest
Schizymenium shevockii	Shevock's copper moss	None	None	List 1B.2	Occurs on rocks along roads in evergreen and decidous woodlands
Astragalus shevockii	Shevock's milk-vetch	None	None	List 1B.3	Conifer forest
Calochortus westonii	Shirley Meadows star-tulip	None	None	List 1B.2	Hardwood forest, conifer forest, wetlands
Hulsea brevifolia	short-leaved hulsea	None	None	List 1B.2	Conifer forest
Eryngium spinosepalum	spiny-sepaled button-celery	None	None	List 1B.2	Annual grassland, vernal pools
Clarkia springvillensis	Springville clarkia	Threatened	Endangered	List 1B.2	Chaparral, hardwood forest, annual grassland
Orthotrichum spjutii	Spjut's bristle moss	None	None	List 1B.3	Lower montane coniferous forests and pinyon/juniper woodlands
Fritillaria striata	striped adobe-lily	None	Threatened	List 1B.1	Hardwood forest, annual grassland
Atriplex subtilis	subtle orache	None	None	List 1B.2	Annual grassland
Monardella beneolens	sweet-smelling monardella	None	None	List 1B.3	Alpine habitat, conifer forest
Monardella Linoides ssp. oblonga	Tehachapi monardella	None	None	List 1B.3	Lower montane coniferous forests and pinyon/juniper woodlands
Cryptantha incana	Tulare cryptantha	None	None	List 1B.3	Conifer forest
Eriogonum twisselmannii	Twisselmann's buckwheat	None	Rare	List 1B.2	Conifer forest
Nemacladus twisselmannii	Twisselmann's nemacladus	None	Rare	List 1B.2	Conifer forest
Atriplex persistens	vernal pool smallscale	None	None	List 1B.2	Vernal pools
Lewisia disepala	Yosemite lewisia	None	None	List 1B.2	Conifer forest, conifer woodland
Bruchia bolanderi	Bolander's bruchia	None	None	List 2.2	Wetlands, conifer forest
Meesia uliginosa	broad-nerved hump-moss	None	None	List 2.2	Wetlands, conifer forest
Imperata brevifolia	California satintail	None	None	List 2.1	Chaparral, Coastal Sage Scrub, Creosote Bush Scrub, wetland-riparian
Botrychium lunaria	common moonwart	None	None	List 2.3	Wetlands in coniferous forests
Mielichhoferia elongata	elongate copper-moss	None	None	List 2.2	Hardwood forest
Utricularia intermedia	flat-leaved bladderwort	None	None	List 2.2	Wetlands, lake margins
Juncus nodosus	knotted rush	None	None	List 2.3	Wetlands, lake margins
Poa lettermanii	Letterman's blue grass	None	None	List 2.3	Alpine habitat
triglochin palustris	marsh arrow-grass	None	None	List 2.3	Wetlands, conifer forest
Botrychium manganese	Minan moonwort	None	None	List 2.2	Yellow pine forests
Didymodon norrisii	Norris' beard moss	None	None	List 2.2	Cismontane woodland and intermediate coniferous forests and intermittently mesic habitats
Carex arcta	northern clustered sedge	None	None	List 2.2	Wetlands, Conifer forest
Asplenium septentrionale	northern spleenwort	None	None	List 2.3	Chaparral, conifer forest
Arabis dispar	pinyon rock cress	None	None	List 2.3	Conifer woodland, desert scrub

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
Sphenopholis obtusata	prairie wedge grass	None	None	List 2.2	Hardwood forest, wetlands
Botrychium crenulatum	scalloped moonwort	None	None	List 2.2	Wetlands, conifer forest
Hackelia sharsmithii	Sharsmith's stickseed	None	None	List 2.3	Alpine habitat, conifer forest
Pohlia tundrae	tundra thread-moss	None	None	List 2.3	Alpine habitat
Botrychium ascendens	upswept moonwort	None	None	List 2.3	Meadows and seeps in lower montane coniferous forests
Calystegia malacophylla var. berryi	Berry's morning-glory	None	None	List 3	Chaparral, conifer forest
Cinna bolanderi	Bolander's woodreed	None	None	List 2.3	Wetlands, coniferous forest, streamsides
Calystegia malacophylla var. berryi	Berry's morning-glory	None	None	List 3.3	Chaparral, conifer forest
Mimulus acutidens	Kings River monkeyflower	None	None	List 3	Hardwood forest, conifer forest
Myosurus minimus ssp. apus	little mousetail	None	None	List 3.1	Annual grassland, vernal pools
Jensia yosemitana	Yosemite tarplant	None	None	List 3.2	Conifer forest, wetlands
Navarretia nigelliformis ssp nigellisformis	adobe navarretia	None	None	List 4.2	Vernal pools in valley and foothill grasslands
Perideridia pringlei	adobe yampah	None	None	List 4.3	Chaparral, hardwood forest, desert scrub, conifer woodland
Antennaria pulchella	beautiful pussy-toes	None	None	List 4.3	Alpine habitat, wetlands
Selaginella asprella	bluish spike-moss	None	None	List 4.3	Hardwood forest, conifer forest, conifer woodland
Carex buxbaumii	Buxbaum's sedge	None	None	List 4.2	Wetlands
Pityopus californicus	California pinefoot	None	None	List 4.2	Conifer forest
Angelica callii	Call's angelica	None	None	List 4.3	Hardwood forest, conifer forest
Juncus hemiendytus var. abjectus	Center Basin rush	None	None	List 4.3	Wetlands, conifer forest
Oxytheca caryophylloides	chickweed oxytheca	None	None	List 4.3	Conifer forest
Cryptantha glomeriflora	clustered-flower cryptantha	None	None	List 4.3	Desert scrub, wetlands, conifer forest
Piperia colemanii	Coleman's rein orchid	None	None	List 4.3	Chaparral, conifer forest
Carex congdonii	Congdon's sedge	None	None	List 4.3	Alpine habitat, conifer forest
Meesia triquetra	three-ranked hump-moss	None	None	List 4.2	Wetlands, conifer forest
Muilla coronata	crowned muilla	None	None	List 4.2	Desert scrub, conifer woodland
Mimulus laciniatus	cut-leaved monkeyflower	None	None	List 4.3	Chaparral, conifer forest
Delphinium hansenii ssp. ewanianum	Ewan's larkspur	None	None	List 4.2	hardwood forest, annual grassland
Streptanthus farnsworthianus	Farnsworth's jewel-flower	None	None	List 4.3	Hardwood forest
Lasthenia ferrisiae	Ferris's goldfields	None	None	List 4.2	Vernal pools
Plagiobothrys myosotoides	forget-me-not popcorn-flower	None	None	List 4.3	Chaparral
Ceanothus fresnensis	Fresno ceanothus	None	None	List 4.3	Hardwood forest, conifer forest
Goodmania luteola	golden goodmania	None	None	List 4.2	Desert scrub, wetlands, annual grassland
Mimulus grayi	Gray's monkeyflower	None	None	List 4.3	Conifer forest
Arabis repanda var. greenei	Greene's rock cress	None	None	List 4.3	Conifer forest
Wyethia elata	Hall's wyethia	None	None	List 4.3	Hardwood forest, conifer forest
Phlox dispersa	High Sierra phlox	None	None	List 4.3	Alpine habitat
Gilia interior	inland gilia	None	None	List 4.3	Hardwood forest, conifer woodland, conifer forest
Clarkia xantiana ssp. parviflora	Kern Canyon clarkia	None	None	List 4.2	Sandy and sometimes rocky slopes and roadsides of valley and foothill grasslands, cismontane woodlands and great basin scrub habitat
Ceanothus pinetorum	Kern ceanothus	None	None	List 4.3	Conifer forest
Astragalus subvestitus	Kern County milk-	None	None	List 4.3	Desert scrub, wetlands, conifer

Table 9-2. Special-Status Species That May Occur In the Planning Area

Scientific Name	Common Name	Federal Listing	State Listing	CNPS	Habitat
	vetch				woodland
Utricularia minor	lesser bladderwort	None	None	List 4.2	Wetlands
Dudleya calcicola	limestone dudleya	None	None	List 4.3	Chaparral, conifer woodland
Claytonia palustris	marsh claytonia	None	None	List 4.3	Wetlands
Azolla mexicana	Mexican mosquito fern	None	None	List 4.2	Wetlands
Piperia michaelii	Michael's rein orchid	None	None	List 4.2	Desert scrub, conifer forest, chaparral, hardwood forest
Phacelia mohavensis	Mojave phacelia	None	None	List 4.3	Lower montane coniferous forest, meadows and seeps and pinyon and juniper woodlands
Carex incurviformis var. danaensis	Mount Dana sedge	None	None	List 4.3	Alpine boulder/rock fields
Phacelia orogenes	mountain phacelia	None	None	List 4.3	Wetlands, conifer woodland, conifer forest
Piperia leptopetala	narrow-petaled rein orchid	None	None	List 4.3	Hardwood forest, conifer forest
Nemophila parviflora var. quercifolia	oak-leaved nemophila	None	None	List 4.3	Hardwood forest, conifer forest
Fritillaria pinetorum	pine fritillary	None	None	List 4.3	Chaparral, conifer forest, conifer woodland
Petradoria pumila ssp. pumila	rock goldenrod	None	None	List 4.3	Conifer woodland
Jamesia americana var. rosea	rosy-petalled cliffbush	None	None	List 4.3	Alpine habitat, desert scrub, conifer woodland, conifer forest
Trichostema ovatum	San Joaquin bluecurls	None	None	List 4.2	Desert scrub, annual grassland
Cordylanthus rigidus ssp. brevibracteatus	short-bracted bird's-beak	None	None	List 4.3	Chaparral, conifer forest, conifer woodland
Monardella candicans	Sierra monardella	None	None	List 4.3	Chaparral, hardwood forest, conifer forest
Linanthus oblanceolatus	Sierra Nevada linanthus	None	None	List 4.3	Conifer forest
Clarkia exilis	slender clarkia	None	None	List 4.3	Hardwood forest
Eriophyllum lanatum var. obovatum	southern Sierra woolly sunflower	None	None	List 4.3	Conifer forest
Clarkia parviflora ssp grandiflora	streambank spring beauty	None	None	List 4.2	Pine and blue oak woodlands in the Sierra Nevada
Microseris sylvatica	sylvan microseris	None	None	List 4.2	Chaparral, hardwood forest, desert scrub, conifer woodland, annual grassland
Eriogonum breedlovei var. shevockii	The Needles buckwheat	None	None	List 4.3	Conifer forest, conifer woodland
Meesia triquetra	Three-ranked hump moss	None	None	List 4.2	Bogs, fens, meadows and seeps
Phacelia exilis	Transverse Range phacelia	None	None	List 4.3	Wetlands, conifer forest
Silene aperta	Tulare campion	None	None	List 4.3	Conifer forest
Dicentra nevadensis	Tulare County bleeding heart	None	None	List 4.3	Conifer forest, alpine habitat
Eriogonum polypodum	Tulare County buckwheat	None	None	List 4.3	Conifer forest
Arabis pygmaea	Tulare County rock cress	None	None	List 4.3	Conifer forest, wetlands
Delphinium inopinum	unexpected larkspur	None	None	List 4.3	Conifer forest

Sources: CDFG, 2008a; USFWS, October 2008; CNPS, October 2008.

In addition to individual species, the USFWS and CDFG are also concerned with sensitive and critical habitat. As previously described, the CNDDB-documented occurrences of sensitive habitat for Tulare County are:

- Big Tree Forest;
- Central Valley Drainage Hardhead/Squawfish Stream;
- Great Valley Oak Riparian Forest;
- Northern Hardpan Vernal Pool;
- Northern Claypan Vernal Pool;
- Southern Interior Cypress Forest;
- Sycamore Alluvial Woodland;
- Valley Sacaton Grassland;
- Valley Saltbush Scrub;
- Valley Sink Scrub;
- Blue Ridge Ecological Reserve (Condor Habitat);
- Sequoia Riverlands Trust; and
- Kaweah Oaks Preserve.

9.3 Archaeological and Historical Resources

Introduction

Consideration of cultural resources, which includes archaeological and historic resources, is an important aspect of all phases of a project, including design, construction, permitting, and maintenance activities. Project proponents operate within federal and state environmental laws and regulations designed to protect cultural resources significant in American architecture, archaeology, history, and Native American values.

Tulare County lies within a historically rich province of the San Joaquin Valley. To assist in the preservation of the county's unique cultural heritage, this section discusses the federal and state requirements for identifying, evaluating, and preserving cultural resources, and introduces the regional historical context.

Methods

Information on Tulare County's archaeological and historic resources was obtained from the 1992 City of Tulare General Plan Update, the Tulare County Historical Society (database dated September 2008), the Native American Heritage Commission (website accessed at http://ceres.ca.gov/nahc/), and the Office of Historic Preservation (California inventory database dated 8 October 2008). Records were also accessed and reviewed in the National Register of Historic Places (database dated September 2008), the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) (database dated September 2008), the California Inventory of Historic Resources (Office of Historic Preservation California inventory database dated 8 October 2008), California Historical Landmarks (database dated September 2008), "The San Joaquin Valley Through Time," and The Buena Vista Museum of Natural History website. A review of the sacred lands file at the Native American Heritage Commission (NAHC) was also completed in September 2008.

Key Terms

- **Cultural Resources.** Cultural resources consist of tangible or observable evidence of past human activity, found in direct association with a geographic location, including tangible properties possessing intangible, traditional cultural values. Cultural resources may include buildings, structures, objects, sites, areas, places, records, or manuscripts, which are historically or archaeologically significant.

- **Ethnohistoric Resources.** Ethnohistoric resources are Native American objects, sites, buildings, or structures that resulted after the arrival of European settlers in California. Ethnohistory began at different times at different places within California. Generally, ethnohistoric resources were produced beginning 1770 to 1850, to roughly 1900.

- **Prehistoric Archaeological Resources.** Prehistoric archaeological resources are sites, buildings, or structures produced prior to western entry into the region, or somewhat later Native American sites characterized by substantially pre-western types of material deposits. Prehistoric archaeological sites can retain remnants of thousands of years of human activity, dating from the early Holocene (10,000 to 7,000 years ago) to European contact (1542). Physical evidence of

prehistoric sites might include stone artifacts and by-products of the manufacturing process, food waste (shell or animal bone debris), soil discoloration (a result of decaying organic matter), fire hearths, stone alignments, grinding slicks, bedrock mortars, or human skeletal remains.

- **Paleontological Resources.** Paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth, with the exception of materials associated with an archaeological resource (as defined in Section 3(1) of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470bb[1]), or any cultural item as defined in Section 2 of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001).

- **Historical Archaeological Resources.** Historical archaeological resources are sites, historic occupations and activities that are generally more than 50 years of age, where the location itself possesses archaeological value, regardless of the significance of any existing historic-era building or structure that may be at the site. Evidence of historic activity might include the physical remains of cemeteries, designed landscapes, battlegrounds, mines, canals, trails, and farmsteads.

- **Historic-era Built Environment Resources.** Historic-era built environment resources include buildings, structures, objects, or districts. Buildings, such as houses, barns, churches, hotels, or similar construction, are created principally to shelter any form of human activity. "Structure" distinguishes buildings from functional structures built for purposes other than human shelter. The term "object" is used to distinguish from buildings and structures those facilities erected that are primarily artistic or relatively small in scale, and simply built. A "district" refers to a significant concentration or grouping of sites, buildings structures, or objects.

Regulatory Setting

Federal Regulations

National Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA). The majority of applicable federal

regulations concerning cultural resources have been established to comply with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) of 1966, as amended. The NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and the NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

American Indian Religious Freedom Act and Native American Graves and Repatriation Act. The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes, as national policy, that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains on federal lands are protected by the Native American Graves and Repatriation Act of 1990.

Secretary of the Interior's Standards. The Secretary of the Interior is responsible for establishing professional standards and providing guidance related to the preservation and protection of all cultural resources listed in, or eligible for, listing in the National Register of Historic Places. The Secretary of the Interior's Standards for the Treatment of Historic Properties apply to all grant-in-aid projects assisted through the National Historic Preservation Fund, and are intended to be applied to a wide variety of resource types, including buildings, structures, sites, objects, and districts. The treatment standards, developed in 1992, were codified as 36 CFR 68 entitled, "The Secretary of the Interior's Standards for Historic Preservation Projects." The standards address four treatments:

- **Preservation** focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time (protection and treatment are also considered under this treatment).

- **Rehabilitation** as a treatment focuses on the repair and replacement of deteriorated features; when alterations or additions to the property are planned for a new or continued use; and when a depiction of a property at a particular point in time is not appropriate.

- **Restoration** is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time through the removal of features from other periods in its history and reconstruction of missing features from the reconstruction period.

- **Reconstruction** addresses those aspects of treatment necessary to re-create an entire non-surviving building with new material.

Certified Local Government Program. The Certified Local Government (CLG) Program is a national program designed to encourage the direct participation of a local government in the identification, registration, and preservation of historic properties located within the jurisdiction of the local government. A local government may become a CLG by developing and implementing a local historic preservation program based on federal and state standards.

The CLG program encourages the preservation of cultural resources by promoting a partnership among local governments, the State of California, and the National Park Service (NPS). Becoming a CLG can provide local staff and commissions with the tools, technical training, and more meaningful leadership roles in the preservation of a community's cultural heritage. Local interests and concerns are integrated into the official planning and decision-making processes at the earliest possible opportunity.

Any local government is eligible to apply for certification, with the exception of regional commissions and councils of governments. A local government is any general purpose political subdivision of California such as a city, county, or city/county. It is important to be aware that certification pertains to the entire local government and its agencies, not simply to the preservation commission that serves the local government.

According to a list provided by the California Office of Historic Preservation dated October 8, 2004, Tulare County is not a Certified Local Government.

Other Federal Legislation. Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect

important historic and archaeological sites. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "preserve for public use historic sites, buildings, and objects of national significance."

State Regulations

California Environmental Quality Act (CEQA). Section 15064.5 of the CEQA Guidelines requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as a "unique archaeological resource," or a "historically or culturally significant resource". Although not the sole consideration, if the resource is listed on the California Register of Historical Resources (CRHR), or is eligible for listing on the CRHR, it is presumed to be a historically significant resource. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If an archaeological or historical resource is found not to be significant or unique under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred strategy of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The three phases of cultural resources studies under CEQA are:

Phase I – Inventory of Cultural Resources:

A records search conducted by the Regional Archaeological Information Center (Information Center). The Information Center for the Tulare County area is located at California State University, Bakersfield. The Information Center works in conjunction with the California Historical

Resources Information System (CHRIS), which is under the authority and direction of the State Office of Historic Preservation (OHP), the State Historic Preservation Officer (SHPO), and State Historical Resources Commission (SHRC).

The Information Center is the repository for records produced during cultural resource studies conducted in the region. The record search will determine if a part or all of the project area has been previously surveyed for cultural resources; if any known cultural resources have already been recorded on or adjacent to the project area; if the probability is low, moderate, or high that cultural resources are located within the project area; and whether a field survey is required to determine the presence of previously unrecorded cultural resources.

A field survey by a professional archaeologist will be required in many instances. The purpose of the field survey is to survey the entire property for cultural resources. The archaeologist will visually inspect the project area for signs of cultural resources.

A written report is prepared when a record search and field survey are completed. If cultural resources are identified, a report must be written which describes how the survey was conducted with recommendations for further work, if needed. Copies of the survey record forms and written report must be filed with the Regional Archaeological Information Center. Guidelines for the format and content of all types of archaeological reports have been developed by the California Office of Historic Preservation, and reports will be reviewed by the regional information centers to determine their ability to meet those requirements.

Native American Consultation. It is recommended that consultation with the Native American Heritage Commission be conducted as part of the Phase I Inventory of Cultural Resources. Upon request, the Native American Heritage Commission will provide project managers with a list of the local region's most likely descendents, tribal elders, and political and spiritual leaders. Each of the persons or organizations listed by the NAHC should be contacted to determine if there are known sites or places important to the heritage of Native Americans.

Phase II – Evaluation of Cultural Resources:

The purpose of this phase is to determine if a cultural resource is significant. If the resource is not significant according to the criteria outlined in Section 15064.5 of the California Environmental Quality Act,

there will be no significant environmental effect, requiring no additional work. If the resource is significant, then impacts to the resource must be mitigated.

Phase III – Treatment of Impacted, Significant Cultural Resources:

If Phases I and II (inventory and evaluation) determine that no significant cultural resources are present within the project area, then no further work is needed. A Negative Declaration can be issued for cultural resources.

If significant resources are identified, there are several ways to treat and mitigate impacts to these resources, including avoidance; site capping (in those instances where avoidance is not feasible, it is often possible to cover burials or other important discoveries with a protective layer of earth or other material); creation of conservation easements; and/or data recovery.

In the case of prehistoric or historic archaeological sites, data recovery consists of archaeological excavations to capture, in the most efficient means possible, information about the site. Data recovery for the built environment – buildings and structures – consists of archival and photographic documentation).

Section 15064.5 of the CEQA Guidelines states: "Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource."

State Laws Pertaining to Native American Consultation. Senate Bill 18 (SB 18) requires local governments to consult directly with Native American tribes before making certain planning decisions and to provide notice to tribes at certain key points in the planning process. The purpose of involving tribes at these early planning stages is to allow consideration of cultural places in the context of broad local land use policy, before individual site-specific, project-level, land use designations are made by a local government. The consultation requirements of SB 18 apply to general plan or specific plan processes proposed on or after March 1, 2005. The following are the contact and notification responsibilities of local governments:

Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the Native American Heritage Commission [NAHC]) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment. Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3).

Prior to the adoption or substantial amendment of a general plan or specific plan, a local government must refer the proposed action to those tribes that are on the NAHC contact list and have traditional lands located within the city or county's jurisdiction. The referral must allow a 45-day comment period (Government Code §65352). Notice must be sent regardless of whether prior consultation has taken place. Such notice does not initiate a new consultation process.

Local government must send a notice of a public hearing, at least 10 days prior to the hearing, to tribes who have filed a written request for such notice (Government Code §65092).

Recent consultation with the NAHC, as part of the County's current update to its General Plan, indicated the presence of cultural places within the Tulare County Planning Area, including the Tulare side of the Williamson, Whitney, Kaweah, and Triple Divide peaks. While the specific locations of these or other cultural places in the County are confidential in nature, a copy of all correspondence with the NAHC and Native American representatives is on file with the County.

State Laws Pertaining to Human Remains. Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Public Resources Code Section 5097) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials is within the jurisdiction of the Native American Heritage Commission.

Local Regulations

According to a survey conducted in 1998 by the Governor's Office of Planning and Research, neither Tulare County, nor any of the eight cities in the county reported having a Historical Resources Commission or Committee. However, several cities have historic preservation ordinances or policies in place (Tulare and Visalia are examples), and many communities have historic preservation projects underway at the present time.

Existing Conditions

The following section summarizes the paleontologic, prehistoric, ethnographic, and historic settings within Tulare County. Figure 9-3 provides a timeline of historic events in Tulare County.

Paleontologic Setting

The following description is summarized from "The San Joaquin Valley Through Time," by Tim Elam (2001), and the Buena Vista Museum of Natural History, Bakersfield, California website.

During the Tertiary Period (65 to 2 million years ago [mya]), the Sierra Nevada Mountains had eroded to mere hills compared to earlier form, and the Coast Ranges rose. This gave way to the formation of the San Joaquin Valley, which comprises the southern portion of the Great Central Valley, an interior lowland 466 miles long and from 19 to 50 km wide. The Great Central Valley is enclosed by the Siskiyou, Sierra Nevada, Tehachapi, and Coast Ranges on the north, east, south, and west, respectively.

The Sierra Nevada is an island arc volcano system that formed about 200 million years ago during the Jurassic Period (144-208 mya). During this time, the area that would become the San Joaquin Valley lay off shore several thousand feet below the surface of the Pacific Ocean. Sediment from the Sierra Nevada, and the movement of the earth's plates (tectonic action) facilitated the accumulation of material into the Late Cretaceous Period (65-75 mya).

The Jurassic and Cretaceous Periods brought flowering plants, early dinosaurs, along with the first birds and mammals. The basic form of the Great Central Valley rose during the Cenozoic period from the Pacific Ocean, first as islands, then as mountains attached to the ocean valleys below them.

10000 BP*

INITIAL OCCUPATION OF THE SOUTHERN SIERRA

1769

THE SPANISH PERIOD

1806

Gabriel Moraga travels through Tulare County in search of mission sites, although nothing was done to establish settlements in the area

1822

THE MEXICAN PERIOD

1826

Jedediah Smith and trappers cross the Sierra Nevada mountains and enter into the Central Valley

1848

Discovery of gold in California

1849

1852

Tulare County was formed from the southern portion of Mariposa County

1856

1857

Tule River Indian Reservation established



Giant Forest, now Sequoia National Park, discovered by Hale Tharp



The Southern Pacific Railroad entered Tulare County, connecting the San Joaquin Valley agriculture with markets in the north and east

1872

1886



The Kaweah Cooperative Commonwealth founded in Tulare County

1890

Sequoia National Park became the nation's second national park

1900

Tulare County boasted a population of about 18,000



Colonel Allen Allensworth and four other settlers established the town of Allensworth

1908

Construction of the John Muir Trail begins

1914

1936

Tulare County population estimated to be 419,909



Sign indicating the Ash Mountain entrance to Sequoia National Park carved by Civilian Conservation Corps (CCC) craftsmen

2006

Source: ESA, 2008

* Before Present (BP)

FIGURE 9-3

Historic Timeline of Tulare County

The Paleocene Period (58-66 mya) witnessed the extinction of the dinosaur and the development, and later, dominance of the mammal. During the Eocene Epoch (53-39 mya), the western edges of the San Joaquin Valley rose above sea level for the first time. Sedimentation and uplift of geological formations continued until two million years ago.

The Holocene Epoch (10,000 years to present) brought the San Joaquin Valley above sea level, and humans entered the area. Fresh water lakes, rivers, and thousands of feet of rich alluvium formed the valley floor.

According to the University of California Museum of Paleontology (UCMP), 12 paleontological resources have been recorded in Tulare County, generally within the valley portion of the County. These resources primarily consist of invertebrates, vertebrate, and plant fossils (UCMP, 2009).

Prehistoric Setting

Although a relatively small amount of information is known concerning the earliest occupants of the Tulare County region, it is clear that much of the San Joaquin Valley and Sierra foothills have been occupied throughout most of the Holocene Epoch (~10,000 B.P. [Before Present] to the present). The reconstruction of cultures inhabiting the subject area during the late Paleo-Indian to early Archaic Periods (~9,000 B.P. to ~3,000 B.P.) has proven difficult based on erosion and depositional patterns of the San Joaquin. Over the millennia, these processes have re-deposited or deeply buried the evidence of much of those early cultures.

A number of investigations into San Joaquin Valley prehistory have been conducted in Tulare County. Much of the literature has supported the notion that the inhabitants of the San Joaquin Valley maintained fairly dense populations situated along the banks of major waterways, wetlands, and streams. Although many sites are more obvious, many of the earliest archaeological records for the region have likely been buried beneath the vast alluvial deposits created by erosion and depositional processes indicative of the valley and Sierra foothills, especially over the last 9,000 years.

Ethnohistoric Setting

Tulare County was inhabited by indigenous California Indian groups consisting of the Southern Valley Yokuts, Foothill Yokuts, Monache, and Tubatulabal. Most information regarding these groups is based on Spanish government and Franciscan mission records of the 18th and 19th centuries, and in studies conducted during the 1900s to 1930s by

American and British ethnographers. The ethnographic setting presented below is derived from the early works, as compiled by W. J. Wallace, Robert F.G. Spier, and Charles R. Smith (*Handbook of North American Indians*, Volume 8, Washington: Smithsonian Institution, 1978), with statistical information provided by the California Native American Heritage Commission.

Of the five main groups inhabiting the Tulare County area, the Southern Valley Yokuts occupied the largest territory, which is defined roughly by the crest of the Diablo Range on the west and the foothills of the Sierra Nevada on the east, and from the Kings River on the north, to the Tehachapi Mountains on the south. The Foothill Yokuts inhabited the western slopes of the Sierra Nevada, between the Fresno River and Kern River, with settlements generally occurring between the 2,000 to 4,000-foot elevations. The Tubatulabal inhabited the Sierra Nevada Mountains, at the higher elevations, near Mt. Whitney in the east, extending westward along the drainages of the Kern River, and the Kern River-South Fork. The Monache were comprised of six small groups that lived in the Sierra east of the Foothill Yokuts, in locations ranging between 3,000 to 7,000 foot elevations.

Historical Setting

California's coast was initially explored by Spanish and some Russian military expeditions during the late 1500s. However, European settlement did not occur until the arrival into southern California of land-based expeditions originating in Spanish Mexico. The early groups arrived during the 1760s, and consisted of Spanish military, Mexican Indian, Franciscan missionary, and citizen colonists. Thus began what is today known as the Spanish Period (1769-1822). This period includes the establishment of a chain of 21 Franciscan missions, constructed in old California, from San Diego to Sonoma. With the establishment of the missions came the exertion of Spanish religious and military authority over California's indigenous population, and the development of presidios, civilian ranchos, and pueblos throughout California. Although the region known today as Tulare County did not come under the jurisdiction of a mission proper, periodically small numbers of indigenous tribal members fleeing the control of distant missions would enter the valley.

In 1822, the colonial territory of Mexico won its independence from Spain, and established a republic. Because it lay strategically situated within the new republic's northern frontier, California remained a territory of Mexico, and home to a new group of ranchers and settlers

that arrived to take advantage of large land grants being offered by the new government. During the 1840s, Mexico awarded five grants (known as ranchos) on what later became Tulare County lands. However, in 1860, Kern County was formed from a portion of Tulare County; all five Tulare County ranchos were included within the new Kern County boundaries.

In 1846, hostilities between Mexico and the United States led to war. Two years later (1848), war ended, and the United States and Mexico signed the Treaty of Guadalupe Hidalgo. As part of the post-war arrangements, Mexico ceded California and the Southwest to the United States. In 1848-1849, the discovery of gold in northern California brought tens of thousands of itinerant miners, merchants, and speculators. By 1850, the huge influx of prospective citizens allowed California to skip the usual stage of territorial status, and enter the union as a state. Two years later (1852), Tulare County was formed from the southern portion of Mariposa County. And, although Tulare County is listed today as the seventh largest of California's 58 counties (containing 4,840 square miles), several other counties were subsequently carved from Tulare, including Fresno (1856), Kern (1860), Inyo (1866), and Kings Counties (1893).

Early settlement in the Tulare County area focused on ranching. In 1872, the Southern Pacific Railroad entered Tulare County, connecting the San Joaquin Valley with markets in the north and east. About the same time, valley settlers constructed a series of water conveyance systems (canals, dams, and ditches) across the valley. With ample water supplies and the assurance of rail transport for commodities such as grain, row, crops, and fruit, a number of farming colonies soon appeared throughout the region. Colonies such as Mt. Whitney, Orosi, Oakview, Holliday, Vina, and McCall's offered affordable farmland, water, and modern transportation. The colonies grew to become cities such as Tulare, Visalia, Porterville, and Hanford. Visalia, the county seat, became the service, processing, and distribution center for the growing number of farms, dairies, and cattle ranches. By 1900, Tulare County boasted a population of about 18,000. New transportation links such as Highway 99 (completed during the 1950s), affordable housing, light industry, and agricultural commerce brought steady growth to the valley. The U.S. Census Bureau estimated the 2007 Tulare County population to be 429,000 (TCAG, 2007).

Existing Cultural and Historic Resources

Tulare County's known and recorded cultural resources were identified through historical records, such as those found in the National Register of Historic Places, the Historic American Building Survey/Historic American Engineering Record (HABS/HAER), the California Register of Historic Resources, California Historical Landmarks, and the Tulare County Historical Society list of historic resources.

Due to the sensitivity of many prehistoric, ethnohistoric, and historic archaeological sites, the resources listed in the following table (Table 9-3) include only those that are available to the general public. The Information Center at California State University Bakersfield houses records associated with reported cultural resources surveys, including the records pertinent to sensitive sites. Only qualified professionals can access the records and other responsible parties such as selected representatives of the region's Native American community. Sensitive sites include burial grounds, important village sites, and other buried historical resources protected under state and federal laws. The San Joaquin Valley is rich in such sites, and part of a local government's cultural resources program should include the education of project participants, agency representatives, and concerned citizens as to the laws, codes, and ordinances that forbid the collecting of items such as grave goods, pottery, arrowheads, glass, and pottery associated with archaeological sites of any kind.

Table 9-3. Historic Properties of Tulare County, 2008

Site/Building	Location	Year Constructed	Historical Landmark Designation	National Register Status
First Tule River Indian Reservation	Alta Vista School, Porterville	1857	CA SHL No. 388/TCHS HS	Not Applicable
Charter Oak/Election Tree	Charter Oak Dr., 7 mi East of Visalia	1852	CA SHL No. 410/TCHS HS	Not Applicable
Tailholt Gold Mining Camp	County Hwy. M109, 8.0 mi S. Fountain Springs	1856	CA SHL No. 413/TCHS HS	Not Applicable
Butterfield Stage Route	SW Corner Hermosa St and SR 65, 1 mi W of Lindsay	1858	CA SHL No. 471/TCHS HS	Not Applicable
Tule River Stage Station	Porterville Public Park	1854	CA SHL No. 473	Not Applicable
Fountain Springs	Junction Co. Rd. J22/M109	1858	CA SHL No. 648/TCHS HS	Not Applicable
Temporary Detention Camps for Japanese-Americans	Tulare Co. Fairgrounds	1942	CA SHL No. 934	Not Applicable
Commercial and Savings Bank/Bank of America Building	343 East Main St.	1915	None	Listed in NR as individual property
Allensworth Historic District	SR 43, Allensworth	1908-1912	Not Applicable	Listed in NRHP as district
Ash Mountain Entrance Sign	N of Three Rivers in Sequoia National Park	1925	Not Applicable	Listed in NRHP
Bank of Italy Building	128 E. Main St, Visalia	1900-1924	Not Applicable	Listed in NRHP as building
Barton-Lackey Cabin	N of Mineral King, in Kings Cyn. Nat. Park	1900	Not Applicable	Listed in NRHP
Cattle Cabin	NE of Three Rivers on Sequoia Nat. Park	1875	Not Applicable	Listed in NRHP
Elster, C.A. Building	SR 190 and Tule River Dr., Springville	1912	Not Applicable	Listed in NRHP
Exeter Public Library	Exeter	1900-1924	Not Applicable	Listed in NRHP as Building
Giant Forest Lodge Historic District	NE of Three Rivers in Sequoia Nat. Park	1900-1924	Not Applicable	Listed in NRHP as District
Giant Forest Village – Camp Kaweah Historic District	N of Three Rivers in Sequoia Nat. Park	1886-1924	HABS/TCHS Historical Site	Listed in NRHP as District
Groenfeldt Site	Address Restricted	1000-2999BC	Not Applicable	Listed in NRHP
Hockett Meadow Ranger Station	S. of Silver City in Sequoia Nat. Park	1925-1949	Not Applicable	Listed in NRHP
Hospital Rock	Address Restricted	1499-1000AD	Not Applicable	Listed in NRHP
Hyde House	500 S. Court St., Three Rivers	1875	Not Applicable	Listed in NRHP
Moro Rock Stairway	N. of Three Rivers in Sequoia Nat Park	1925-1949	Not Applicable	Listed in NRHP
Orosi Branch Library	12662 Ave. 416, Orosi	1900-1924	Not Applicable	Listed in NRHP as Building
Pear Lake Ski Hut	N. of Mineral King on Sequoia Nat. Park	1925-1949	Not Applicable	Listed in NRHP as Building
Pogue Hotel	32792 Sierra Dr., Lemoncove	1879	TCHS HS	Listed in NRHP as Building

Table 9-3. Historic Properties of Tulare County, 2008

Site/Building	Location	Year Constructed	Historical Landmark Designation	National Register Status
Quinn Ranger Station	S. of Mineral King on Sequoia Nat. Park	1900-1924	Not Applicable	Listed in NRHP as Building
Redwood Meadow Ranger Station	NE of Three Rivers n Sequoia Nat. Park	1925-1949	Not Applicable	Listed in NRHP as Building
Sequoia Field – Visalia – Dinuba School of Aeronautics	Jct. Of Ave. 368 and Road 112, 9 mi N. of Visalia	1925	Not Applicable	Listed in NRHP as Building
Shorty Lovelace Historic District	E. of Pinehurst on Kings Cyn. Nat. Park	1900-1949	Not Applicable	Listed in NRHP as District
Smithsonian Institution Shelter	W. of Lone Pine in Sequoia Nat. Park	1900-1924	Not Applicable	Listed in NRHP
Squatter's Cabin	NE of Three Rivers, Three Rivers	1875	Not Applicable	Listed in NRHP as Building
Tenalu	Address Restricted	1925-1949	Not Applicable	Listed in NRHP
Tharp's Log	NE of Three Rivers, Three Rivers	1850-1874	Not Applicable	Listed in NRHP
The Pioneer	27000 S. Mooney Blvd., Visalia	1900-1924	Not Applicable	Listed in NRHP as Building
Tulare Union High School Auditorium and Administration Building	755 E. Tulare Ave., Tulare	1925-1949	Not Applicable	Listed in NRHP as Building
US Post Office, Porterville Main	65 W. Mill Ave., Porterville	1925-1949	Not Applicable	Listed in NRHP as Building
US Post Office, Visalia Downtown Center Station	11 W. Acequia St., Visalia	1925-1949	Not Applicable	Listed in NRHP as Building
Wilsonia Historic District	Roughly bounded by Pine Ln., Fern Ln., Hillcrest Rd., Sierra Ln., Kaweah Ln., Goddard Ln., and Park Rd.	1900-1924	Not Applicable	Listed in NRHP as District
Zalud House	393 N. Hockett St.	1875-1899	Not Applicable	Listed in NRHP as Building
Cabin Creek Ranger Residence and Dormitory	SE of Wilsonia on General's Highway in Sequoia National Park	1935	Not Applicable	Listed in NRHP as Building
First Congregational Church	165 E. Mill St, Porterville	1909	Not Applicable	Listed in NRHP as Building
Generals' Highway Stone Bridges	N of Mineral King in Sequoia National Park	1931	Not Applicable	Listed in NRHP as Building
Mineral King Road Cultural Landscape	Mineral King Rd, Sequoia National Park	1926	Not Applicable	Listed in NRHP as Building
Porterville Flour Mill		1868	TCHS HS	Not Applicable
Butterfield Overland Mail Route	7 mi. E. of Ducor	1855	TCHS HS	Not Applicable
Fremont Trail	W. of Lindsay	1844	TCHS HS	Not Applicable
Mooney Grove	RE Kaweah Delta	1852	TCHS HS	Not Applicable
Jordan Trail	Yohohl Rd., near SR 198	1861	TCHS HS	Not Applicable
George S. Berry Marker	Lindsay High School	1880s	TCHS HS	Not Applicable

Table 9-3. Historic Properties of Tulare County, 2008

Site/Building	Location	Year Constructed	Historical Landmark Designation	National Register Status
Hog Wallow Preserve	Ave. 314/Rd. 220, Exeter	n.d.	TCHS HS	Not Applicable
Fort Visalia	Garden, between School and Oak Streets	1852	TCHS HS	Not Applicable
Woodville School Marker	Woodville Memorial Bldg.	n.d.	TCHS HS	Not Applicable
Lone Oak Cemetery	Ave. 324, off Rd 168, East of Ivanhoe	n.d.	TCHS HS	Not Applicable
Plano Marker	Former site of Plano	1861	TCHS HS	Not Applicable
Old State Road	Ave. 56, Fountain Springs	n.d.	TCHS HS	Not Applicable
Ina Stiner Home	"E" St., Porterville	n.d.	TCHS HS	Not Applicable
Klink Station Marker	Ivanhoe	n.d.	TCHS HS	Not Applicable
Artesian Well, Pixley	S. of Waukena	Ca 1880s	TCHS HS	Not Applicable
Wilcox Family Monument	Lake Success, Porterville	n.d.	TCHS HS	Not Applicable
Allen I. Russel Tree	Balch Park	1961	TCHS HS	Not Applicable
Liberty Elementary School	Mooney Blvd., Visalia	n.d.	TCHS HS	Not Applicable
Kern Street Commercial Buildings	Tulare		HABS	Not Applicable
Tule River Hydroelectric Complex	SR 90, Tulare	1902	HABS	Not Applicable
Generals Highway	Three Rivers	1921	HAER	Not Applicable
Marble Fork Bridge	Kaweah River, Three Rivers	1919	HAER	Not Applicable
Pumkin Hollow Bridge	Kaweah River, Three Rivers	1922	HAER	Not Applicable
General Grant National Historic District	Kings Canyon National Park, Wilsonia	n.d.	Not Applicable	Listed in NRHP as District

Acronyms/Abbreviations:
CA SHL – California State Historic Landmark
NRHP – National Register of Historic Places
HABS/HAER – Historic American Building Survey/Historic American Engineering Record (National Park Service)
TCHS HS – Tulare County Historical Society Historical Site

Sources: National Register of Historical Places (2008), HABS/HAER (2008), California Office of Historic Preservation (2008), and Tulare Co. Historical Society (2008).

10. NATURAL RESOURCES

10.1 Introduction

This chapter of the Background Report provides a general overview of water resources and mineral resources within Tulare County to identify and understand these key natural resources. This chapter is divided into the following sections:

- Water Resources (Section 10.2);
- Mineral Resources (Section 10.3);
- Oil and Gas Resources (Section 10.4); and
- Timber Resources (Section 10.5).

10.2 Water Resources

Introduction

This section describes existing state and regional water supply issues, major sources of water in the larger Tulare Lake hydrologic basin, and estimates of current water use by agricultural, urban, and environmental interests in the Study Area. Other water resource issues are addressed in 7.2, Domestic Water Infrastructure and in Appendix C, Water Resources.

Methods

The information contained in this section was obtained from various sources, including the 2001 Tulare County General Plan Background Report. Additional information is based on printed reports by the State Department of Water Resources, including *The State Water Plan*, and various water resource management plans prepared for water districts and management entities within Tulare County and the San Joaquin Valley.

Key Terms

The following key terms are used in this section to describe water supply conditions and the framework of regulations that pertain to water resources.

- **Tulare Lake Basin.** The State Department of Water Resources subdivides the state into ten hydrologic regions for planning purposes, corresponding to the state's major drainage basins. Tulare County is located primarily within the Tulare Lake Basin.
- **Acre-feet.** The amount of water needed to cover one acre with one foot of water, or approximately 325,851 gallons.
- **Aquifer.** A geologic formation that stores water and yields significant quantities of water to wells or springs.
- **maf.** One million acre-feet.
- **taf.** One thousand acre-feet.
- **CVP.** Central Valley Project, authorized in 1933. The CVP, operated by the United States Bureau of Reclamation, is the largest water storage and delivery system in California, comprising 29 of the state's 58 counties. The project's features include 18 federal reservoirs and 4 additional reservoirs jointly owned with the State Water Project.
- **SWP.** State Water Project, authorized in 1960. SWP facilities include 20 dams, 662 miles of aqueduct, and 26 power and pumping plants. Major facilities include the multi-purpose Oroville Dam and Reservoir on the Feather River, the California Aqueduct, South Bay Aqueduct, North Bay Aqueduct, and a share of the state-federal San Luis Reservoir.
- **SDWA.** The Safe Drinking Water Act, administered by the U.S. Environmental Protection Agency in coordination with the states, is the chief federal regulatory legislation regulating drinking water quality.
- **USBR.** United States Bureau of Reclamation.
- **Confined aquifer.** A water-bearing subsurface stratum that is bounded above and below by formations of impermeable, or relatively impermeable, soil or rock.
- **Groundwater basin.** A groundwater reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir. In some cases, the boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.
- **Groundwater overdraft.** The condition of a groundwater basin in which the amount of water withdrawn (by pumping) exceeds the amount of water that recharges the basin.

- **Groundwater recharge.** The natural or intentional infiltration of surface water into the zone of saturation (i.e., into groundwater).

Regulatory Setting

Water in California is managed by a complex set of federal and state regulations. California administers rights to surface water at the state level, but not rights to groundwater. In California, groundwater may be managed under a variety of authorities, ranging from judicial adjudication of individual basins to several forms of local agency management. The following discussion summarizes major regulatory policies for water management.

- **California Water Code.** The California Water Code requires the State Department of Water Resources to publish an update of the California Water Plan every five years. The plan evaluates water supplies and assesses agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses.
- **Urban Water Management Planning Act.** The Urban Water Management Planning Act became part of the California water code with passage of AB 797 in 1984. The act requires every urban water supplier (providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually) to adopt and submit an urban water management plan at least once every five years to the Department of Water Resources.
- **Safe Drinking Water Act.** The Safe Drinking Water Act (SDWA), administered by the U.S. Environmental Protection Agency in coordination with the states, is the chief federal regulatory legislation regulating drinking water quality. The 104th Congress reauthorized and made significant changes to the SDWA, which had most recently been reauthorized in 1986. Major changes included establishing a drinking water state revolving loan fund to be made available to public water systems to help them comply with national primary drinking water regulations and to upgrade water treatment systems; and requirements for EPA to establish drinking water standards based on risk assessment and cost/benefit analysis.
- **Bay Delta Accord (1994).** The December 1994 Bay-Delta Accord established several principles governing ESA administration in the Bay-Delta during the agreement's term.

The Accord is intended to improve habitat conditions in the Bay-Delta to avoid the need for additional species listings during the agreement's term. If additional listings do become necessary, the federal government will acquire any additional water supply needed for those species through the purchase of water from willing sellers. There is not intended to be any additional water cost to the CVP and SWP resulting from incidental take of listed species.

- **CEQA.** CEQA Guidelines Section 15083.5 requires the county to request information from the public water systems serving the project area. The requested information includes: an indication of whether the projected water demand associated with the proposed project was included in its last urban water management plan; and, an assessment of whether its total projected water supplies during normal, single-dry, and multiple-dry water years as included in the 20-year projection (contained in its urban water management plan) will meet the projected water demand associated with the proposed project, in addition to the system's existing and planned future uses.
- **SB 610 and SB 221.** Senate Bill 610 became effective January 1, 2002, and requires cities and counties in connection with CEQA to review and consider water supply assessments when evaluating certain development projects to determine if projected water supplies can meet the project's anticipated water demand. SB 610 also requires additional factors to be considered in the preparation of urban water management plans, water supply assessments, and for certain development projects that are otherwise subject to CEQA review. SB 221 requires similar analysis for subdivision maps that meet the threshold review criteria.
- **Water Code Section 10912** (also contained in CEQA Guidelines Section 15083.5) identifies those projects as: (a) a residential development of more than 500 dwelling units; (b) a shopping center or business employing more than 1,000 persons or having more than 500,000 gross square feet of floor space; (c) a commercial office building employing more than 1,000 persons or having more than 250,000 gross square feet; (d) a hotel or motel with more than 500 rooms; (e) an industrial or manufacturing establishment housing more than 1,000 persons or having more than 650,000 gross square feet or 40 acres; (f) a mixed use project containing any of the foregoing; or (g) any other project that would generate a water

demand at least equal to a 500 dwelling unit residential project.

- **Local Agency Groundwater Management Programs.** Some local agencies have specific statutory authority to manage groundwater resources in their service areas. Other local agencies may manage groundwater under authority provided by general enabling legislation, such as Water Code Section 10750 et seq. A few counties have adopted local ordinances to administer groundwater management. AB 3030 (Water Code Section 10750 et seq.) provided broad general authority for local agencies to adopt groundwater management plans and to impose assessments to finance the cost of implementing the plans. To date, about 150 local agencies have adopted AB 3030 groundwater management plans.
- **NRDC v. Kempthorne: Delta Smelt Biological Opinion Case**. The Natural Resources Defense Council (NRDC) challenged an Endangered Species Act (ESA) biological opinion issued by the U.S. Fish and Wildlife Service (USFWS). The biological opinion concluded that the Operations and Criteria Plan (OCAP) for management of the SWP and CVP would not jeopardize the delta smelt, an endangered species. However, the trial court held that the biological opinion was invalid because it relied on unenforceable mitigation measures, failed to adequately analyze the impact of the projects on the species' potential for recovery, and failed to consider current information on population size. This federal court decision filed May 25, 2007, along with findings of fact and interim remedial orders filed in December 2007, require state and federal agencies to reduce withdrawals of water from the Delta to protect the delta smelt until a new biological opinion for the OCAP is completed.

Existing Conditions

The State Department of Water Resources subdivides the state into regions for planning purposes. The largest planning unit is the hydrologic region, corresponding to the state's major drainage basins. Tulare County is located primarily within the Tulare Lake Basin, the closed drainage basin at the south end of the San Joaquin Valley, south of the San Joaquin River watershed, encompassing basins draining to Kern, Tulare, and Buena Vista Lakes.

Precipitation provides California with nearly 200 million acre-feet of surface water supply on an average basis. Of this renewable supply, about 65 percent is depleted through evaporation and transpiration by trees and other plants. The remaining 35 percent remains in the state's hydrologic system as runoff.

Over 30 percent of the state's runoff is not explicitly designated for urban, agricultural, or environmental uses. This water is depleted from the hydrologic system as outflow to the Pacific Ocean or other salt sinks. The remaining runoff (2 – 3 percent) is available as a renewable water supply for urban, agricultural, and environmental uses.

Table 10-1 shows California's estimated water supply, for average and drought years under 1995 and 2020 levels of development, with existing facilities and programs. This information is excerpted from the *California Water Plan*, prepared by the California Department of Water Resources. The state's 1995-level average year water supply was about 77.9 million acre-feet (maf), including about 31.4 maf of dedicated flows for environmental uses.

Table 10-1. California Water Supplies with Existing Facilities and Programs[a] Thousand Acre Feet (taf)

Supply	1995		2020	
	Average	Drought	Average	Drought
Surface				
CVP	7,004	4,821	7,347	4,889
SWP	3,126	2,060	3,439	2,394
Other Federal Projects	910	694	912	683
Colorado River	5,176	5,227	4,400	4,400
Local Projects	11,054	8,484	11,073	8,739
Required Environmental Flow	31,372	16,643	31,372	16,643
Reapplied	6,441	5,596	6,449	5,575
Groundwater[b]	12,493	15,784	12,678	16,010
Recycled and Desalted	324	333	415	416
Total (rounded)	**77,900**	**59,640**	**78,080**	**59,750**

a Bulletin 160-98 presents water supply data as applied water, rather than net water. This distinction is explained in a previous section. Past editions of Bulletin 160 presented water supply data in terms of net supplies.

b Excludes groundwater overdraft

Source: Department of Water Resources, California Water Plan.

The annual average statewide supply is projected to increase about 0.2 maf by 2020 without implementation of new water supply options. While the expected increase in average year water supplies is due mainly to higher Central Valley Project (CVP) and State Water Project (SWP) deliveries (in response to higher 2020-level demands), new water production will also result from groundwater and from recycling facilities currently under construction.

The state's 1995-level drought year water supply was about 59.6 maf, of which about 16.6 maf is dedicated for environmental uses. Annual drought year supply is expected to increase slightly by 2020 without implementation of new water supply options. The increase is expected to be created through higher CVP and SWP deliveries and new production from surface water, groundwater, and recycling facilities currently under construction.

Surface Water Supplies

Surface water supplies for the Tulare Lake Basin include developed supplies from the CVP, the SWP, rivers, and local projects. Surface water also includes the supplies for required environmental flows. Required environmental flows are comprised of undeveloped supplies designated for wild and scenic rivers, supplies used for instream flow requirements, and supplies used for Bay-Delta water quality and outflow requirements. Finally, surface water includes supplies available for reapplication downstream. Urban wastewater discharges and agricultural return flows, if beneficially used downstream, are examples of reapplied surface water.

Central Valley Project. The Legislature authorized the State Central Valley Project in 1933. Because California was unable to sell the bonds needed to finance the project during the Great Depression, the United States Bureau of Reclamation (USBR) initiated project construction. Initial congressional authorization for the CVP included facilities such as Shasta and Friant Dams, Tracy Pumping Plant, and the Contra Costa, Delta-Mendota, and Friant-Kern Canals.

The USBR's CVP is the largest water storage and delivery system in California, comprising of 29 of the state's 58 counties. The project's features include 18 federal reservoirs and 4 additional reservoirs jointly owned with the State Water Project. The keystone of the CVP is the 4.55 maf Lake Shasta, the largest reservoir in California. CVP reservoirs provide a total storage capacity of over 12 maf, nearly 30 percent of the total surface storage in California, and deliver about 7 maf annually for agricultural (6.2 maf), urban (0.5 maf), and wildlife refuge use (0.3 maf) (Table 10-2).

Table 10-2. Major Central Valley Project Reservoirs

Reservoir	Capacity (taf)	Year Completed	Stream/River Outflow
Shasta	4,552	1945	Sacramento River
Trinity	2,448	1962	Trinity River
New Melones	2,420	1979	Stanislaus River
Folsom	977	1956	American River
San Luis (Federal Share)	966	1967	Off stream
Millerton	520	1947	San Joaquin River
Whiskeytown	241	1963	Clear Creek

Source: Department of Water Resources, *California Water Plan1999.*

The CVP supplies water to more than 250 long-term water contractors, including 15 districts in Tulare County. The majority of CVP water is allocated to agricultural water users. Large urban centers receiving CVP water include Redding, Sacramento, northeastern Contra Costa County, and Fresno. Collectively, the contracts identify a maximum annual delivery of 9.3 maf, including the delivery of 1.7 maf of Friant Division supply when available in wet years.

The capability of the CVP to meet full water supply requests by its south-of-Delta contractors in a given year depends on rainfall, snow pack, runoff, carryover storage, pumping capacity from the Delta, and regulatory constraints on CVP operations. Existing CVP facilities have only a 20 percent chance of making full deliveries in any given year.

Friant Dam on the San Joaquin River, constructed by the United States Army Corps of Engineers (ACOE) and operated by the USBR was completed in 1944. This is the key facility in the San Joaquin Valley that made the first major inter-basin transfer of water possible in the service area. Millerton Reservoir has a capacity of 520,000 acre-feet of which about 400,000 acre-feet is annually usable for irrigation.

Water diverted through the Friant-Kern Canal to users in Tulare County is replaced to water right holders along the lower San Joaquin River with water imported from the Delta through an exchange agreement.

State Water Project. State voters authorized the State Water Project (SWP) in 1960. The majority of existing project facilities were constructed in the 1960's and 1970's. SWP facilities include 20 dams, 662 miles of aqueduct, and 26 power and pumping plants. Major facilities include the multi-purpose Oroville Dam and Reservoir on the Feather River, the California Aqueduct, South Bay Aqueduct, North Bay Aqueduct, and a share of the state-federal San Luis Reservoir.

Initial project contracts were signed for an eventual annual delivery of 4.2 maf. Of this annual entitlement, about 2.5 maf was to serve Southern California and about 1.3 maf was to serve the San Joaquin Valley. Except during very wet or drought years, San Joaquin Valley use of SWP supply has been near full contract amounts since 1980. The ability of the SWP to deliver full water supply requests by its contractors in a given year depends on rainfall, snow pack, runoff, carryover storage, pumping capacity from the Delta, and regulatory constraints on SWP operation. Existing SWP facilities have only a 65 percent chance of making full deliveries.

In 1975, the locally financed Cross Valley Canal was completed, transforming water from the California Aqueduct through a series of six pump stations to the east side of the southern San Joaquin Valley near the City of Bakersfield. A complex series of transport and exchange agreements allows of equivalent amounts of water to be swapped between the Arvin-Edison Water Storage District (a long-term Friant Unit contractor) and eight entities that contract for water with the ACOE from Shasta Dam and Reservoir, (including five in Tulare County). Water delivered to the Arvin-Edison Water Storage District is exchanged for a portion of their water supply from Millerton Reservoir. This exchange is capable of bringing an additional 128,300 acre-feet to the southern valley.

Rivers and Reservoirs. In addition to water from the San Joaquin River delivered by the Friant Kern Canal, other rivers serving Tulare County are the Kings, Kaweah, Tule, Kern, and White Rivers.

The Kings River watershed encompasses 1,742 square miles, ranging in elevation from 500 to 14,000 feet above sea level. The current yearly average runoff for the Kings River is 1,689,700 acre-feet. Variation in runoff is great, not only from year to year, but month to month. As a result of this variation, there were alternating periods of flood in then drainage area until Pine Flat Dam was completed in 1954 by the Army Corps of Engineers (ACOE). Pine Flat Reservoir has a capacity of 1,000,000 acre-feet and over 1,000,000 acres of agricultural land receive Kings River water.

The Kaweah River drains an area of 561 square miles of the Sierra Nevada Mountains. The headwaters are at elevations near 12,000 feet. Below the foothills, the Kaweah divides into several distributaries that cross the river's alluvial fan and terminate in Tulare Lake. The average annual runoff is nearly 430,000 acre-feet. Terminous Dam on the Kaweah River was completed in 1962 by the ACOE and creating Lake Kaweah with a capacity of 150,000 acre-feet.

The Tule River is a watershed of 390 square miles above Success Dam, with headwaters rising to an elevation of about 9,500 feet. Flood flows historically traversed the fan through several channels terminating in Tulare Lake. The average annual runoff is approximately 136,000 acre-feet. Success Dam was completed in 1961 by the ACOE and has a capacity of 85,000 acre-feet.

Isabella Dam on the Kern River was completed in 1954 by the ACOE and has a capacity of 570,000 acre-feet.

The subject of flood control merits special mention because of the direct relationship between the operation of water supply projects and flood control projects. Water supplies can be affected by flood control actions such as increasing the amount of reservoir storage dedicated to flood control purposes. In many major river systems, flood control dams have reduced flood flows by half or more, saving lives and significantly reducing property damage. However, in some areas, leveed flood control systems can be overwhelmed causing significant damages.

The 1997 Final Report of the Governor's Flood Emergency Action Team identified many actions that could be taken to increase valley flood protection, including better emergency preparedness, floodplain management actions, levee system improvements, construction of new floodways, temporary storage of floodwaters on wildlife refuges, reoperation or enlargement of existing reservoirs to increase flood storage, and construction of new reservoirs.

Groundwater Supplies

The San Joaquin Valley is a geologic depression formed between two uplifted areas, the Coastal Mountain Range on the west and the Sierra Nevada Mountains to the east. The depression has been filled by over 20,000 feet of sedimentary material, most of which contains water too saline for domestic use. The upper and most recently deposited material consists of alluvial deposits that extend to a depth of approximately 3,000 feet. These alluvial deposits contain fresh water and comprise an extensive underground reservoir. Within the basin, groundwater moves generally from areas of major replenishment along the eastern side of the San Joaquin Valley westerly to its trough. It is estimated that over 150 million acre-feet of fresh water is stored in the underground reservoir to a depth of 500 feet.

Groundwater in Tulare County occurs in an unconfined state throughout, and in a confined state beneath its western portion. Extensive alluvial fans associated with the Kings, Kaweah, and Tule Rivers provide highly permeable areas in which groundwater in the unconfined aquifer system is readily replenished. Interfan areas between the streams contain less permeable surface soils and subsurface deposits, impeding groundwater recharge and causing well yields to be relatively low. The mineral quality of groundwater in Tulare County is generally satisfactory for all uses.

In an average year, about 30 percent of California's urban and agricultural water is provided by groundwater extraction. In drought years when surface supplies are reduced, groundwater supports an even larger percentage of use. The amount of water stored in California's aquifers is far greater than that stored in the state's surface water reservoirs, although only a portion of California's groundwater resources can be economically and practically extracted for use.

The Department of Water Resources has estimated the groundwater overdraft by hydrologic region. For the Tulare Lake Basin, the total overdraft is estimated at 820,000 acre-feet per year, the greatest overdraft projected in the state, and 56 percent of the statewide total overdraft. This overdraft is due to reductions of surface supplies in recent years by Delta export restrictions, Endangered Species Act requirements, and other factors. CVP contractors in these regions who rely on Delta exports for their surface water supply have experienced supply deficiencies of up to 50 percent subsequent to implementation of export limitations. Many of these contractors have turned to groundwater pumping for additional water supplies.

Groundwater overdraft is expected to decline statewide by 2020. The reduction in irrigated acreage in drainage problem areas on the west side of the San Joaquin Valley is expected to reduce groundwater demands in the Tulare Lake region by 2020.

The groundwater overdraft is most pronounced along the western boundary of the county, as manifested by a lowering of pressure levels in the confined aquifers. There is also a progressive lowering of ground water levels along the easterly margins of the basin, particularly in the southerly part of the Kern-Tulare Water District. The importation of additional CVP water through the Cross Valley Canal, obtained by exchange with the Arvin-Edison Water Storage District, will act to mitigate the lowering of ground water levels,

particularly in the Pixley Irrigation District and Rag Gulch Water District. The Kern-Tulare Water District is actively proceeding with plans to provide facilities for distribution of its full supply of Arvin-Edison exchange water that should alleviate the problem in that area.

There are 19 entities in Tulare County with active programs of groundwater management. These management programs include nearly all types of direct recharge of surface water. Groundwater recovery is accomplished primarily through privately owned wells. Among the larger programs of groundwater management are those administered by the Kaweah Delta Water Conservation District, the Kings River Water Conservation District, the Tulare Irrigation District, the Lower Tule Water Users Association, and the Alta Irrigation District, utilizing water from the Friant-Kern Canal and local streams. The Kings River Water Conservation District covers the western county.

Water Marketing. While several long-term agreements have been completed in recent years, short-term agreements have comprised the majority of water marketing. Short-term agreements, with terms less than one year, can be an effective tool to alleviate the most severe drought year impacts. Short-term agreements can be executed on the spot market. However, water purveyors are increasingly interested in negotiating longer-term agreements for drought year transfers. In such future agreements, specific water supply conditions may be the triggers to determine whether water would be transferred in a specific year.

Water Quality. A critical factor in determining the usability and reliability of any particular water source is water quality. The quality of a water source will significantly affect the beneficial uses of that water. Water has many potential uses, and the water quality requirements for each use vary.

The establishment and enforcement of water quality standards for water bodies in California is administered by the State Water Resources Control Board (SWRCB) and the nine regional water quality control boards (RWQCB). The RWQCB's protect water quality through adoption of region-specific water quality control plans, commonly known as basin plans. In general, water quality control plans designate beneficial uses of water and establish water quality objectives designed to protect them. The designated beneficial uses of water may vary through individual water bodies.

The mineral quality of groundwater extracted for use in Tulare County is generally satisfactory for crop irrigation. The salinity of groundwater typically increases in a westward direction across the San Joaquin Valley. Under natural conditions, groundwater moves from recharge areas along the sides of the Valley toward the low or central portion where it is discharged at the land surface by seepage and evapotranspiration. The great alkali areas of the southwestern parts of the county indicate natural discharge of groundwater by evaporation has occurred, leaving salt accumulations in surface soils.

The SDWA requires states to implement wellhead protection programs designed to prevent the contamination of groundwater supplies. Wellhead protection programs rely heavily on local efforts to be effective, because communities have the primary access to information on potential contamination sources and can adopt locally based management.

Existing and Projected Water Use

Tulare County water supplies are apportioned into thirds comprising local (37 percent), imported (31 percent), and groundwater (32 percent) supplies. The conveyance system consists of unlined canals and pipelines. Groundwater recharge occurs both naturally and artificially. Natural recharge consists of percolation from lakes, drainage channels, and rainfall. Artificial recharge occurs through seepage from conveyance facilities and percolation from irrigation, as well as deliveries of surface water to recharge basins, open land, unlined canals, and fields in the off-season. Recharge can serve to stabilize groundwater reservoirs and utilize groundwater storage capacity made available by the removal of water from the groundwater aquifer. Most recharge programs are designed to retain and percolate surface water supplies not immediately needed or used for irrigation.

Urban Water Use. Table 10-3 summarizes urban water use for the Tulare Lake Basin compared to the entire state. Statewide urban use is estimated at 8.8 maf in average water years and 9.0 maf in drought years compared to 690,000 acre-feet for the Tulare Lake Basin (7.9 percent). Drought year demands are slightly higher because reductions in precipitation are not available to meet exterior water uses, such as landscape watering. 2020 statewide use is projected to increase to 12.0 maf in average years and 12.4 maf in drought years, compared to 1.099 maf in the Tulare Lake Basin (9.1 percent). The increase in percentage of the state total reflects the higher growth levels projected for the San Joaquin Valley.

Table 10-3. Urban Water Use in the Tulare Lake Basin and State (taf)

Region	1995		2020	
	Average	Drought	Average	Drought
Tulare Lake	690	690	1,099	1,099
Total (rounded)	**8,770**	**9,010**	**12,020**	**12,360**

Source: Department of Water Resources, *California Water Plan 1999*

Agricultural Water Use. Crop water use information and irrigated acreage data are combined to generate the agricultural water use for the Tulare Lake Basin shown in Table 10-4, which compares agricultural water use in the Tulare Lake Basin to the entire state.

Agricultural water use is expected to decline over time as land is removed from agriculture uses through urbanization and the retirement of agricultural land occurs in areas with poor soils and drainage. The percentage of agricultural water use in the Tulare Lake Basin compared with the State is projected to remain at nearly 1/3 of the state total (see Table 10-5).

Table 10-4. Irrigation Districts in Tulare County

Entity	Surface Water	Imported Water Source	Groundwater Extraction
Alpaugh Irrigation District	NA	Friant-Kern Canal (1,000af average)	19,000 af
Alta Irrigation District	King River	Friant-Kern Canal (surplus)	230,000 af
Delano-Earlimart Irrigation District	NA	Friant-Kern Canal (146,050 af average)	8,000 af
Exeter Irrigation District	NA	Friant-Kern Canal (1,000 af average)	14,000 af
Hills Valley Irrigation District	NA	Cross Valley Canal (2,000 af average)	1,000 af
Ivanhoe Irrigation District	Kaweah River	Friant-Kern Canal (11,650 af average)	15,000 af
Kaweah Delta Water Cons. District	Kaweah River	Friant-Kern Canal (24,000 af average)	130,000 af
Kern-Tulare Water District	Kern River	Cross Valley Canal (41,000 af average)	33,000 af
Lindmore Irrigation District	NA	Friant-Kern Canal (44,000 af average)	28,000 af
Lower Tulare River Irrigation Dist.	Tule River	Friant-Kern Canal (180,200 af average) Cross Valley Canal (31,000 af average)	NA
Lindsay-Strathmore Irrigation District	NA	Friant-Kern Canal (24,150 af average)	NA
Orange Cove Irrigation District	NA	Friant-Kern Canal (39,200 af average)	30,000 af
Pioneer Water Irrigation District	Tule River		3,000 af
Pixley Irrigation District	NA	Friant-Kern Canal (1,700 af average) Cross Valley Canal (31,000 af average)	130,000 af
Porterville Irrigation District	Tule River	Friant-Kern Canal (31,000 af average)	15,000 af
Rag Gulch Water District	Kern River	Friant-Kern Canal (3,700 af average) Cross Valley Canal (13,300 af average)	
Saucelito Irrigation District	Tule River	Friant-Kern Canal (37,600 af average)	15,000 af
Stone Corral Irrigation District	NA	Friant-Kern Canal (10,000 af average)	5,000 af
Teapot Dome Irrigation District	NA	Friant-Kern Canal (5,600 af average)	
Terra Bella Irrigation District	NA	Friant-Kern Canal (29,000 af average)	2,000 af
Tulare Irrigation District	Kaweah River	Friant-Kern Canal (100,500 af average)	65,000 af

Source: Bookman-Edmonston Engineering Inc. Water Resources Management in the Southern San Joaquin Valley, Table A-1.

Table 10-5. Applied Agricultural Water in the Tulare Lake Basin and State (taf)

Region	Year			
	1995		2020	
	Average	Drought	Average	Drought
Tulare Lake	10,736	10,026	10,123	9,532
State Total	**33,780**	**34,540**	**31,500**	**32,330**

Source: Department of Water Resources, California Water Plan

Environmental Water Use. Water flows in wild and scenic rivers constitute the largest environmental water use in the state. In the Tulare Lake Basin, designated state and federal wild and scenic rivers include the north and south forks of the Kern River. The 1968 National Wild and Scenic Rivers Act, codified to preserve the free-flowing characteristics of rivers having outstanding natural resource values, prohibited federal agencies from constructing, authorizing, or funding the construction of water resources projects having a direct or adverse effect on the values for which the river was designated. (This restriction also applies to rivers designated for potential addition to the national wild and scenic rivers system.) Table 10-6 shows the Wild and Scenic River flows in the Tulare Lake Basin.

Table 10-6. Wild and Scenic River Flows (taf)

Region	1995		2020	
	Average	Drought	Average	Drought
Tulare Lake	1,614	751	1,614	751
State Total	**23,560**	**10,560**	**23,560**	**10,560**

Source: Department of Water Resources, California Water Plan

Water Use Summary. Tables 10-7 and 10-8 summarize average and drought year applied water use for the Tulare Lake Basin. The tables combine the urban, agricultural, and environmental water use described in earlier subsections of this chapter.

Table 10-7. Tulare Lake Basin Average Year Water Use (taf)

Region	1995				2020			
	Urban	Agricultural	Environmental	Total (rounded)	Urban	Agricultural	Environmental	Total (rounded)
Tulare Lake	690	10,736	1,672	**13,100**	1,099	10,123	1,676	**12,900**

Table 10-8. Tulare Lake Basin Drought Water Use (taf)

Region	1995				2020			
	Urban	Agricultural	Environmental	Total (rounded)	Urban	Agricultural	Environmental	Total (rounded)
Tulare Lake	690	10,026	809	**1,530**	1,099	9,532	813	**11,440**

10.3 Mineral Resources

Introduction

From an economic standpoint, minerals extraction activities in Tulare County focus on aggregate (sand, gravel and crushed stone), which is the most significant resource and is used for building materials. Other minerals present but not mined include asbestos, copper, gold, iron and silver.

Methods

The information contained in this section was compiled using the Mineral Land Classification of Concrete Aggregate Resources in the Tulare Production-Consumption Region, California, 1997; California Department of Conservation-Division of Mines and Geology.

Regulatory Setting

California Surface Mining and Reclamation Act of 1975. Enacted by the State Legislature in 1975, the Surface Mining and Reclamation Act (SMARA) insures a continuing supply of mineral resources for the state. The act also creates surface mining and reclamation policy to assure that:

- Production and conservation of minerals is encouraged;
- Environmental effects are prevented or minimized;
- Consideration is given to recreational actives, watersheds, wildlife, range and forage, and aesthetic enjoyment;
- Mined lands are reclaimed to a useable condition once mining is completed; and
- Hazards to public safety both now and in the future are eliminated.

Areas in the state (city or county) that do not have their own regulations for mining and reclamation actives rely on the Department of Conservation, Division of Mines and Geology, Office of Mine Reclamation to enforce this law.

SMARA only covers mining activities that impact or disturb the surface of the land. Deep mining (tunnel) or petroleum and gas production is not covered by SMARA.

Key Terms

- **SMARA.** SMARA contains provisions for the inventory of mineral lands in the State of California. The State Geologist, in accordance with the State Board's Guidelines for *Classification and Designation of Mineral Lands,* must classify Mineral Resource Zones (MRZ) as designated below.
- **MRZ-1.** Areas where available geologic information indicates that there is minimal likelihood of significant resources.
- **MRZ-2.** Areas underlain by mineral deposits where geologic data indicate that significant mineral deposits are located or likely to be located.
- **MRZ-3.** Areas where mineral deposits are found but the significance of the deposits cannot be evaluated without further exploration.
- **MRZ-4.** Areas where there is not enough information to assess the zone. These are areas that have unknown mineral resource significance.

Environmental Setting

Mineral Resources

Economically, the most important minerals that are extracted in Tulare County are sand, gravel, crushed rock and natural gas. Other minerals that could be mined commercially include tungsten, which has been mined to some extent, and relatively small amounts of chromite, copper, gold, lead, manganese, silver, zinc, barite, feldspar, limestone, and silica. Minerals that are present but do not exist in the quantities desired for commercial mining include antimony, asbestos, graphite, iron, molybdenum, nickel, radioactive minerals, phosphate, construction rock, and sulfur. Figure 10-1 shows the general locations of the 13 corrosion mineral production sites within the county. The majority of these activities appear to occur in the Sierra Foothill Area.

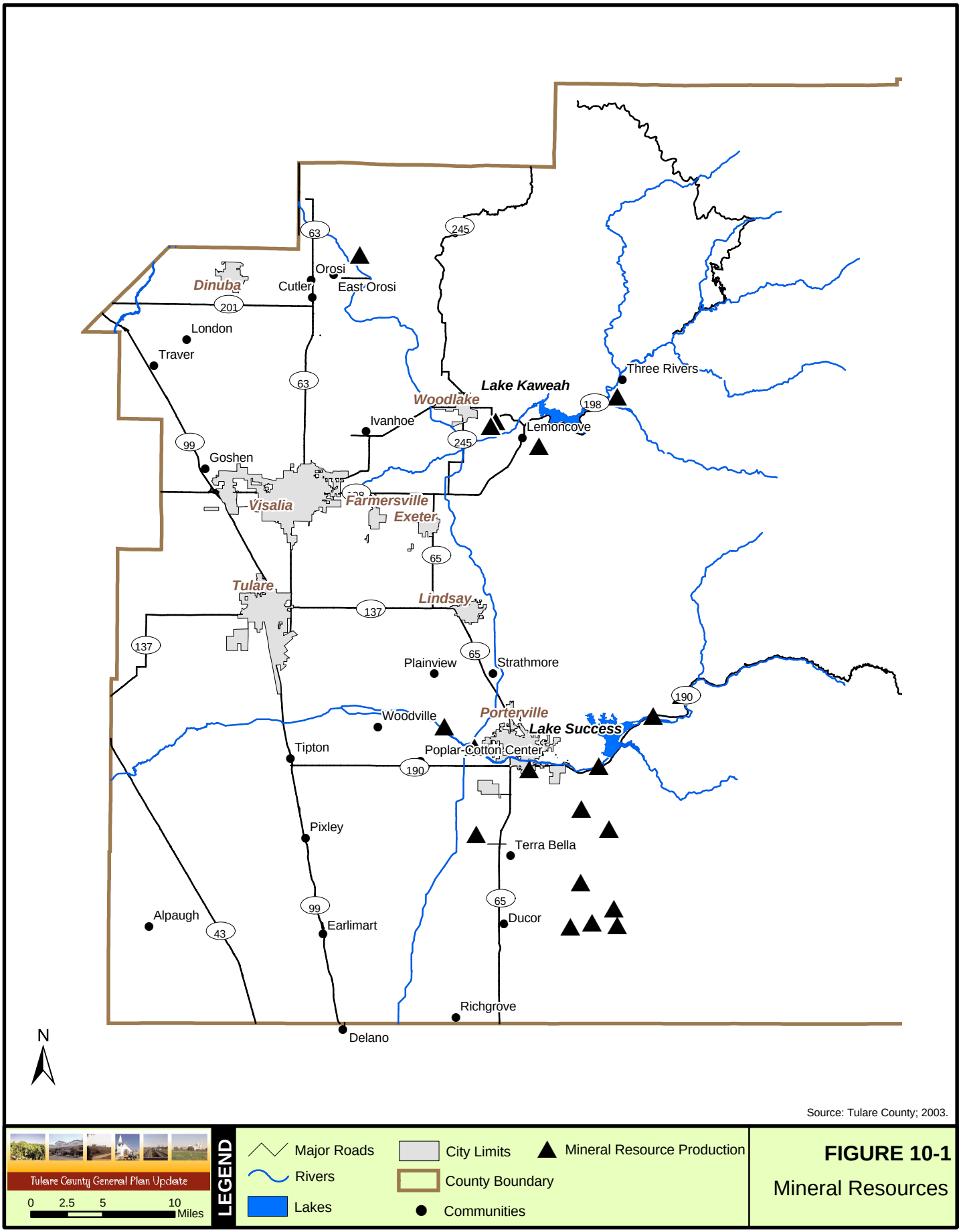
Aggregate resources are the most valuable mineral resource in the county because it is a major component of the Portland cement

concrete (PCC) and asphaltic concrete (AC). PCC and AC are essential to constructing roads, buildings, and providing for other infrastructure needs. There are three streams that have provided the main source of high quality sand and gravel in Tulare County to make PCC and AC. They include the Kaweah River, Lewis Creek, and the Tule River. The highest quality deposits are located at the Kaweah and Tule Rivers. Lewis Creek deposits are considerably inferior to that of the other two rivers. This is due to the fact that the sand and gravel particles in Lewis Creek are flat. The higher quality aggregate resource areas located along the Kaweah River, near Lemon Cove, and a location on the Tule River between Porterville and Lake Success. These deposits are ideal because the streams have steep gradients, which wash away soft, weak rocks allowing concentrated amounts of the desired round and hardened material in the streambed.

Projected Potential Shortages

There is estimated to be a total of 932 million tons of aggregate resources in Tulare County, which includes 219 million tons of reserves available for mining and 200 million tons that are located in the hard rock quarries southeast of Porterville. Of that total, 19 million tons are located in Northern Tulare County, which is expected to be depleted by the year 2010 unless new resources are permitted for mining. Lemon Cove has been the most highly extracted area for PCC quality aggregate supplies.

Past studies have shown that there is a strong correlation between the total amount of aggregate production and the population in a defined area. Using this correlation, the historical rate of consumption of aggregate resources in the entire county has been calculated to be 5.33 tons, per person, per year. This rate was calculated using the population (approximately 187,663) and reported aggregate production record for both PCC and AC aggregate from 1960 to 1995. A 3-year moving average of annual aggregate production was used due to erratic variations in aggregate production year to year, with the 3-year average of aggregate consumption increasing by 877,000 tons between 1960 and 1995. See Table 10-9 for the 50-year demand for aggregate resources in Tulare County. The projected consumption is based on the population projections from the California Department of Finance (1995) and the historic rate of consumption (5.33 tons/person/year). The California Department of Finance (DOF) population changed slightly since 1995. The current population projection for 2030 is 742,969 (DOF, 2007), which falls within the



Source: Tulare County; 2003.

Tulare County General Plan Update

0 2.5 5 10 Miles

LEGEND

Major Roads
Rivers
Lakes
City Limits
County Boundary
Communities
Mineral Resource Production

FIGURE 10-1

Mineral Resources

projections included in the report, Mineral Land Classification of Concrete Aggregate Resources in the Tulare County Production – Consumption Region. This means the projected consumption rates are similar to previously thought.

Table 10-9. Projected Aggregate Consumption from 1995 - 2044

Years	Projected Average Yearly Population	Projected Consumption of all Aggregate (tons)	Projected Consumption of PCC Aggregate (tons)	Projected Consumption of AC Aggregate (tons)
1995-1999	389,000	10,386,000	5,089,000	3,220,000
2000-2004	437,000	11,668,000	5,717,000	3,617,000
2005-2009	488,000	13,030,000	6,385,000	4,039,000
2010-2014	544,000	14,525,000	7,117,000	4,503,000
2015-2019	605,000	16,153,000	7,915,000	5,007,000
2020-2024	672,000	17,942,000	8,792,000	5,562,000
2025-2029	743,000	19,838,000	9,721,000	6,150,000
2030-2034	820,000	21,894,000	10,728,000	6,787,000
2035-2039	901,000	24,057,000	11,788,000	7,458,000
2040-2044	1,010,000	26,967,000	13,214,000	8,360,000
Totals		**176,460,000**	**86,466,000**	**54,703,000**

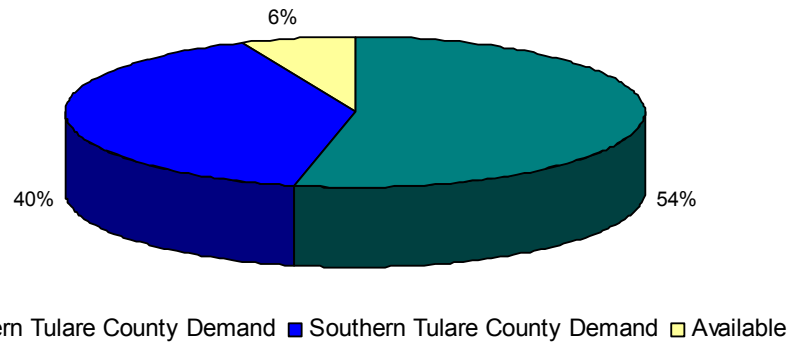
Source: Department of Conservation Division of Mines and Geology Mineral Land Classification of Concrete Aggregate Resources in the Tulare County Production – Consumption Region, California 1997.

The 50-year aggregate resource demand was calculated to be 86 million tons for PCC and 54 million tons for AC. The current reserves are estimated to be 219 million tons. A total of 150 million tons of aggregate will be consumed by 2044 if consumption rates stay constant and the aggregate resources are accessible. The projected population used in the *Mineral Land Classification of Concrete Aggregate Resources in the Tulare County Production –Consumption Region* report is slightly higher than the current population estimate by the DOF. Even with the higher population number used in this report consumption rates are well below the current aggregate reserve base of 219 million tons. Other important factors to consider are that of the 219 million tons of aggregate resources in reserve: 200 million tons exist in hard rock and 19 million tons exist in the Woodlake-Lemon Cove area. According to the *Mineral Land Classification* report, the Woodlake-Lemon Cove area will be depleted by 2010. Additional resources not included in these estimates include aggregate resources from the Kings River area, Coalinga Area and the Bakersfield area.

Map Sheet 52, Aggregate Availability in California (Kohler, 2006), updates previous 50-year aggregate demand for aggregate study areas throughout the state. Demand for aggregate resources in Tulare County is reported in *Map Sheet 52* as 117 million tons for Northern

Tulare County and 88 million tons for Southern Tulare County (Kohler, 2006). Figure 10-2 shows total demand for aggregate resources in Tulare County as accounting for 94% of the total supply of aggregate resources.

Figure 10-2. 50-Year Supply and Demand for Aggregate Resources in Tulare County



Source: Kohler, 2006.

10.4 Oil and Gas Resources

Introduction

This section describes the existing oil and gas resources that can be found in Tulare County.

Methods

The information contained in this section was compiled from documents provided by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources.

Regulatory Setting

State Regulations

- **California Laws for Conservation of Oil and Gas.** This document, as published by California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, includes several chapters of the California Public Resources Code, which governs the regulation of oil and gas operations.

Key Terms

The following key terms are used in this section to describe oil and gas resources.

- **Associated gas production.** Gas produced with oil.
- **Non-associated gas production.** Gas produced without oil.

Existing Conditions

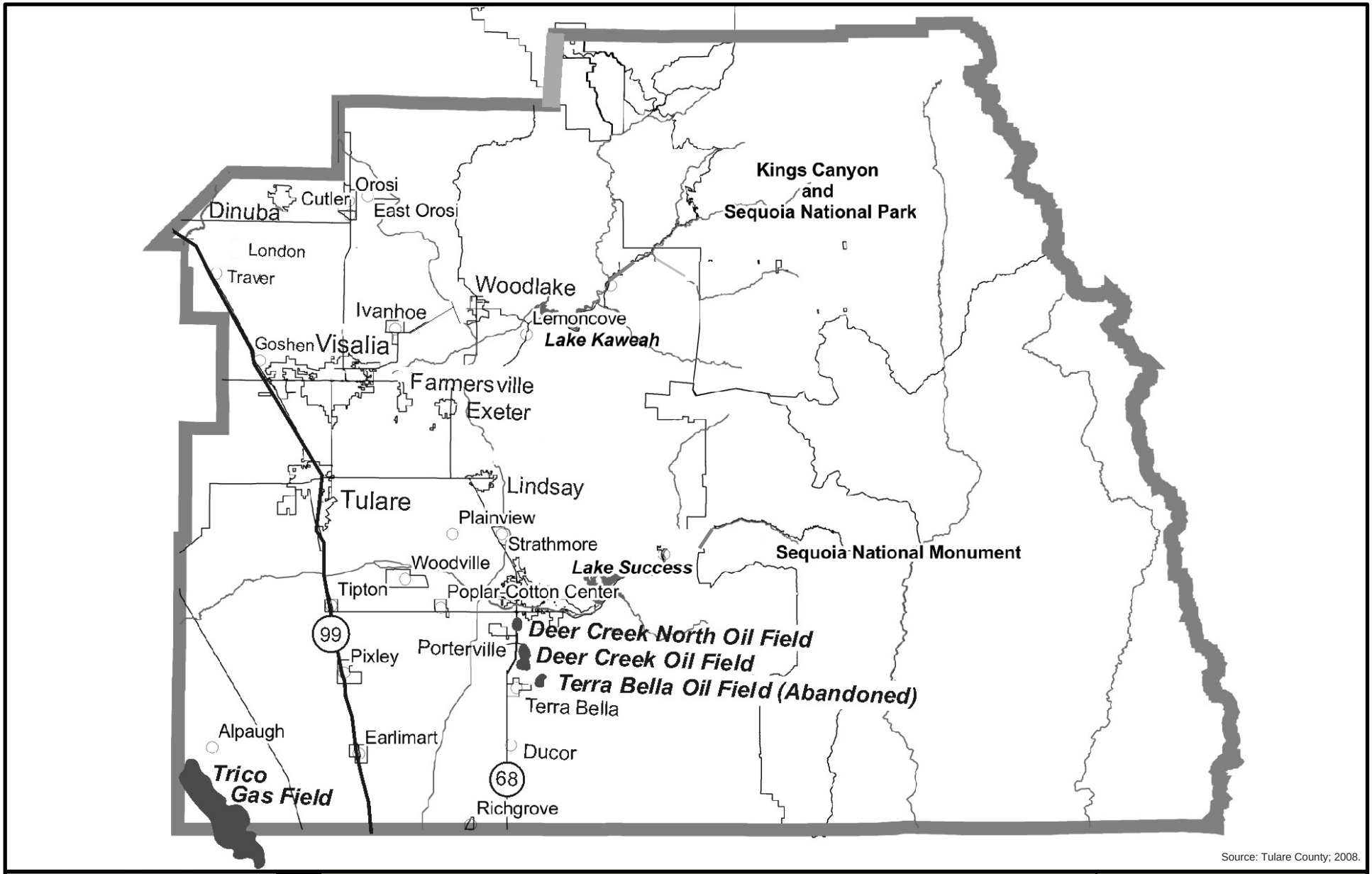
Oil and gas resources have historically been an important commodity in California. However, the demand for these resources tends to fluctuate with changing market conditions. According to the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, from 1991 to 2006, oil production has decreased statewide. Statewide oil production has declined to a level not seen since 1942. Associated gas production (gas produced with oil) has increased since 1990 by approximately 7.5 billion cubic feet (cf). Non-associated gas production (gas produced without oil) has decreased since 1990 by about 51.7 billion cf. Overall, net gas production has decreased since 1990 (DOGGR, 1991 and 2007).

According to the *2006 Annual Report of the State Oil & Gas Supervisor*, Tulare County had a total of 68 active oil wells and no active gas wells producing a total of 45,219 barrels of oil. There are two areas where oil resources exist, and one area where gas resources exist in Tulare County. They are described as follows:

- **Deer Creek.** The Deer Creek oil fields were discovered in 1953. Peak oil production for this field occurred in 1978 when a total of 92,862 barrels were produced. As of 2006, there were a total of 65 oil wells.
- **North Deer Creek.** The North Deer Creek oil fields were discovered in 1961. Peak oil production for this field occurred in 1980, when a total of 2,915 barrels of oil were produced. As of 2006, there were a total 3 oil wells.
- **Trico.** The Trico gas fields were discovered in 1934. As of 2006, there were no active wells.

Figure 10-3 shows these oil and gas fields, which includes the Terra Bella oil field that is now abandoned.

Table 10-10 shows trends in oil and gas production for Tulare County and California between 1990 and 2006. As shown in the table, the number of oil wells in production have increased slightly in Tulare County between 1990 and 2006. The number of wells at the statewide level has increased from 1990 to 2006. During this same period the overall daily production per well has decreased at both the county and statewide levels.



Source: Tulare County; 2008.

Tulare County General Plan Update

0 5 10 20 Miles

FIGURE 10-3

Oil and Gas Resources

Table 10-10. Oil and Gas Production, Tulare County and California, 1990-2006

Oil and Gas	1990			1995			2006			Number of Producing Wells, Net Change (1990-2006)
	Number of Producing Wells	Daily Production per Oil Well (bbl)	Cumulative Gas (MMcf)	Number of Producing Wells	Daily Production per Oil Well (bbl)	Cumulative Gas (MMcf)	Number of Producing Wells	Daily Production per Oil Well (bbl)	Cumulative Gas (MMcf)	
Deer Creek	50	3	NA	47	1	NA	6	1	NA	
Deer Creek North	5	1	NA	0	0	NA		1	7	
County Oil Total:	55	2	NA	54	1	NA	6	1	NA	
Tulare County Gas										
Trico	11	NA	201,100	7	NA	201,224		NA	201,416	-1
California Oil/Gas Production:	45,668	21.		45,389	21.		51,330	13.		5,662

Source: DOGGR, 1991, 1996; 2007

10.5 Timber Resources

Introduction

This section describes existing timber resources and protection of these resources within Tulare County.

Methods

The information contained in this section was compiled from consulting with the U.S. Forest Service website (http://www.nps.gov/seki/) and Tulare County Zoning Ordinance.

Regulatory Setting

- **U.S. Forest Service - Giant Sequoia National Monument Management Plan.** The U.S. Forest Service has prepared the Giant Sequoia National Monument Management Plan. The Plan identifies the need to establish management direction in order to provide for the proper care and management of the Giant Sequoia National Monument Management Plan.

Key Terms

There are no key terms for this section.

Existing Conditions

Timberlands are located in the eastern portion of Tulare County in Sequoia National Forest and Sequoia and Kings Canyon National Park. There are four major types of timber vegetation in Tulare County. These include Ponderosa Pine, which is the dominant species between elevations of 3,000 and 5,000 feet above sea level, mixed conifers including Ponderosa Pine, Jeffrey Pine, Sugar Pine, White Fir and Incense Cedar, which grow between the 4,000 to 6,000 foot elevation range. It is also at this elevation range that the Giant Sequoias exist in scattered groves and form some of the oldest coniferous forests in the world. Between the 7,000 to 9,000 foot elevation range, the Red Fir and Lodgepole Pine is dominant. Foxtail Pine and Whitebark Pine exist in the cooler and drier Subalpine forests, which can be found above 9,000 feet.

Much of the Timberland areas in Tulare County are zoned as Timberland Preserve Zoning (TPZ). This designation is used in an effort to reduce property taxes and protect timberlands from the encroachment of incompatible land uses. According to the California Forest Taxation Reform Act of 1976, which created the TPZ designation, if the County has qualifying land it must adopt TPZ zoning in order to restrict the use of the land to timber production and other compatible open space land uses which protect wildlife, watersheds, and recreational uses. In addition to creating the TPZ designation, the Act also regulates the timber harvesting on private land. Since a majority of the forest land in the County is located in the Sequoia National Forest (federal jurisdiction), the TPZ designation is mainly applied to privately-owned land within the Sequoia National Forest.

According to Zoning District data compiled by Tulare County, there are approximately 9,202 acres zoned as TPZ in the Tulare County. Of that total, approximately 7,463 acres (29 parcels) are currently in Timberland use according to the Tulare County Assessor's Database (2008).

In an effort to protect timberland in the Sequoia National Forest, 34 groves of ancient sequoias located in the Forest, which encompasses 327,769 acres, were designated as the Giant Sequoia National Monument in 2000 by President Clinton.

The proclamation contained the following measures:

- No portion of the Monument shall be considered to be suited for timber production, and no part of the monument shall be used for a sustained yield of timber.

- With the exception of personal use for fuel wood, tree removal can only occur if it is needed for ecological restoration and maintenance or public safety purposes.

- Preparation of a management plan for the monument. The Plan would contain measures to protect the Monument's resources. Examples include only permitting motorized vehicles on designated roads and only allowing new roads to further the purpose of the monument.

The U.S. Forest Service has recently completed the Giant Sequoia National Monument Management Plan. The U.S. Forest Service has recently completed the Giant Sequoia National Monument

For more information on timber resources, see Chapter 4. Agriculture, Recreation, and Open Space.

Management Plan. The Plan identifies the need to establish management direction in order to provide for the proper care and management of the Monument. The Plan addresses two critical problems facing the giant sequoias and their ecosystems, the failure in giant sequoia reproduction, and the buildup of woody debris and surface fuels, leading to an increased hazard from severe wildfires. The Plan also identifies opportunities for scientific research, interpretation, and recreation.

11. SCENIC LANDSCAPES

11.1 Introduction

"Tulare County is Big Country" is a featured banner on a travel map of the county. Tulare County has a complex structure of scenic natural landscapes, agricultural landscapes, and urban and rural communities. It possesses many of California's most unspoiled places and is experiencing rapid population growth and the need to diversify its economy.

This chapter of the Background Report provides a qualitative overview of the county's scenic features.

This chapter is divided into the following four sections:

- Organizing Features (Section 11.2);
- Scenic Corridors and Places (Section 11.3);
- Urban Structure (Section 11.4); and
- Visual Implications of Environmental Issues (Section 11.5).

11.2 Organizing Features

Introduction

The visual and spatial organization of Tulare County has been and will continue to be typically shaped by natural forces, agricultural activities and transportation. The variety and scope of the visual texture of the county is the result of how these three overlapping features collide and coexist.

Methods

A variety of methods were used in preparing this section. The Tulare County General Plan, GIS maps and consultant analytical mapping were used to characterize the features that organize the county. Historic research relied on various books, websites, and maps. One of the most important sources of information included the perceptions and experience of the many people that participated in community

workshops. The participants mapped and discussed valuable visual and landscape resources. General plan consultants and county staff also toured and photographed various landscapes in the county.

Key Terms

- **Working Landscapes**. Landscapes that are utilized for agriculture. Including distinctive visual elements such as crops, orchards, agricultural structures, and canals.

- **Urban Form**. Urban form pertains to the shape, patterns and visual texture of development. It includes roads, city blocks, buildings, land subdivision, and other types of historic and contemporary features that contribute to the form of communities and cities.

Regulatory Setting

Land use policies of cities and counties particularly the General Plans of Tulare County and its cities guide construction and the resulting urban form. State and federal policies also impact farming, natural resource extraction, and environmental protection.

A variety of special infrastructure districts have a significant impact on the urban form, as well. Irrigation districts create and manage water distribution systems that include canals. Water districts provide services for growing urban areas. Stormwater and drainage districts contribute to groundwater recharge and quality, and influence site and land planning standards. School districts and community college districts serve rural and urban communities and these school sites contribute to the urban form.

There are two land use policy plans that protect and guide development in the Sierra portion of the county. These include the Kennedy Meadows Plan and the Great Western Divide (North ½) Plan. Future growth guidance for the foothill areas is captured in the Foothill Growth Management Plan. For the valley floor, future growth is guided by the county land use policies for this area which can be found in the Rural Valley Lands Plan and Urban Boundaries Element.

Existing Conditions

Natural Landscapes

There are three principal environmental landscapes in Tulare County. These include the Sierra Nevada Mountains, the foothills, and the valley floor.

Sierra Nevada Mountains. The Sierra Nevada Mountains are landscapes of national and international importance. The two national parks, Kings Canyon and Sequoia National Parks include approximately 1,300 square miles of granite mountains, deep canyons, and forests. Mount Whitney is the highest point in North America (outside of Alaska) at 14,495 feet. The communities of Springville and Three Rivers are important gateway communities. Springville is a gateway to the Sequoia National Forest and Sequoia National Monument, while Three Rivers is the gateway to Sequoia National Park.

Foothills. Lying between the valley floor and the Sierra Nevada are the foothills. Characterized by rolling landscapes of orchards, oak woodlands and rangelands, the foothills provide the mid-range view of the mountains from many of Tulare County's communities. Their seasonal transformations of form and color add visual variety to the travel experience for park visitors and eastern valley floor communities located along State Route (SR) 65. The incorporated cities of Woodlake, Exeter, Lindsey and Porterville are located at the base of the foothills. Figure 11-1a provides an example of this important scenic resource, with a typical motorist view of a foothill area from a public roadway.

Valley Floor. About 25 percent of the county is included in the valley floor. The mountains' snowpack provides hundreds of thousands of acre-feet of water each year that is captured by an extensive system of dams and irrigations canals. The water supports a variety of crops and livestock, making Tulare County the second most productive agricultural county in California. From 2000 to 2007, milk has consistently ranked as the number one commodity in Tulare County. Oranges, grapes, cattle and calves, peaches, alfalfa, plums, and corn have ranked in the top ten crops during this period. These crops and the many others grown here contribute to the landscape and character of rural communities, as well as the setting of the county's urban communities. Figure 11-1a provides an example of a typical motorist view of the valley floor from a public roadway.



Photograph 1: The rolling oak woodland landscape typical of the foothills visible from a public roadway.



Photograph 2: Typical motorist view of agricultural areas on the valley floor from a public roadway.

Source: Tulare County; 2008.



Photograph 3: County orchards provide a contoured foreground to the mountains and a spatially enclosed corridor view along country roads.



Photograph 4: Beef and dairy herds are primarily located on the western side of the valley. The rangelands reflect the pastoral nature of the grazing lands located in the foothills of the county.

Source: Tulare County; 2008.



Photograph 5: Water delivery resources add movement and edges to the valley.



Photograph 6: Water resources create a lush working landscape and add movement and edges to the valley.

Source: Tulare County; 2008.

Working Landscapes

About half of the county is currently used for agricultural production and grazing. There are three types of working landscapes including rangelands, croplands, and orchards. Within each of these landscapes, there exist a variety of visual characteristics that reflect both the land's natural and agricultural history.

Croplands. Most cropland areas are located on the valley floor, supported by extensive irrigation systems. The western part of the county produces crops of cotton, barley, hay, vegetables, grapes, and orchards. The landscape reflects the low growing crops, tree rows and agricultural buildings that frame the visible horizon.

Vineyards and Orchards. Citrus is one of the county's most important agricultural products. Citrus is grown in the lower elevations of the foothills. The communities along the base of the hills started out as packing shed towns that developed along Southern Pacific Railroad's "Orange Belt" line. Other citrus orchards located along the foothills produce tangerines and lemons. Other tree crops include olives, plums, peaches, prunes, and nut crops including walnuts, almonds, and pistachio. The county's orchards provide a geometric foreground to the mountains and a spatially enclosed corridor view along rural roads. A representative view is provided in Figure 11-1b. Vineyards are primarily located in the valley region of Tulare County.

Rangelands/Livestock. Dairy and beef products are an important part of the Tulare County economy. According to the California Department of Food and Agriculture and the U.S. Department of Agriculture, there were a total of 332 dairies and over 481,000 dairy cows in the county in 2007. Beef and dairy herds are primarily located on the western side of the valley. Poultry (chickens and turkeys) are located in the northern part of the valley as well as several sheep herds. The rangelands for cattle and related stockyards provide a contrasting visual (and aromatic) atmosphere. The open lands are beautiful but the stockyards and dairy facilities are not always visually and/or aromatically appealing (see Figure 11-1b).

Irrigation, Railroads, and Highways. The story of Tulare County's city and working landscapes cannot be told without examining the role of railroads and highways in shaping settlement patterns. Early routes used by the Spaniards and early explorers included the Tulare Trail that generally follows the SR 65 alignment. The gold rush era Tulare Trail became the part of the Stockton-Los Angeles Road used

by early stage lines. An important stage stop named Porter's Station became Porterville. These early roads and trails were precursors to the transformation of the county due to these irrigation and railroad investments.

Surface Water. At one time, Tulare Lake was the largest body of fresh water west of the Mississippi River. The lake was 200,000 acres in size at its peak and it was the transient home of millions of migratory birds and elk herds. The lake, as much of the valley floor, was transformed by agriculture.

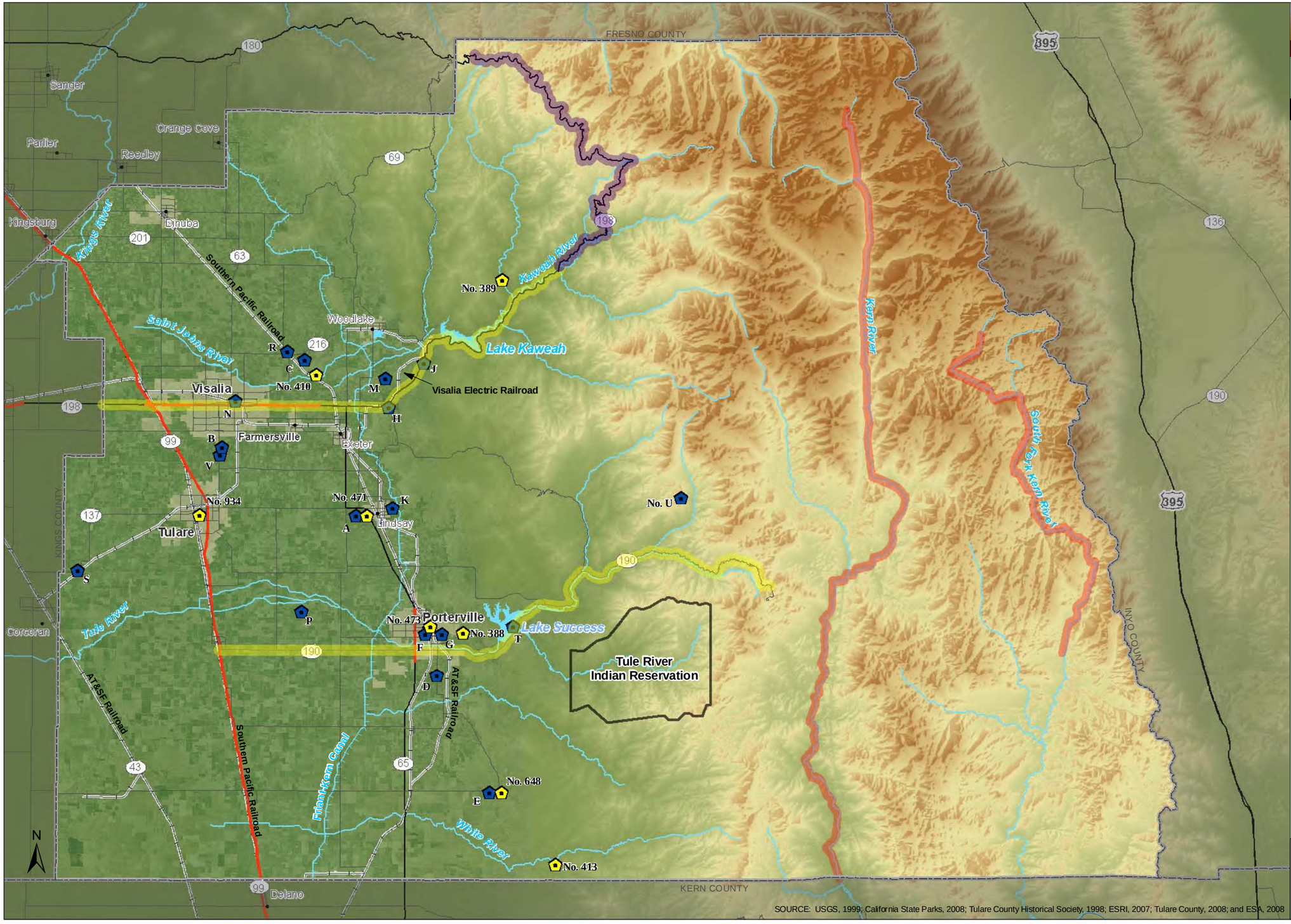
Tulare Lake could flood to 500,000 acres engulfing Kern and Buena lakes to the south in Kern County. Fed by snowfall in the Sierra Nevada Mountains via Kings, Kaweah, White and Tule Rivers, the lake was large enough to move freight with steamboats. Flood control dams have, except for rare periods of heavy rains, ended the seasonal formation of the lake. The lakebed now is covered with cotton and safflower crops. Figure 11-1c provides several views of surface water resources (both natural and human-made) on the valley floor.

Dams and Sources. There are four primary natural watercourses in Tulare County (see Figure 11-2). These include the Kings River, Kaweah River, White River and the Tule River. All except the Kern River transport water to Tulare County's valley floor. The Kings River Dam has created Pine Flat Lake; damming of the Kaweah River has resulted in Lake Kaweah; and Lake Success is fed by the Tule River.

There are two major water transmission facilities that trend north-south through the Central Valley. The state-funded Friant-Kern Canal is located in Tulare County and the California Aqueduct is to the east in Kings County.

Irrigation. The Friant-Kern Canal feeds irrigation districts serving Tulare County's agricultural lands. The canals have transformed the valley floor. Prior to irrigation in the mid 1880s, farming focused on dryland wheat. Besides creating a lush working landscape, the canals themselves are an important part of the scenery. They intersect the landscape adding movement and edges to the valley. Figure 11-1c provides a typical view of the Friant-Kern Canal.

Railroads. The railroad brought new prosperity to Tulare County's towns and farms. Tulare was the division headquarters for Southern Pacific Railroad from 1872 to 1891. The Southern Pacific Railroad (now Union Pacific Railroad) and Atchison Topeka & Santa Fe Railroad are the two major railroad lines serving Tulare County communities (Figure 11-2).



Tulare County General Plan Update

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LEGEND

- Cities
- State Historic Markers
- County Historic Markers
- Limited Access Highway
- State or County Highway
- Railroad
- Canal
- Rivers and Streams
- Wild and Scenic River
- Lakes
- City Boundary
- County Boundary

Scenic Highways

SR 190
Eligible State Scenic hwy, Not Officially Designated

SR 198
Connecting Federal Highways
Eligible State Scenic hwy, Not Officially Designated

State Historic Markers
No. 388 - First Tule River Indian Reservation
No. 389 - Kaweah Post Office, Kaweah Colony
No. 410 - Charter Oak or Election Tree
No. 413 - Tailholt
No. 471 - Butterfield Stage Route
No. 473 - Tule River Stage Station
No. 648 - Fountain Springs
No. 934 - Temporary Detention Camps for Japanese Americans-Tulare Assembly Center

County Historic Markers
A - Fremont Trail
B - Mooney Grove
C - Lone Oak Cemetery
D - Plano
E - Old Stage Road
F - Ina Stiner Home
G - Porterville Flour Mill
H - Jordan Trail
J - Pogue Hotel
K - George S. Berry
M - Hog Wallow Preserve
N - Fort Visalia
P - Woodville School
R - Klink Station
S - Artesian Well - Pixley
T - Wilcox Family Monument
U - Allen I. Russell Tree
V - Liberty Elementary School

SOURCE: USGS, 1999; California State Parks, 2008; Tulare County Historical Society, 1998; ESRI, 2007; Tulare County, 2008; and ESA, 2008

Figure 11-2

Scenic Resources

SPRR/UPRR has two major lines, which roughly parallel Highway 99 and SR 65. The AT & SF lines roughly follow SR 65, SR 43 and SR 63. Historically, the railroads collected farm produce and provided transportation between the county's small communities and regional and national markets. The cities and communities in the county have distinctive urban forms where their historic edges were planned around packaging and loading produce onto rail cars. The packing shed is an important vernacular building type and symbol throughout the valley.

Highways. Tulare County has been shaped by highways and roads, like much of post war California. Highway 99, state routes and county routes connect and serve rural and urban centers (Figure 11-2).

According to the Caltrans Website, Highway 99 was developed in the 1950s. It has served as a regional connection for residents and as a critical economic development facility for the county's agricultural industry. There are efforts underway by Caltrans to prepare a master plan for the highway to improve its appearance and performance. There is a goal of designing Highway 99 to "foster a valley-wide identity."

There are eight other state routes (SR) in Tulare County: SR 65, 63, 43, 137, 245, 201, 190, and 198. These routes, primarily two lane roads, offer some of the most enjoyable and diverse scenic driving experiences in the county (see Figure 11-2).

County routes cross the rural portions of Tulare County connecting smaller communities. These roads exhibit rural character and are the conduit to serve more isolated, and scenic parts of the valley floor, foothills and mountains.

Airports. The City of Visalia has the largest airport in the county and is the only facility with scheduled commercial service. There are several other general aviation airports that serve industrial tenants, such as Porterville. Smaller county-owned airports, such as Pixley, are located throughout the valley portions of the county. Whether large commercial or small general aviation facilities, airports shape cities. Development in the noise contours or flight path is restricted to open space or nonresidential uses.

11.3 Scenic Corridors and Places

Introduction

Traveling through the county reveals a wide variety of natural and historic resources. The county's eligible scenic highways, gateway communities to the Sierra Nevada Mountains, and other historic settlements contribute to a rich pallet of visual and cultural assets.

Methods

Methods used to research Section 11.3 included the review of the county history in books and websites, reviewing existing policies and maps of the Tulare County General Plan, and analytical mapping.

Key Terms

- **Scenic Highway Corridor.** The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

- **Scenic Highway/Scenic Route.** A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. They are considered eligible or designated by the State of California based on criteria established in Section 260 et seq. of the Streets and Highway Code. Benefits of "scenic highway" status include protecting environmental assets that encourage tourism and inclusion on travel maps produced by the State Division of Tourism. There are also national and local scenic highway programs.

- **Scenic Area.** An open or mostly undeveloped area, the natural features of which are visually significant, or geologically or botanically unique.

- **View Corridor.** The line of sight, identified as to height, width, and distance, of an observer looking toward an object

of significance to the community (e.g., ridgeline, river, historic building); the route that directs the viewer's attention.

- **Historic Places.** There are official national, state and local historic landmark programs. They identify and acknowledge places of important historical, cultural and/or architectural importance. A detailed description of these can be found in Section 9 of the Background Report.

Regulatory Setting

Because the designation of scenic highways and historic places can occur at the national, state or local level, there are a variety of jurisdictions that have approval of their eligibility. However, the groundwork and implementation for acceptance often falls upon the local jurisdictions and their commitment to implementing scenic enhancement and protection policies.

California Department of Transportation - California Scenic Highway Program. California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and a map identifying their locations may be obtained from the Caltrans Scenic Highway Coordinators.

For a specific route to be included on a list of highways eligible for scenic highway designation, it must be added to the list prior to being considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

When a local jurisdiction nominates an eligible scenic highway for official designation, it must also identify and define the scenic corridor of the highway. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic highway

designation protects theses scenic values of an area. Jurisdictional boundaries of the nominating agency are also considered, and the agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

To receive official designation, the local jurisdiction must follow the same process required for official designation of State Scenic Highways. The minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

Citizen participation in developing these requirements is very important if the program is to have popular support.

Existing Conditions

Scenic Highways

Tulare County's existing General Plan identifies state designated scenic highways and county designated eligible highways. There are three highway segments designated as eligible by the state. These include State Route 198 from Visalia to Three Rivers, State Route 190 from Porterville to Ponderosa, and State Route 190 extending through the northern portion of Tulare County. State Route 198 closely follows around Lake Kaweah and the Kaweah River, while State Route 190 follows around Lake Success and the Tule River. Both Scenic Highways travel through agricultural areas of the valley floor to the foothills and the Sierra Nevada Range. Figure 11-3 provides several typical motorist views from various points along State Route 198.

Gateway Communities

Three Rivers (located on State Route 198) and Springville (located on State Route 190) are important gateway communities to the Sierra Nevada Mountains. These historic towns once provided commercial

services for the Sierra logging and resource mining activities. Now, the communities support visitors and tourism and provide locations for second homes, according to the Springville Chamber of Commerce Website. The image and character of these two gateway communities are an important part of the travel experience and economic development opportunities that showcase Tulare County's natural beauty.

Historic Settlements and Places

For more information on historic resources, please see Chapter 9.

Visalia, the county's largest city, was established in 1852 and has the distinction of being the first community established between Stockton and Los Angeles. At that time, Tulare County included all of the area between Mariposa and Los Angeles Counties, and stretched from the Coastal Mountain Range to the State of Nevada. Through the years - the Counties of Fresno, Tulare, Kings, Kern, and Inyo have been formed out of what was once that original territory.

Initially, a number of farming "colonies" were established in the county. These small communities, such as Mt. Whitney, Orosi, Oakview, Holliday, Vina, and McCall's, took advantage of affordable land and water. Communities along railroads grew to become the county's larger cities such as Tulare, Visalia, and Porterville. Visalia, the county seat became the service, processing, and distribution center for the growing numbers of farms, dairies, and cattle ranches.

The Tulare County Historical Society has placed 26 markers throughout the county designating important historic places (Figure 11-2). These markers reflect the historic places, important events, and scenery. They mark both visual assets and cultural features. When combined with the scenic travel experience of Tulare County's rural roads and highways, these places provide "points-of-interest."

The Biological, Archeological, and Historical Resources (Chapter 9), provides a complete summary of official national, state and local cultural resources.

Tulare County Historical Society Historical Sites

Since 1948, Tulare County Historical Society members have identified historical sites and placed 26 markers, some as joint projects with other groups. The following markers commemorate early sites, individuals and groups throughout Tulare County. Additional details regarding each marker's location and its dedication can be found in "Los Tulares" (a quarterly publication by the Tulare County Historical Society) issues, as noted.



Photograph 7: Typical motorist view of agricultural and rural residential areas abutting the foothills from a public roadway.



Photograph 8: A Scenic Highway, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest).

Source: Tulare County; 2008.

- **Kaweah Colony.** Placed October 24, 1948 (Los Tulares #2). Kaweah was a utopian project started in 1886, which for several years attracted international attention. Unable to secure title to the land and because of internal difficulties, the organization ceased to exist after 1892. The Kaweah Post Office is a tangible reminder of the colony. (Figure 11-2, State Marker No. 389).

- **Tailholt.** Placed May 15, 1949 (Los Tulares #9, #85). Tailholt began as a gold mining camp about 1856, during the Kern River gold rush. Mining has been carried on here intermittently since the time of discovery. (Figure 11-2, State Marker No. 413).

- **Election Tree.** Placed July 10, 1949 (Los Tulares #44). At this tree, a party commanded by Major James D. Savage conducted the election on July 10, 1852, by which Tulare County was organized. Woodsville, the first permanent settlement, was located south of the monument. (Figure 11-2, State Marker No. 410).

- **Tule River Indian Reservation.** Placed October 16, 1949 (Los Tulares #32, #139). Was originally established in 1857. Indians from a widespread area were brought here. The marker is on the grounds of the Alta Vista School. (Figure 11-2, State Marker No. 388).

- **Butterfield Stage Station (Tule River).** Placed October 11, 1953 (Los Tulares #17). Here Peter Goodhue operated an emigrant trail stopping place on the bank of the Tulare River, until the river changed its course in 1862. It was a Butterfield Stage Station from 1858-1861. (Figure 11-2, State Marker No. 471).

- **Fountain Springs.** Placed in 1958 (Los Tulares #112). The marker is at the road intersection seven miles east of Ducor, about a mile and a half south of the old settlement, which dates back to at least 1855. It was a station on the Butterfield Route. (Figure 11-2, State Marker No. 648).

- **Butterfield Overland Mail Route.** Placed in 1958 (Los Tulares #63). Highway 65 west of Lindsay followed the old Los Angeles-Stockton Road, established about 1853. It was used by

the Butterfield Stages from 1858-1861. (Figure 11-2, State Marker No. 471).

- **Fremont Trail.** Placed in 1958 (Los Tulares #39). The Fremont Trail used by John Charles Fremont on his famous exploring expedition to California. The date on the marker should be 1844. It is located next to the Butterfield Stage Station marker (above), west of Lindsay. (Figure 11-2, County Marker A).

- **Mooney Grove.** Placed October 26, 1958 (Los Tulares #38). This marker is a memorial to those who have preserved a part of the Valley Oaks that formerly covered the Kaweah Delta. The area was visited by early explorers. Benjamin Willis settled here in 1852. The grove was owned by the Mooney family until purchased by Tulare County for park purposes in 1909. (Figure 11-2, County Marker B).

- **Lone Oak Cemetery.** Placed October 19, 1975 (Los Tulares #108). This is probably the oldest cemetery in the southern San Joaquin Valley. The marker is located on Avenue 324, off of Road 168, east of Ivanhoe. (Figure 11-2, County Marker C).

- **Plano.** Placed May 25, 1975 (Los Tulares #106). This marker overlooks the former pioneer village of Plano, first settled in 1861 by a wagon train of settlers from Texas who followed the Butterfield Stage Route west. This town became a way-station on the stage routes of the 1860s. The marker is two miles south of Porterville on Plano Road. (Figure 11-2, County Marker D).

- **Old Stage Road.** Placed October 24, 1976 (Los Tulares #112). Running north and south, following an older Indian trail, is the route taken by many Spanish expeditions, American trappers, traders and parties of exploration. The Old Stage Road was the major inland route of gold seekers to the northern and southern mines, and was the first public road in Tulare County. The marker is located at Fountain Springs, east of Ducor, on Avenue 56. (Figure 11-2, County Marker E).

- **Ina Stiner Home.** Placed January 1, 1976 (Los Tulares #109). Former home site of historian Ina Stiner. The plaque is placed in the sidewalk of the Ina Stiner home on "E" Street, Porterville. (Figure 11-2, County Marker F).

- **Flour Mill.** Placed April 25, 1976 (Los Tulares #110). From 1868-1912, flour gristmills operated on this site, which were

very important to this area. Using an extension of a ditch from the Monache Reservation to provide water power—dug by Indian labor in 1863, and water taken from the Tule River five miles upstream—the first mill was built by John Fleck and Henry Clarke, to grind grain produced in the surrounding area and provide food for the community. The marker is located at East Putnam Avenue (between Plano Street and Leggett Drive). (Figure 11-2, County Marker G).

- **Jordan Trail.** Placed April 17, 1977 (Los Tulares #113, #114). When gold was discovered in the Coso Range on the east side of Owens Valley, there was a need of a short route to the supply town of Visalia. John Jordan, who had settled in the lower Yokohl Valley in 1861, petitioned the Tulare County Board of Supervisors for the right to build a toll trail across the Sierra. The marker is at the side of the Yokohl Road, near the intersection with Highway 198. Rocky Hill Inc. granted an easement for placing the monument. (Figure 11-2, County Marker H).

- **Pogue Hotel.** Placed May 8, 1977 (Los Tulares #114). The hotel and home was built in 1879 by J.W.C. Pogue and his partners. The Pogues came to the Lime Kiln area in 1865 and planted the first citrus in the foothill district. It is the first house in the Lemon Cove townsite, laid out by J.W.C. Pogue in 1894. (Figure 11-2, County Marker J).

- **George S. Berry.** Placed March 12, 1978 (Los Tulares #118). The George Stockton Berry marker is placed on the grounds of the Lindsay High School. Berry was among the first to plant oranges and olives in the Lindsay area and had a vineyard. He was a member of the California Assembly in 1888, and was elected to the State Senate in 1890. He was a member of the Lindsay School Board in the 1890s. (Figure 11-2, County Marker K).

- **Hog Wallow Preserve.** Placed April 22, 1979 (Los Tulares #123). Located at Avenue 314 and Road 220 in Exeter, this plaque was donated by Carol Buckman and her father, Phillip E. Buckman, MD. The rough, mounded land is typical of what much of the Tulare County prairie along the base of the Sierra looked like before farming began. (Figure 11-2, County Marker M).

- **Fort Visalia.** Placed February 21, 1981 (Los Tulares #130). This fort is located on Garden Street, between School and Oak Streets in Visalia. This is the site where pioneer settlers first built a log stockade and lived during the fall and winter of 1852-1853. (Figure 11-2, County Marker N).

- **Woodville School.** Placed March 24, 1981 (Los Tulares #132). The marker is placed at the Woodville Memorial Building and commemorates the centennial of the district. (Figure 11-2, County Marker P).

- **Klink Station.** Placed October 25, 1986 (Los Tulares #154). The marker is placed near the fire station in Ivanhoe, and is dedicated to the founding of present day Ivanhoe. (Figure 11-2, County Marker R).

- **Artesian Well, Pixley.** Placed March 12, 1989 (Los Tulares #163). Marks the artesian well at Artesia, south of Waukena (now in Kings County). By 1885, there were 250 artesian wells in the county, all of which helped develop the semi-arid west side for agriculture. (Figure 11-2, County Marker S).

- **Wilcox Family Monument.** Placed March 4, 1990 (Los Tulares #167). Overlooking Lake Success in Porterville, this marker is dedicated to the early pioneers of Tulare County east of Porterville. (Figure 11-2, County Marker T).

- **Allen I. Russell Tree.** Placed June 23, 1991 (Los Tulares #173). This dedication grew from the many campers at Balch Park and the people who knew of Allen I. Russell's hard work in improving Balch Park during his assignment there from 1961-1990. (Figure 11-2, County Marker U).

- **Liberty Elementary School.** Placed November 1, 1992 (Los Tulares #178). The marker commemorates the 125th anniversary of the school's founding, and is located at Mooney Boulevard and Liberty Road in Visalia (Figure 11-2, County Marker V).

In addition to these places, there are a number of important cultural sites and districts with historic character in the county. Allensworth was an important African American farming community established in the early 1900s. Woodsville was the first county seat. The tree no longer exists, but the Charter Oak, the place where Tulare County was organized, remains. The county's smaller unincorporated communi-

ties have traditional commercial storefront districts. They also have institutional structures, such as churches and schools that are visual landmarks and cultural resources. The larger communities, such as Visalia, Tulare, Porterville, and Exeter have historic central districts and neighborhoods. Connected by rural roads, these places provide a visual framework and fabric that makes traveling in Tulare county a unique experience.

11.4 Urban Structure

Introduction

Interspersed around the natural and working landscapes are the towns and cities that define the character of urban and rural edges and the travel experience. Over time, policies about the direction, amount and quality of urban development continue to change the visual character of both rural and urban regions.

Methods

Section 11.4 involved preparing analytical maps based on tours of the county and existing General Plan policies. Information from state agency and historical society websites was also used.

Key Terms

- **Core Areas.** The traditional centers of cities (downtowns and historic neighborhoods) and communities are "core" or original centers of these regions. These areas often have many cultural, governmental, economic and residential activities that serve the surrounding area.

- **Compatible Development.** This includes new public or private development, such as buildings and infrastructure, which is harmonious with natural and historic structures.

- **Edge Conditions.** This refers to the way urban uses interface with rural and agricultural landscapes.

- **Rural-Urban Separators.** Rural-urban separators maintain natural and working landscapes between urban areas. They are used to enhance definition of individual communities and maintain their identity.

Regulatory Setting

Policies and regulations that define the shape of community growth and investment are prepared by a variety of sources. These include incorporated cities, the county, state agencies, and the federal government. Local Agency Formation Commissions (LAFCOs), comprised of local and regional governments and agencies, establish growth and service boundaries. These boundaries reflect a complex system of policies, economic forces, environmental constraints and growth projections. Tulare County is an important partner in the establishment and implementation of policies that impact the location and nature of urban uses.

Existing Conditions

City and Community Centers

The county's cities, unincorporated communities, and rural communities provide land and infrastructure resources that can support the future land requirements for growth while enhancing its image. These places provide for the social and economic focus of communities and the rural lands they serve. Revitalization policies for "core areas" of communities are directly linked to the need for urban expansion at the edges.

The need to expand urbanized uses onto farmland can be reduced by developing and redeveloping land in the core areas of communities. For every 100 acres of urban land developed with a mix of single family homes, townhouses, and apartments (assuming an average density of 20 units per acre), 500 acres of farmland can be saved at the edges (assuming a typical density of 4 units per acre [suburban character]).

Incorporated Cities. Tulare County's fastest growing and larger communities are located along Highway 99 and SR 65. Fueled by inexpensive land, the vast majority of new housing and commercial development has targeted the edges of the two major cities on the Highway 99 corridor. While both Visalia and Tulare have the capacity for infill development, the market interest has focused on developing additional suburban-level homes with a corresponding low density. While the downtown and traditional community centers are experiencing increased interest by professional and specialty businesses, this trend has not yet translated to higher residential densities at a scale that can make a difference at the urban-

agricultural edge. Between 1998 and 2000 (on 22 occasions) Visalia converted irrigated farmland to residential and business uses. There were also five urban additions (annexations) to the Tulare Urban area. New regional shopping centers detract from the surrounding shopping areas and encourage surrounding land development.

In the SR 65 corridor, cities are also growing at a brisk pace, including Porterville. Located along the edge of the foothills, these communities have typically expanded west utilizing the relatively flat, easy to develop land. This asymmetrical growth pattern encroaches on croplands while sparing the foothills' orchards. The traditional downtown areas are losing their literal and perceived central focus as cities grow to the west. Fractional and dispersed patterns of growth strain the social and economic threads that the downtown areas use to create the every day experience of its residents, employers and visitors.

Unincorporated Communities. The unincorporated communities of Tulare County could take on a larger role in providing land for urban uses. Many communities need infrastructure improvements, but the existing lot and block patterns and vacant and underutilized land provide a pre-existing structure to build upon. If land use policies are adopted to encourage growth in these communities, accompanying them with community image and design policies can increase the likelihood of creating viable towns with distinctive character and identities.

Along Highway 99 are a string of unincorporated communities that have significant highway visibility and access. These areas may likely be the first to have an opportunity to undergo significant growth. Traver, Goshen, Pixley, and Earlimart have designated redevelopment areas where efforts are underway to improve their infrastructure, including needed sidewalks, shade trees, parks, and utility infrastructure. Each improvement presents an opportunity to enhance the image of the community. Other unincorporated places such as Cutler-Orosi require a similar level of consideration.

The importance of the foothill gateway communities (Three Rivers and Springville) to the county's image was discussed earlier. They are also under pressure to grow and policies regarding their economic role and commitment to compatible development will certainly have an impact on their character and livability.

Rural Settlements. Scattered throughout the county are rural settlements. Some exhibit a few commercial uses or a post office, like Alpaugh. Others are clusters of older houses, farm buildings and vacant commercial buildings. Their existence has provided affordable housing and a reminder of how a shifting economy can change the future of small places. In some cases, these rural places are experiencing the growth impacts from larger communities and can take advantage of economic opportunities created by new visitor or urban traffic. Cultural policies for these areas are important as well; they can make the difference between restoring a historic commercial building or razing it for a mini-mart.

Urban Expansion—Edges

According the California Department of Conservation, about 55% of Tulare County land area is designated farmland and about 3.5% of the land area is urbanized. The California Department of Conservation Website reported that between 2004 and 2006 1,616 acres of important farmlands and grazing land were urbanized, 992 acres of which was prime farmland. A total of approximately 8,210 acres of land was urbanized in the county between 1996 and 2006 according to the California Department of Conservation land use conversion summaries from that time period (California Department of Conservation, Division of Land Resource Protection, 1998, 2001, 2003, 2005, and 2007). As the county continues to add population and urbanize land, there will be policy choices made regarding the pattern, edge conditions and the differentiation between communities.

Urbanization Pattern. The growth policies of existing and future designated cities will have a major impact on farmland and the overall image of the county as a place to live. If land use policies permit building out to the existing urban area boundaries, there will be a large urban region in the center of the valley lands area (Figure 11-2). If growth continues to be organized by state roads, there is a possibility of an urbanized area stretching between Visalia, Tulare, Farmersville, and Exeter; and south to Lindsey, Strathmore, and Porterville.

Edge Conditions. The interface between farm and urban lands is a continuously shifting condition. Generally, cities are expanding through lower density residential development at the edges. Schools and other institutional uses are also locating where land is cheap and available in approximate 10-acre parcels. Low-density subdivisions

and schools are difficult neighbors for farms due to dust, noise, truck traffic and other environmental conditions necessary to cultivate the fields and manage livestock. Complaints about these issues are not uncommon from new residents at the city-edge. The sight of long sound walls and commercial centers are in stark contrast to both the rural travel experience outside cities and formal blocks and neighborhoods of the traditional core areas. The "sameness" of the suburban edges blurs the distinctiveness of Tulare County's communities and landscapes.

Rural Separators. Urban Area Boundaries (UABs) and Spheres of Influence (SOI) provide policy directions to guide how a city grows. A majority of these areas are unincorporated county lands requiring consistent policies among cities and the county in terms of the timing and character of these areas. For example, SR 63 (Mooney Boulevard) between Visalia and Tulare could easily be urbanized allowing the communities to grow together along a commercial corridor. Or, the road could be retained as a rural separator between the two cities. The same alternative scenarios pertain to Highway 198 east of Visalia and the unincorporated communities along Highway 99. Maintaining distinctive communities is a policy choice that will require city and county cooperation.

Highway Commercial. The Central Valley's travel experience is transforming into franchise architecture, billboards and internally lit tenant pole signs. In contrast, Tulare County has not developed along Highway 99 in the same manner as other Central Valley counties. Maintaining the county's landscape and image along highways and scenic routes is a policy choice that can be made now to retain its desired character. Figure 11-2 identifies several transportation corridors that have yet to experience widespread highway commercial development.

Highway 99. Highway 99 has maintained a rural character in the county. The rural land uses, large eucalyptus trees, and limited billboards allow the Highway 99 scenery to reflect the economic importance of Tulare County's agricultural economy. However, the desire for job creation, increasing the sales tax base and providing commercial services for rural unincorporated communities makes them susceptible to highway commercialization. Tulare is the only incorporated city that has significant amounts of Highway 99 frontage. The balance of the frontage along Highway 99 is currently in agricultural use or part of an unincorporated community.

State Route 198. Historic photos of the oak-lined entry to Visalia from the west illustrate why the existing General Plan designates, as a candidate, State Route 198 a Scenic Highway. The new freeway design and overpasses have forever changed that the city's gateway. The increased traffic and pressure to develop the freeway interchanges typifies the evolution of rural highways. The future protection of this area as an open space and rural entry is under review by the City of Visalia. The Kaweah Oaks Preserve is located east of Visalia. This beautiful drive is an urbanizing corridor between Visalia and the growing SR 65 corridor communities. Highway commercial uses in this area, particularly convenience centers, interrupt the rural landscape. Beyond SR 65, Highway 198 winds up the foothills to Lake Keweah Recreation Area and Three Rivers. This scenic drive is one of the national park gateways. The image of the small communities and the county's commitment to accept only compatible investment will protect this area from insensitive highway oriented uses.

State Route 190. Highway 190, with the exception of the Porterville segment, is a rural experience that cuts a section through the valley floor's croplands, foothill's orchards, and into the Lake Success Recreation Area on the way to Springville. Cooperation with the City of Porterville and continued efforts to protect the scenic drive from insensitive highway commercial uses is a policy that Tulare County should consider.

State Route 63 and State Route 65. North-south state roads connect many of the valley floor communities. The auto-oriented services and commercial uses along these routes blur the edges of communities. Along SR 65, the smaller unincorporated communities have been "packing shed" towns focused on transporting produce onto the Southern Pacific "Orange Belt" Railroad. These communities do not have a tradition for highway commercial uses. As the county's population grows, there could be pressure to take advantage of the SR 65 frontage, similar to what has occurred along SR 63 between Visalia and Tulare. The northern portion of SR 63 may also present policy choices regarding the proliferation of highway commercial uses.

11.5 Visual Implications of Environmental Issues

Introduction

In addition to typical urban design and regional identity issues, there are several environmental issues that can have long-term impacts on the scenic beauty of Tulare County.

Methods

These issues were identified in community workshops and viewed during tours. The 2003 Public Policy Institute of California (PPIC) survey of southern San Joaquin Valley residents identified air quality as the number one issue facing the region.

Key Terms

There are no key terms for this section.

Regulatory Setting

Many of the environmentally related conditions facing Tulare County are the result of its unique geology and federal and state polices. Air quality regulations, natural resource policies, economic trade, The Endangered Species Act (ESA), and other laws and regulations shape the choices that can be made locally to resolve environmental conditions.

Existing Conditions

Light and Glare. There are primarily two sources of light intrusion:

- light emanating from structural interiors and passing through windows; and
- light from exterior sources, such as street lighting, building illumination, security lighting, event lighting in resort areas, traffic headlights, and landscape lighting.

Land uses such as residences, hospitals, and hotels are considered light sensitive, as they are typically occupied by persons who have expectations for privacy during evening hours and are subject to disturbance by bright light sources. At night, lights from cities and communities illuminate the developed areas, providing contrast with the generally uninterrupted darkness of the surrounding mountains

and agricultural lands. The preservation of views of the night sky has been identified as valuable to the community.

Glare results mainly from sunlight reflection off flat building surfaces with glass and reflective metal surfaces typically contributing to the highest degree of reflectivity. Glare can also be produced during evening and nighttime hours by the reflection of artificial light sources, such as automobile headlights. Glare generation is typically related to either moving vehicles or sun angles, although glare resulting from reflected sunlight can occur regularly at certain times of the year. Glare-sensitive uses generally include residences and transportation corridors.

Existing sources of light and glare within the County are primarily focused in the cities, hamlets, and other urban development boundary areas. It is anticipated that most new sources of light and glare (resulting from build-out of the General Plan) will occur within and around these urbanized areas. Figure 11-2 identifies several of these urban areas. A majority of the County is used for open space or agricultural purposes (with some scattered rural residential uses) and therefore currently contains limited sources of light and glare.

Air Quality. Not only is it an important health and economic issue, the San Joaquin Valley's air quality is impacting Tulare County's scenic vistas. Clear views of the mountains and foothills are becoming increasingly rare. Clear days in the county remind its residents of their proximity and connectedness to the snowpacks, watersheds and habitats of the mountains, foothills and valley floor. These views are also a major economic asset and the primary reason that thousands visit Tulare County each year in search of an original California experience with spectacular beauty.

Forestry. Not the important economic component now, forestry and mining nonetheless have historically transformed large parts of the county. Current federal policies regarding logging and thinning practices to reduce fire danger can impact their scenic quality. Natural and man-induced fire events can also have direct and indirect impacts on forests for generations.

Mining. Sand and gravel mining are large operations that not only alter the natural landscape, but all foster indirect impacts on forests, water resources, and roads. Visible equipment, dust and noise generate local impacts on the experience of traveling in rural portions of the county.

Billboards. Due to the presence of highway corridors, the Central Valley's landscape is a magnet for billboards. Policies regarding off-site advertising are complicated and political. However, the visual blight of billboards can effectively diminish the rural travel vistas in the county.

Highway 99 Corridor Plan. Local and state policies can greatly impact the travel experience of Highway 99. Caltrans is preparing a transportation master plan for Highway 99. It explores various futures for the facility. If it becomes an Interstate, new standards will apply significantly changing its design character. In addition, a collaborative nonprofit effort to map the corridor's visual conditions is underway. The mapping identifies visual assets and character in Tulare County and other southern San Joaquin Valley counties.

Environmental Issues and the Visitor Industry. Environmental implications of the before-mentioned environmental issues can have a significant impact on the desirability of Tulare County's traditional and potential to expand economic development opportunities related to the visitor industry. Federal, state, and local policy choices that adversely impact the visual beauty of Tulare County will have a detrimental economic impact.

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12.3 Personal Communications

Ackley, Patty, Recycling Coordinator, Tulare County

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Benton, Gerald, Superintendent, Tulare Joint Union High School District

Blevens, I.J., Administrator, Hot Springs School District

Brainard, Elain, District Superintendent, Outside Creek Elementary School District

Bromley, Collin S., Superintendent/Principal, Pleasant-View Elementary School District

Brown, Norman, District Superintendent, Springville Union School District

Byars, Tom, Superintendent, Sunnyside Union Elementary School District

Cannon, Paul, Superintendent/Principal, Alta Vista Elementary School District

Corley, Del, Director of Construction, Lindsay Unified School District

Durborow, Richard, Superintendent, Sequoia Union Elementary School District

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Finney, George, Tulare County Resource Management Agency

Garcia , Lucy, Director of Community Relations, Sierra View Hospital

Gonzalez, David, Superintendent/Principal, Buena Vista School District

Goode, Georgia, Teaching Principal, Hope Elementary School District

Gordon, Cliff, Superintendent, Sundale School District

Groth, Gary, Superintendent, Kings River Elementary School District

Haggard, Harold, Superintendent, Saucelito Elementary School District

Hailey, Rebecca, Superintendent, Strathmore Union High School District

Jimpetro, Tom, Superintendent, Mason Sultana School District

Jones, Janet, Superintendent, Farmersville Unified School District

Jones, Timothy, Superintendent, Principal, Columbine Elementary School District

Kunze, Pamela, Public Information Officer, Tulare County Office of Education

Lederwood, Eileen, Administrative Services Officer II, Tulare County Superior Court of California

Manning, John, Superintendent, Palo Verde School District

Mebane, Mary, Administrator, Linns Valley Poso Flat School District

Meier, Scott, Ed.D., Superintendent, Dinuba Unified School District

Monaco, Jeff, Solid Waste Manager, County of Tulare Resource Management Agency,

Solid Waste Division

Neve, Ron, Tulare County

Nord, George M., Superintendent/Principal, Traver School District

Polak, Rudy, Sergeant, Tulare County Sheriffs Department

Probasco, Ronald, W., Director, Tulare County Health and Human Services Agency

Spencer, Rosemary, Principal/Superintendent, Liberty Elementary School District

Stevens, Wolfgang Ph.D., Principal/Superintendent, Ducor Elementary School District

Thomas, Lori, , City of Porterville

Tietjen, Steve M., Ed.D., Superintendent, Woodlake Union School Districts

Trujillo, Roger Z., Superintendent, Earlimart School District

Turk, Clifford P., Ph.D., Superintendent, Woodville Union School District

Valentino, Lorene, Administrator, La Sierra High School

Whitlock, Mike, Flood Control / Subdivision Engineer, Tulare County

Whitson, Renee, Superintendent, Exeter Union High/Elementary School District

Williamson, Carol, Administrative Assistant/Chief Business Officer, Clay Joint Elementary School District

APPENDIX A. EXCERPTS FROM TULARE COUNTY CEDS

County Infrastructure Projects

1) **Goshen Redevelopment Project Area – North Goshen Industrial Area Sewer and Water Extensions** - The project will extend sewer service to vacant industrial properties in the north and northeast of the community (North Goshen Industrial Area) and require installation of a new pump station. The project will also upgrade the existing water distribution system, extend the water lines 1,700 feet to the north, construct a water storage facility, and a new domestic well. Currently the sewer lines are 600 feet short of reaching the periphery of the subject area and the water distribution system is undersized and incapable of providing required fire flows. The project may be undertaken in 2004/05 in cooperation with Goshen CSD and California Water Service Co., as new industrial prospects will require extension of sewer and water services. Currently applying for funding with which to construct the project.

Status: The project is in the study phase.

2) **Goshen Redevelopment Project Area - Betty Drive Interchange Improvements** - Caltrans has improved the travel lanes and added a sidewalk to the Betty Drive Bridge as a temporary measure to improve pedestrian and traffic safety within the vicinity of the bridge. In conjunction with this project, in 2004, Caltrans will construct a pedestrian overcrossing bridge along the Ave. 308 alignment, approximately 1,000 feet south of the Betty Drive interchange, to link students on the east side of State Road 99 with the elementary school on its west side. Caltrans replaced the existing bridge travel surface with wider travel lanes (12 feet each way) and a new handicap compliant sidewalk (7.5 feet) on the south side. Caltrans will also prepare a Preliminary Study Report (PSR) to analyze the replacement configuration for the interchange to be included in its 20-year plan. It will be two to three years before this study is completed.

Status: The project underway (Pedestrian Bridge Design – construction in 2004). Interchange project in the design phase (Preliminary Study Report). Interchange bridge modifications completed.

3) **Goshen Redevelopment Project Area - Betty Drive/Ave. 312 Realignment Project Phase 1 & 2** – The Tulare County Redevelopment Agency (TCRA) received Economic Development Administration (EDA) funding for the proposed realignment of Betty Drive east of State Road 99 to connect with Avenue 312 and its widening to County Road 80. This project has been classified as a Regionally Significant Transportation project as Ave. 312 improvements will provide alternative truck transport access to the northern portion of the Visalia Industrial Park and to the northern portions of the Goshen Redevelopment Area designated for industrial development. Phase I of the

project is currently in construction and additional funding for Phase 2 is secured from the State Transportation Improvement Program. Phase 1 funding from the State Infrastructure and Economic Development Bank has closed. The project is a joint effort of the TCRA, Tulare County, and the City of Visalia. Phase 2 will widen the facility to four lanes.

Status: The project is underway. Phase 1 is in construction. Phase 2 is in the design phase.

4) **Goshen Redevelopment Project Area – West Betty Drive/Ave. 308 Realignment Project** – This project will provide the link for alternative truck transport access to the northern portion of the Visalia Industrial Park and the North Goshen Industrial Area to traffic from the west originating in Kings County. The project will realign a western extension of Betty Drive to Ave. 308 and a potential new interchange on State Road 198 and County Road 64. The project is currently in preliminary study for alignment options and funding opportunities.

Status: The project is in the design phase.

5) **Goshen Redevelopment Project Area - State Road 99 Landscaping** - This is a long-term project to landscape and beautify the "99" corridor from State Road 198 to the Betty Drive interchange. The Redevelopment Agency (Agency) will participate in a joint project with Caltrans, the City of Visalia (City), and the Goshen Community Services District (District). Caltrans will provide right-of-way access to install the landscaping, the Agency and City will provide the landscaping materials, and the District will provide its reclaimed treated wastewater from the City for irrigation waters. Upon completion of the project, Caltrans will maintain the improvements.

Status: The project in the study phase. Project on hold as other capital improvement projects have priority.

6) **Goshen Redevelopment Project Area - Storm Water Drainage & Recreation Project** – Limited portions of the project will be completed under the Betty Drive – Avenue 312 Realignment and Improvement Project with drainage improvements serving the northern sectors of the areas east of State Road 99 and creation of a seven acre detention basin will be created with a passive recreational park with recreational facilities west of Camp Drive.

Status: The project is in the study phase, but on hold until other projects with higher community priority are completed.

7) **Richgrove Redevelopment Project Area - Storm Water Drainage, Air Quality and Recreation Facilities -** The revised Storm Water Master Plan has been completed and final plans and specifications are nearly 100 percent complete. Purchase of the South Tulare County Memorial District property for the combined ponding basin/recreational facility has been initiated now that the elections have been held in compliance with

Proposition 218. The Joint Development Authority (TCRA/Richgrove School District/Richgrove Community Services District) has received a grant for sidewalk, curb, gutter, and road improvements from Caltrans via the Tulare County Association of Governments under the Congestion Management and Air Quality program. Approval to submit final applications to the United States Department of Agriculture has been obtained.

Status: The project is in the study phase. A revised master drainage plan for Richgrove has been completed and the project has applications submitted for funding. As partial funding for the project, a grant has been received from Caltrans under its Congestion Management and Air Quality Grant Program. The final design is pending Proposition 218 election.

8) **Richgrove Redevelopment Project Area - Richgrove Drive Underground Utility District Study –** A preliminary study showed that complete undergrounding of power lines along Richgrove Drive may be impractical. The power lines are high voltage transmission lines and their replacement or relocation may be more cost effective. Further study will be conducted when the project resumes.

Status: The project is in the study phase. The project was put on hold by Southern California Edison Co. pending resolution to California energy crisis.

9) **Poplar-Cotton Center Redevelopment Area - Storm Water Drainage Air Quality and Recreation Project** - Community Storm Water Master Plan completed; preliminary engineering design extended to begin mid-September 2003. The project is ready to proceed to the preparation of final plans and specifications phase. The Storm Water project, which includes a combined ponding basin/recreational facility, will be initiated after required elections, planned for March 2005, are held in compliance with Proposition 218. The Joint Development Authority (TCRA and the Poplar Community Services District) has received a grant for sidewalk, curb, gutter, and road improvements from the Tulare County Association of Governments under the Congestion Management and Air Quality program and is pursuing funding from the United States Department of Agriculture (USDA) and the State Parks and Recreation Department. The USDA has approved the pre-applications submitted in March 2003 and final applications are due in 2005.

Status: The project is in the study phase.

10) **Poplar-Cotton Center Redevelopment Project Area - Enhance street lighting, landscape to beautify the communities and transportation improvements** - Transit service is now in place, and rider-ship continues to grow. Funds secured for installation of new streetlights with emphasis on streets (where there are security and safety issues during the winter fog season) have been placed in a trust fund and are awaiting participation by Southern California Edison (SCE) Co. SCE has put its participation in all projects on hold pending resolution of the energy crisis.

Status: Project is in the study phase. The transit system is in place, and the street lighting project is on hold.

11) **Poplar-Cotton Center Redevelopment Area - Chamber of Commerce and Community Center Project -** Funding has been obtained from State Community Development Block Grant (CDBG) program and transfer of property ownership from Tulare County to the Tulare County Redevelopment Agency (TACR) is complete. Community volunteers have performed 90 percent of the reconstruction work to date. Property is temporarily transferred to the TCRA until construction is completed and then will transfer to the Poplar Chamber of Commerce. Construction began in September 2001 and will be complete in June 2003.

Status: The project is underway and under construction.

12) **Poplar-Cotton Center Redevelopment Project Area - Piping of Poplar Ditch -** Project on hold pending availability of funding and completion of community projects with higher priority. A portion of the Poplar Ditch will be piped and covered under the Caltrans Improvements to State Highway 190.

Status: The project is in the study phase.

13) **Poplar-Cotton Center Redevelopment Project Area - New Fire Station -** On hold pending donation of land and securing sources of funding to build a new regional fire station.

Status: The project is under consideration**.**

14) **Cutler-Orosi Redevelopment Project Area - Sidewalk and Community Improvements Projects No. 5 & 6 -** Waiting for Caltrans permits and final design. The next phase of the project (No. 5) is due to begin in late fall 2003 and entails completion of restructuring intersection curbs and handicap ramp installation by Caltrans. This will be followed by installation of all missing sidewalk segments (approx. ¾ mile) between Sand Creek and Ave. 416. Project No. 6 will start in the spring of 2004 and complete the last north/south link of sidewalk from the northern developed area of Orosi to the new Junior High School campus. In all, the projects No. 1 through 6 will have constructed over three miles of pedestrian sidewalk providing an all weather surface with access to businesses and educational facilities.

Status: The project is underway.

15) **Cutler-Orosi Redevelopment Project Area - Business Microenterprise (Incubator) Project** – This project funded by a State of California Economic Development Block Grant with main office located in Cutler-Orosi and satellite offices now established in Porterville and the unincorporated communities of Pixley and Goshen. The project is a joint venture with Tulare County, Community Services and Employment Training

(CSET) and the Cal. State University Fresno Small Business Development Center. The purpose of the center is to provide development of new businesses within low-income communities by providing entrepreneurs with computer, accounting and business management training and financial assistance. The Agency is seeking funding to continue the project beyond the October 2003 completion date.

Status: The project is underway. Initial project to be completed by October 2003.

16) **Cutler-Orosi Redevelopment Project Area - Underground Utility District No. 2 –** Project on hold pending resolution of the California energy crisis.

Status: The project is in the study phase.

17) **Pixley Redevelopment Project Area - Increase Capacity for Pixley Wastewater Treatment Facility -** The project will require engineering design and construction to enlarge the existing treatment facility to 1.5 million gallons per day of capacity and the capability to treat industrial wastes. Minor improvements have been made to the facility to comply with the corrections order from the Regional Water Quality Control Board.

Status: The project is in the study phase.

18) **Pixley Redevelopment Project Area – Industrial Wastewater Treatment Facility Study –** Under consideration for funding of a study to construct a new industrial wastewater facility as an alternative to additional capacity and plant modifications at the existing community wastewater facility. The existing facility serves residential development and is not currently designed or capable of handling industrial wastes.

Status: The project is in the study phase.

19) **Pixley Redevelopment Project Area - Master Storm Water Drainage Plan and Improvements -** Develop a master plan to integrate the individual (subdivision) storm water drainage systems and develop drainage facilities in areas that currently lack them. This project is currently placed on hold until funding sources are identified and other priority projects have been completed. The completed first phase of the project is in the downtown commercial district. This portion of the project constructed 800 lineal feet of new curb/gutter and sidewalk adjacent to Pixley Place (a proposed community park site).

Status: The project is in the study phase.

20) **Pixley Redevelopment Project Area - Fire Station Expansion** – Enlarge the current fire station building to accommodate the larger modern water tender units or build a separate building. This project is currently on hold until funding sources are identified and other priority projects have been completed.

Status: The project is in the study phase.

21) **Pixley Redevelopment Project Area - Industrial Park Access & Development Study** - The proposed study will focus on truck transport access solutions to the designated industrial development area within the community, improvements to the frontage road along State Road 99, and analysis of the types of industrial development which could occur with the review of infrastructure capacity needs assessment.

Status: The project is in the study phase.

22) **Pixley Redevelopment Project Area - Community Improvements** - Enhance street lighting, improve alleys, landscape and install welcome signs to enhance the appearance of the community and facilitate traffic circulation. The entry sign project is on hold pending availability of funding from a private foundation. The street lighting project is on hold pending completion of similar model projects in other communities.

Status: The project is in the study phase.

23) **Pixley Redevelopment Project Area - Industrial Park -** Development of the Pixley Industrial Park including upgrades, the extension of sewer and water systems, improvement and construction of new roads (industrial design standards) and improvement of freeway access with restructured interchange.

Status: The project is in the study phase.

24) **Pixley Redevelopment Project Area - Pixley Place Landscaping Project (Formerly Pixley Beautification) – *Phase 1-*** Sidewalk project with improvements in existing County rights-of-way including installation of curb, gutter and sidewalk. The paved shoulder parking areas along the east and north sides of the new park area have been completed. Rough grading of the park strip and the ponding basin for storm water drainage have also been completed. The project was funded with a Bank of America grant and USDA Community Facilities grant and is a joint project of the TCRA and Pixley Public Utility District. Construction completed. ***Phase 2 -*** Park improvements that include landscaping, streetlights, walk paths, irrigation, restoration of the artesian well monument and cleanup of the underground storage tanks on the parcel south of the park area for future expansion. This is a joint project of the TCRA, Pixley Public Utility District and Pixley Elementary School District and is pending funding availability.

Status: Phase 1 has been completed. Phase 2 is in the study phase with construction estimated to be completed by June 2005.

25) **Earlimart Redevelopment Project Area - Downtown Business District & Highway Commercial Study -** The study will focus on attraction of freeway commerce especially the tourist trade to entice traffic to stop in the community. The increasing volume of vehicular traffic is passing Earlimart by and the study will address the kinds of development needed

to attract this mobile trade. A secondary phase of the study will include the preparation of a Downtown Development Specific Plan to address growth and revitalization issues.

Status: The project is in the study phase.

26) **Earlimart Redevelopment Project Area - Storm Water Drainage, Air Quality and Recreation Project -** The project is a joint endeavor between the Earlimart Public Utilities District, Earlimart Elementary School District and TCRA. The school district has agreed to provide five acres for a mid-community detention basin, which will incorporate a small children playground for dry season use. The Public Utility District has agreed to operate and maintain the completed project. The project is now in the design phase and will require a community-wide election for an assessment district, in compliance with Proposition 218 before going to construction. The Tulare County Association of Governments has provided funding under the Congestion Management and Air Quality Program. USDA has approved the preliminary funding application for grant and loans.

Status: The project is in the study phase.

27) **Ivanhoe Redevelopment Project Area - Community Improvement Program –** Significant projects on hold pending the availability of funding. Enhanced improvements include street lighting and adding curb, gutters, bike paths and walkways for improved community access and circulation. The recent closing of the Save More Market, together with the prior closing of the hardware store and the relocation of Bradford Steel Construction out of town makes self-funding or match-funding from redevelopment revenues unlikely. Other sources of funding using pooled funds from multiple agencies will be sought.

Status: The project is in the study phase.

28) **Ivanhoe Redevelopment Project Area - Storm Water Drainage –** The construction of improvements to designed and implement the Storm Water Drainage Master Plan project include the installation of curbs, gutters, and sidewalks.

Status: The project is in the study phase.

29) **Ivanhoe Redevelopment Project Area - Entrance Sign & Landscaping Project -** The project includes the installation of an entrance sign at the south entrance to the community, development of a landscaped area near Depot Drive and Avenue 328 that will feature a pedestrian or bicycle path on surplus railroad property and a neighborhood park on an irregular shaped lot owned by a local produce packing company. These aesthetic improvements will make the community a more desirable place in which to live. The project is on hold pending the availability of funding.

Status: The project is in the study phase.

30) **Ivanhoe Redevelopment Project Area - Storm Water Drainage Master Plan** – The project is on hold pending the availability of funding and buildup of reserve funds. The updated

existing 40-year-old master plan will incorporate existing and new residential/commercial development into a community system.

Status: The project is in the study phase.

31) **Traver Redevelopment Project Area - Community Center Project** – The project is determined to be a lower priority for use of Redevelopment Agency funding than expansion of sewer/water infrastructure. The community is seeking other sources of funding for a community center.

Status: The project is in the study phase.

32) **Traver Redevelopment Project Area - Industrial Water and Wastewater Capacity Study** - In order to accommodate a planned residential subdivision and to encourage highway commercial growth, expansion of the service area of the water and sewer systems is required. In addition, capacity expansion is required at the wastewater treatment facility and new domestic water sources, storage, and filtering must be added to meet the community needs for water supply and sewage disposal. A study of the existing sewer and water systems began July 2003 to determine future requirements.

Status: The project is in the study phase.

33) **Goshen - Pedestrian Overcrossing Bridge** – The project sponsored by Caltrans. Funding was provided by Caltrans and the Tulare County Association of Governments. The project will provide direct pedestrian access from residential areas on the east side of State Road 99 (SR99) to the Goshen Elementary School and recreation facilities on the west side of SR99. Construction began in the Summer of 2003 and the project was completed in November 2003.

Status: The project is in the study phase.

34) **Strathmore Storm Water Flood Diversion Project** – The project is under consideration. It would study potential sites that could be acquired for diversion of storm water runoff, determine capacities and the potential for use as a natural habitat and endangered species preserve. A list of funding sources is under review for preparation.

Status: The project is in the study phase.

35) **Alpaugh-Allensworth Fire Station –** The project is under consideration. A proposed study will establish a new fire station facility to replace the existing substandard buildings in Alpaugh. The study would determine if the facility should remain in Alpaugh or would provide better service if located between Alpaugh and Allensworth.

Status: The project is in the study phase.

36) **Terra Bella Sewer System Expansion Project** – The project is under consideration. It is in a study phase to determine scope, cost, and potential ownership issues for serving existing and planned new Self Help Enterprise residential developments. The proposed project

would also serve highway commercial and would include the construction of new sewer mains, lift station(s) and modifications to the sewage plant head works.

Status: The project is in the study phase.

37) **County Route 137 Expansion Project** – The project is under consideration. This project will widen County Route 137 between Tipton on State Road 99 and the industrial areas of Porterville by providing a much shorter and more direct access route designed to truck traffic standards.

Status: The project is in the study phase.

38) **County Road 80 Expansion Project** – the project is in the design and environmental compliance phases. The project will widen the existing regional route from two lanes to four lanes, including replacing bridges and conduits, to accommodate the high volume of traffic, which uses the route to access industrial and agricultural areas in the north Tulare County area.

Status: The project is in the study phase.

APPENDIX B. TULARE COUNTY IMPROVEMENT STANDARDS

Introduction

Improvement standards for local infrastructure needs are provided in this Appendix. The appendix also identifies a variety of maps and sphere of influence boundaries for local utility districts that serve Tulare County.

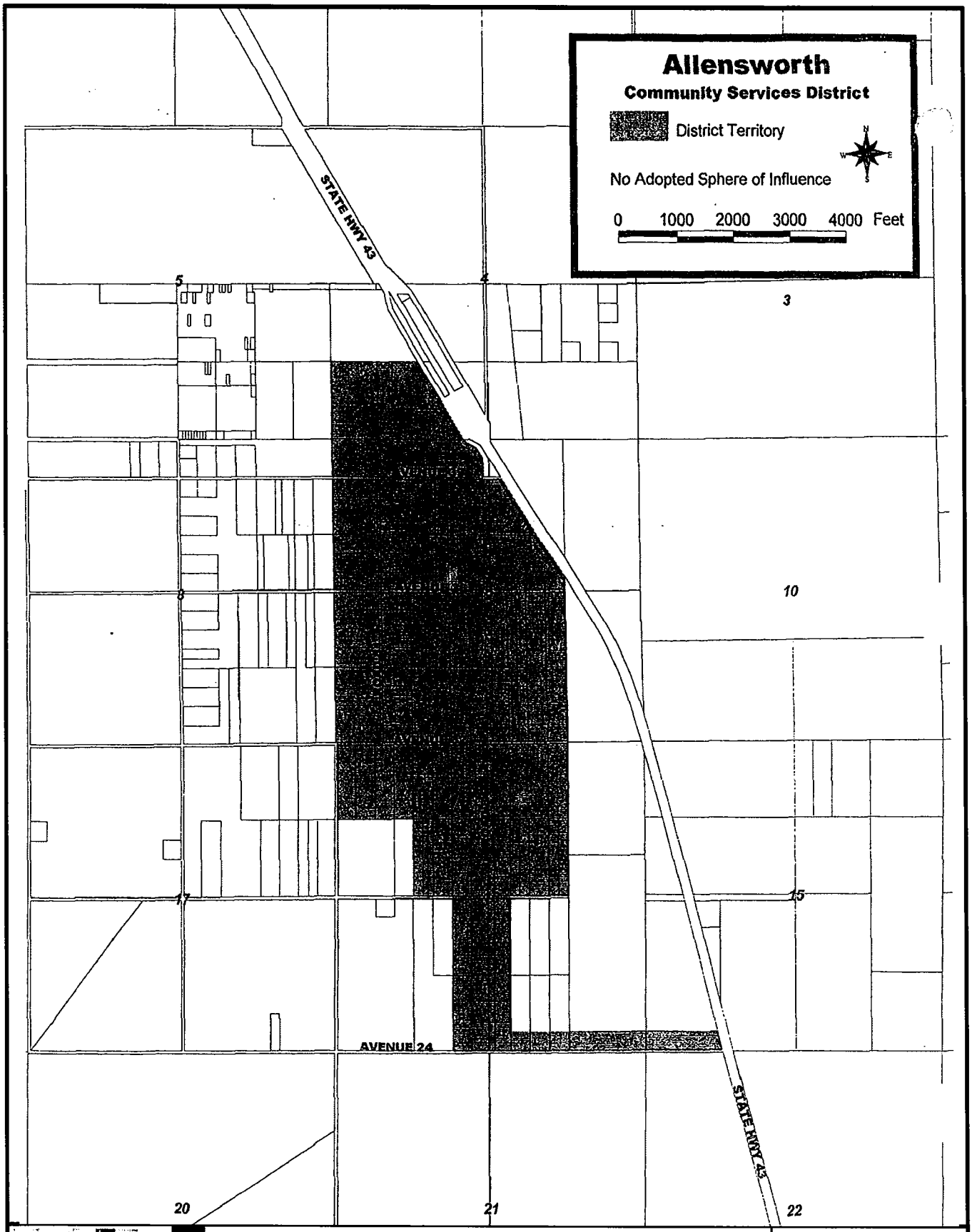


EXHIBIT 1-0
Allenworth CSD
Territory

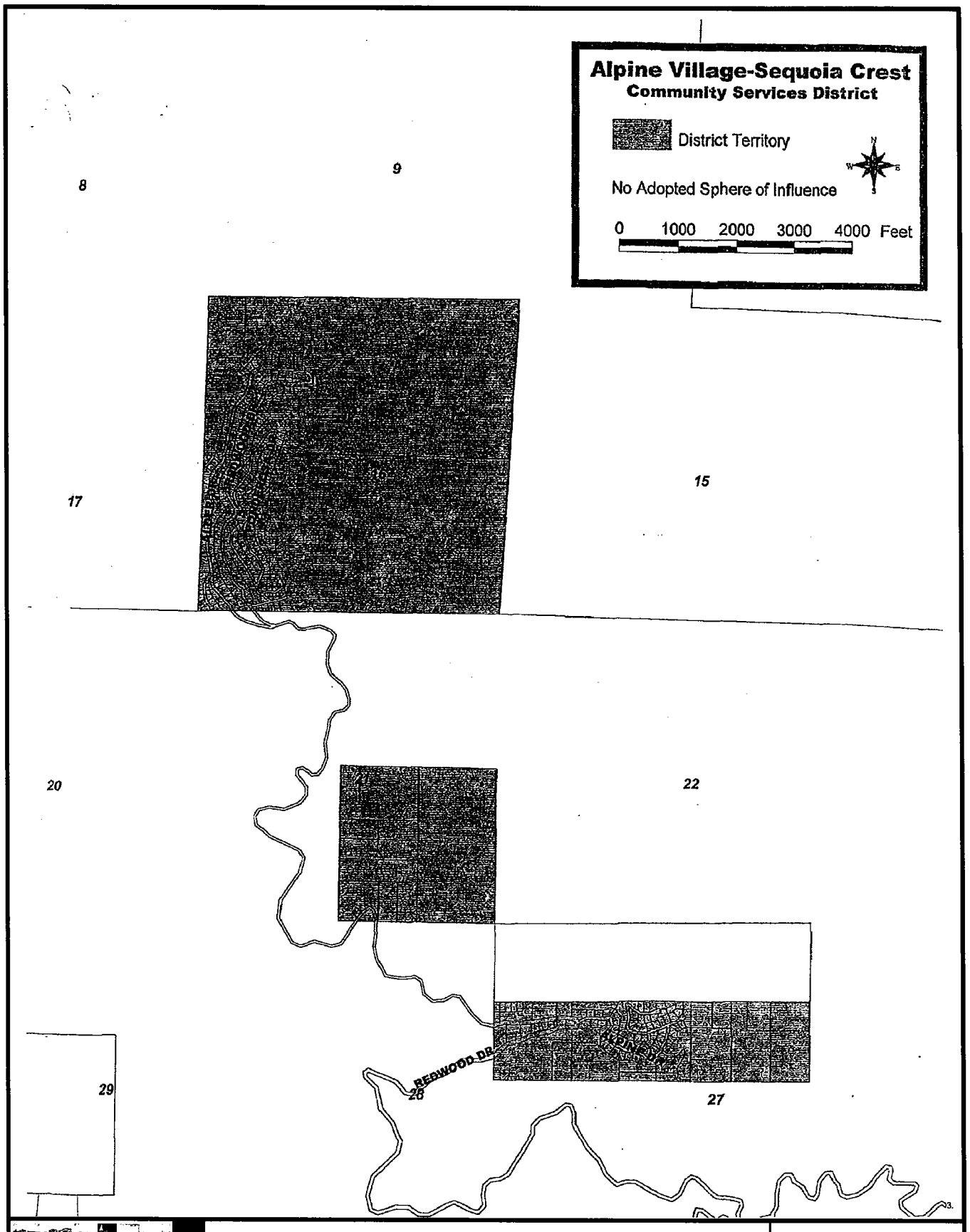


EXHIBIT 1-1
Alpine Village-Sequoia Crest CSD Territory

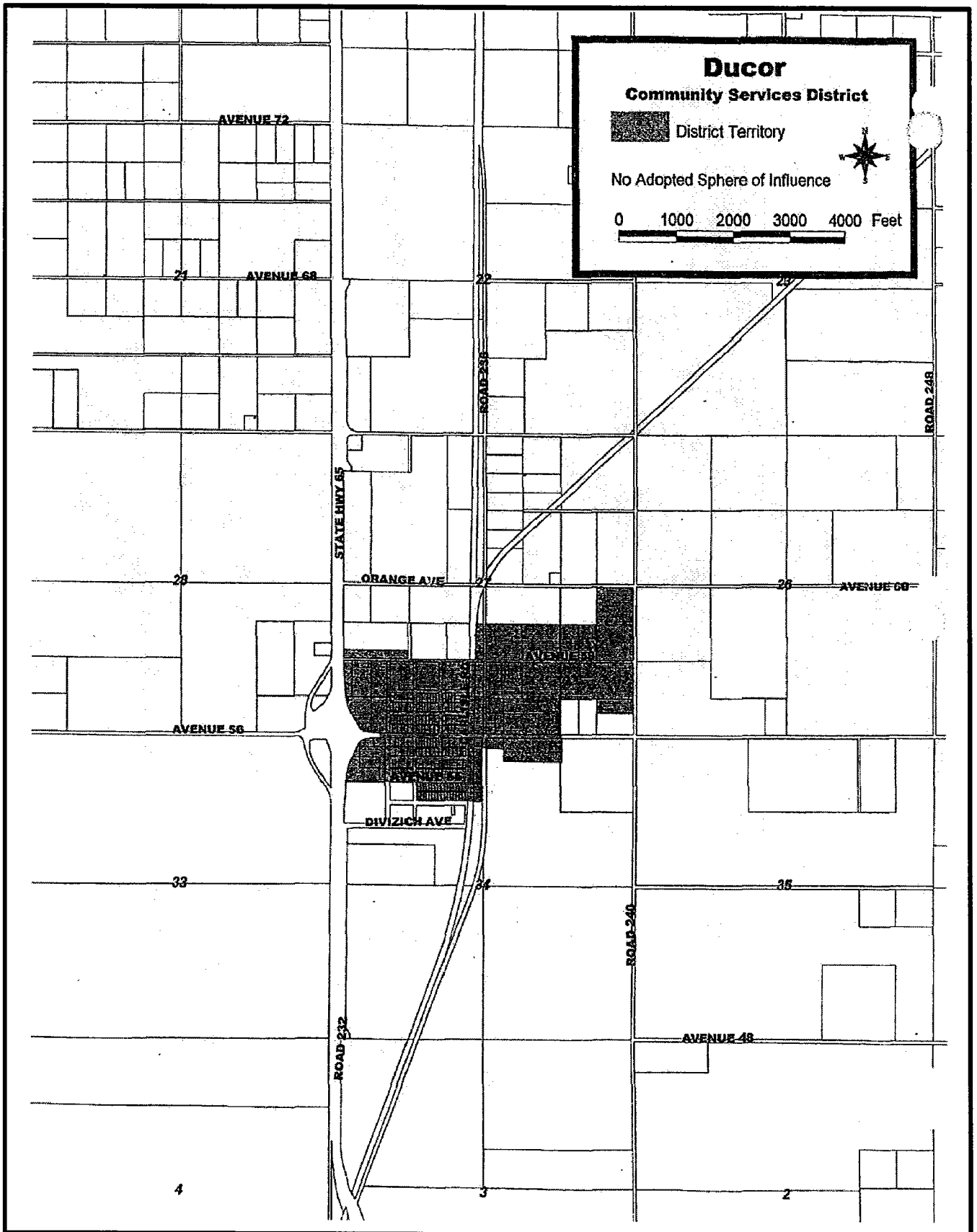


EXHIBIT 1-2
Ducor CSD Territory

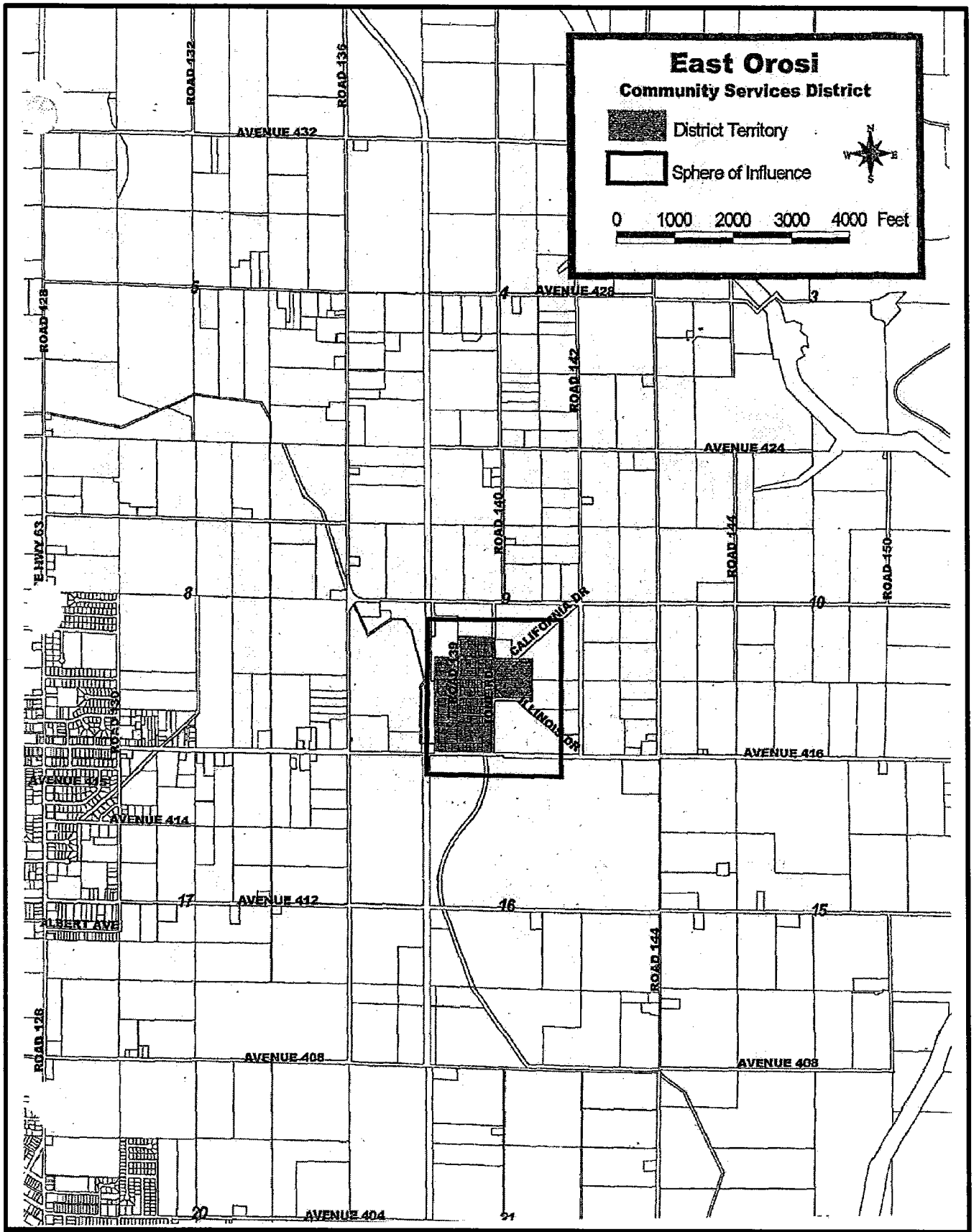


EXHIBIT 1-3
East Orosi CSD
Territory and Sphere of Influence

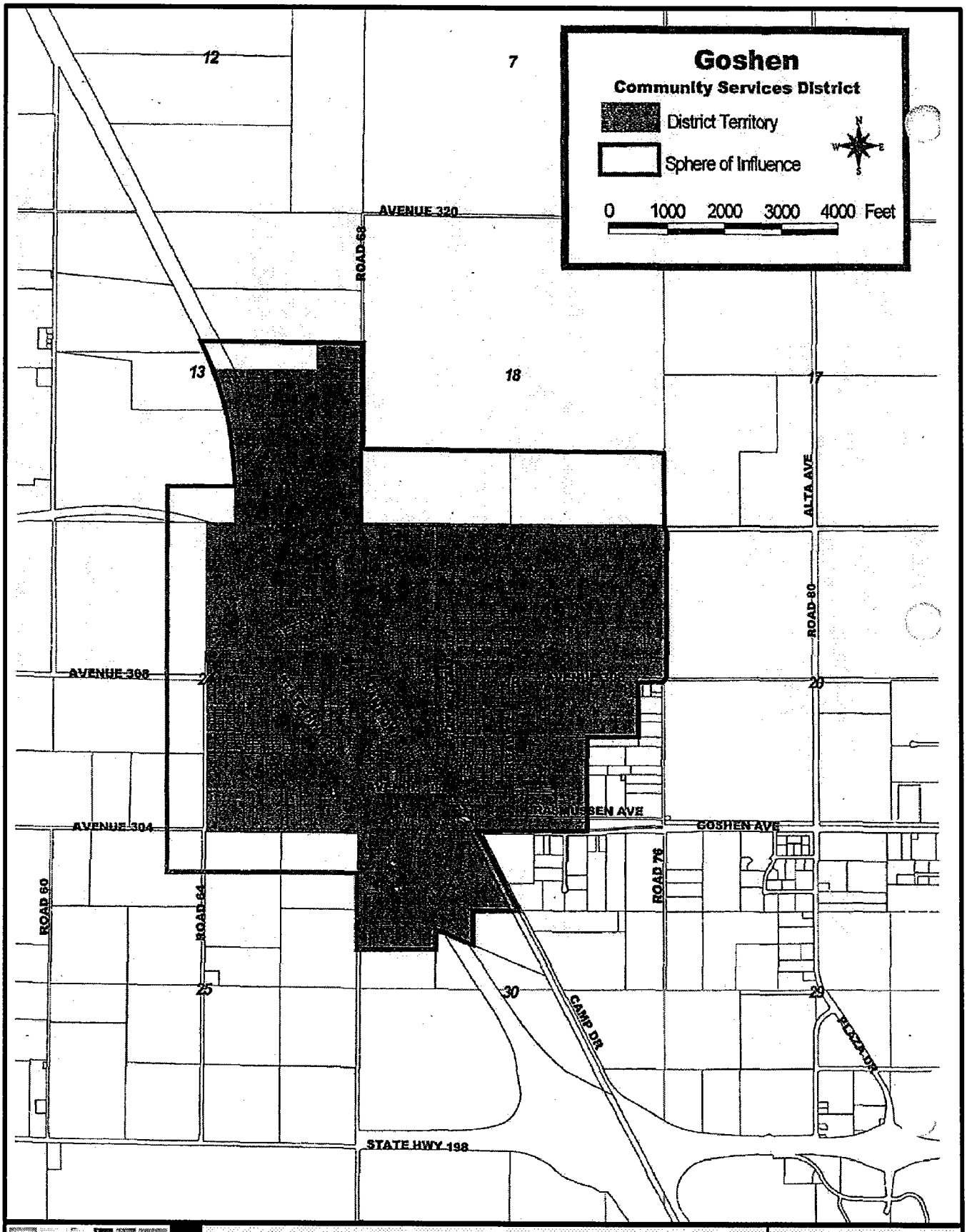


EXHIBIT 1-4
Goshen CSD Territory and Sphere of Influence

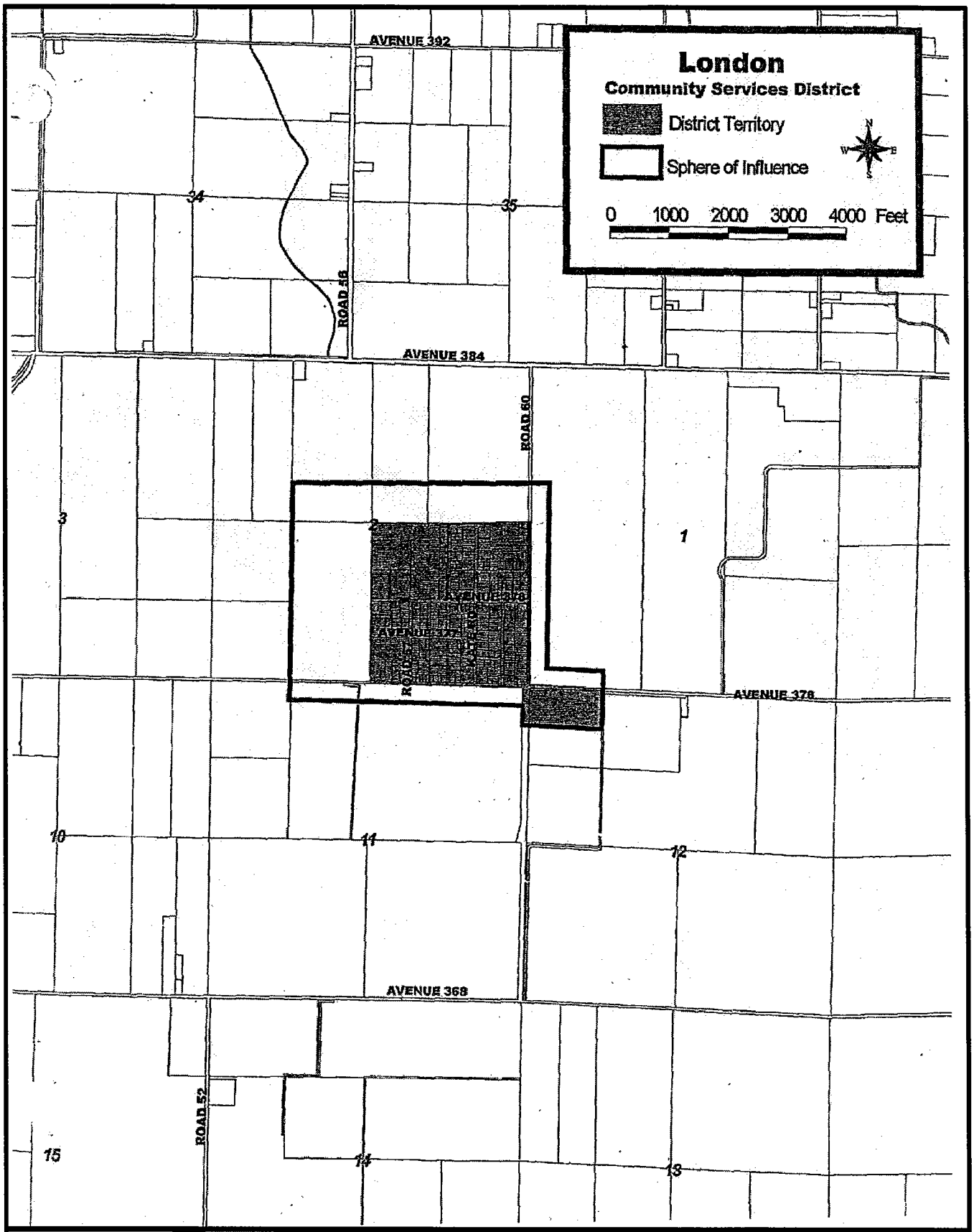


EXHIBIT 1-5
London CSD Territory
and Sphere of
Influence

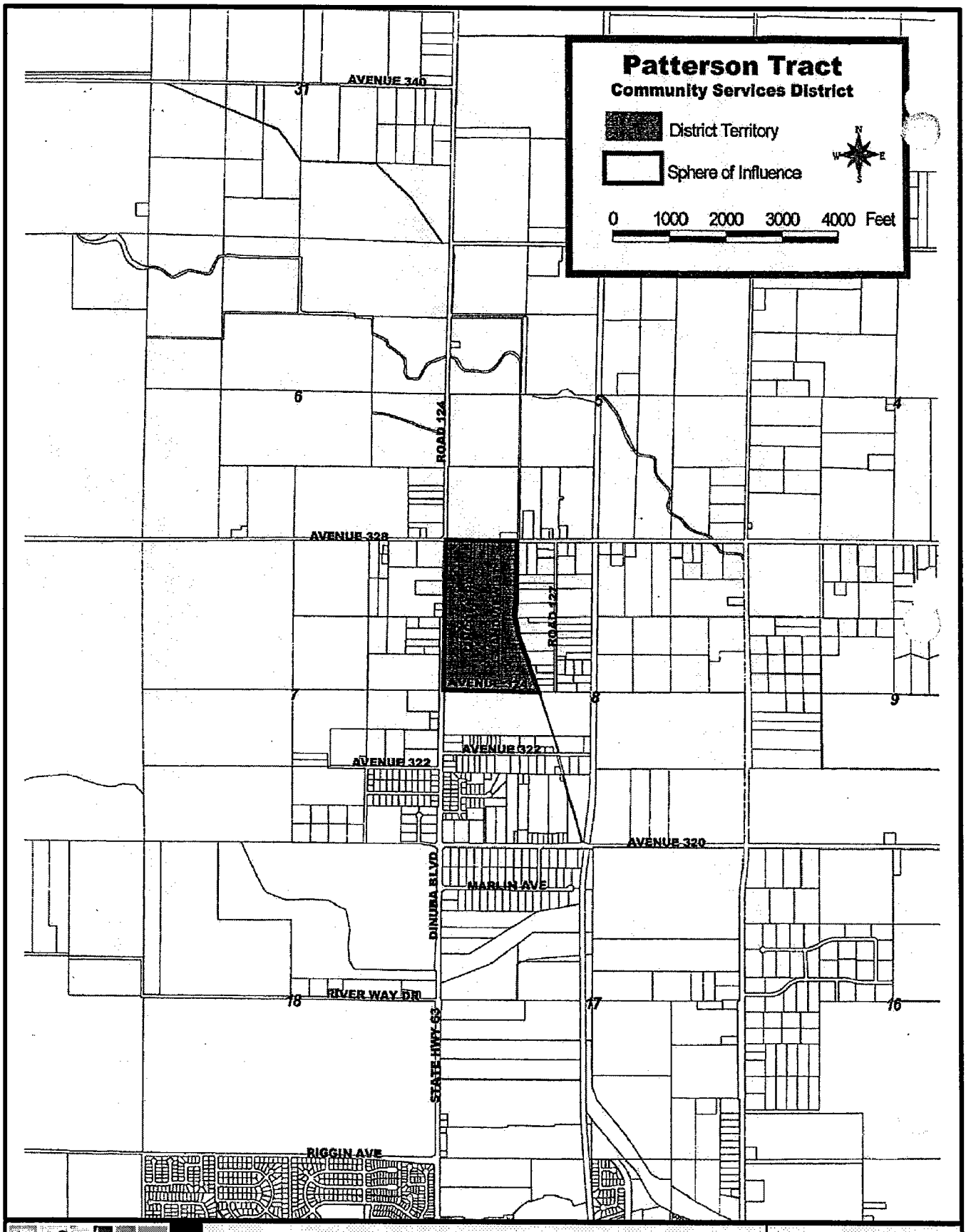


EXHIBIT 1-6
Patterson Tract CSD
Territory and Sphere of Influence

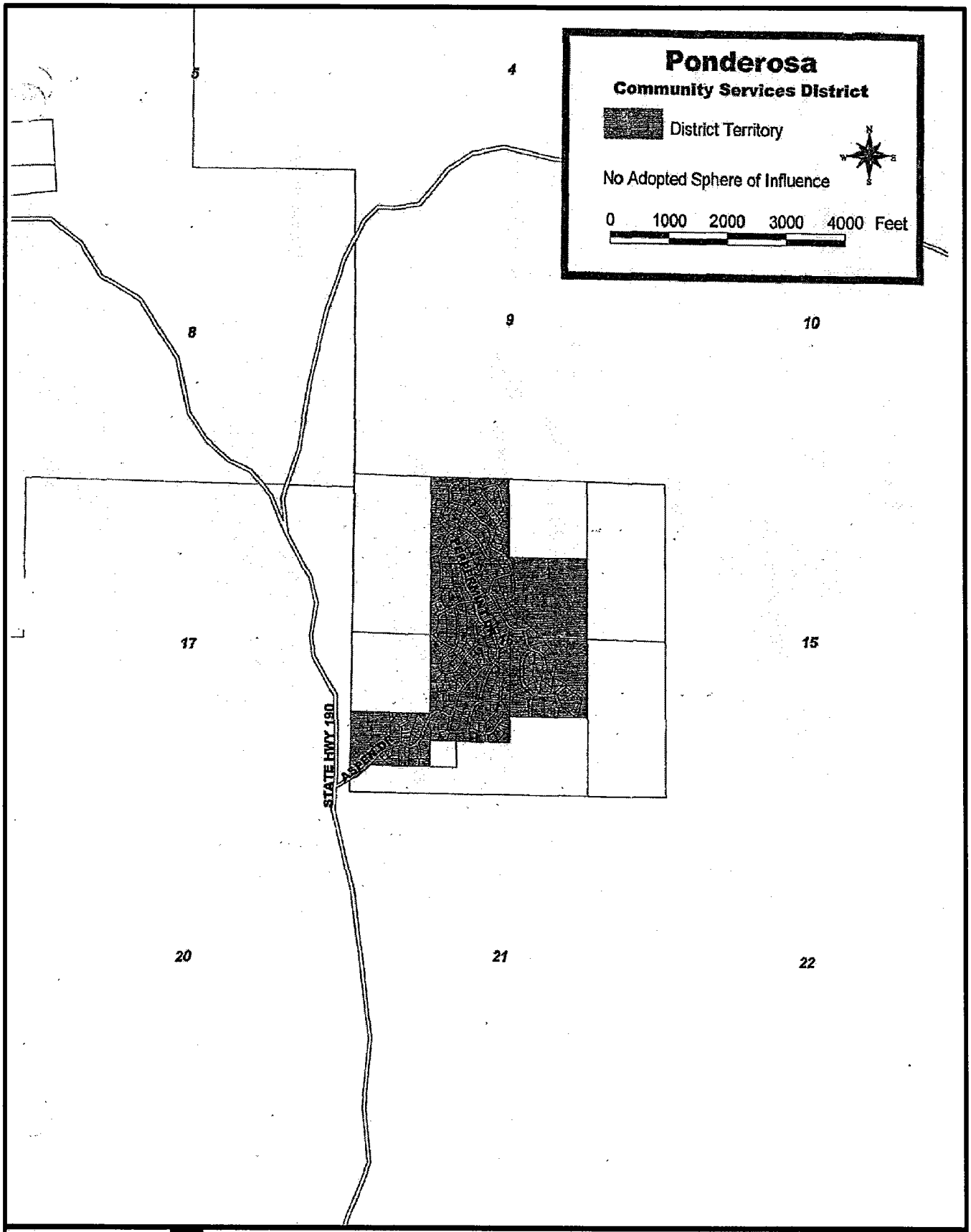


EXHIBIT 1-7
Ponderosa CSD
Territory

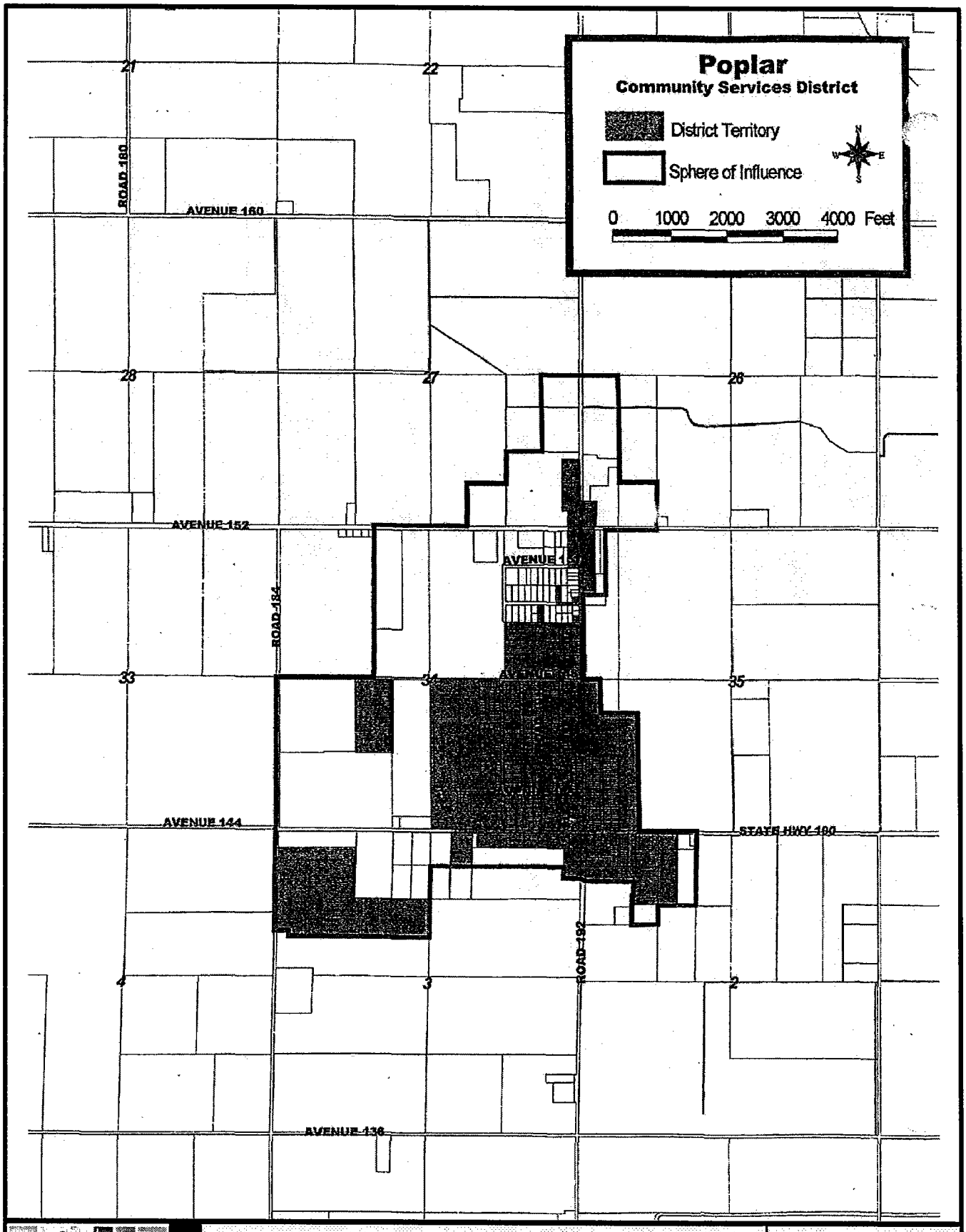


EXHIBIT 1-8
Poplar CSD Territory
and Sphere of
Influence

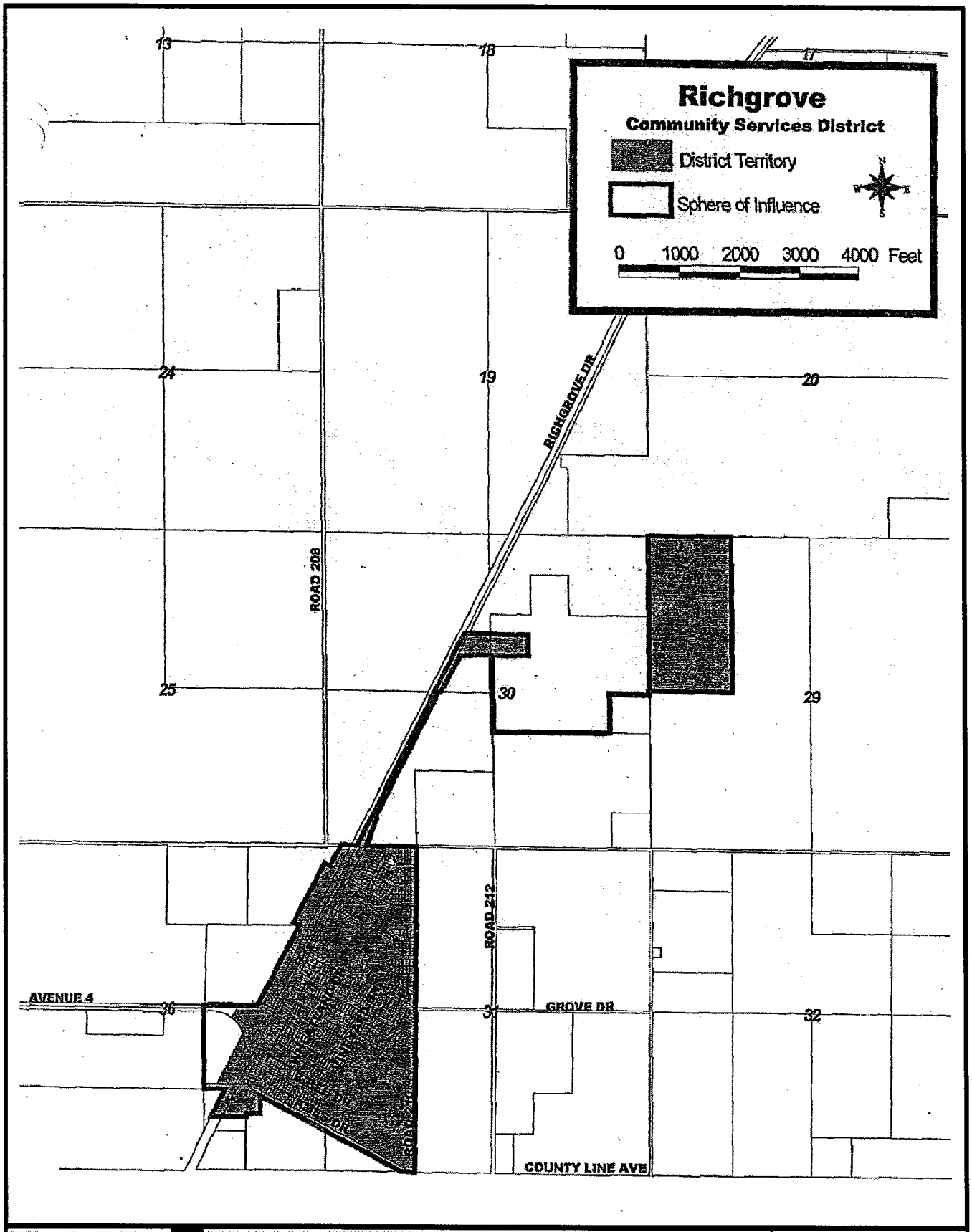


EXHIBIT 1-9
Richgrove CSD
Territory and Sphere
of Influence

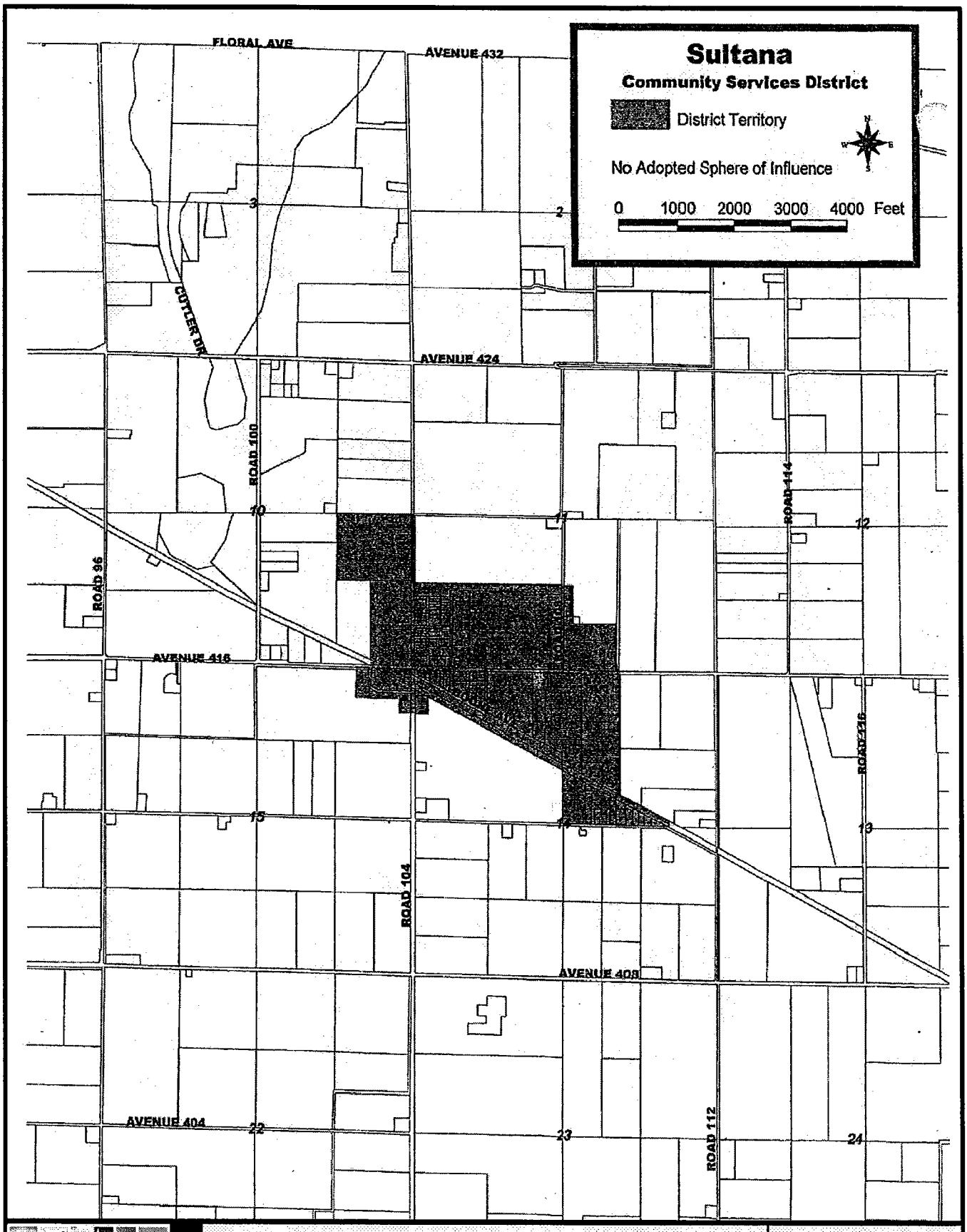


EXHIBIT 1-10
Sultana CSD Territory

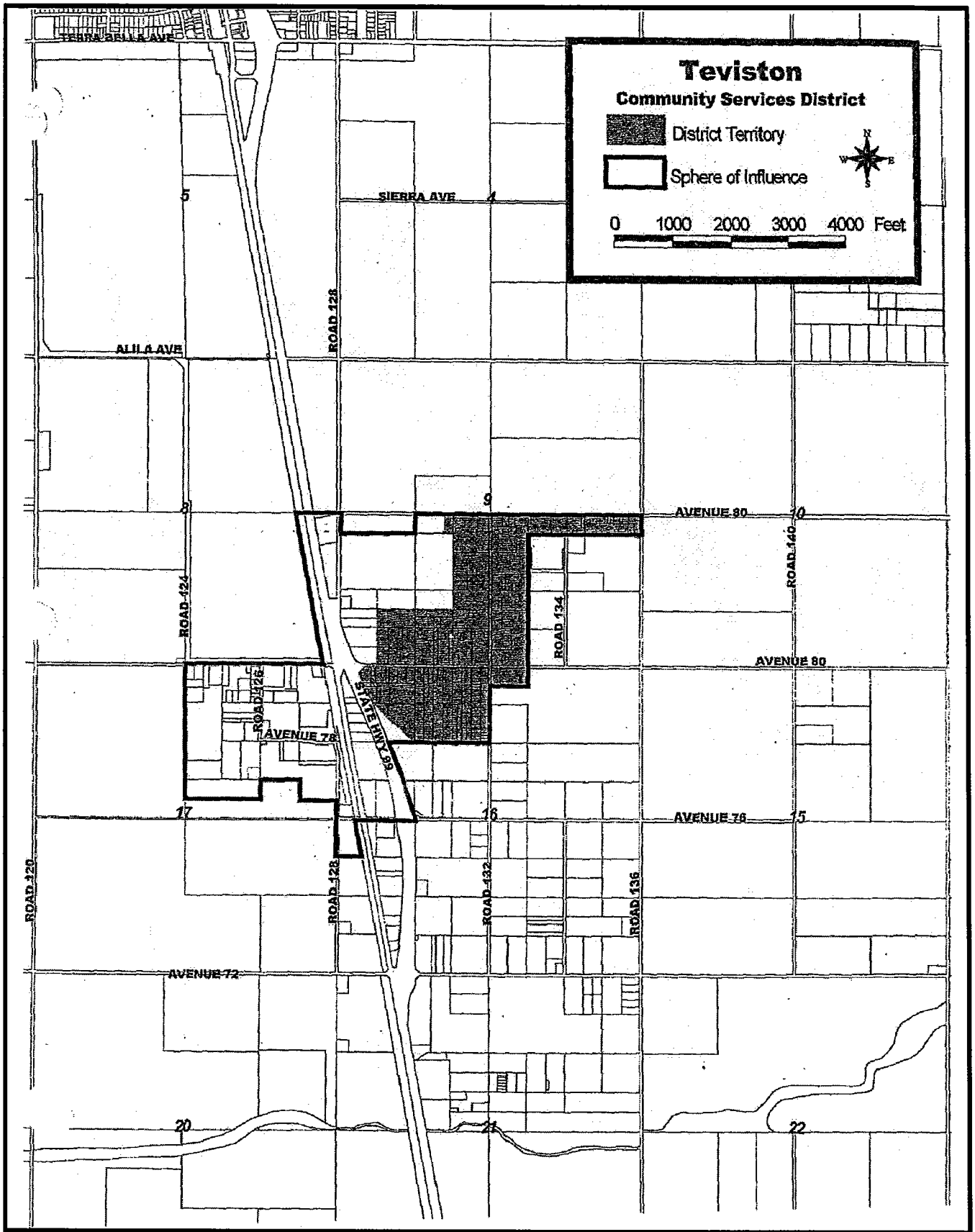
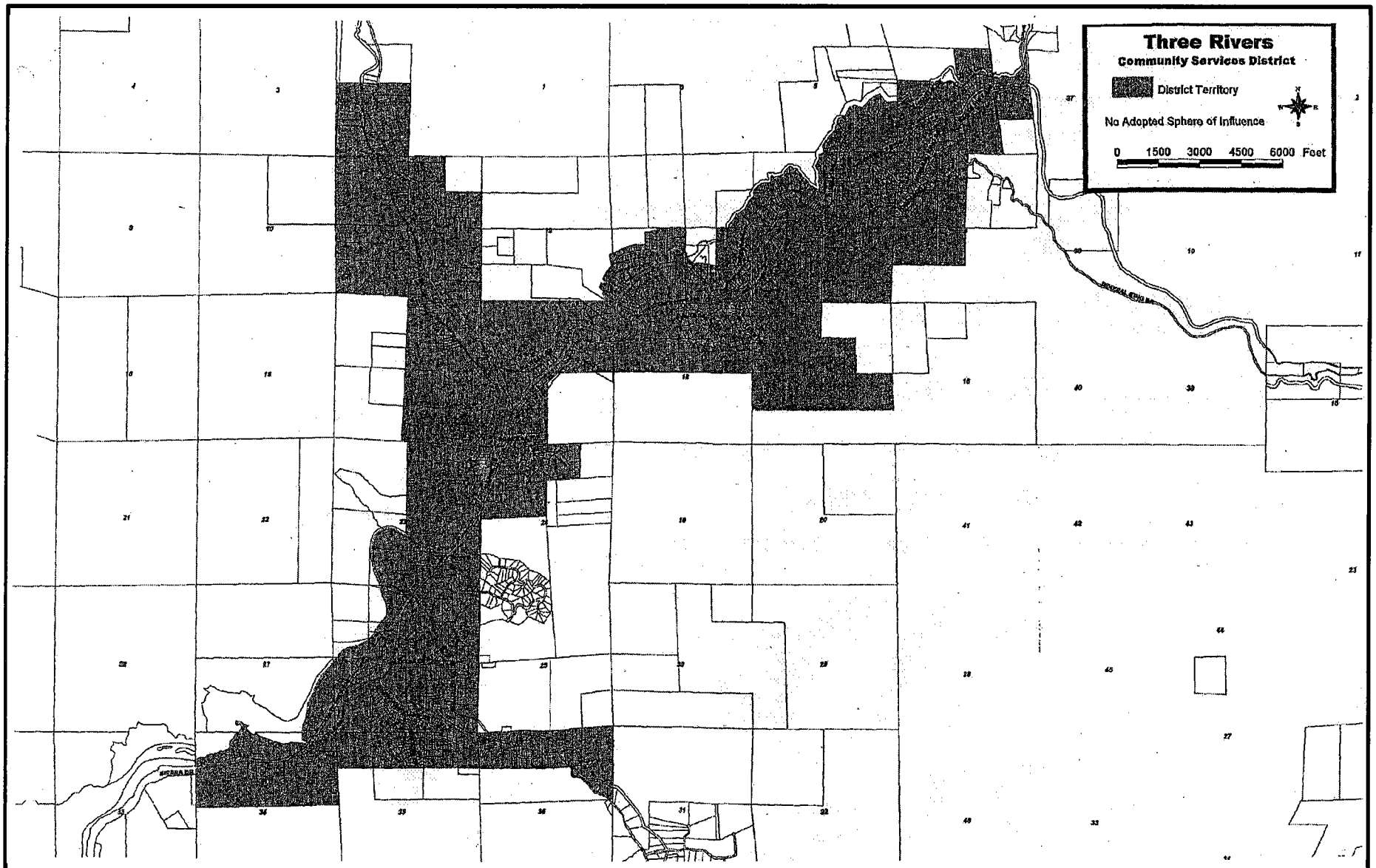


EXHIBIT 1-11
Sultana CSD Territory and Sphere of Influence



Tulare County General Plan Update

EXHIBIT 1-12
Three Rivers CSD
Territory

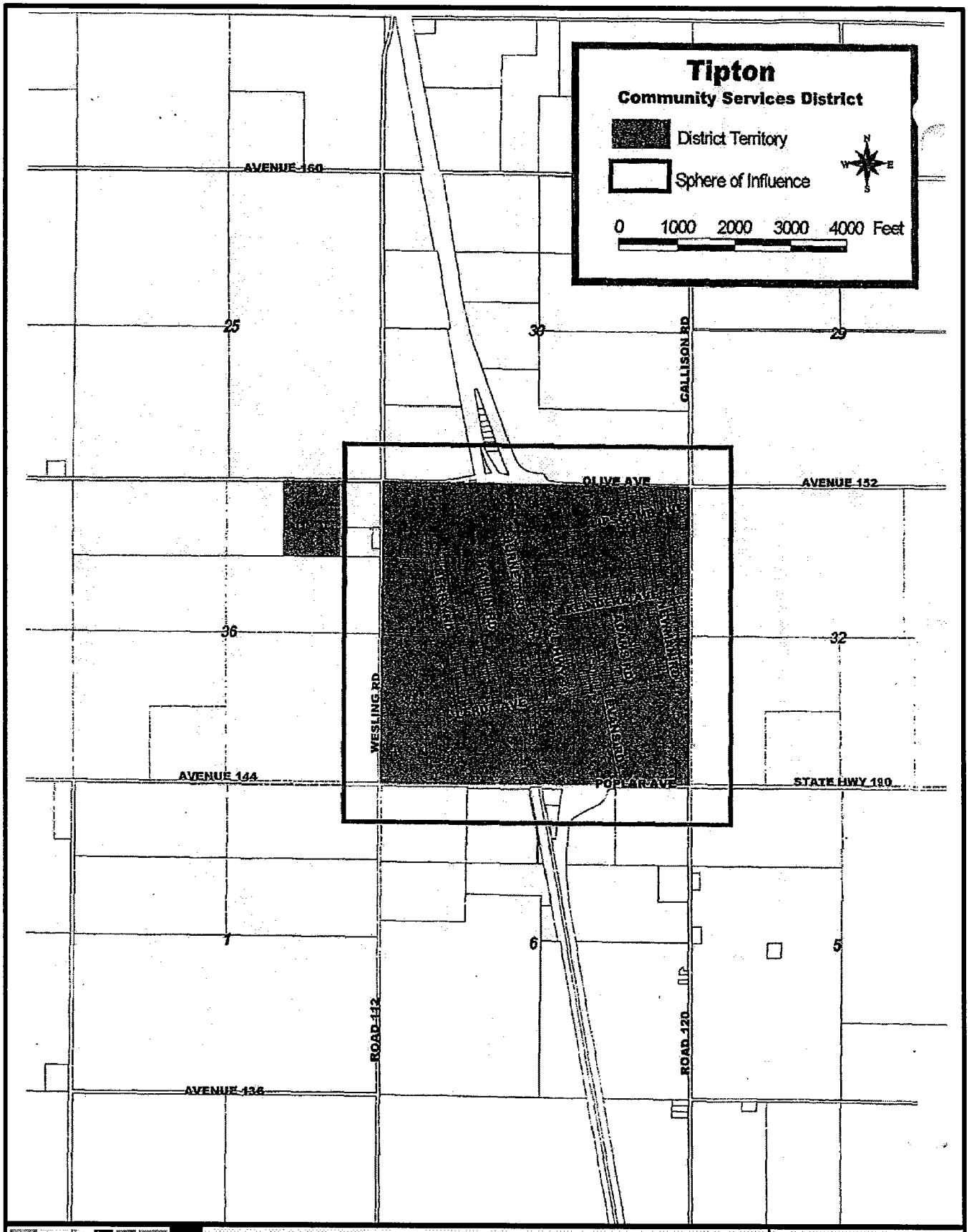


EXHIBIT 1-13
Tipton CSD Territory and Sphere of Influence

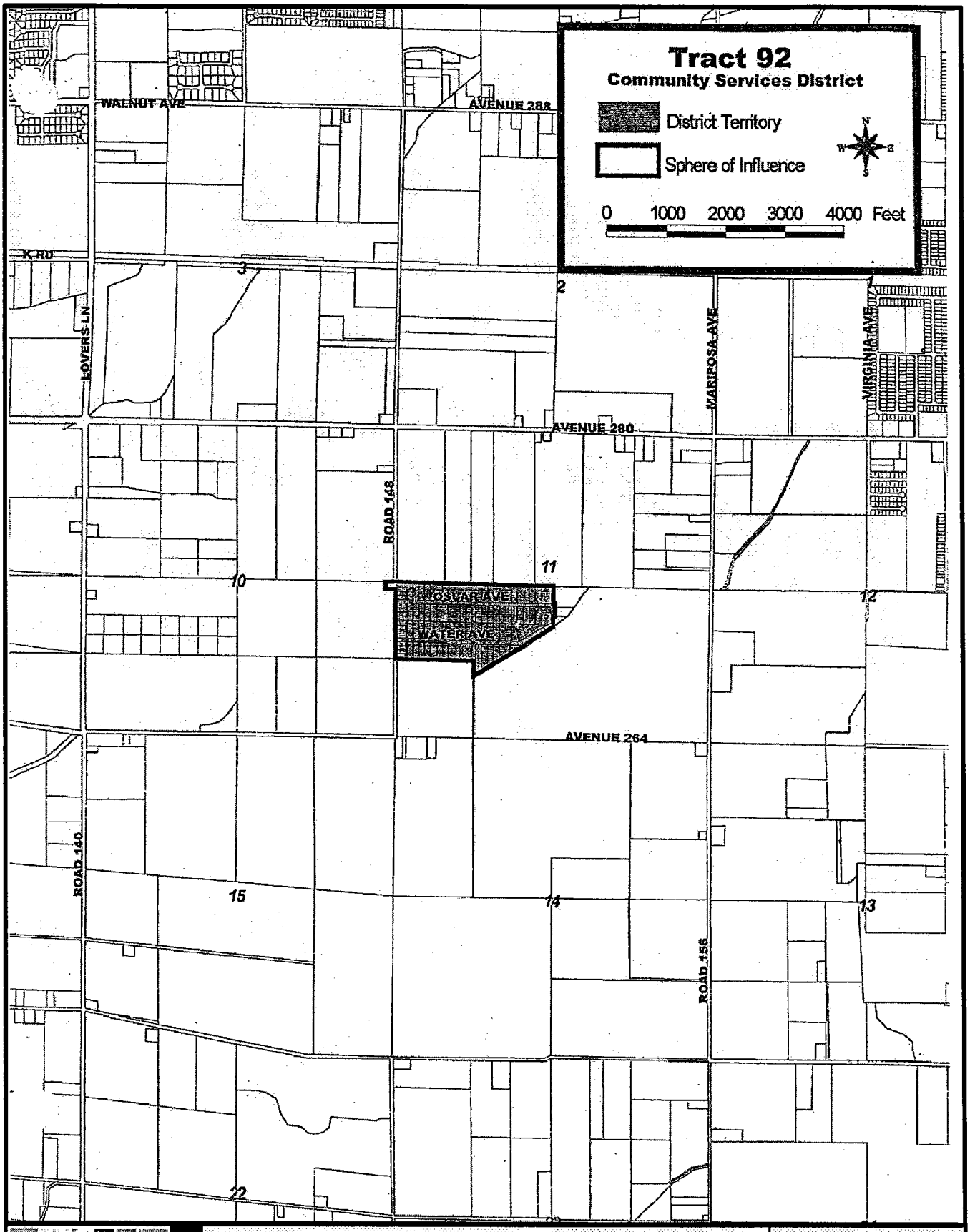


EXHIBIT 1-14
Tract 92 CSD Territory and Sphere of Influence

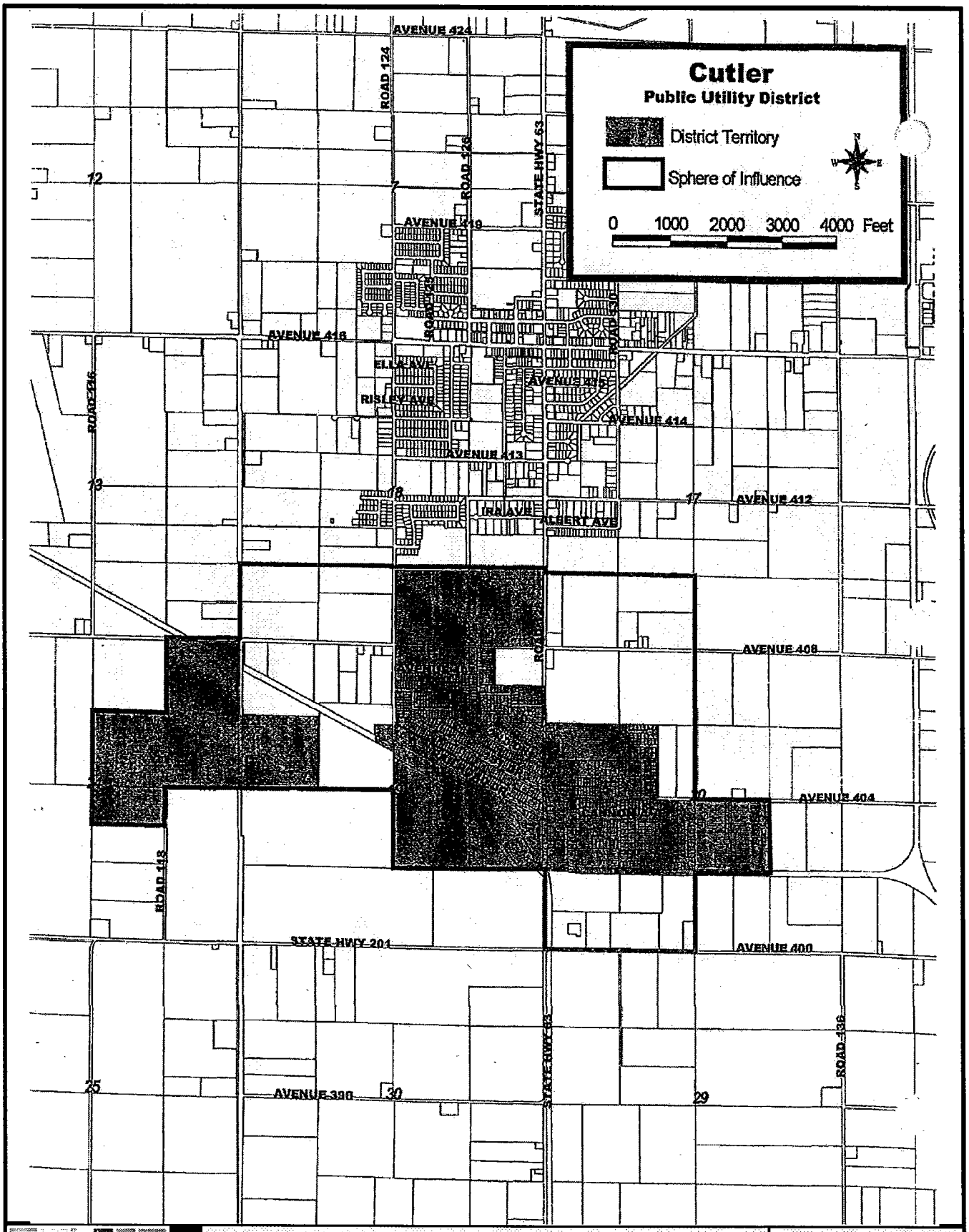
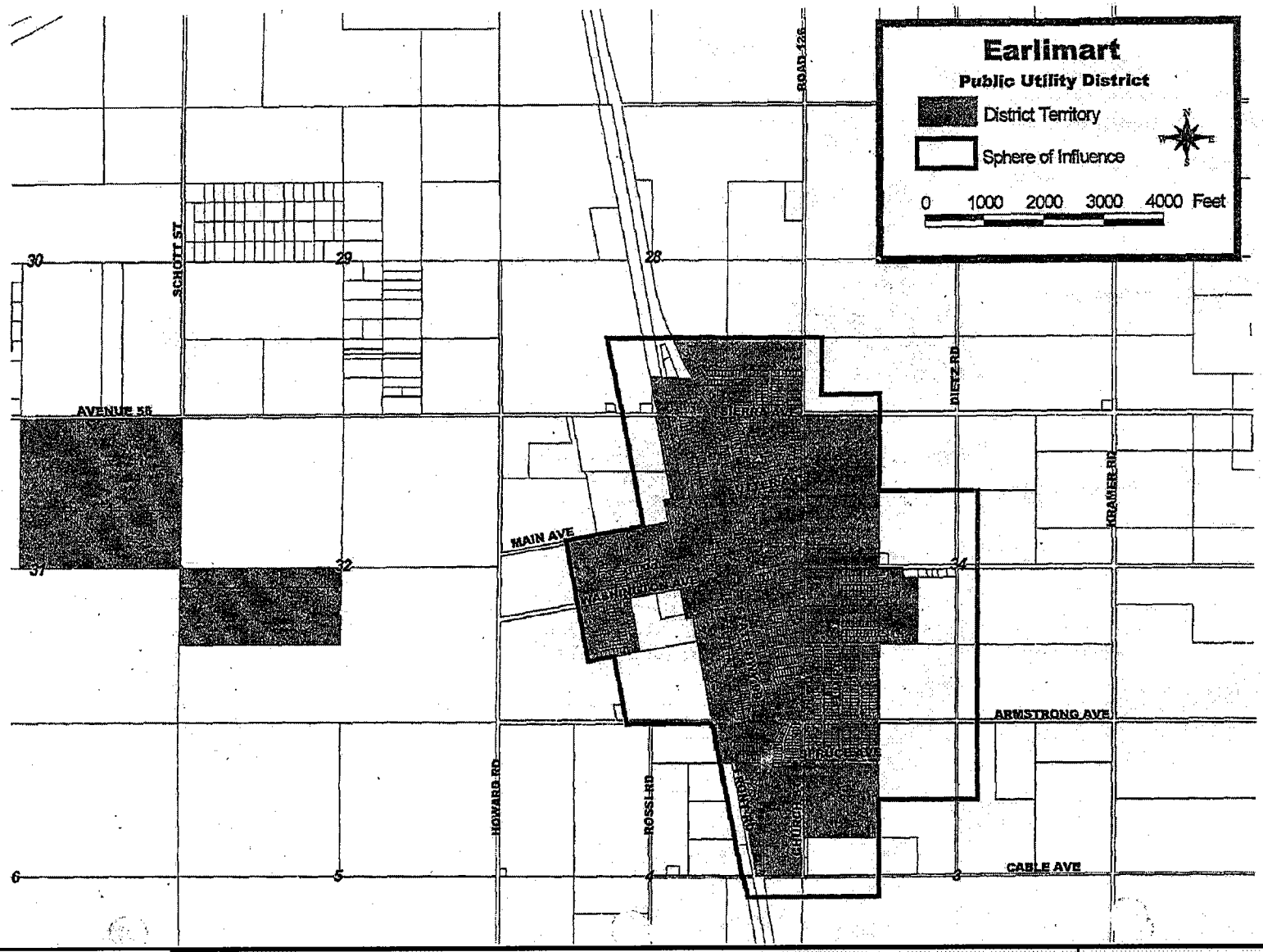


EXHIBIT 1-15
Cutler PUD Territory
and Sphere of Influence



Tulare County General Plan Update

EXHIBIT 1-16
Earlimart PUD Territory
and Sphere of Influence

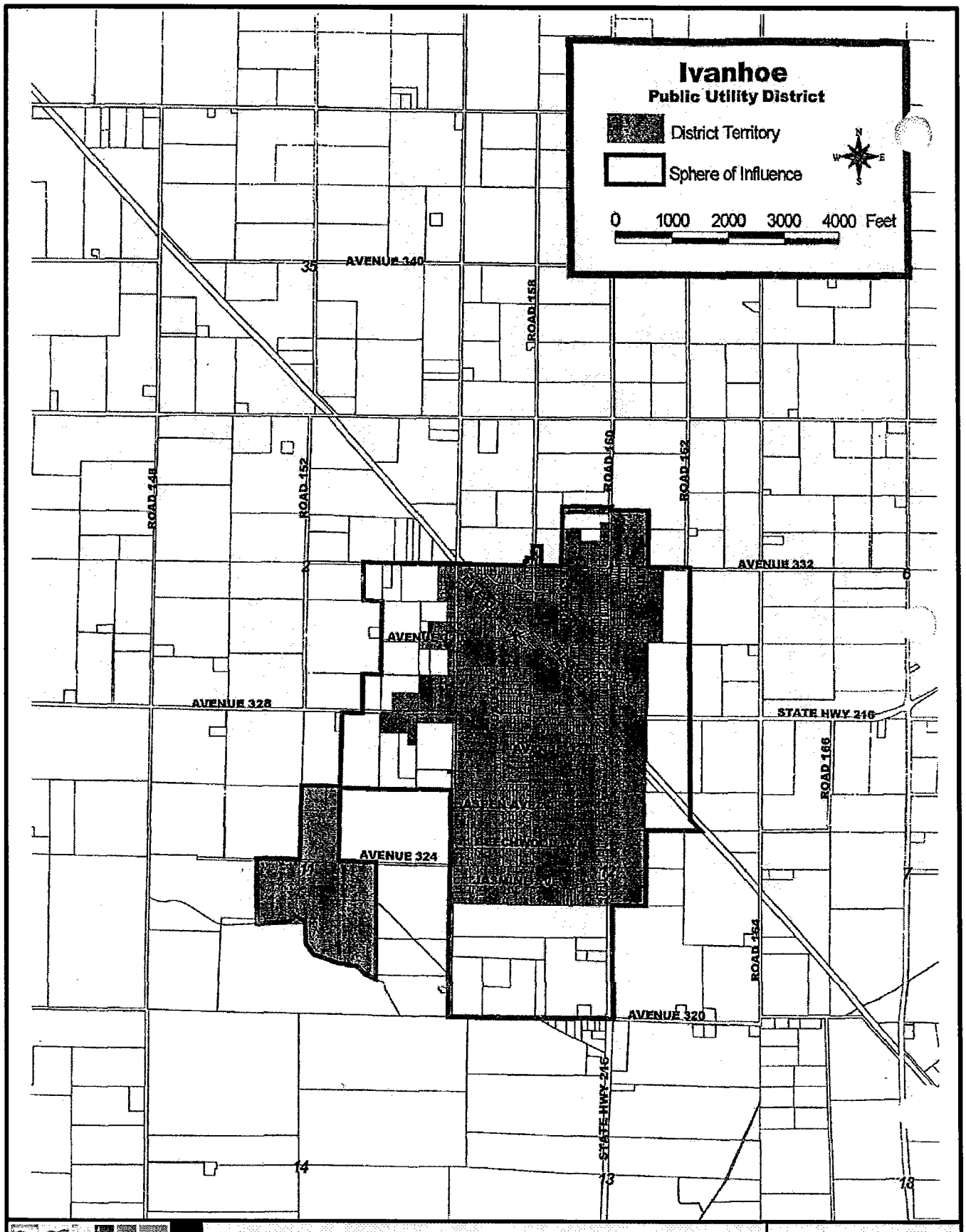


EXHIBIT 1-17
Ivanhoe PUD Territory and Sphere of Influence

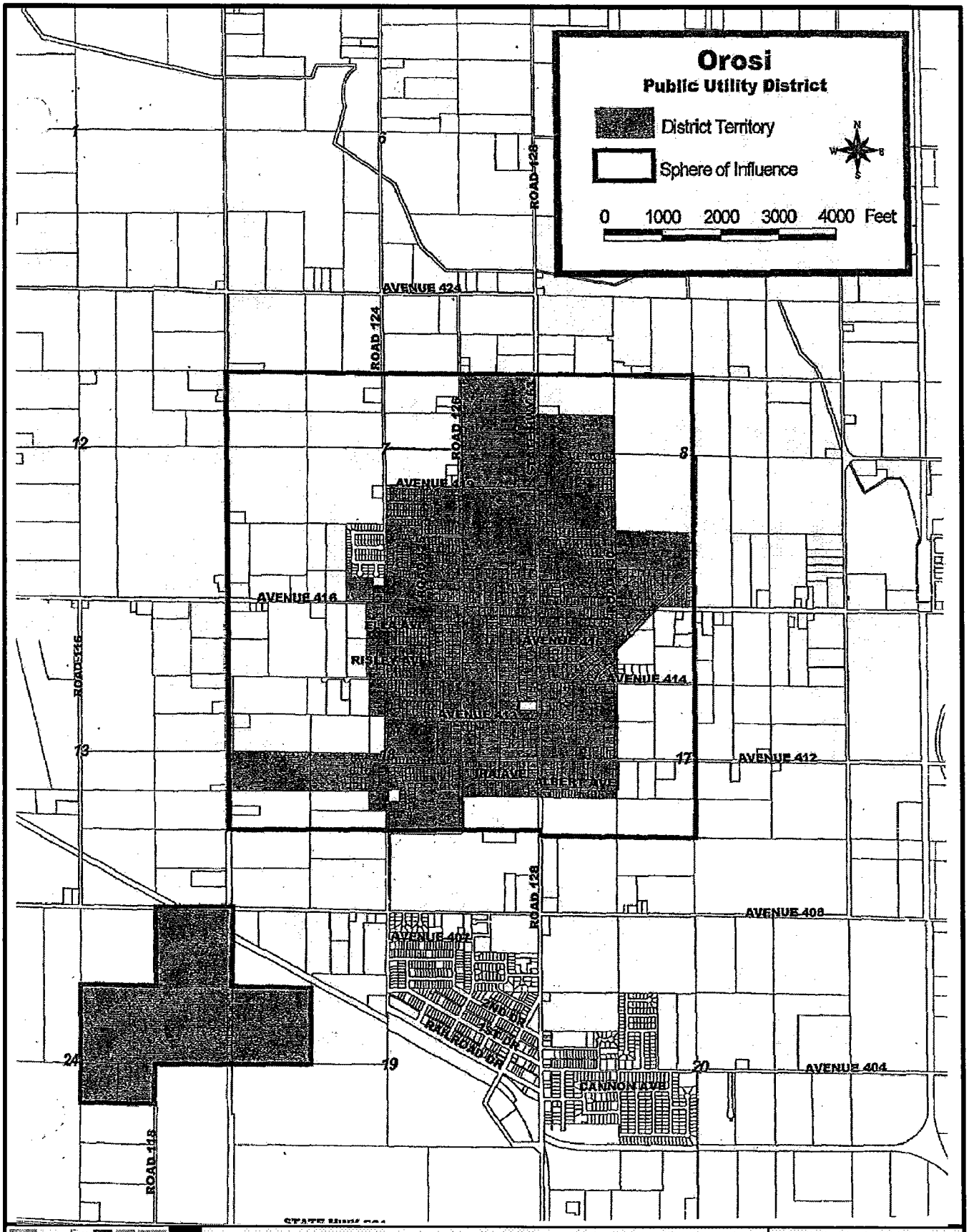


EXHIBIT 1-18
Orosi PUD Territory and Sphere of Influence

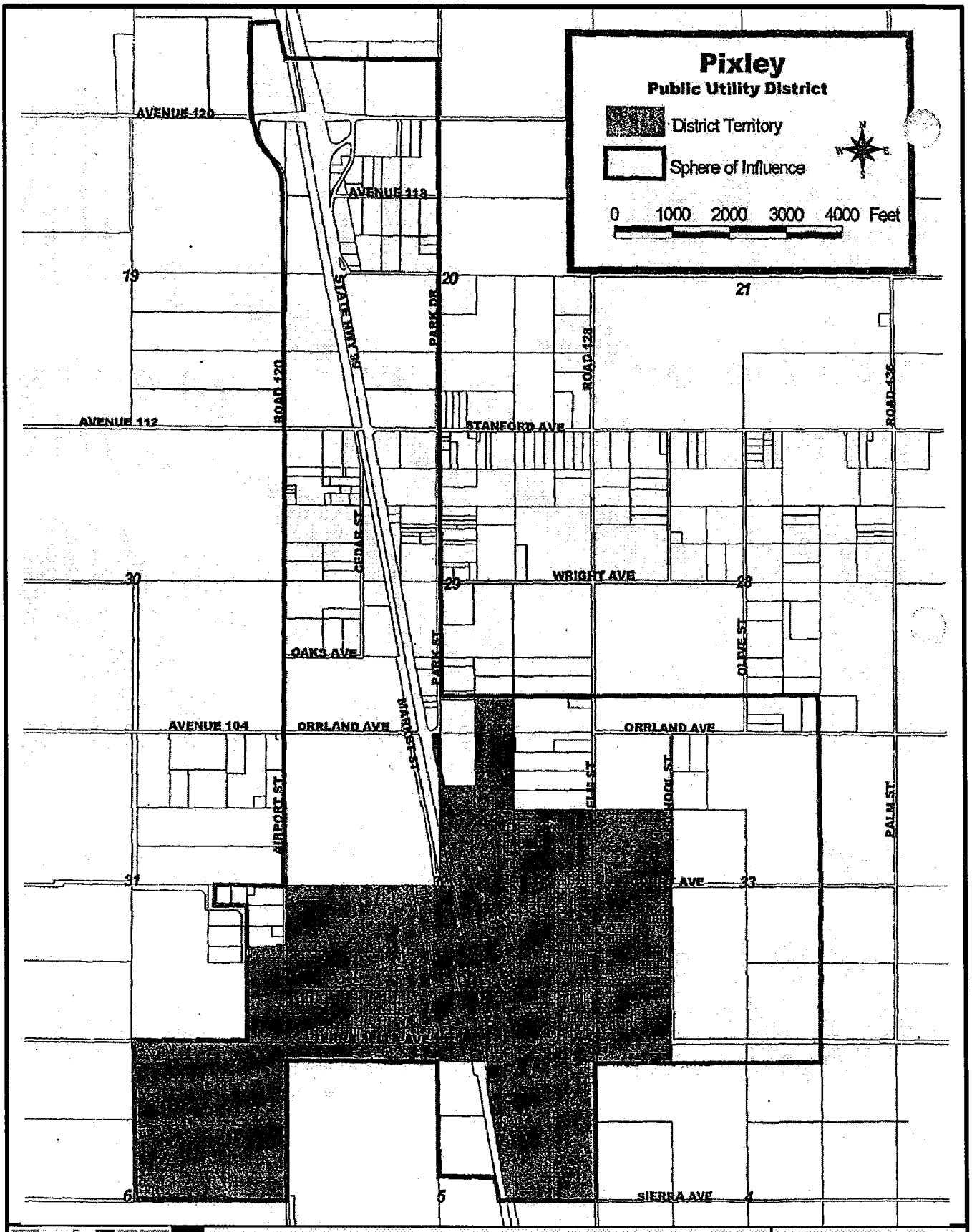
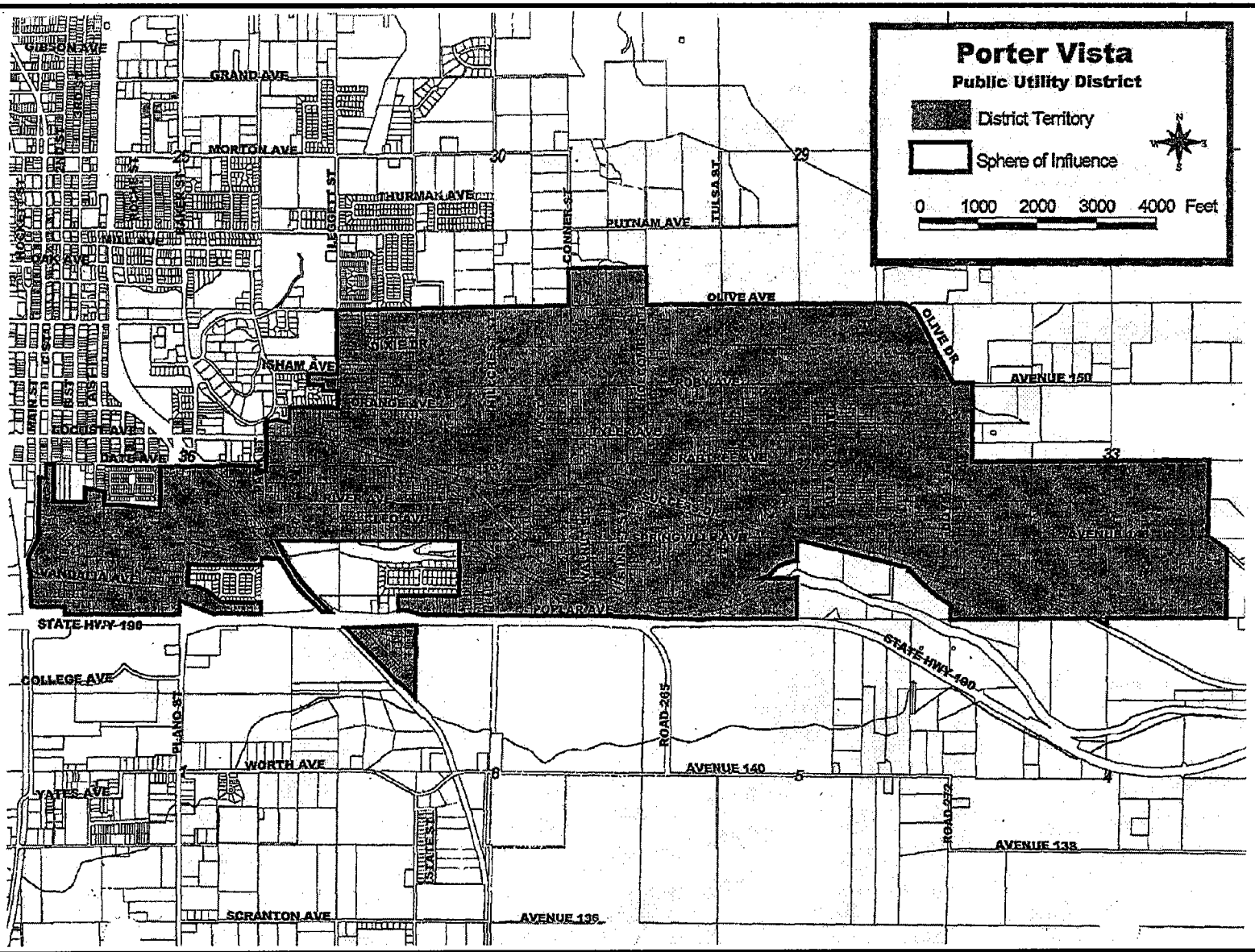


EXHIBIT 1-19
Pixley PUD Territory
and Sphere of
Influence



Tulare County General Plan Update

EXHIBIT 1-20
Porter Vista PUD
Territory and Sphere of Influence

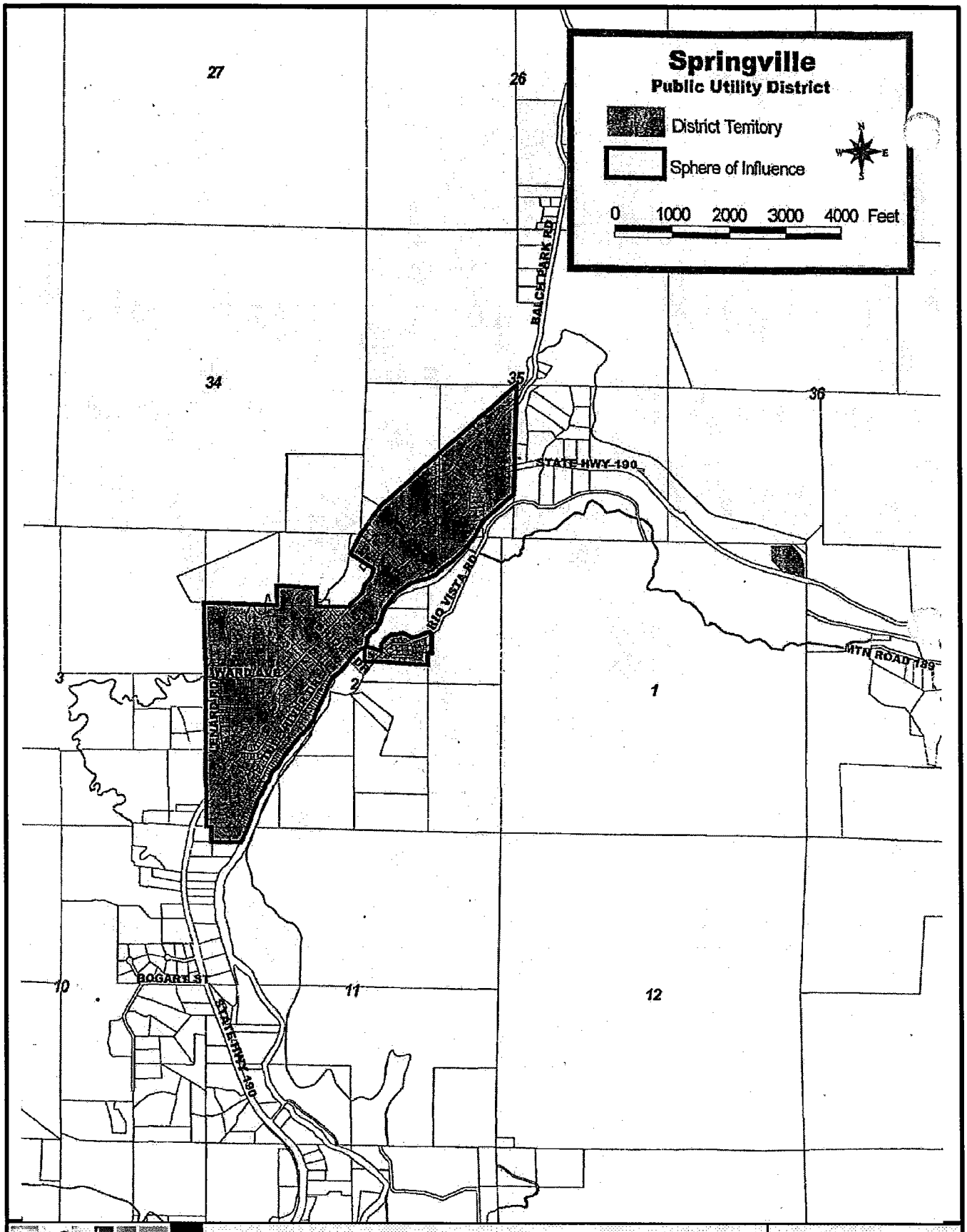


EXHIBIT 1-21
Springville PUD
Territory and Sphere
of Influence

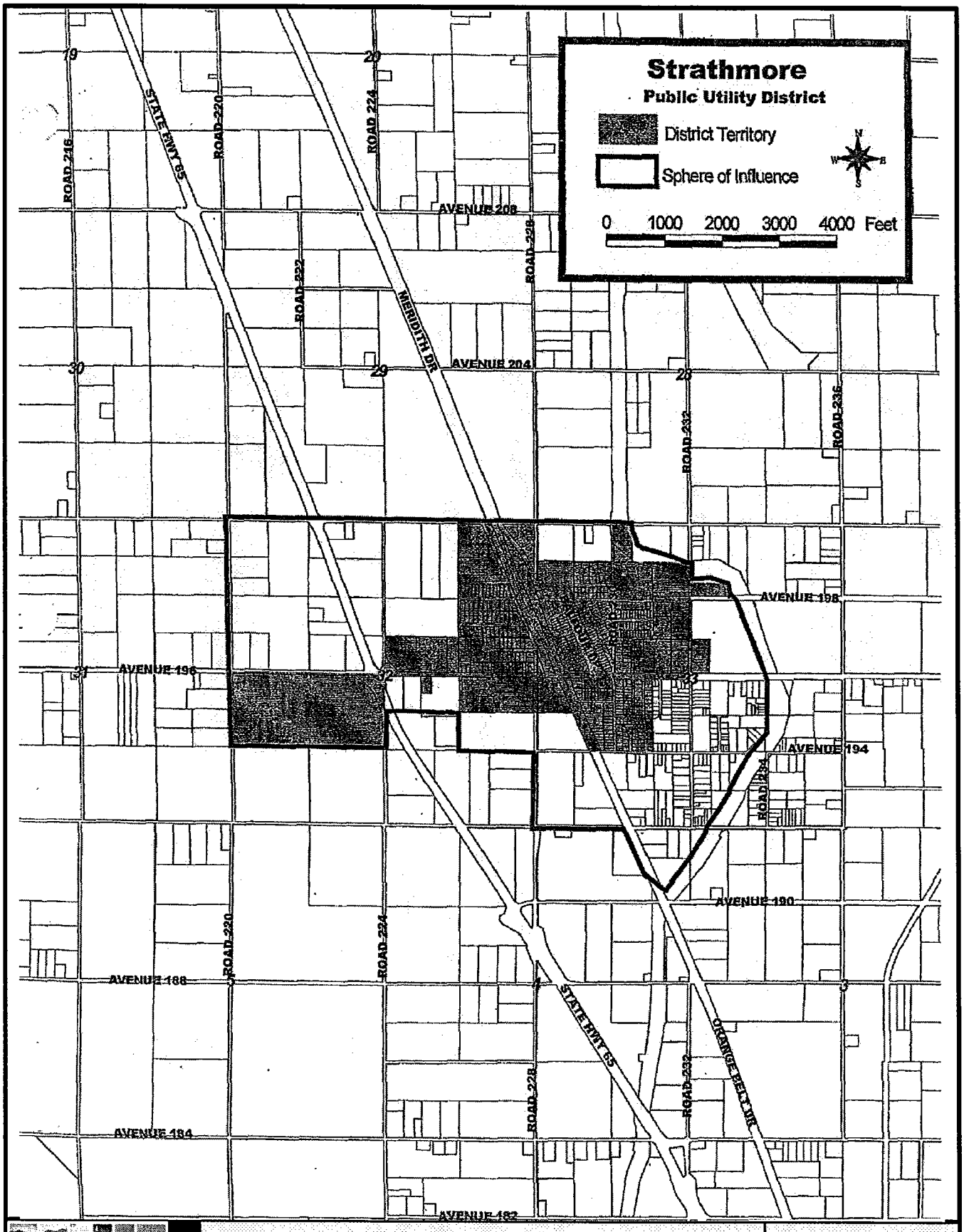


EXHIBIT 1-22
Strathmore PUD
Territory and Sphere
of Influence

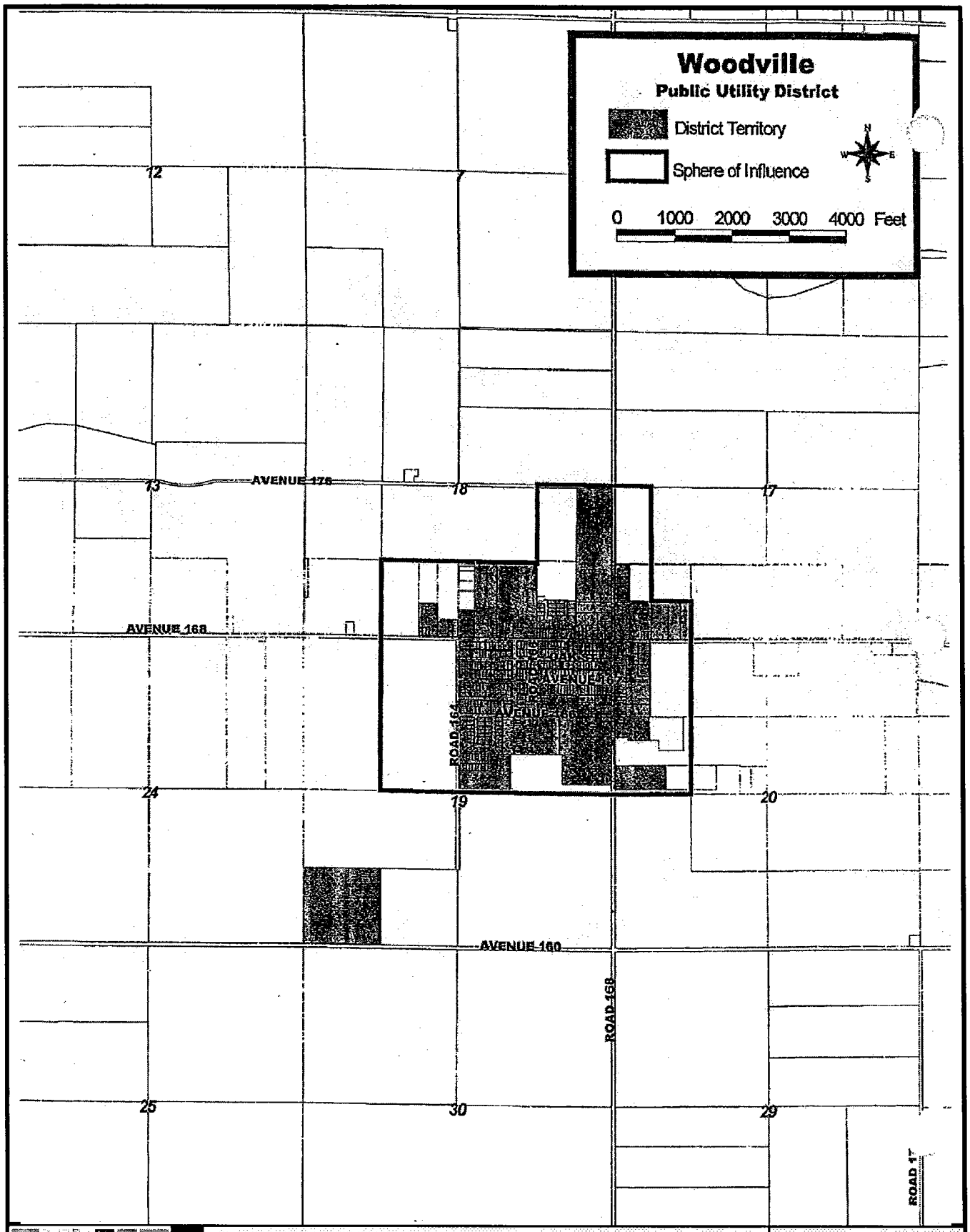
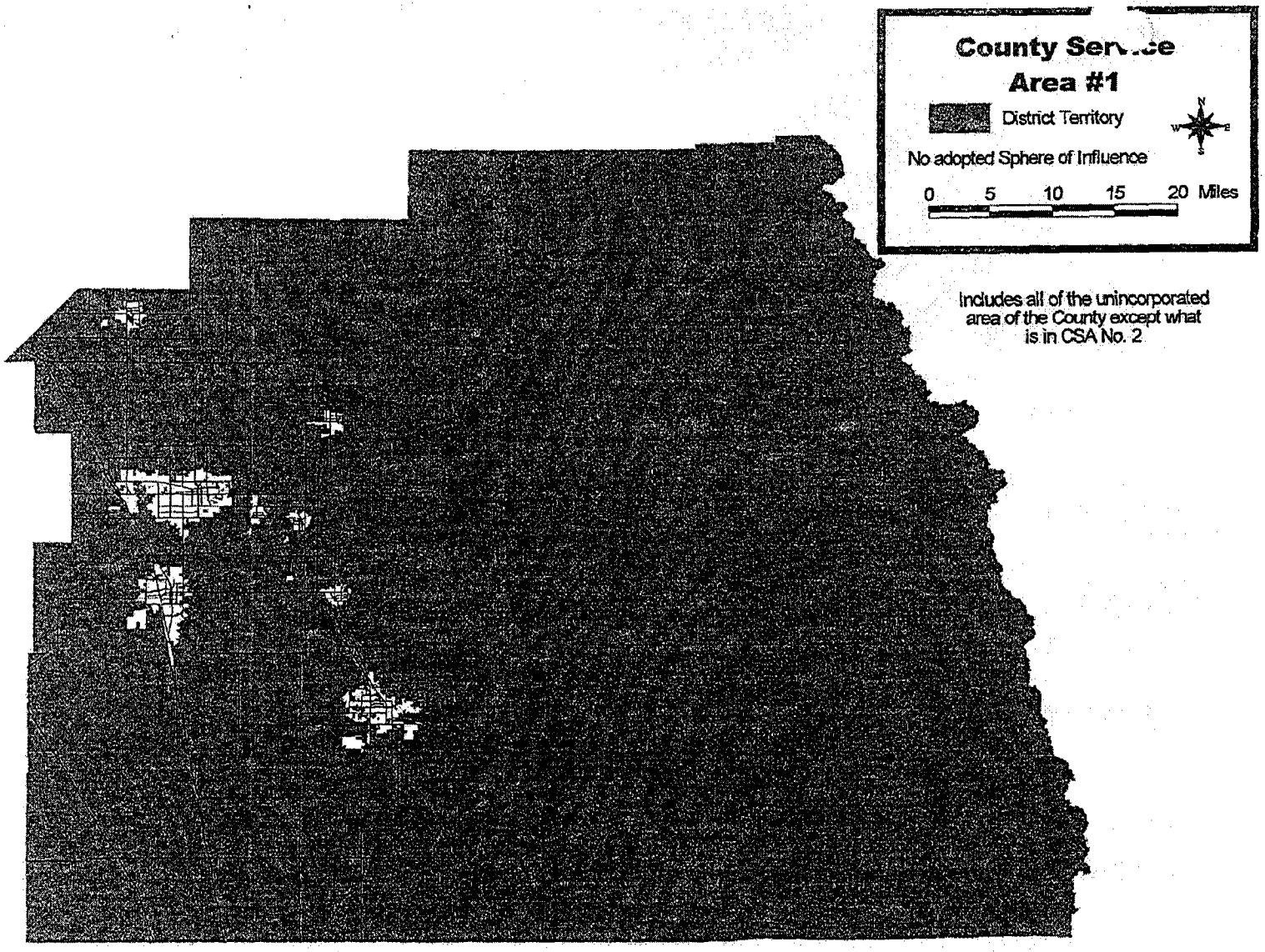


EXHIBIT 1-23
Woodville PUD
Territory and Sphere
of Influence



Tulare County General Plan Update

EXHIBIT 1-24
County Service Area #1
District Territory

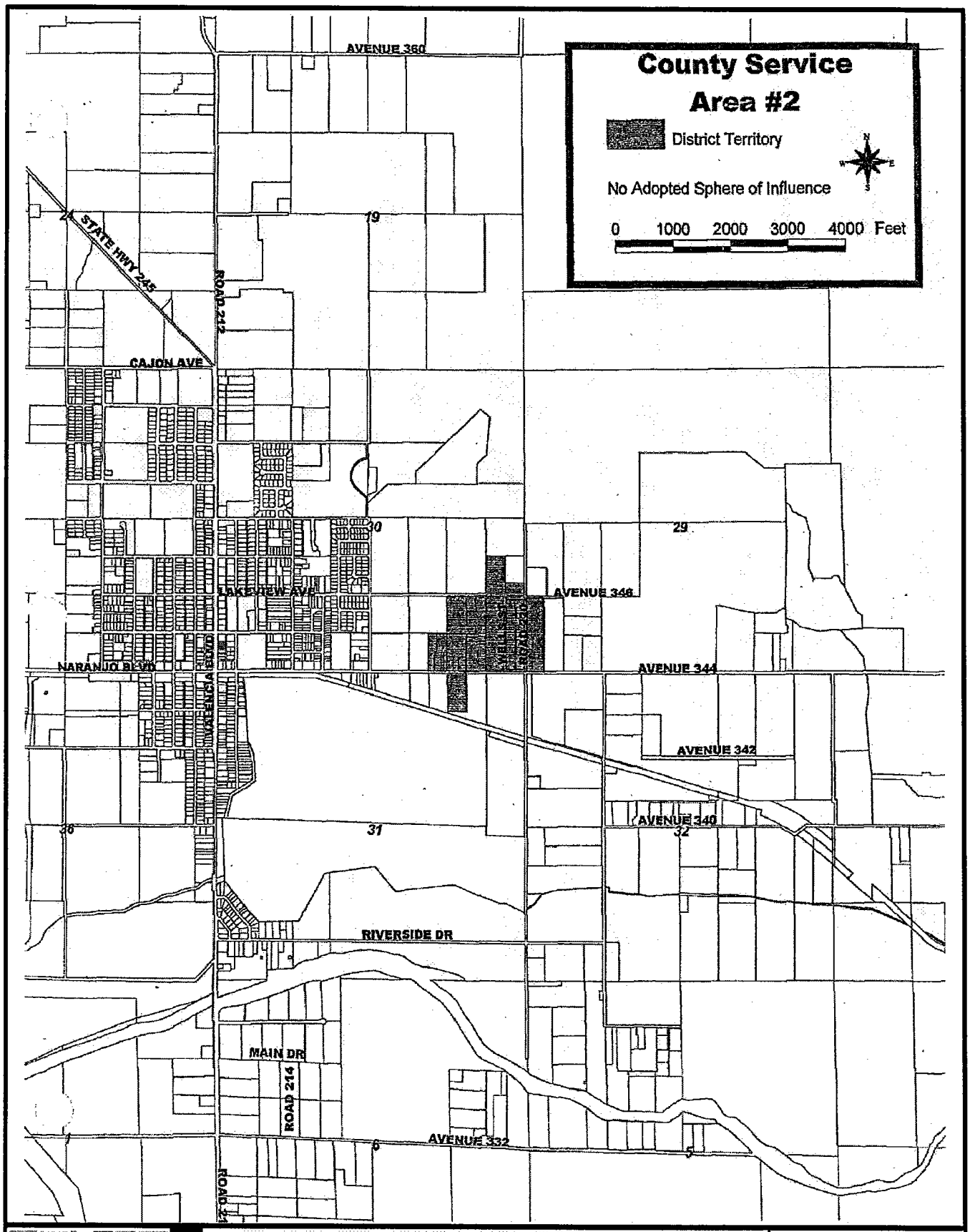


EXHIBIT 1-25
County Service Area #2
District Territory

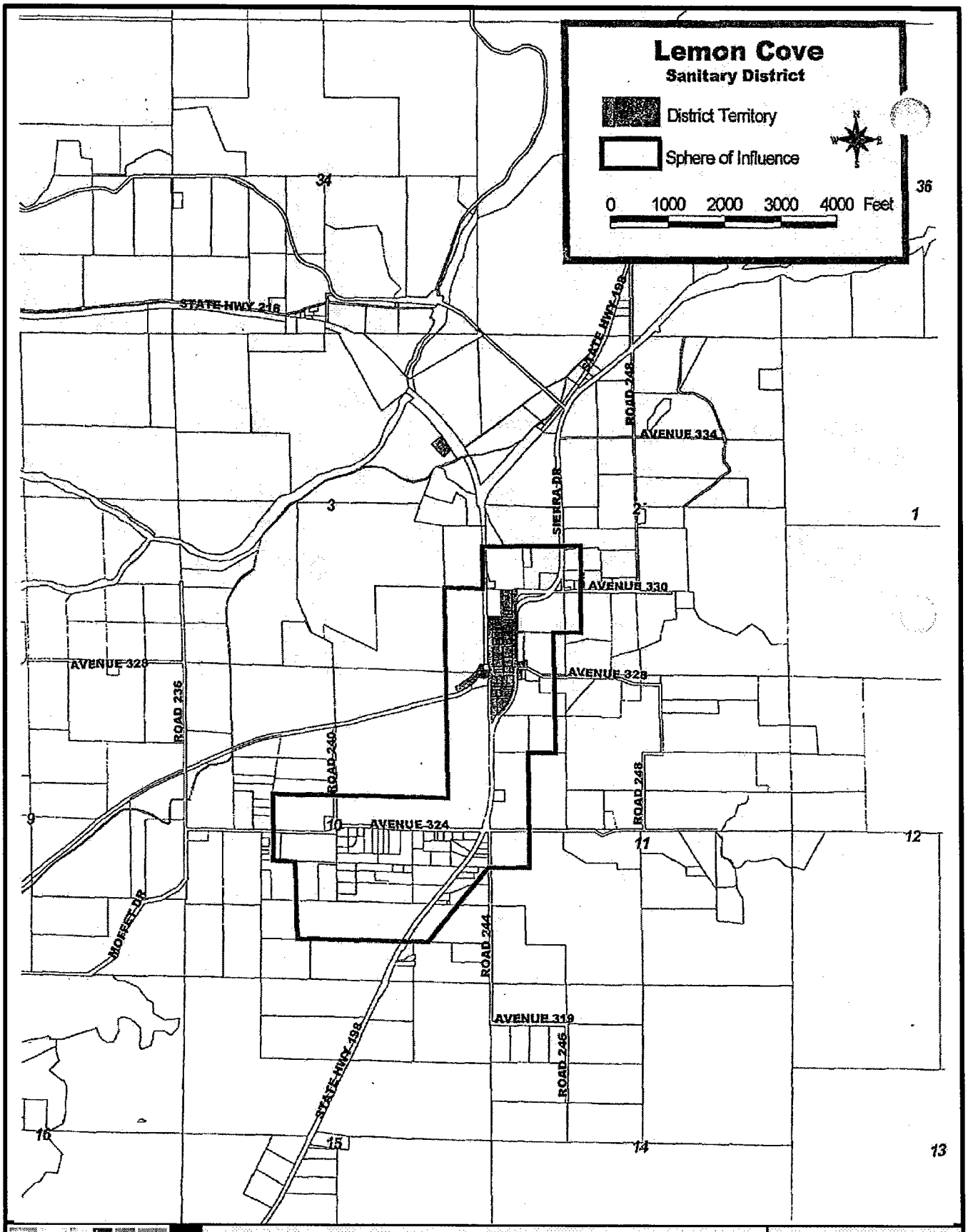


EXHIBIT 1-26
Lemon Cove Sanitary District Territory and Sphere of Influence

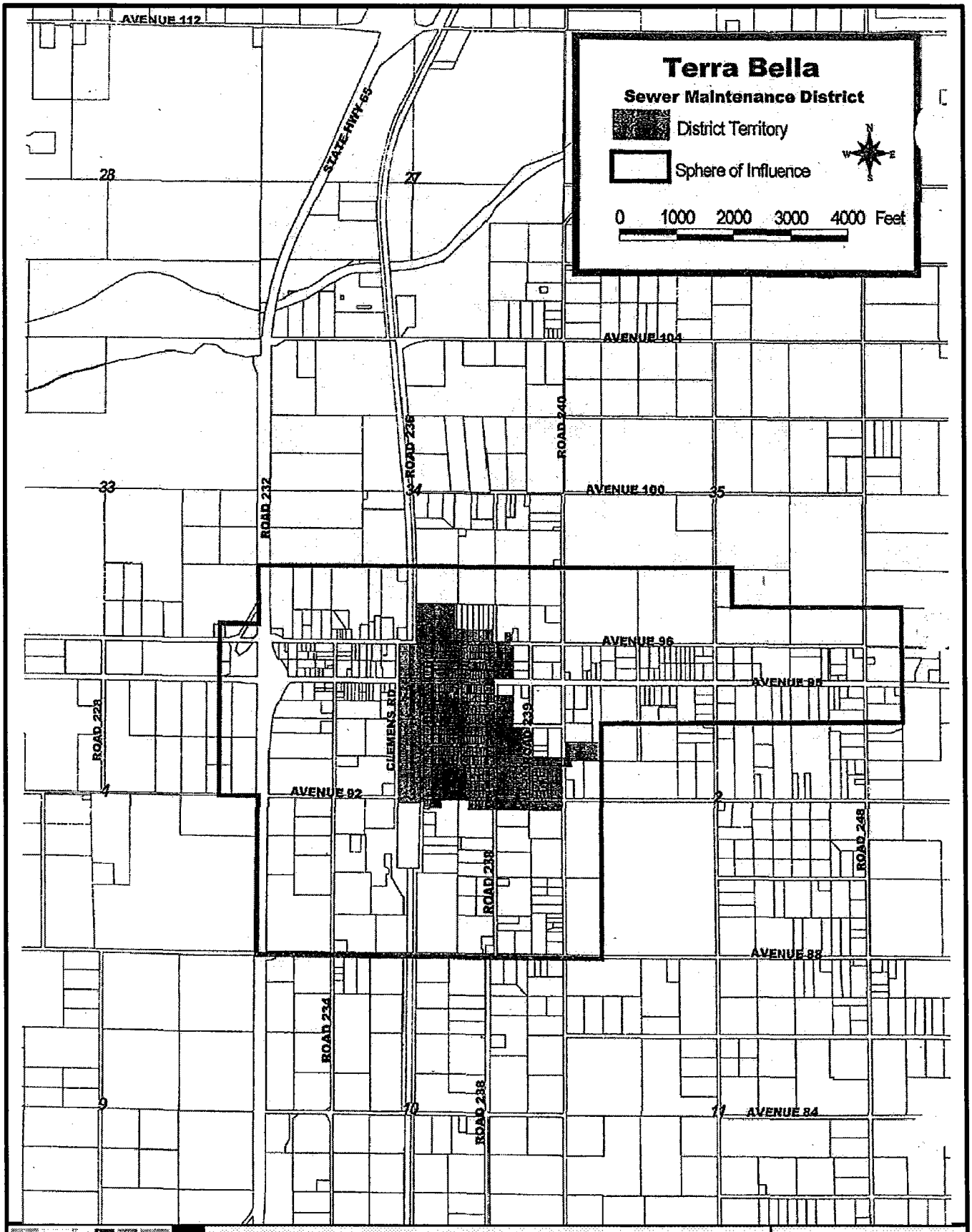


EXHIBIT 1-27
Terra Bella Sewer Maintenance District Territory and Sphere of Influence

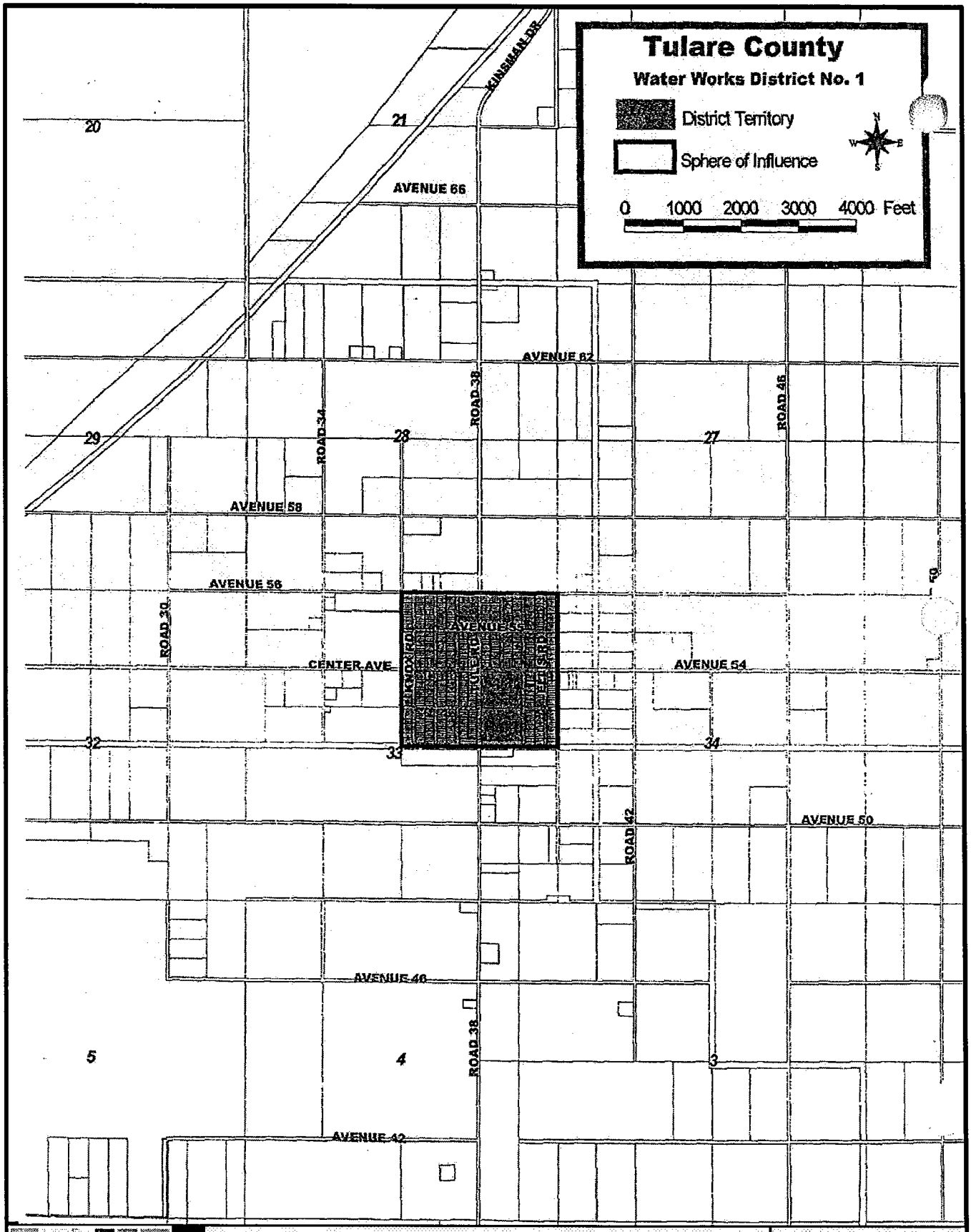
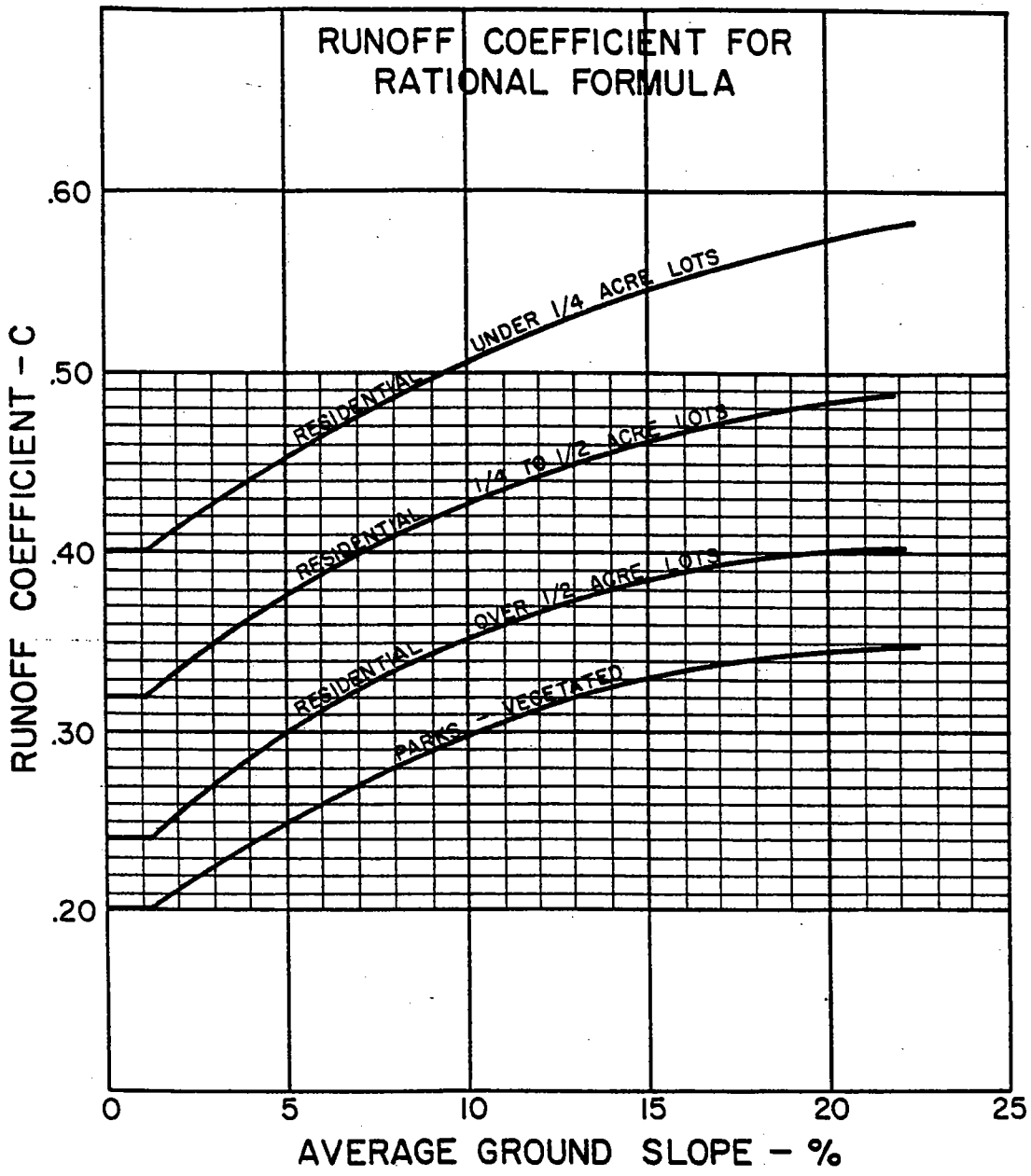


EXHIBIT 1-28
Tulare County Water Works District No. 1 Territory and Sphere of Influence



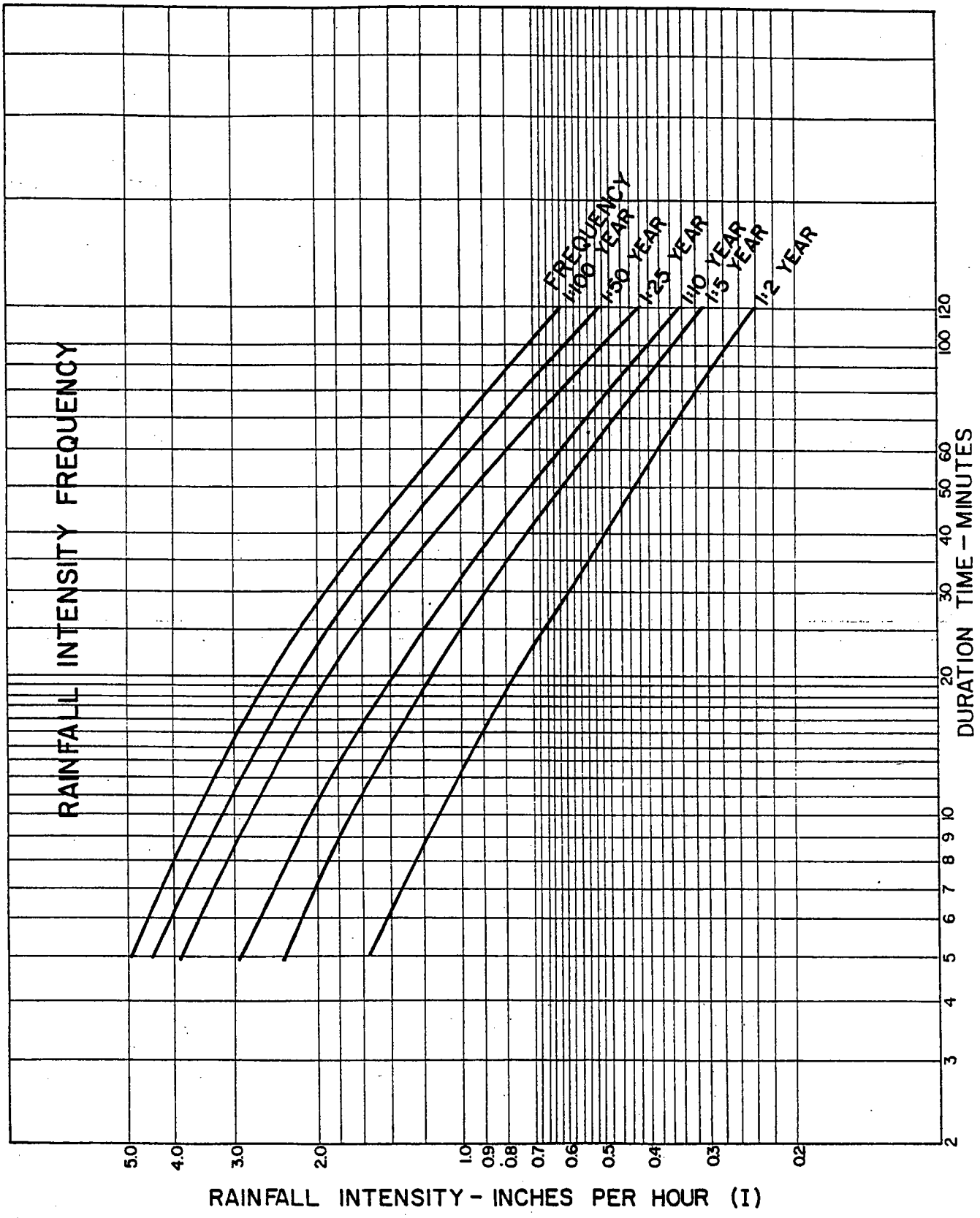
NOTE: USE C=0.85 FOR COMMERCIAL, INDUSTRIAL AND MULTIPLE RESIDENTIAL AREAS

DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

RUNOFF
COEFFICIENT

PLATE NO. B-1



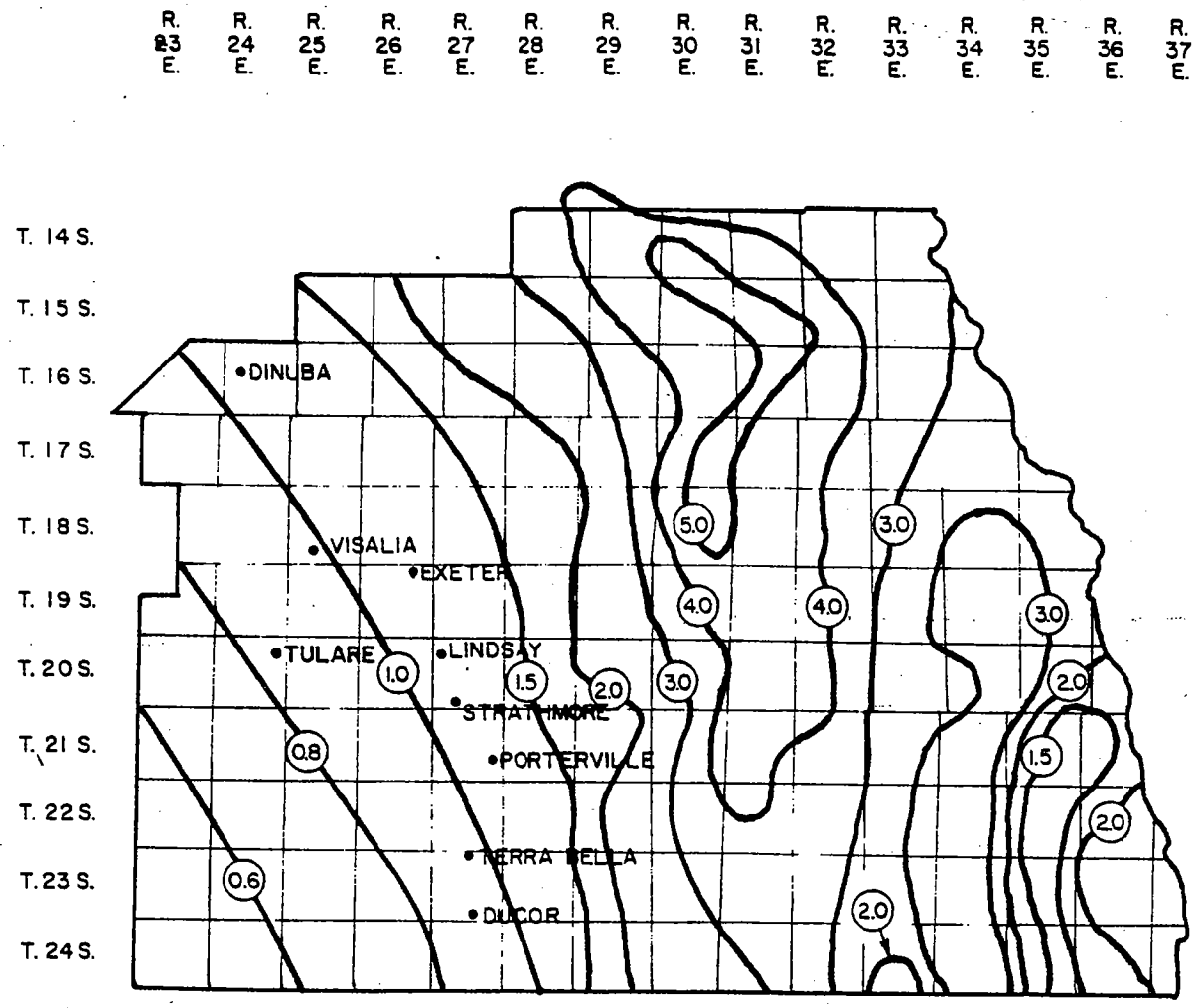
DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

INTENSITY
DURATION CURVES

PLATE NO. B-2

TULARE COUNTY



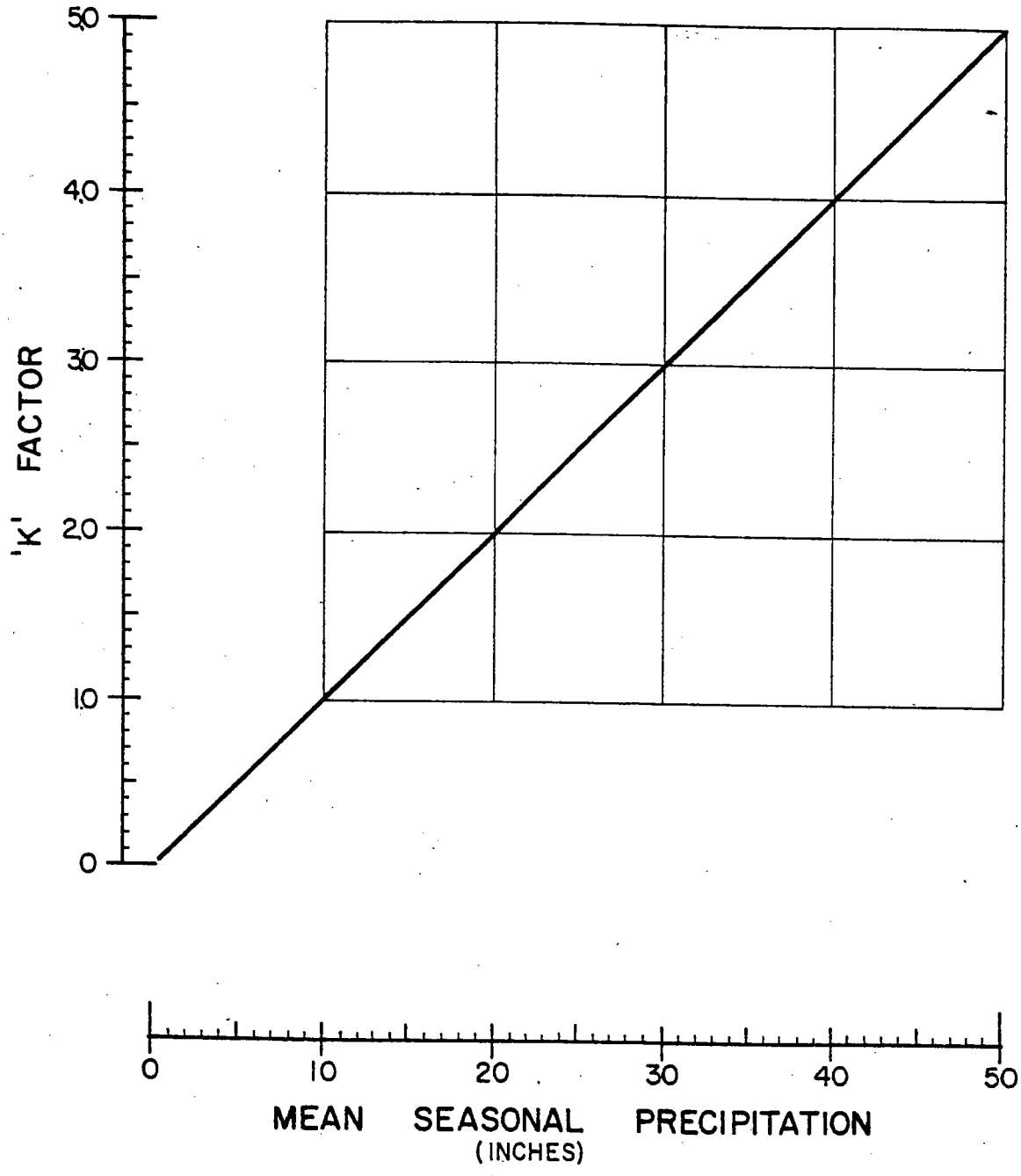
(1.0) INDICATES 'K' FACTOR TO BE USED WITH THE MODIFIED RATIONAL FORMULA (Q=KCIA)

DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

RATIONAL FORMULA 'K' FACTOR

PLATE NO. B-3

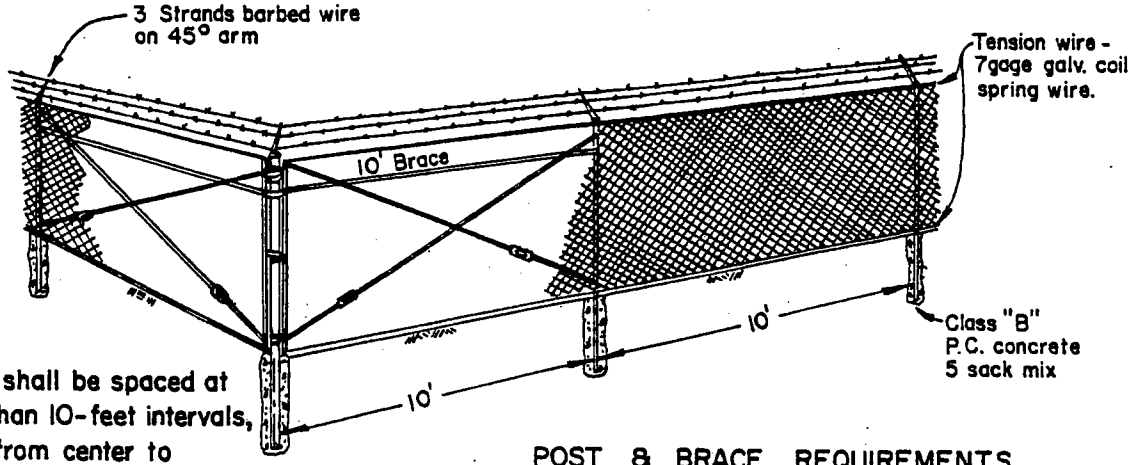


DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080
'K' FACTOR TO PRECIPITATION
PLATE NO. D-1

Post tops, extension arms, stretcher bars and other required fittings and hardware shall be steel or malleable iron or wrought iron and shall be galvanized.

Wire used in the manufacture of the fabric shall be 11-gage for all fence 84" or less in height, and shall be woven into approximately 2-inch mesh.

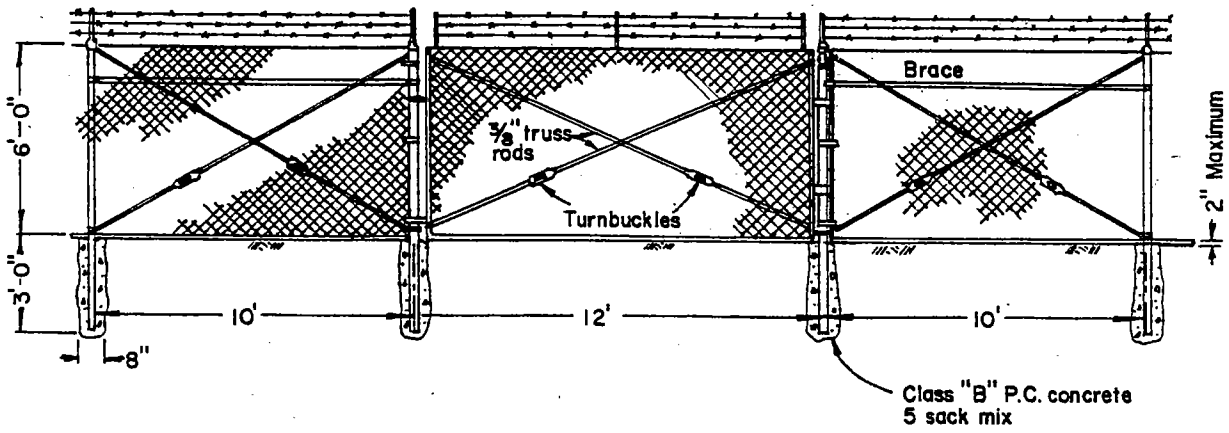


Line posts shall be spaced at not more than 10-feet intervals, measured from center to center of posts.

End, corner, and gate posts shall be braced to the nearest line post with galvanized diagonal or horizontal braces used as compression members and galvanized ⅜" steel truss rods with turnbuckles used as tension members.

POST & BRACE REQUIREMENTS

LOCATION	TYPE	MIN. SIZE	MIN. WT.(LB./FT.)
End and corner posts	Pipe	2.351 O.D.	3.10
Line posts	Pipe	1.869 O.D.	2.31
Braces	Pipe	1.630 O.D.	1.93
Gate posts	Pipe	3.960 O.D.	8.65



Gate frame shall be constructed of not less than 1½" galvanized pipe and shall be cross trussed with ⅜" adjustable truss rods. The corner of gate frames shall be fastened together with a malleable iron fitting.

The gate shall be hung by at least two (2) steel or malleable iron hinges not less than three inches (3") in width, and a malleable catch and locking attachment.

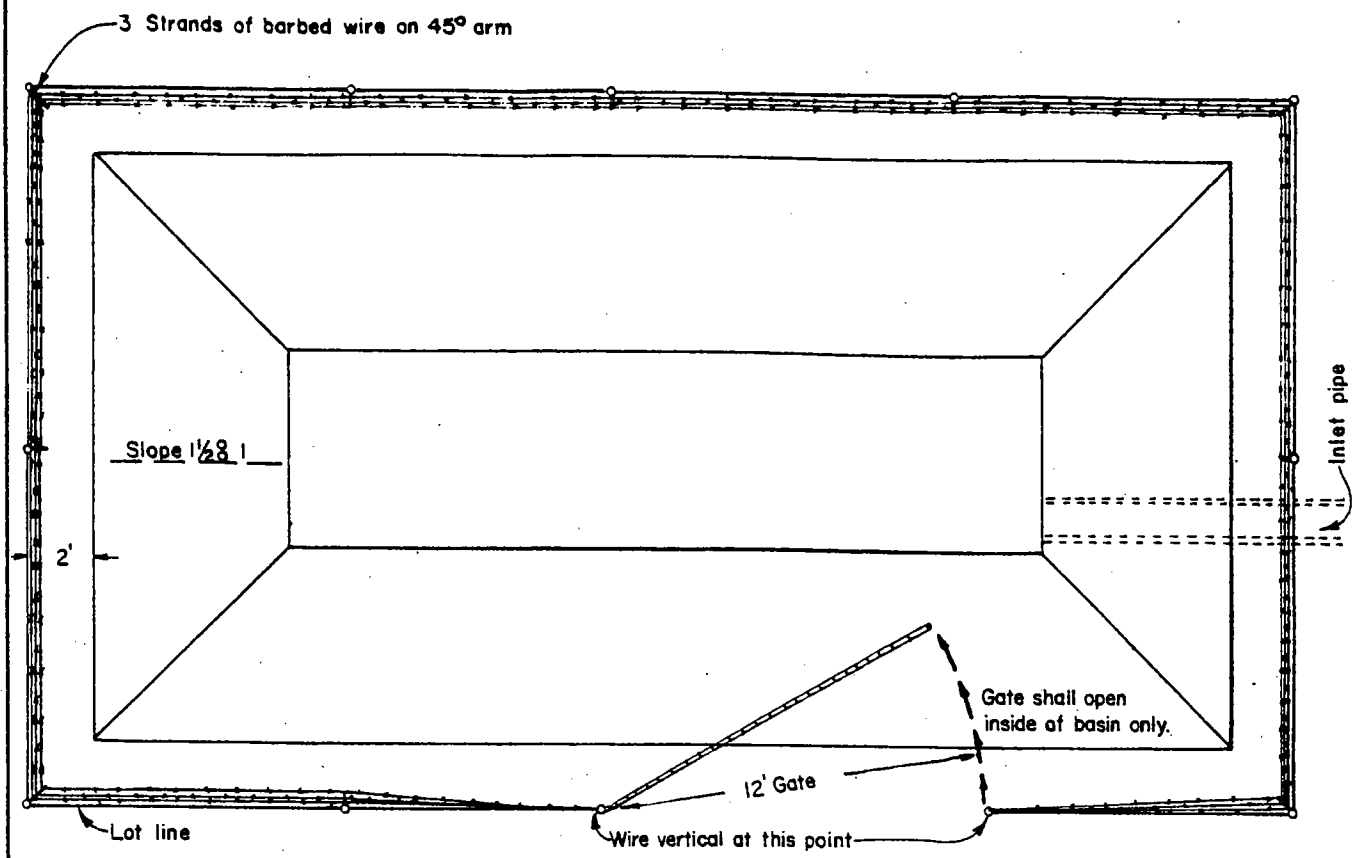
All posts shall be a minimum of 9' long.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

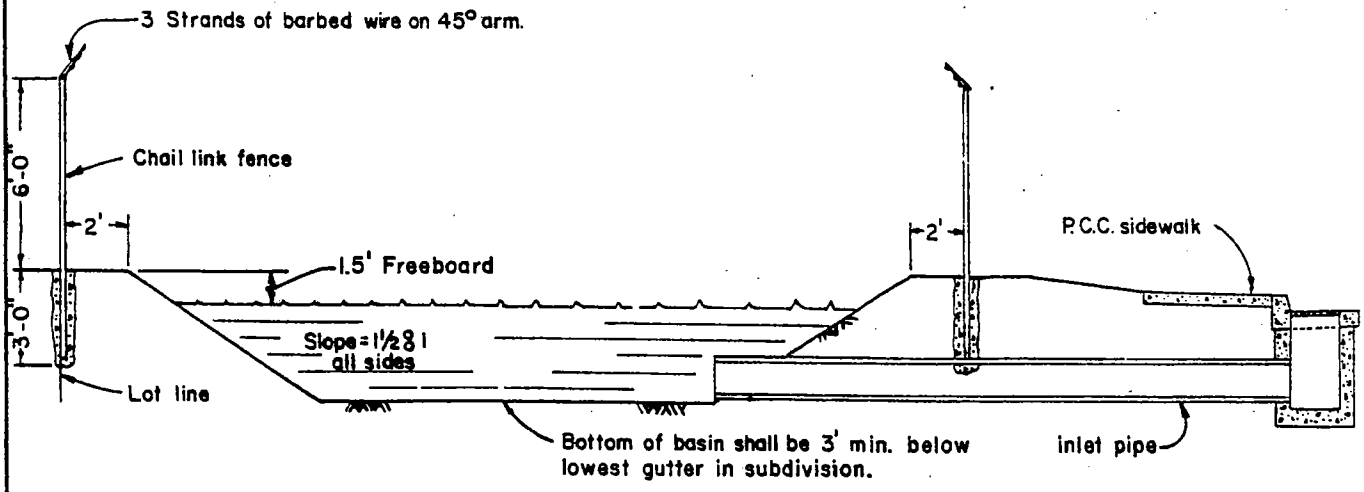
CHAIN LINK FENCING

PLATE NO. R-5



GENERAL NOTES

Fence to be placed on lot line.
Maximum depth of water in ponding basin - 3'-0".
Fence post to be placed in class "B" P.C. Concrete.
Access gate 12'-0" minimum, open inside of basin only.
Entire area of ponding lot to be treated with soil sterilant to one foot outside of fence or to back of concrete curb or sidewalk.
The soil sterilant to be used and rate of application must be approved by the Public Works Director before being applied.
Where ponding basin is on corner lot, fence shall follow curve of lot line.

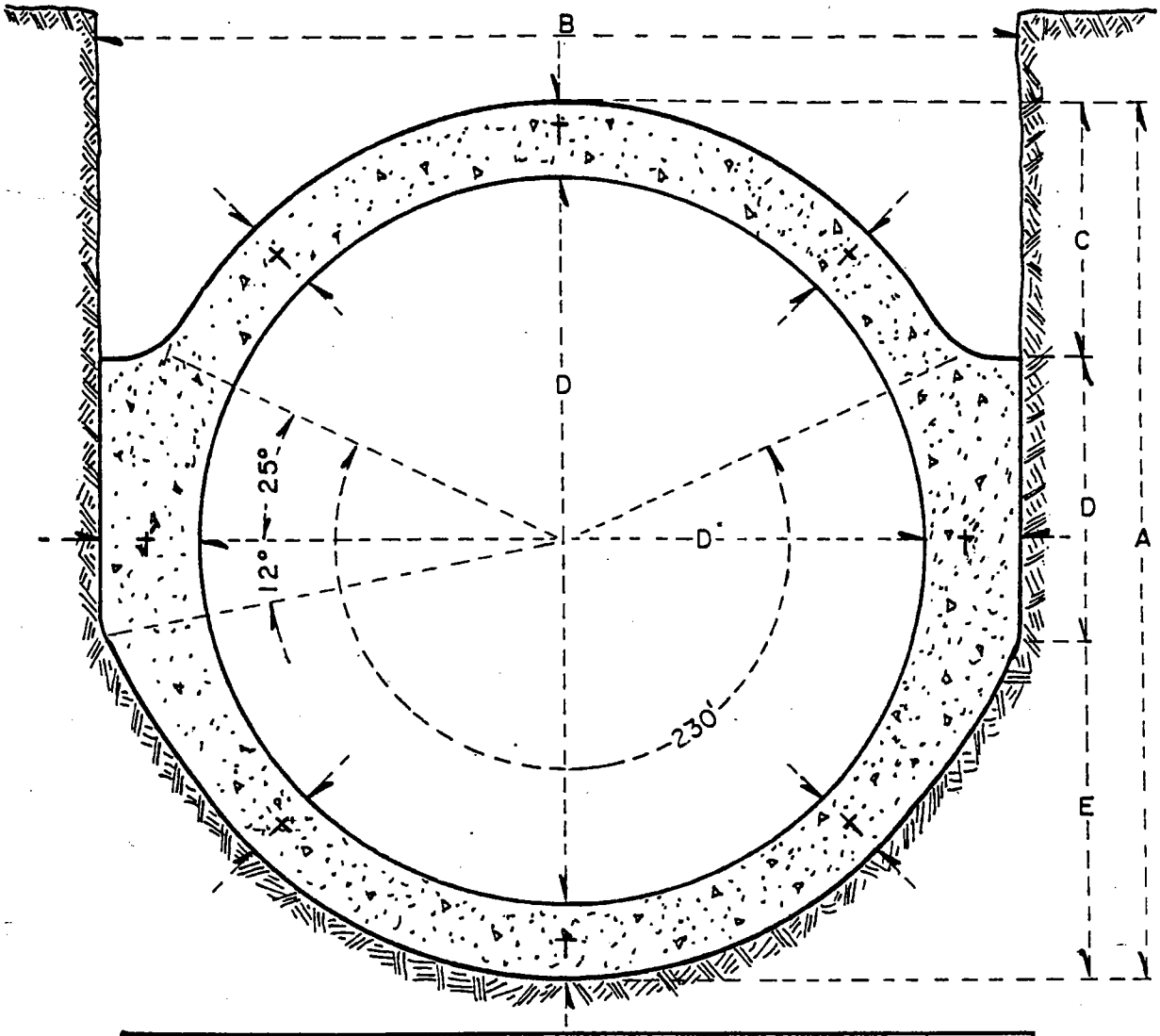


DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

PONDING BASIN DETAILS

PLATE NO. P-6



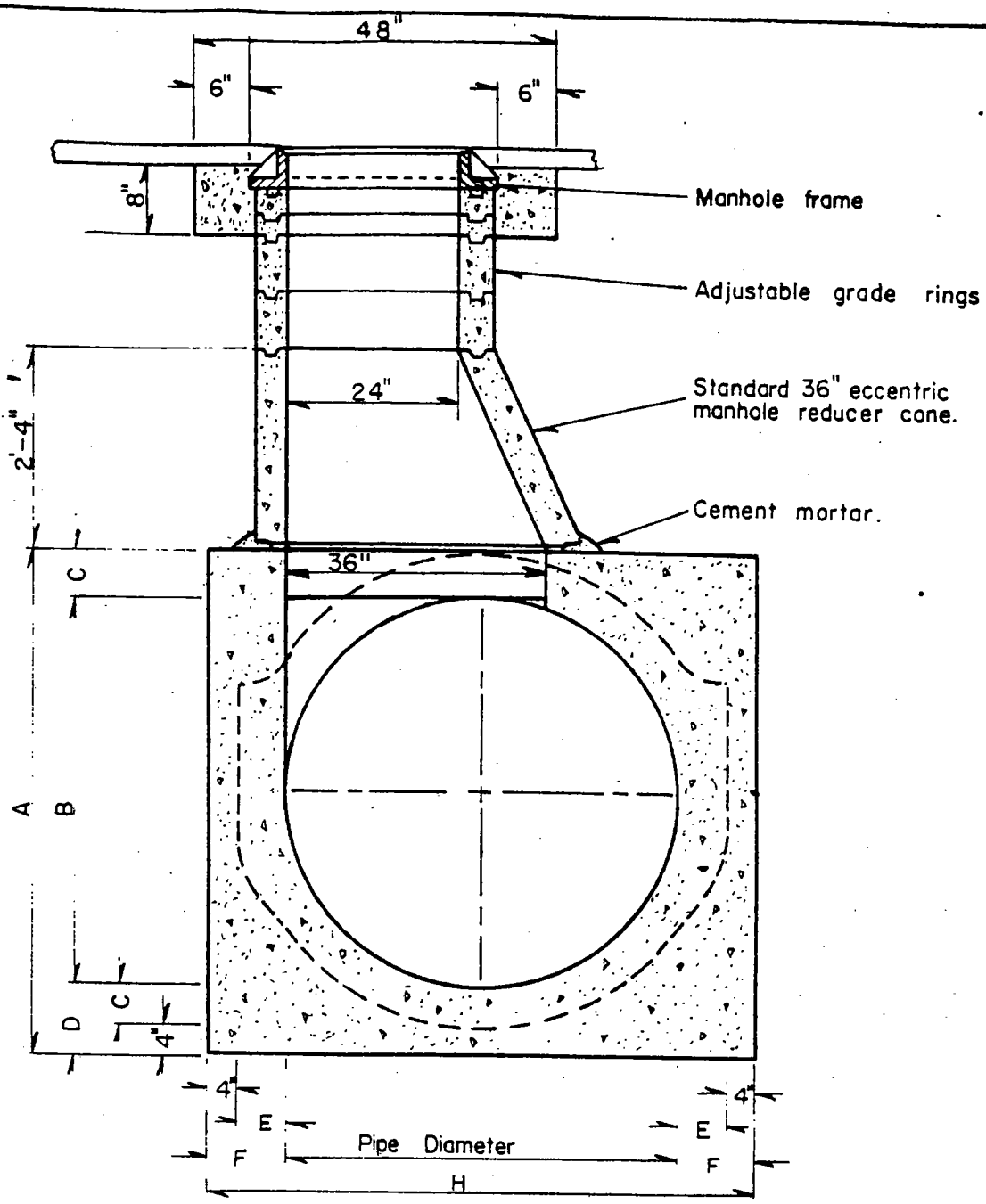
D	t	t'	B	C	D	E	A
24	3	3 3/4	31 1/2	8 1/2	10	11 1/2	30
30	3	3 3/4	37 1/2	10	12	14	36
36	3 1/2	4 1/4	44 1/2	12 1/2	14	16 1/2	43
42	4	4 3/4	51 1/2	14 1/2	16	19 1/2	50
48	5	6 1/2	61	16 1/2	19	22 1/2	58
54	5 1/2	7 1/2	69	18 1/2	21	25 1/2	65
60	6	8	76	21	23	28	72
72	7	8 1/2	89	25	27 1/2	33 1/2	86

All dimensions in inches.

DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CAST-IN-PLACE CONCRETE PIPE SECTION



*H equals width parallel to pipe flowline also.

Pipe Dia.	A	B	C	D	E	F	H*
36	49 1/2	36	3 1/2	7 1/2	4 1/2	8 1/2	53
42	56	42	4	8	5	9	60
48	63	48	5	9	6	10	68
54	69 1/2	54	5 1/2	9 1/2	6 1/2	10 1/2	75
60	76	60	6	10	7	11	82
66	83	66	6 1/2	10 1/2	7 1/2	11 1/2	89
72	90	72	7	11	8	12	96

All dimensions in inches.

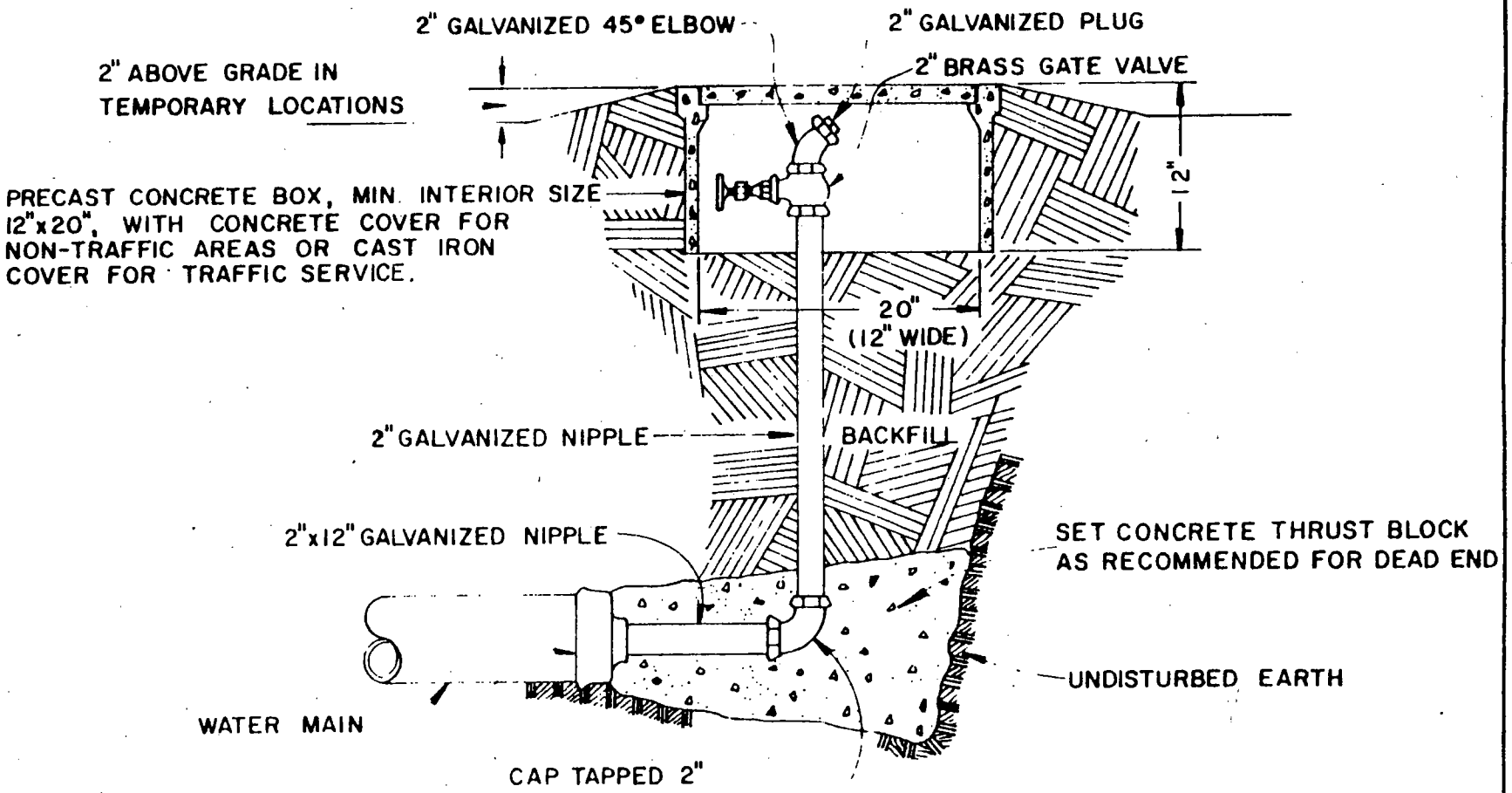
DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CAST - IN - PLACE MANHOLE

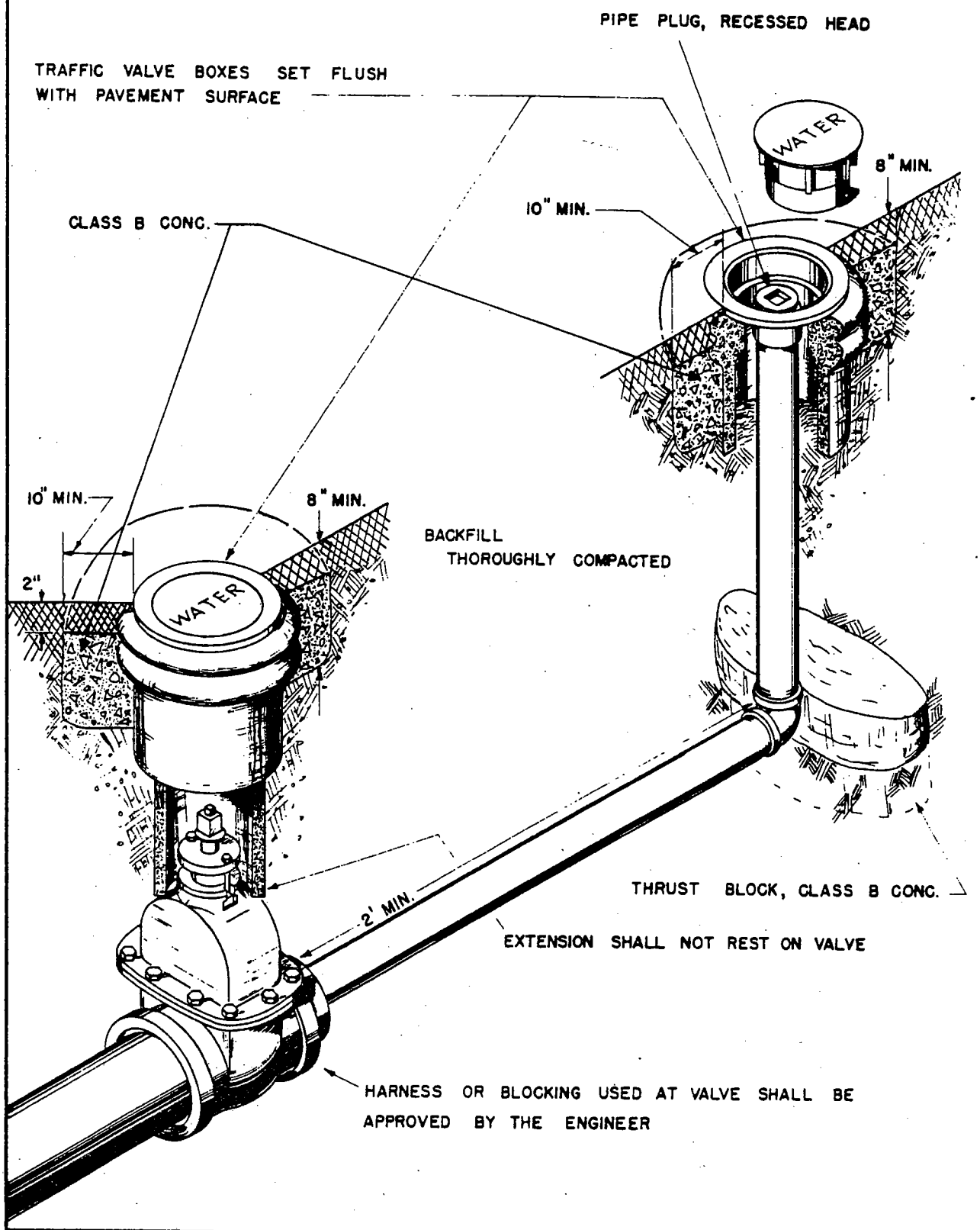
PLATE NO. B-8

WATER SYSTEM STANDARDS



ELEVATION

TULARE COUNTY ORDINANCE CODE SECTION No. 7080	PLATE No WS-1
BLOW-OFF WITH 2" VALVE	

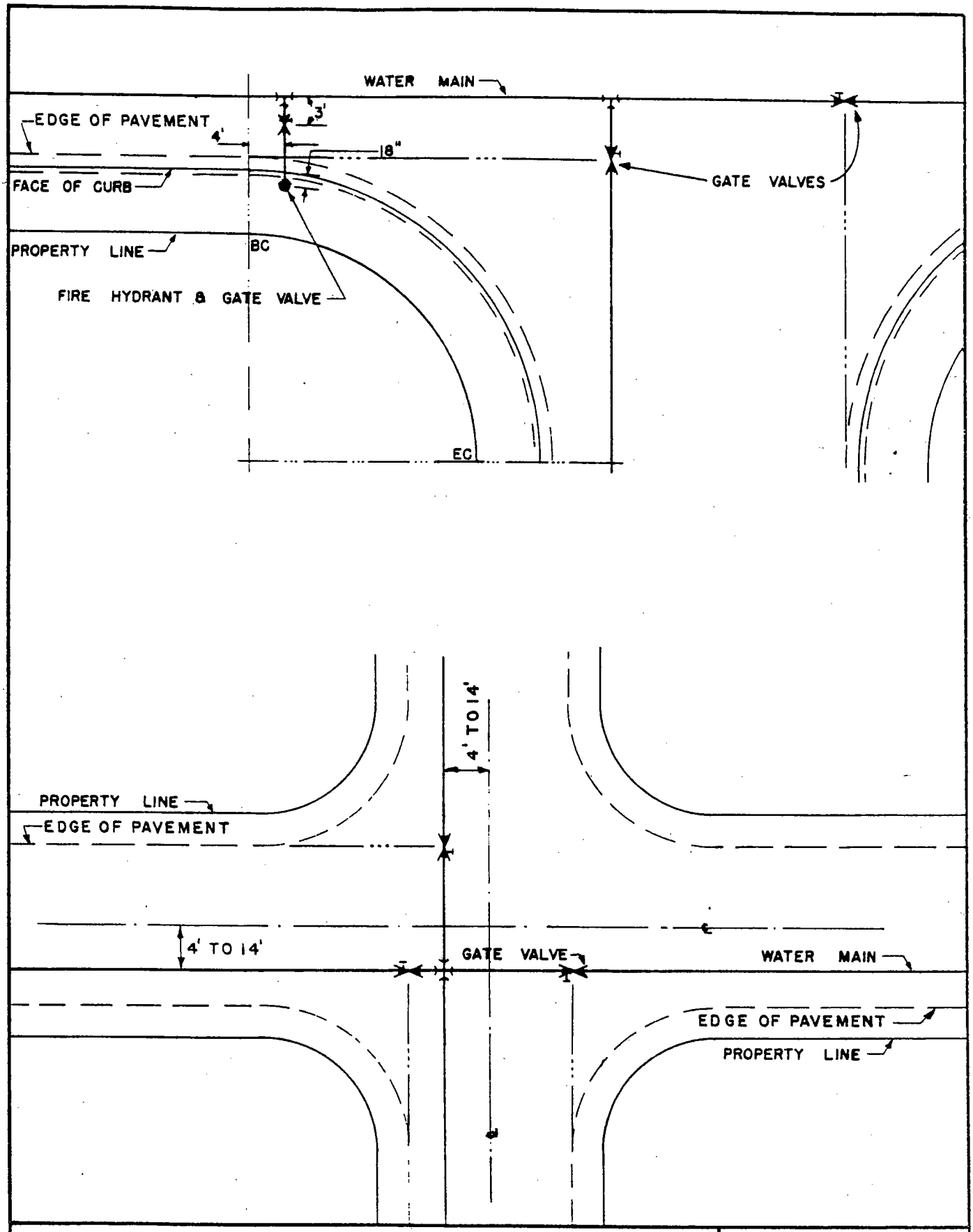


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

BLOW-OFF WITH
6" VALVE

PLATE No. WS-2

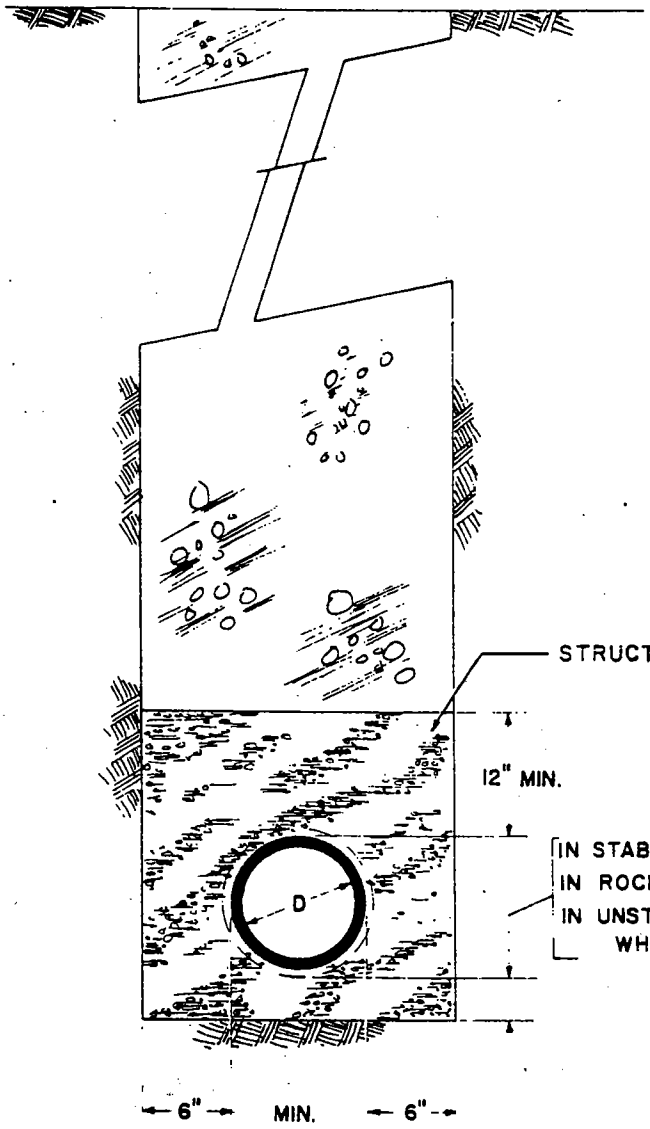


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

LOCATION OF VALVES
& HYDRANTS AT
INTERSECTIONS

PLATE No. WS-3



STRUCTURE BACKFILL	
SIEVE SIZE	PERCENT PASSING
3"	100
No. 4	35 — 100

ANY OVEREXCAVATION SHALL BE BACKFILLED WITH APPROVED BEDDING MATERIAL

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

PIPE BEDDING

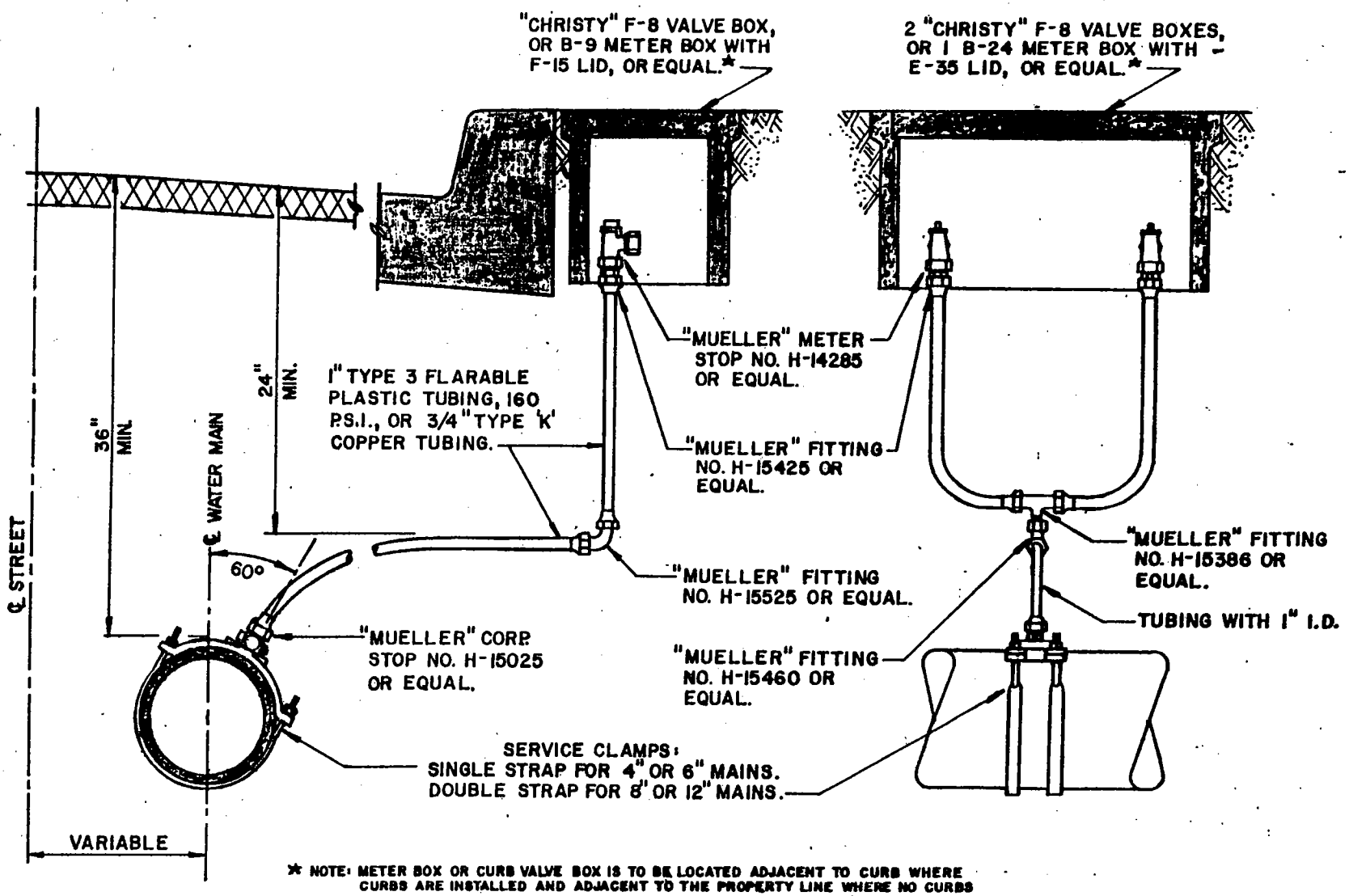
PLATE No. WS-4

WATER SYSTEM STANDARDS

TYPICAL WATER SERVICE INSTALLATION

FOR SINGLE SERVICE

FOR DOUBLE SERVICE



* NOTE: METER BOX OR CURB VALVE BOX IS TO BE LOCATED ADJACENT TO CURB WHERE CURBS ARE INSTALLED AND ADJACENT TO THE PROPERTY LINE WHERE NO CURBS ARE INSTALLED. SPLIT SERVICES ARE TO BE CENTERED ON THE PROJECTED LOT LINE.

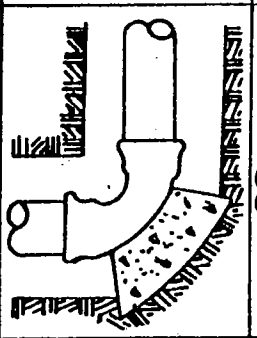
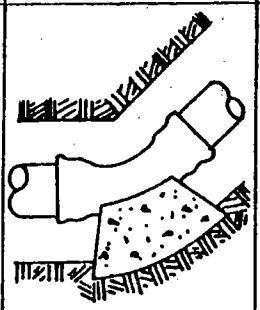
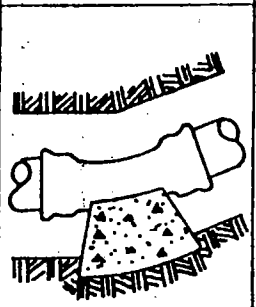
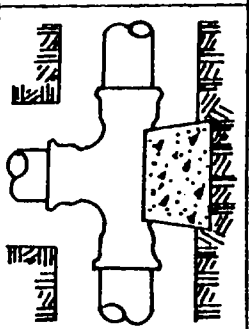
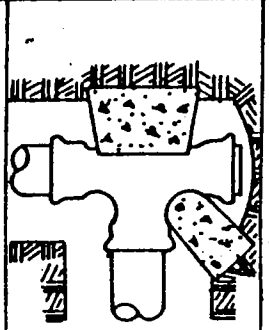
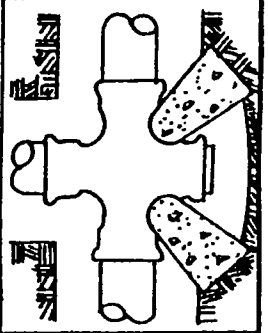
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

DOMESTIC WATER SERVICES

PLATE NO. WS-8

WATER SYSTEM STANDARDS

REQUIRED BEARING AREA – TOTAL SQUARE FEET

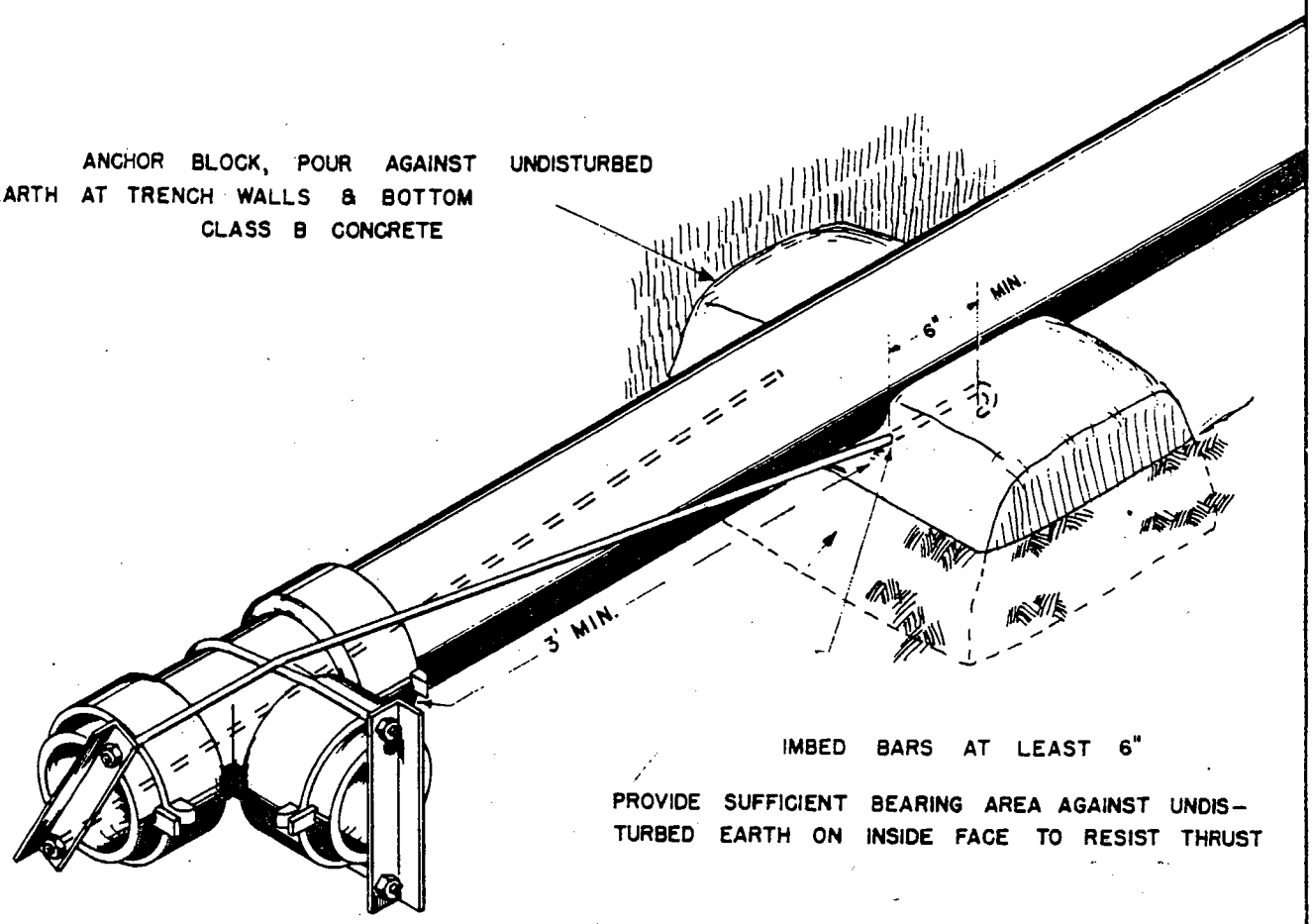
TYPE OF FITTING		90° BEND	45° BEND	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END	TEE w/PLUG	CROSS w/ PLUG
TYPICAL INSTALLATION							
SIZE OF PIPE	4"	2	1	1	2	2	2
	6"	4	2	1	3	4	4
	8"	7	4	2	5	7	7
	10"	12	6	3	8	12	12
	12"	16	10	5	12	16	16

NOTES:
(1) THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "B" CONCRETE
(2) AREAS GIVEN ARE FOR CLASS 150 PIPE AT PRESSURE OF 150 P.S.I. IN SOIL WITH 2000 P.S.F. BEARING CAPACITY.
INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND/OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
(3) BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
(4) JOINTS AND FACE OF PLUG TO BE KEPT CLEAR OF CONCRETE.
(5) MINIMUM THICKNESS OF THRUST BLOCKS TO BE 6 INCHES.

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

THRUST BLOCK BEARING AREA REQUIREMENTS

PLATE NO. WS-6



IMBED BARS AT LEAST 6"

PROVIDE SUFFICIENT BEARING AREA AGAINST UNDISTURBED EARTH ON INSIDE FACE TO RESIST THRUST

HARNESS & ANCHOR BLOCK SHALL BE DESIGNED TO WITHSTAND THRUSTS DEVELOPED BY THE TEST PRESSURE

BARE STEEL TO BE ASPHALT COATED

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

PIPE HARNESS

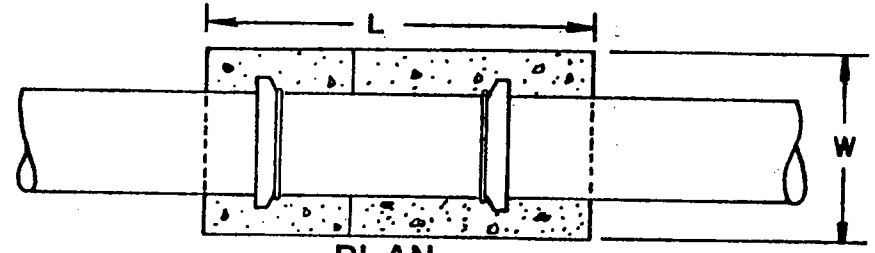
PLATE No. WS-7

WATER SYSTEM STANDARDS

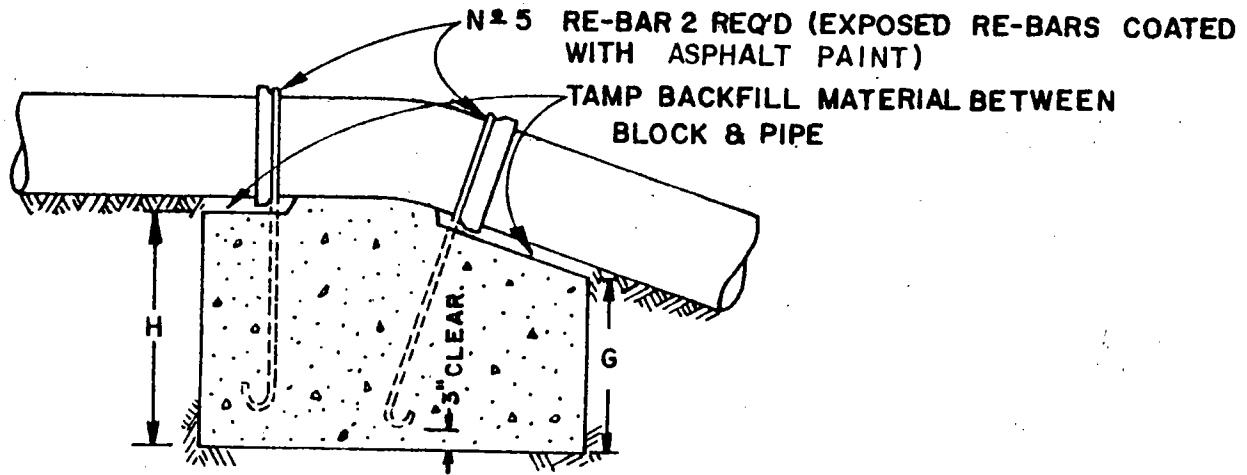
TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

THRUST BLOCKING
AT VERTICAL BENDS

PLATE No. WS-8



PLAN

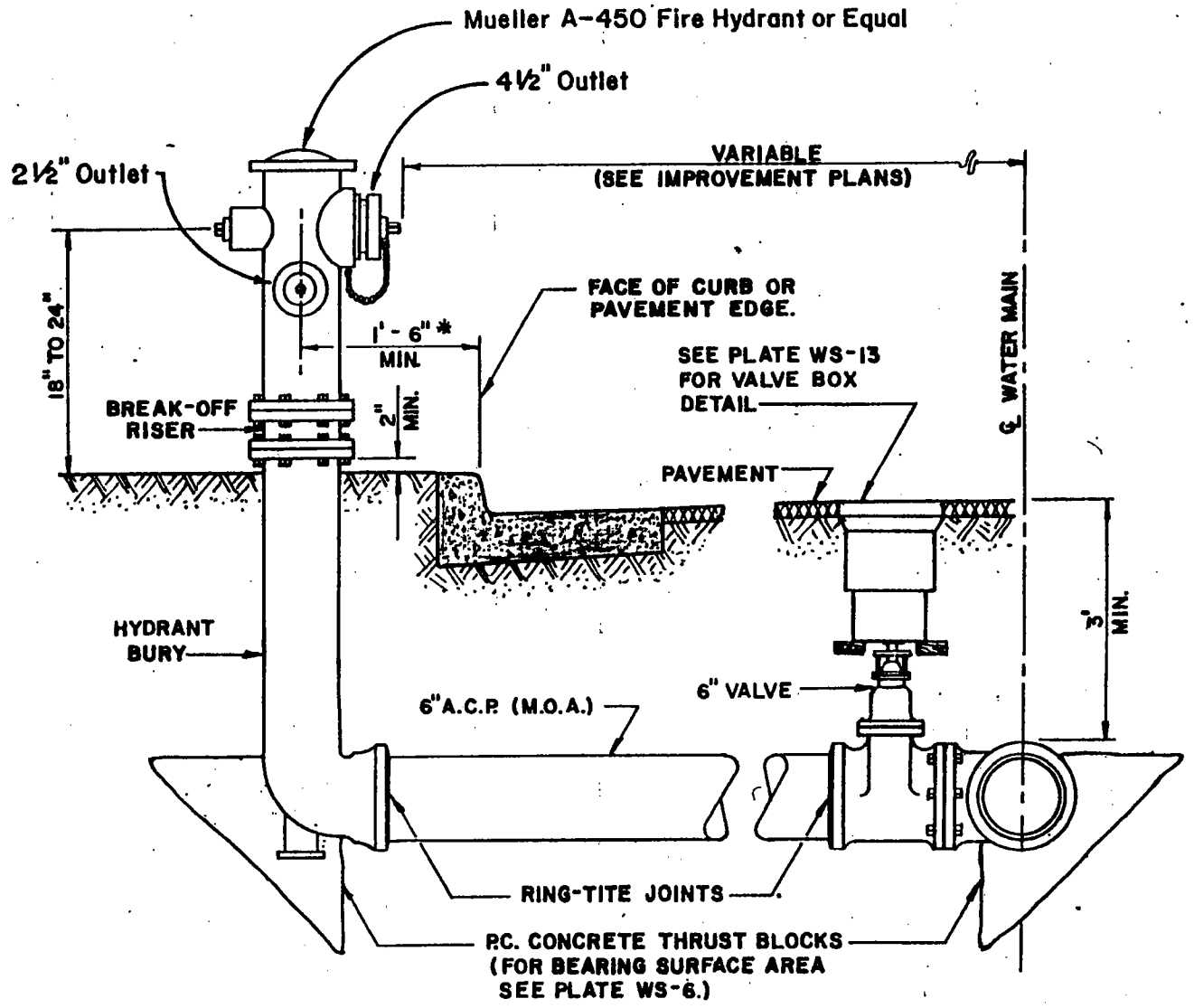


ELEVATION

THRUST BLOCK DIMENSIONS - UPWARD THRUST

PIPE SIZE	11 1/4" BEND				22 1/2" BEND				45° BEND			
	L	W	H	G	L	W	H	G	L	W	H	G
4"&6"	2'-0"	2'-0"	1'-0"	9"	2'-0"	2'-0"	2'-0"	1'-0"	3'-0"	2'-0"	2'-0"	6"
8"	2'-0"	2'-0"	1"-0"	9"	3'-0"	2'-0"	2'-0"	1'-0"	4'-6"	2'-0"	3'-0"	6"
10"	3'-0"	2'-0"	2'-0"	1'-8"	4'-0"	2'-0"	2'-0"	1"-0"	6'-0"	2'-0"	3'-8"	8"
12"	3'-0"	2'-0"	2'-0"	1'-8"	6'-0"	2'-0"	2"-0"	1'-0"	7'-0"	2'-6"	4"-0"	6"

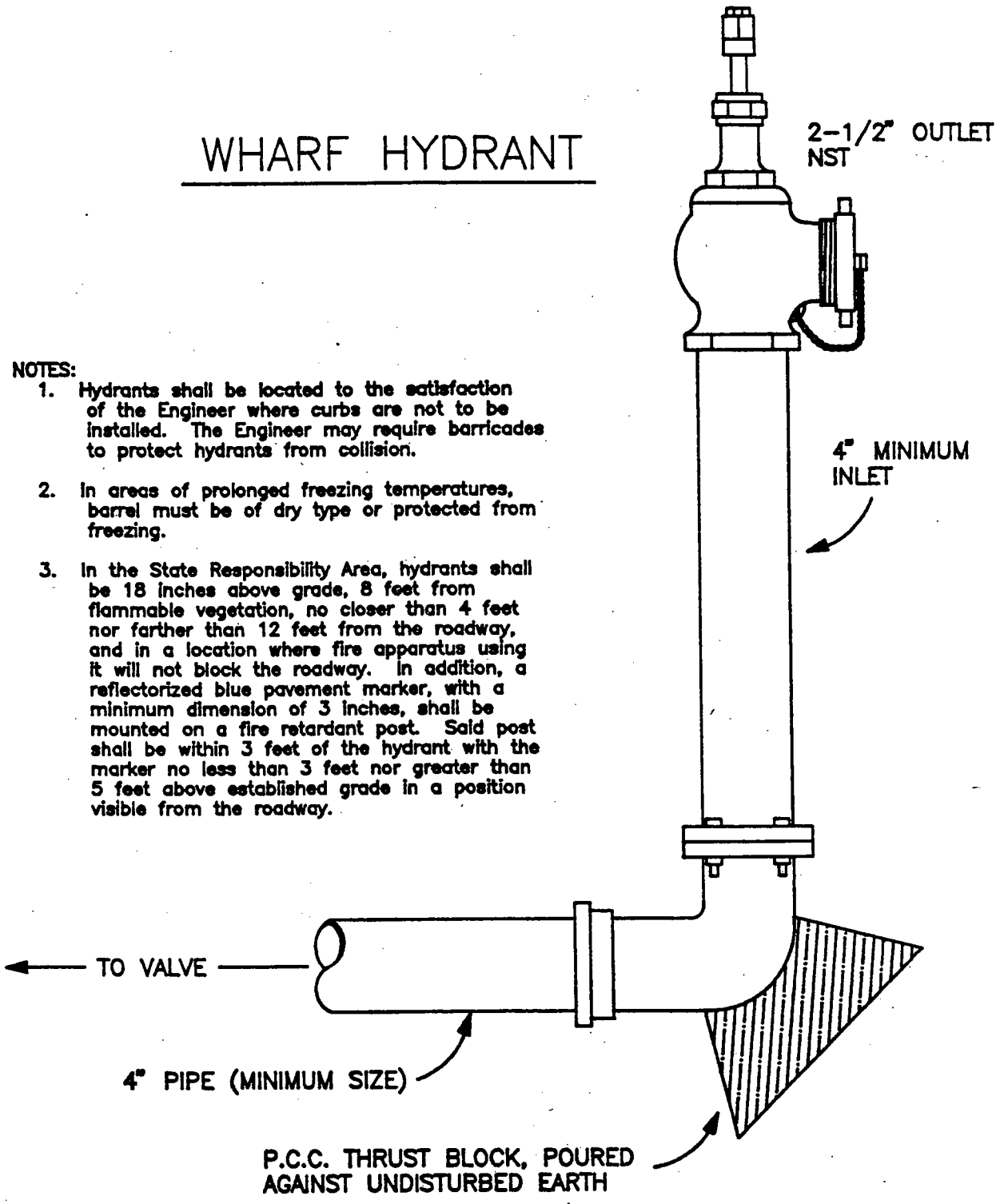
WATER SYSTEM STANDARDS



* When sidewalk is constructed, or if within Urban Improvement Area, distance shall be 5'-0" min.

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080	FIRE HYDRANT INSTALLATION (WET BARREL)	PLATE NO. WS-9

WHARF HYDRANT



NOTES:

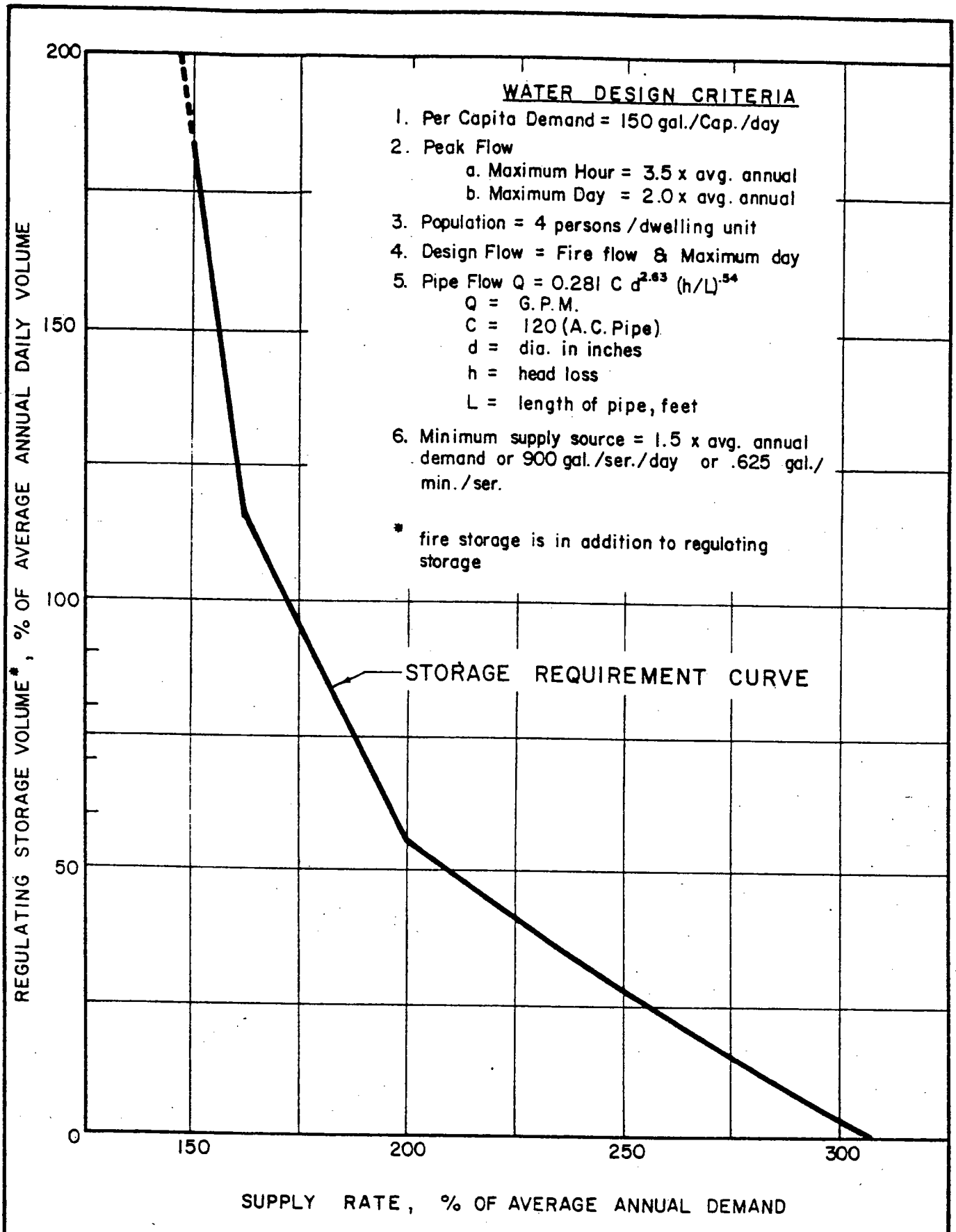
1. Hydrants shall be located to the satisfaction of the Engineer where curbs are not to be installed. The Engineer may require barricades to protect hydrants from collision.
2. In areas of prolonged freezing temperatures, barrel must be of dry type or protected from freezing.
3. In the State Responsibility Area, hydrants shall be 18 inches above grade, 8 feet from flammable vegetation, no closer than 4 feet nor farther than 12 feet from the roadway, and in a location where fire apparatus using it will not block the roadway. In addition, a reflectorized blue pavement marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. Said post shall be within 3 feet of the hydrant with the marker no less than 3 feet nor greater than 5 feet above established grade in a position visible from the roadway.

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

FIRE HYDRANT
INSTALLATION
MOUNTAINOUS AREAS

PLATE NO. WS-10

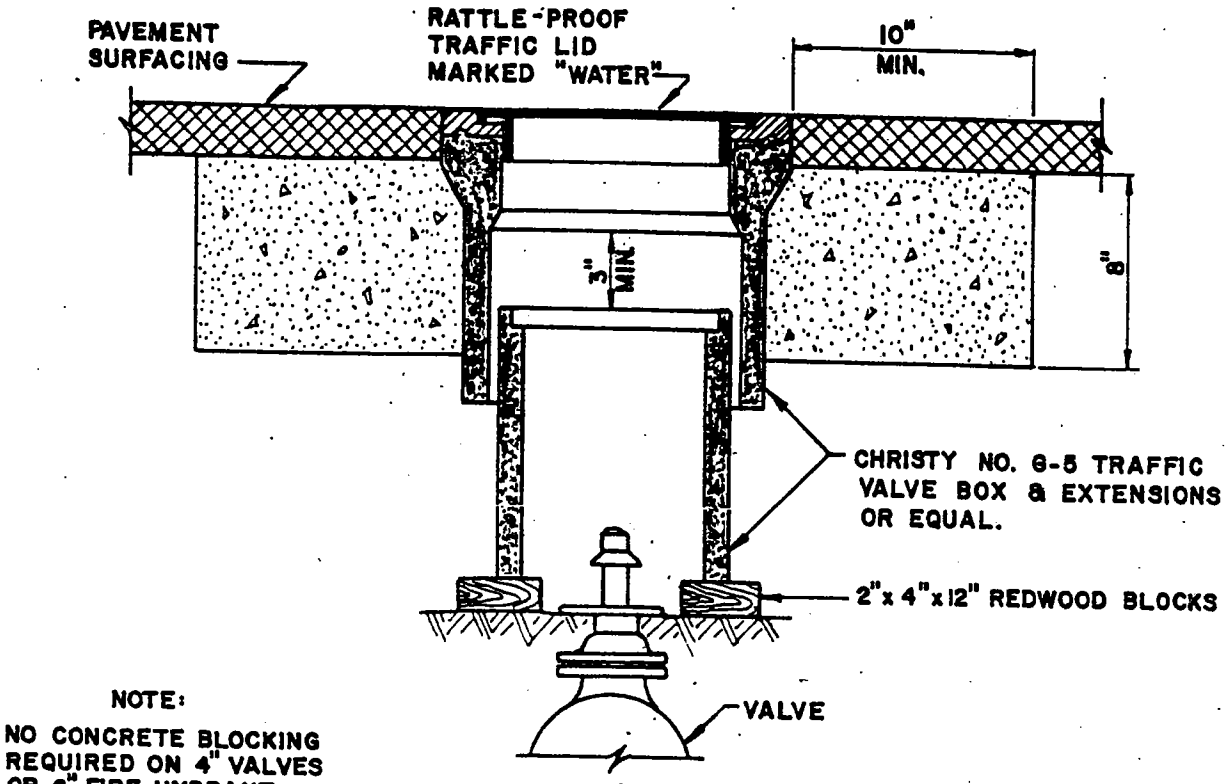


PUBLIC WATER SYSTEMS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

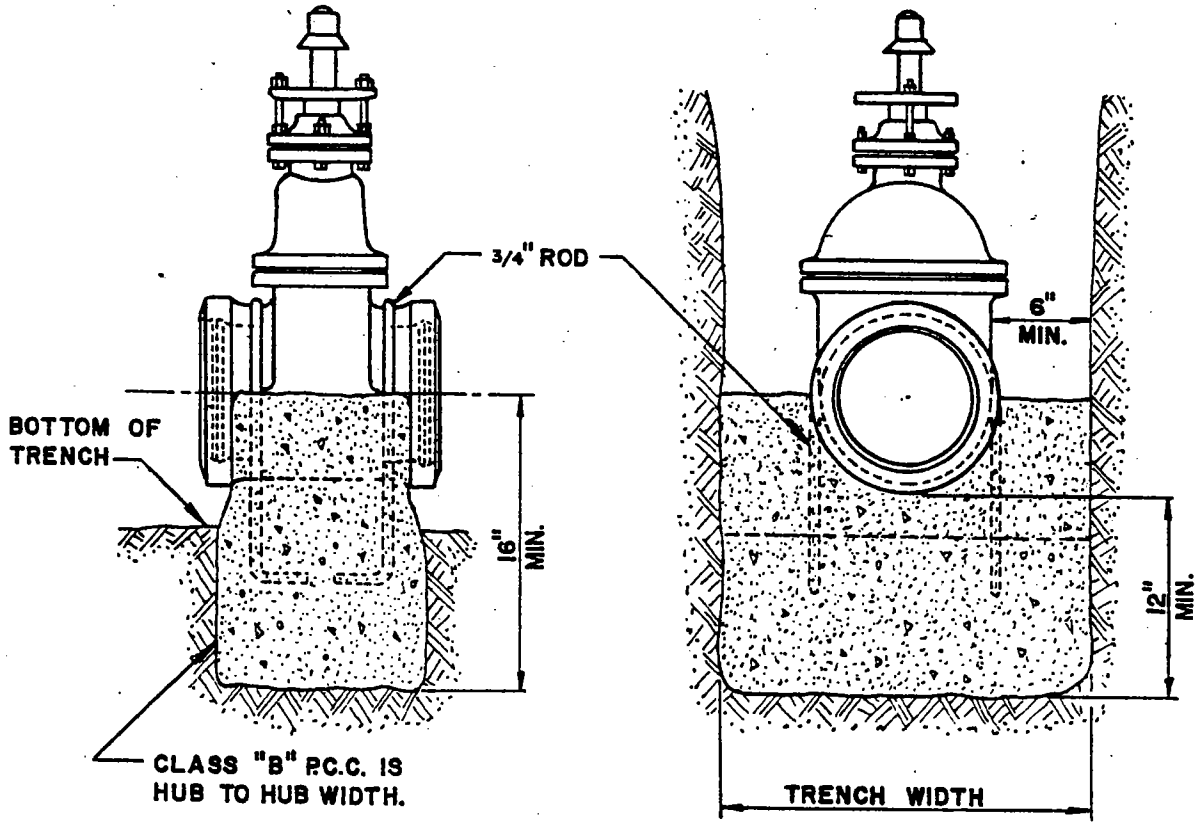
FLOW DESIGN
AND STORAGE
REQUIREMENTS

PLATE No. WS-11



NOTE:

NO CONCRETE BLOCKING REQUIRED ON 4" VALVES OR 6" FIRE HYDRANT VALVES.

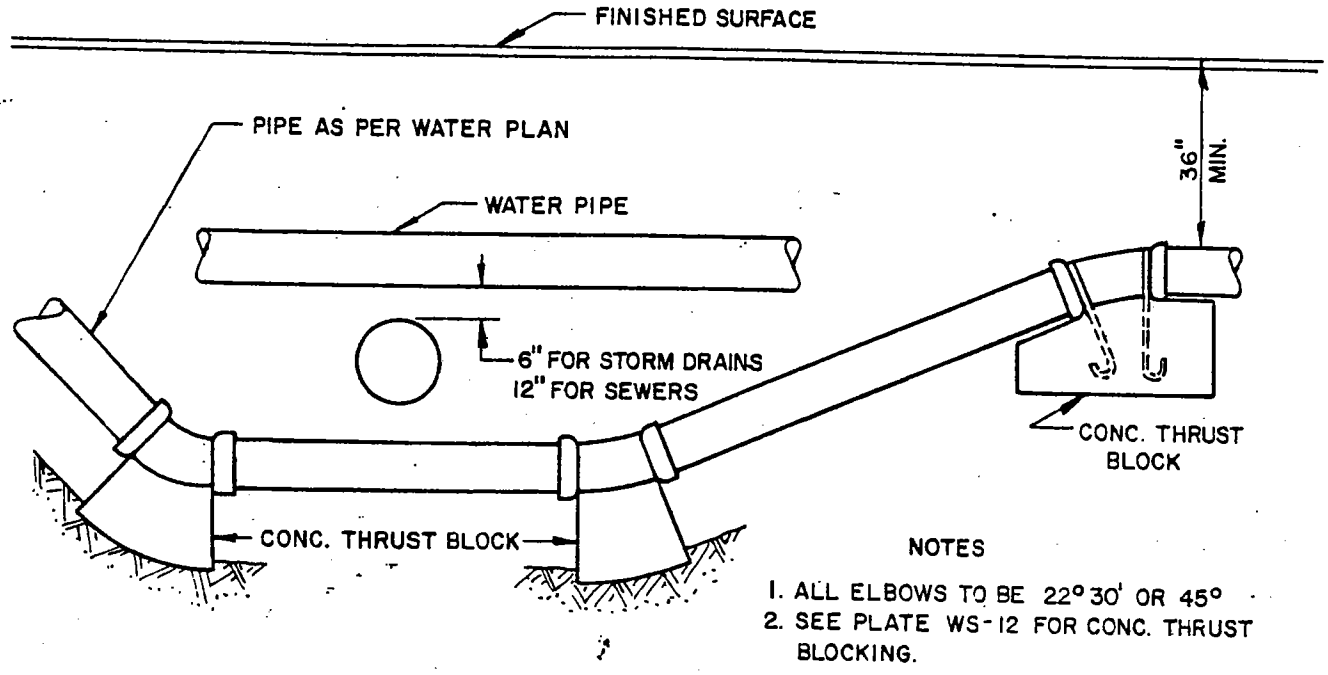


WATER SYSTEM STANDARDS

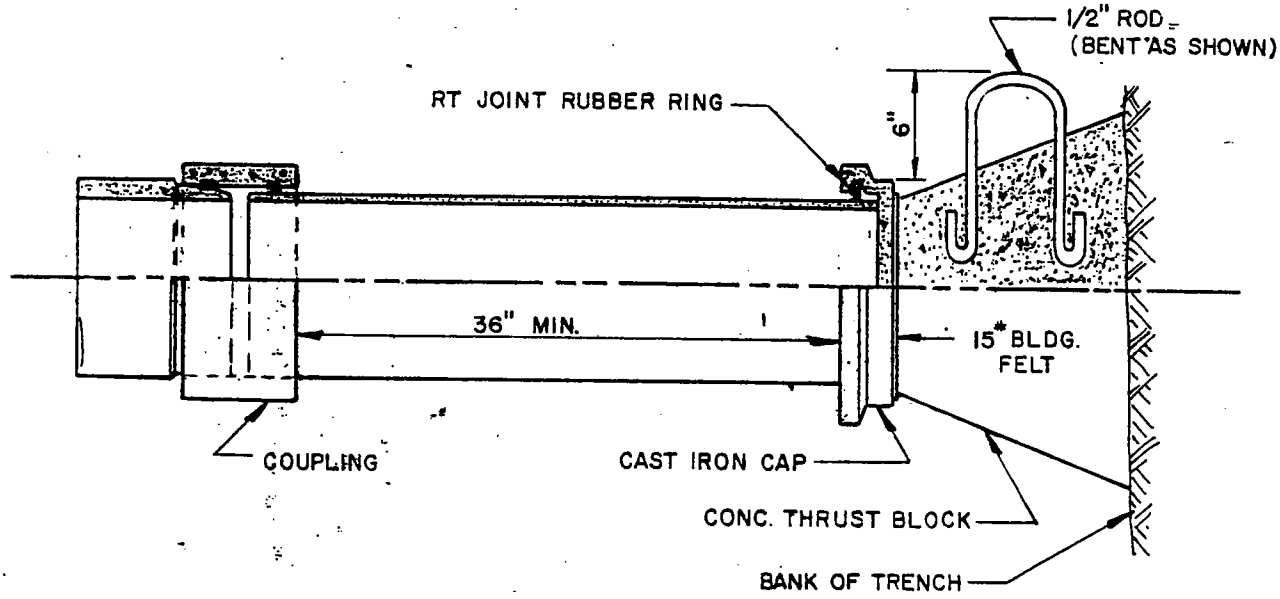
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

GATE VALVE BLOCKING & COVERS

PLATE NO. W9 - 13



UNDER & OVER CROSSING DETAIL



BULL PLUG ASSEMBLY DETAIL

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

UTILITY CROSSINGS
AND
BULL PLUG ASSEMBLY

PLATE NO. WS-14

APPENDIX C. WATER RESOURCES

GENERAL PLAN

Demands for water resources within the County of Tulare (County) are met from four (4) major sources. These sources include groundwater, local streams and rivers, imported surface water and imported surface water by exchange. The purpose of this chapter is to provide an overview of those resources and their relationship to existing and projected development within the County. This overview includes the status of each of the major sources and any anticipated change in status over the planning horizon covered by the General Plan update. In addition, issues addressed include groundwater quality, groundwater overdraft and the reliability of identified surface water sources. The current status of the San Joaquin River litigation has been included and its possible implications for the future presented.

Geographically, the information in this chapter is presented by major watershed. The principal valley floor divisions are the Kings River Watershed, the Kaweah River Watershed, the Tule River Watershed and the Deer Creek/White River Watershed. Defined population centers in the foothill-mountain region has been addressed, namely, the Three Rivers corridor, the Springville corridor, the Kennedy Meadows basin, Camp Nelson and California Hot Springs. Sparsely populated areas of the County foothill and mountainous areas have not been addressed. Sequoia National Park, Sequoia National Forest, Giant Sequoia National Monument and the Tule Indian Reservation are also not specifically addressed as land use changes in these jurisdictions are not part of this General Plan update.

The Central Valley Project (CVP) supply made available through Friant Division contracts is addressed as the imported surface water supply and the federal contractor entitlements made available through the Cross Valley Canal program are discussed as the exchange surface water supply. As boundaries associated with water purveyors do not always follow watershed boundaries, the principal contractor land mass is the basis for the watershed identity.

DEFINITIONS OF KEY TERMS

- **Acre-feet**. The amount of water needed to cover one acre with one foot of water, or approximately 325,851 gallons.
- **Aquifer**. A geological formation that stores water and yields significant quantities of water to wells or springs.
- **Appropriated Right**. That right to put to reasonable beneficial use a quantity of water subordinate to the use thereof by prior appropriators and defined riparian diverters.
- **Central Valley Project.** The water supply project in California owned by the United States and managed by the Department of the Interior, Bureau of Reclamation.
- **Class 1 Water.** That supply of water stored in or flowing through Millerton Lake which,

subject to defined contingencies, is available for delivery from Millerton Lake and the Friant-Kern and Madera Canals as a dependable water supply during each year.

- **Class 2 Water.** That supply of water which can be made available, subject to defined contingencies, for delivery from Millerton Lake and Friant-Kern and Madera Canals in addition to the supply of Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water is undependable in character and is furnished only if, as, and when it can be made available as determined by the Department of the Interior, Bureau of Investigation.
- **Confined Aquifer**. A water-bearing subsurface stratum that is bounded above and below by formations of impermeable, or relatively impermeable, soil or rock.
- **Groundwater Overdraft**. The condition of a groundwater basin in which the amount of water withdrawn (by pumping) exceeds the amount of water that recharges the basin.
- **Groundwater Recharge**. The natural or intentional infiltration of surface water into the zone of saturation (i.e. into groundwater).
- **Non-Transient System.** A water system serving customers who will be exposed to the water supply for an extended period of time.
- **Reasonable Beneficial Use.** This is the measure and limit of an appropriative right.
- **Safe Yield.** The maximum dependable draft that can be made continuously on a source of groundwater supply during a period of years during which the probable driest period or period of greatest deficiency in water supply is likely to occur.
- **Transient System.** A water system serving customers who will be exposed to the water supply for only a short period of time.

FIGURES

As a supplement to the text of this chapter, several figures have been developed which are presented at the end of this chapter. The figures and their relationship to the topics in the chapter presentation are as follows.

- **FIGURE: Water Resources.** The Water Resources figure has been developed to present the mountain and foothill watershed boundary information as a primary function. Shown on the figure are the locations of Lake Kaweah and Lake Success, which are operated as flood control/water conservation facilities, depending on the month of the year. Also shown is the location of Sand Creek Dam which functions solely as a flood control facility. The figure further presents the general location of major valley floor stream and irrigation distribution systems, along with the location of a few communities and elements of the surface transportation system for reference purposes.
- **FIGURE: Valley Watershed Boundaries.** As the presentation of water resources on the valley floor is based on defined watershed boundaries, this figure has been presented to define the specific location of those boundaries.

- **FIGURE: Public Utility Districts.** Provision of defined utility services are provided to customers within many of the valley-floor unincorporated communities by public entities formed pursuant to the statutory provisions related to public utility districts. This figure provides the location and community name for each of those areas so served.
- **FIGURE: Zones of Benefit and Community Services Districts.** Prior to formation, community leaders within those unincorporated communities with defined public agency services determine the type of instrument to offer services under. This figure presents the location and name of those communities served by zones of benefit and those formed to provide services pursuant to the community services district act provisions. Information depicted on this figure identifies which of the entity structures has been chose.
- **FIGURE: California Water Districts.** Surface water provided by public entities, like domestic water, can be provided by different types of public agencies. The land areas which are served by California water districts are depicted on this figure. One of the principal features of California water districts is related to the landowner voting basis which allows for votes to be cast on a land measurement or land valuation basis.
- **FIGURE: Irrigation Districts.** The principal public entity type providing irrigation water to lands within the County is that of the irrigation district. The voting structure for this type of district is based on the one-vote principal which differs significantly from that of appurtenant to a California water district.
- **FIGURE: Groundwater Elevation Contours.** A general depiction of the elevation of groundwater above sea level is presented in this figure. The contours presented are for readings taken of elevations of unconfined aquifers. The westerly portion of the County has wells which principally are sealed through this unconfined zone and extract water from the pressurized, confined zone located below the Corcoran Clay layer. In addition to providing the information for the noted time period, the purpose of the figure is to indicate the type of information which is of available from public sources such as the State Department of Water Resources.
- **FIGURE: Average Groundwater Elevations, City of Visalia**. Of particular concern to local agencies of jurisdiction, as well as to the County, is the condition of groundwater beneath the organized communities and cities. Typical of all communities with groundwater as the principal source of supply, conversion of land from agricultural use to urban use has brought about a change in the sources supply from a conjunctive basis of surface supply and groundwater supply to one which is generated exclusively from groundwater. The impacts of such conversion where not offset by groundwater recharge mitigation measures, results in a decline in the volume of water available in the groundwater reservoir and an increase in the distance from which that groundwater needs to be mined. This figure is presented is an indication of the type of information which is available for the cities and communities located within the County.

FOOTHILL MOUNTAIN REGION

General

The predominant water supply system providing service to the foothill and mountain regions of the County is the individual system. Principal among these systems are those which utilize groundwater which is, in most cases, untreated. There exists, however, occurrences of treatment systems, which are for the most part, maintained by commercial contract service and include both transient and non-transient systems.

In order to provide background information for community planning in specific locations, this Chapter contains information on the systems associated with the areas of California Hot Springs, Camp Nelson, Kennedy Meadows, Springville and Three Rivers.

California Hot Springs

The California Hot Springs area is served by a number of small water systems, in addition to individual systems. The Campanero Oaks Mutual Water Company is the only system classified as a State small water system. The system serving the Hot Springs School is the only system classified as a non-transient system over which has County oversight. The balance of the permitted systems are all classified as transient systems and include the Deer Creek Lodge, the Quail Valley Recreation Village and the U.S. Forest Service Deer Creek/Levis Flats Center. Each of these systems utilizes groundwater as the source of supply.

With respect to quality, each of the systems complies with applicable water quality requirements. Attention is paid, on a continuous basis, as with any foothill or mountain system, to radiological test results.

Camp Nelson

The Camp Nelson Water Company diverts water from Belknap Creek for its source of supply. Once diverted, the supply is treated by means of filtration and disinfection to a level compliant with applicable state and federal drinking water standards. The system operates under a permit issued by the Department of Health Services of the State of California. In addition to being operated and monitored by trained personnel, the Company contracts with a licensed operator for operations and regulations compliance oversight.

The system operates with a storage component which offers several advantages. These include allowance for a uniform level of treatment, reliability for deliveries due to the quantity kept in storage during peak demand events and for maintaining the instantaneous diversion rate within the prescribed water rights held by the Company. The latter is a major constraining factor relative to entertainment of additional connected development.

Kennedy Meadows

Systems within the Kennedy Meadows area are classified as both individual and transient. The

source of water for both types of systems are from groundwater. The transient systems report compliance with applicable state and federal drinking water quality standards.

Springville

In the Springville area, a mixture of water supply sources are utilized to meet consumer demands. For rural residential applications, the predominant source of supply is groundwater. In a limited number of cases, individual water treatment plants exist, some with maintenance oversight by commercial vendors. Some systems, like the Triple R Water Company system utilize wells for the source of supply. In several cases, development has been limited due to the limited amount of groundwater which is available and the seasonal and dry/wet cycle impacts on the dependable safe yield of groundwater wells.

This cyclic effect is addressed by the Springville Public Utility District for the Springville community area proper through the utilization of a state permitted surface water treatment facility. This facility utilizes state of the art filtration and disinfection facilities to achieve compliance with applicable state and federal drinking water standards. In addition to providing service to the customers within the Springville Public Utility District boundaries, the facilities also wheel water rights of others through the plant for delivery outside of the Springville Public Utility District boundaries. These customers include the Tulare County Housing Authority, utilizing water rights owned by the County of Tulare, riparian water rights holders along the Middle Fork of the Tule River and riparian and appropriative rights associated with the Borrer Ranch.

The Springville Public Utility District recently participated in the completion of a Watershed Sanitary Survey of the entire Tule River drainage above the Friant-Kern Canal. The report was released in August, 2005. It is also in the process of evaluating the necessity for additional treatment processes, namely clarification, in order to maintain compliance with the Surface Water Treatment Rule.

The Springville Public Utility District utilizes pre-1914 water rights conveyed to the Springville Public Utility District upon its formation. With the inclusion of both raw water and polished water storage, the diversion is maintained within the stated water right, assisted by metering of the customer base and subsequent billing by metered quantities. Water rights remain reserved for the eventual development of lands currently within the Springville Public Utility District boundaries. The remaining rights appear to be sufficient to meet the anticipated demand. Such development has been constrained since 1982 with a self-imposed sewer utility moratorium brought about by the Board of Directors in response to the lack of an adequate method of disposing of the treated wastewater stream.

Three Rivers

Service to residential and commercial users within the Three Rivers area is principally accomplished through the extraction of groundwater. This groundwater is characterized as both from deep, hard rock sources, as well as from localized alluvium associated with the forks of the Kaweah River. In some instances, principally commercial in nature, service is provided by way of the diversion of surface water which is treated to meet applicable state and federal drinking water standards. For the

commercial installations, permits have been issued by the County of Tulare and compliance with operational requirements and adherence to water quality parameters are ensured by the Division of Environmental Health of the County. Water quality test results are monitored to insure compliance with applicable quality standards.

A number of single-family dwellings within the area are also equipped with point of entry water treatment units. These units have been proven to be necessary due to the quality issues related to the water available for consumption, with consumption only being tolerable following treatment. Quality parameters which are of concern are bacteriological, viral and pathogenic in nature. In addition, the impacts on plumbing fixtures and bathroom and kitchen fixture finishes are able to be minimized with the purchase and maintenance of treatment units. Another factor influencing the number and type of treatment units is the change in construction safety standards which have brought about the demise of radial spoke wells, commonly referred to as "wagon wheel" wells. The drafting of water from subterranean stream flow utilizing this type of facility, which is no long an available option, enabled many residents to avoid searching for the groundwater available from the limited number of rock fissures.

KINGS RIVER WATERSHED

General

The Kings River Watershed has been so identified, as the dominant source of surface water to this area of Tulare County is from the Kings River. The area is predominantly agricultural in nature with many of the residents of the Kings River Watershed being employed directly in agriculture, or in agriculturally supported industries. Crops grown in the area range from permanent plantings of citrus and stone fruit, to row crops which include labor intensive truck crops. Lands within the Kings River Watershed exhibit the full range of resource utilization including lands which are able to be sustained totally on groundwater with no surface water supplement and those which rely entirely on surface water due to the lack of the availability of groundwater. In general, the majority of the lands are operated in a conjunctive use fashion, utilizing surface water, when available and resorting to the use of groundwater when surface water supplies are unavailable.

Surface Water Sources

Surface water sources in the area are predominantly from one (1) of two (2) sources. The principal source is from the Kings River, utilizing flows managed by the operations of Courtright and Wishon reservoirs in the High Sierra and by operation of Pine Flat Reservoir, located in the foothills of eastern Fresno County. The supply of water from the Kings River is made available in the County utilizing the water rights of the Alta Irrigation District. Based on the last 25 years of record, annual deliveries of the Alta Irrigation District average 163,500 acre-feet. Surface supplies are also imported into the Kings River Watershed utilizing both Friant Division and Cross Valley supplies made available by the Federal Central Valley Project. Table I presents the water contract information related to those CVP contractors which exist within the Kings River Watershed. As is noted in Table I, both of the entities importing water into the County from CVP sources serve lands located within the County, as well as lands located within Fresno County.

Groundwater Conditions

The groundwater reservoir which is appurtenant to the Kings River Watershed does not respect the political boundary between the County and Fresno County. Operations of each of the irrigation districts serving lands within the Kings River Watershed acknowledge the flow of groundwater from Fresno County into aquifers underlying the lands located within the County. The safe yield of the aquifers immediately adjacent to the foothill areas are limited, which is borne out by the nature of the allocation of surface water by the Alta Irrigation District and the increased firm contract entitlement of the Orange Cove Irrigation District. It is further borne out by the almost 2:1 ratio of surface water requested by landowners within the Hills Valley Irrigation District between contract supply and anticipated firm yield.

TABLE I: CVP Contract Quantities (1) Kings River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
Hills Valley I.D. (4)	0	0	6,259	0
Orange Cove I.D. (4)	39,000	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.
(4) District serves lands in Fresno County and Tulare County.

Safe yield typically increases with increasing distance from the foothills; however, withdrawals in excess of safe yield also increase, as a general rule, within increasing distance from the foothills. The static levels of groundwater within the Kings River Watershed exhibit a gradual decline, with time. For this reason, the Groundwater Management Plans of each of the entities within the Kings River Watershed emphasize conjunctive use operations and the entities each actively pursue groundwater recharge as a function of the management aspects of the adopted Groundwater Management Plans. These plans include policies to encourage recharge where conditions are conducive to such recharge efforts and to allow for delivery of surface water to areas which are not able to enjoy such recharge conditions. The principal purpose of plan policies is to abate the general decline in the amount of water in storage in the groundwater reservoir and associated static levels.

Water Quality

No single expression satisfies the water quality conditions which exist within the Kings River Watershed. In general, groundwater along the immediate fringe of the foothills tends to be high in nitrates and, in certain cases, radiological parameters. Naturally occurring contaminants are reduced in their intensity as flows extend onto the valley floor, due principally to the influence of recharge of surface water which, for the most part, is absent any naturally occurring contaminants.

Contamination problems which are experienced, once groundwater is a reasonable distance from the foothill fringe, are generally man-induced. Contaminants include those associated with fertilizers, pesticides and herbicides, many of which have been banned with residual effects now remaining. The presence of fertilizers in some samples exists due to application timing issues, as well as infrequent occurrences of over application. There are no communities which are not impacted, to some degree, by either naturally occurring or man-induced contamination within this watershed.

Project Development Considerations

There are a number of projects in stages of investigation and/or development which could play a role in the future planning efforts of the County. The first of these are the coordinated efforts of Fresno County and Tulare County surface water entities in conjunction with specific cities, in a collaborative identified as the Integrated Regional Water Management Plan for the Kings River Basin. This collaborative covers efforts in Fresno County, Kings County and Tulare County. Of principal impact on Tulare County planning issues is the groundwater recharge efforts of the Alta Irrigation District which is in the implementation stage for some projects and in the planning stages for other projects, all designed to increase the amount of water being recharged into the area south of Avenue 384 and extending between Highway 99 on the west and Road 80 on the east.

In addition to these efforts, the Alta Irrigation District has entered into a Memorandum of Understanding with the Cutler Public Utility District and the Orosi Public Utility District for the initial evaluation of a surface water treatment plant. The evaluation which is to be conducted calls for the technical and economic feasibility evaluation of a surface water treatment plant located in proximity to the Friant-Kern Canal at Avenue 416. Utilizing water from the Kings River supplies of the Alta Irrigation District, introduced into the Friant-Kern Canal by exchange, the treatment facility would provide water to the communities of East Orosi, Orosi, Cutler and Sultana. Water could also be provided to the City of Dinuba, as currently proposed. The evaluation called for in the executed Memorandum of Understanding has just been initiated and the results of the evaluation procedures will not be available for several months. If demonstrated to be a feasible alternative, the eventual construction of such a plant would resolve the groundwater quality issues which currently exist in each of the named communities and the City of Dinuba.

KAWEAH RIVER WATERSHED

General

The principal surface water feature within the Kaweah River Watershed is the Kaweah River which combines with the uncontrolled runoff from Dry Creek as it is released from Terminus Reservoir. Terminus Reservoir impounds the Kaweah River to form Lake Kaweah. The average annual yield of the Kaweah River is 430,009 acre-feet based on 100 years of record, with the principal portion of the yield of the river being delivered in the County. Enlargement of the reservoir to 183,800 acre-feet from 142,500 acre-feet was recently completed.

The portion of Kings County which receives a surface water allocation from the Kaweah River is in the same groundwater basin as lands within the County and the deliveries are of significant importance to the overall area water management efforts. Additional surface water is introduced into the Kaweah River Watershed as a result of CVP deliveries to entities located within said Watershed. These entities are listed in Table II and include both long-term Friant Division CVP contractors, as well as Cross Valley contractors. Currently, the City of Visalia exchanges their CVP Cross Valley contractual supply with the Hills Valley Irrigation District, with the City making use of Kaweah River supplies held by a grower within the Hills Valley Irrigation District. The City's entitlement is delivered to lands in Hills Valley Irrigation District which are located in the northern portion of the County.

Lands in the westerly portion of the Kaweah River Watershed enjoy delivery of water from the Kings River which further augments the supply available from the Kaweah River.

TABLE II: CVP Contract Quantities (1) Kaweah River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
City of Visalia	0	0	300	0
Exeter I.D.	11,500	19,000	0	0
Ivanhoe I.D.	7,700	7,900	0	0
Stone Corral I.D.	10,000	0	950	0
Tulare I.D.	30,000	141,000	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group Contractors.
(3) Fresno-Tulare "B" Group Contractors.

The quality of the surface water is very high. This includes water from stream groups feeding on to the valley floor, as well as the ater introduced into the Kaweah River Watershed from the Friant-Kern Canal.

Cropping patterns exhibit a stratified pattern leading from east to west beginning with a significant citrus belt extending from the lower foothills on to the valley floor. A sprinkling of olives and stone fruit threads through the citrus belt. Once temperature conditions become nonconductive for citrus, crops begin to transition into a nut and stone fruit pattern, with some interspersed vines and field crops. Extending farther to the west, dairies and lands growing crops to support the dairies begin to appear, interspersed with nut varieties and vines. On the westerly side of the Kaweah River Watershed, lands historically have been farmed to cotton along with a variety of rotational crops. With the poor returns associated with cotton, transitions to permanent plantings and higher value row crops are beginning to emerge. Depth to groundwater impacts and associated cost impacts related energy consumption are further contributing to this shift in cropping patterns.

Surface Water Sources

As noted, the dominant surface water source for the Kaweah River Watershed is the Kaweah River and its tributaries. The Kaweah River, which is officially considered to be a tributary to the Tule River, has been declared by the State Water Resources Control Board to be a fully appropriated stream. The diverters are made up of a mixture of riparian and appropriative diverters with many of the riparian diverters having agreements with the Kaweah and St. Johns Rivers Association. These agreements acknowledge which of their lands are riparian in nature and further address amounts of water which can be diverted from the Kaweah River to be put to reasonable beneficial use. The Association is comprised of two (2) associations operating in a joint manner to administer the appropriative water rights of the Kaweah River. These individual associations are the Kaweah River Association and the St. Johns River Association.

Augmenting the local supply are waters made available by the CVP contracting entities located within the Kaweah River Watershed. These entities are shown in Table II with CVP annual

deliveries averaging 124,980 acre-feet. The City of Visalia exchange arrangement with the Hills Valley Irrigation District allows the City to hold their water in trust until a determination is made as to its future disposition.

Groundwater Trends

The Kaweah Delta Water Conservation District (KDWCD) recently completed a Water Resources Investigation which specifically examined the groundwater conditions within the KDWCD boundaries and the lands in reasonable proximity thereto. The report addressed groundwater conditions by specific hydrologic unit within the KDWCD, as well as on a KDWCD-wide basis. While the easterly unit showed approximate balance, computations utilizing different methodologies showed that the overall underground reservoir was overdrafted at a level of between 17,000 to 36,000 acre-feet per year. Groundwater trend information for the City of Visalia area is presented on Figure 4-8. As can be seen from an analysis of this figure, the static groundwater trend is ever decreasing, as is the corresponding quantity of water being held in storage in the groundwater reservoir. Parallel conditions exist on the westerly side of the Kaweah River Watershed, which have abated somewhat with the development of the State Water Project and the delivery of Project supplies to lands in Kings County. The delivery of the State Water Project supply has helped to abate the more serious decline in groundwater levels which were occurring in eastern Kings County prior to the availability of said supply. Said deliveries have helped to further abate the outflow of water from lands within Tulare County to lands within Kings County.

Water Quality

As with the Kings River Watershed, water quality trends within the Kaweah River Watershed change from east to west. Lands immediately adjacent to foothills exhibit elevated chloride and nitrate characteristics. As groundwater is tapped toward the central portion of the valley floor of the County, the water normally produced is of excellent quality. Anomalies occur where man-induced contamination has adversely influenced the quality characteristics. Influences from nematodecides such as DBCP, herbicides, pesticides and fertilizers all appear at certain locations within the Kaweah River Watershed, as do the impacts from industrial chemicals such as dry cleaning solvents and petroleum fuels.

Some water purveyors within the area have installed surface water treatment facilities on selected water extraction facilities; however, the principal method for dealing with contaminant-related issues is to shift to another area where water quality problems are absent. The County and the State of California conduct extensive programs of oversight for petroleum hydrocarbon contamination which is an on-going process which has further impacted the availability of groundwater for consumptive purposes in numerous locations.

Project Development Considerations

In a move unprecedented amongst San Joaquin Valley floor communities, the City of Visalia has adopted a very aggressive stance designed to abate the downward trend in static water elevations and declining quantity of water available in the groundwater reservoir. These procedures started with a Proposition 218 based process wherein $100,000 per year was authorized to be generated, at a

minimum, from a customer surcharge to develop groundwater management programs, purchase surface water for recharge and purchase water rights for delivery into areas impacting the groundwater reservoir underneath the City. As an augmentation step, the City has now imposed a land-based charge on lands being converted from agriculture to urban uses to address the shift of water supply from a conjunctive use basis to that of exclusive groundwater. The funds are to be utilized for projects which address the mitigation steps required to abate the decline in the groundwater elevations beneath the City and, hopefully, over time, to reverse the trend of decline.

Additional projects are being addressed by the KDWCD, in partnership with the City of Visalia, in the development of multipurpose sites identified as Oaks Basin and Peoples Basin. These basins have the capability to function not only as groundwater recharge facilities, but also as storm water layoff facilities providing relief in the natural channels coursing through the City during precipitation and resulting runoff events.

As a further step to insure optimization of importation of water into the Kaweah River Watershed, the Ivanhoe Irrigation District and the KDWCD have entered into an agreement calling for an exchange of resources. The basics of the agreement call for dry year, low-flow rights to accrue to the Ivanhoe Irrigation District along with a component of storage behind Terminus Dam. The storage component will allow for better management of water rights of the Ivanhoe Irrigation District. In exchange, the KDWCD is to be the recipient of an assignment of a portion of the Friant Division CVP contract of the Ivanhoe Irrigation District.

In order to further augment the groundwater capabilities within the Kaweah River Watershed, the Tulare Irrigation District has entered into a reimbursement agreement with the KDWCD. This agreement was entered into in lieu of the proposed Main Intake Canal lining project of the Tulare Irrigation District and compensates for water seeping from the canal, thus rendering it unavailable for delivery and sale as surface water within the Tulare Irrigation District.

As a final management issue, the entities within the Kaweah River Watershed have joined together to manage available water supply under an Integrated Regional Water Management Plan. The participants have and are applying for funding under the provisions of Proposition 50 to further implement the specifics of the Plan. Funding announcements for the first round yielded mixed results. At the current time, the Cities of Exeter, Ivanhoe and Woodlake have requested to participate in the area-wide Groundwater Management Plan conducted by the KDWCD. Said cities have taken this step as a first step in participation in the integrated basin-wide management efforts.

TULE RIVER WATERSHED

General

The dominant natural watershed impacting the Tule River Watershed is the Tule River. As previously noted, the Tule River has been declared a fully appropriated stream by the State Water Resources Control Board. The waters of the Tule River are impounded behind Success Dam in Success Reservoir and regulated downstream for beneficial purposes during the irrigation season and according to an adopted flood control diagram during the flood control season. These waters are augmented by waters of the San Joaquin River which are imported by the Friant Division contractors

located within the Tule River Watershed.

For the most part, the groundwater located underneath lands in the Tule River Watershed is managed in a conjunctive use fashion with available surface water supplies. Water quality issues parallel the circumstances associated with other lands located within the County with more communities adversely impacted by nitrate conditions than the other watersheds.

Cropping patterns parallel those within the Kaweah River Watershed with citrus and olives being the principal crops on the east side of the watershed with nuts, stone fruit and dairy support crops tending towards the mid-section. Dairies, dairy support lands and field and row crops dominate the landscape on Valley floor lands to the west.

Surface Water Sources

As noted above, the principal source of surface water available within the Tule River Watershed is the yield of the Tule River, controlled by the operations of Success Reservoir. Operation of the reservoir during the conservation period is performed by the U.S. Army Corps of Engineers at the direction of the Watermaster of the Tule River acting on behalf of the member units of the Tule River Association. Operations during the flood control season are under the direction of the U.S. Army Corps of Engineers with entitlement and diversion issues being addressed by the Watermaster. The average annual yield of the Tule River below Lake Success is 141,960 acre-feet based on 102 years of record. With the exception of infrequent uncontrolled winter runoff, when in-basin irrigation and spreading demands are met, the entire yield of the Tule River is put to reasonable beneficial use within the Tule River Watershed.

The local supply is augmented by the importation of Friant Division CVP water by several Friant Division contractors. A listing of those contractors and their contract amounts are presented in Table III.

In an effort to further optimize the management of water within the Tule River Watershed, several of the entities within the Watershed have organized to form the Deer Creek and Tule River Authority. Said Authority operates with both a Board of Directors and an Advisory Committee who have joined together to consider the optimization of the available water supplies, both local, as well as imported. Further, they have developed a Groundwater Management Plan which is currently undergoing its first major revision. One of the revisions being considered in the Plan is the inclusion of several of the domestic water purveyors located within the Tule River Watershed. A meeting has been held with the City of Porterville with regard to their potential interest in participation and discussions have taken place with regard to the inclusion of entities such as the Poplar Community Services District, the Tipton Community Services District and the Woodville Public Utility District. The goal is to coordinate, on a regional basis, issues related to both water quality and water quantity.

TABLE III: CVP Contract Quantities (1) Tulare River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
City of Lindsay	2,500	0	50	0
Lindmore I.D.	33,000	22,000	0	0
Lindsay-Strathmore I.D.	27,500	0	0	0
Lower Tule River I.D.	61,200	238,000	572	31,180
Pixley I.D.	0	0	572	31,180
Porterville I.D.	16,000	30,000	0	0
Saucelito I.D.	21,200	32,800	100	0
Strathmore I.D.	0	0	400	0
Tea Pot Dome W.D.	7,500	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.

Water Quality

The east side of the valley floor in the Tule River Watershed contains the highest population of individuals impacted by lower quality groundwater of any area within the County. From the foothill fringe, adverse groundwater quality extends into the valley floor for several miles in all locals, except for those immediately adjacent to the Tule River. As a result of these conditions, the City of Lindsay, the Lindsay-Strathmore Irrigation District and the Strathmore Public Utility District have all constructed and operate surface water treatment plants treating water from the Friant-Kern Canal. In the Lindsay area, adverse water quality parameters include chlorides, nitrates and DBCP. The numbers of wells constructed in this area which have been successfully designed to avoid groundwater containing these parameters are limited. In the Tonyville and Strathmore areas, where population concentrations are served by the Lindsay-Strathmore Irrigation District and the Strathmore Public Utility District, the primary groundwater contaminant is nitrate. These areas are served with potable water by surface water treatment plants operated by both public entities.

The east Porterville and Plainview areas exhibit similar high nitrate characteristics. Extensions of pipelines from the City of Porterville into the east Porterville unincorporated area have solved the problem for several customers in that area. The California Water Service Company has a system in the area and they are in the process of evaluating different methodologies to allow for compliance with the Maximum Contaminant Level for the nitrate parameter in their system. The Sunnyside School governing board chose to extend a pipeline from the Strathmore joint water treatment plant to the school to resolve their nitrate contamination problem. Just to the west, efforts are now being initiated to address the problems which exist in the Plainview community area.

It is anticipated, over time, that an increase in the number of well head treatment and surface water treatment facilities will develop in order to address the demands associated with both existing population and increased population within this area of the Tule River Watershed. Extending to the west, water quality improves to the extent that the only current concerns are those related to proposed changes in water quality parameters for radon and arsenic. These changes could lead to some systems, which are currently in compliance with all state and federal drinking water criteria,

finding themselves out of compliance for one or more parameters.

Project Development Considerations

At the current time, the Groundwater Management Plan for the Deer Creek and Tule River Authority is in the process of being updated. Policy considerations relative to the update have been addressed and the draft final document is in the process of preparation. Following the adoption of the Plan revision, a determination has been made to invite domestic water purveyors in the area to consider participating in the Plan implementation which would be by way of approval and execution of a Memorandum of Understanding. Efforts are called for to jointly coordinate efforts to improve conjunctive management efforts.

The existence of the Deer Creek and Tule River Authority, the Tule River Sub-watershed of the Southern San Joaquin Valley Water Quality Coalition and joint efforts with the County of Tulare are the basis for the development of an Integrated Regional Water Management Plan. An application was recently submitted to the state for the funding of the development of such a plan. Funding was not allocated in the initial round of competition, but efforts to fund and develop that plan continue with the support of the majority of the irrigation and drinking water purveyors within the Tule River Watershed. A new application has been authorized to be prepared and submitted. Additional benefits are expected to be realized with the implementation of the seismic retrofit of Success Dam and the proposed enlargement of Success Reservoir. An appropriation of $25 million was recently announced by Congress for the seismic retrofit project. Current estimates of the time to completion range from 7 to 12 years, principally based on funding levels which are approved. Coordination with the County is also proposed with the initial efforts directed at the County's efforts to implement an improved program related to the destruction of abandoned wells.

DEER CREEK/WHITE RIVER WATERSHED

General

The Deer Creek/White River Watershed is characterized by having runoff available from local stream groups which have their origins in the lower elevations of the Sierra Nevada. As a result, the area is further characterized by having the least number of communities of any of the watersheds located adjacent to the foothill fringe and the highest dependency on imported surface water for maintenance of the viability of agricultural plantings.

Water quality issues exist on both the east and west sides of the Deer Creek/White River Watershed. The communities located along the Highway 99 axis, however, enjoy reasonably compliant water quality if wells are designed to extract water out of shallow and deep aquifers.

Cropping patterns still exhibit the long-term dry land farming characteristics along the east side of the Deer Creek/White River Watershed, but are now interspersed with plantings of citrus and nuts as a result of the availability of imported CVP water. Said supplies are made available by both the Friant Division and the Cross Valley exchange program. High value permanent plantings dominate the central part of the area, with an increasing number of dairies and associated support lands characteristics of the landscape to the west. Historically, this area was formed principally to upland

cotton. The decreasing returns related to the production of cotton and the increasing costs, particularly that related to water, have resulted in significant reductions in the acreage planted to cotton over the last decade.

Surface Water Supplies

Limited and intermittent surface water is available from the flow of Deer Creek and White River. The area east of Highway 65 on Deer Creek experiences spring and early summer recharge with the channel exhibiting excellent recharge characteristics. Diversions downstream of Highway 65 natural flows are limited both in quantity and duration. In only the wettest of years do any substantial flows exist below Highway 99 and then, flows often result in property damage as a result of their intensity and duration.

As its watershed origins are lower than that of Deer Creek, coupled with its more southerly location, White River offers limited reliability for agricultural purposes. The upper part of the White River Watershed has historically been dry farmed, with the exception of a few areas where the groundwater reservoir is stronger in nature due to intermittent recharge from White River.

Dependable surface water for the Deer Creek/White River Watershed only became available with the construction of the Friant Division of the CVP. Contracts issued as a result of the construction of the Friant Dam and the Friant Kern Canal were designed to abate the overdraft which was occurring in the area and, in some cases, to reverse the declining groundwater trend. Contracts were originally issued for a 40-year period of time for the Friant Division contracts and for a 20-year period, beginning in 1975, for the Cross Valley contracts. Contract quantities for these respective contracts are presented in Table IV. Due to weak natural groundwater conditions, the majority of the agricultural development within the Deer Creek/Tule River Watershed is dependent on surface water supplies for its long-term viability. In some cases, this supply demand is satisfied by the yield of the Tule River, in some cases by the federal CVP contracts and in other cases, a combination of the two. Areas relying principally on surface water have also, in some cases, made arrangements to bank within the boundaries of other Friant Division contractors who have conjunctive use capabilities in order to provide a reliable dry year source of supply.

Lands developed along the Highway 65 corridor located to the east of the long-term Friant Division contractor lands and extending into Kern County were dependent originally on groundwater as their supply source. As this supply proved to be incapable of sustaining the development which had occurred without severe overdraft conditions and adverse water quality conditions developing, the opportunity arose to contract with the Federal Government for a supply of water from the Sacramento-San Joaquin Rivers Delta. The contracts which were entered into were accomplished in conjunction with the construction of a canal and appurtenant pumping facilities extending from the California Aqueduct near Tupman and to the end of the Friant-Kern Canal at its terminus with the Kern River. This “cross valley” canal facility was financed by local Kern County and Tulare County entities with a small increment of capacity for future foothill and mountain development purchased by the County of Fresno. The initial 20-year long-term contract has been replaced with a series of Interim Renewal Contracts pending renegotiation of the long-term contract position. Draft long-term contract instruments are currently on the negotiating table.

TABLE IV: CVP River Quantities (1) Deer Creek/White River Watershed

	Friant Division		Cross Valley	
Entity	Class 1	Class 2	FT-A (2)	FT-B (3)
Atwell Island W.D.	0	0	50	0
Alpaugh I.D.	0	0	100	0
Delano-Earlimart I.D. (2)	108,800	74,500	0	0
Frasinetto Farms, LLC	0	0	400	0
Kern-Tulare W.D. (4)	0	0	40,000	0
Rag Gulch W.D. (4)	0	0	12,500	0`
Styro-Tek	0	0	45	0
Terra Bella I.D.	29,000	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.
(4) District serves lands in Kern County and Tulare County.

Within the boundaries of the County, contracts for Cross Valley supplies were initially entered into by several districts located in the Deer Creek/White River Watershed which are no longer participants. Entities such as the Hope Water District and the Ducor Irrigation District held contract positions for several years. A final determination was made that the mechanisms to deliver water from the Friant-Kern Canal were financially insurmountable and long-term assurances of the reliability of the base supply were not conducive to assurances required by some entities for long-term debt instruments. The supply rights and obligations associated with their original contract quantities were assumed by other entities within the County with a small quantity being assigned to the Tri-Valley Water District, located in Fresno County.

The alluvial plain of Deer Creek is comprised of a high fraction of sand. As such, recharge characteristics into the shallow zone aquifers are excellent and water available from those zones is of relatively high quality and at reasonable depths. The Terra Bella Irrigation District has a significant well field located on the Deer Creek alluvial fan located easterly of Old Stage Road. This well field provides the principal supply of water to the Terra Bella Irrigation District customers during periods of outage of the Friant-Kern Canal. This well field has recently been augmented by the modification of facilities necessary to store water in the prism of the Friant-Kern Canal during periods of canal outage for maintenance purposes.

The recharge characteristics of the Deer Creek fan have also been the focus of a joint groundwater recharge facility located on lands adjacent to the current alignment of Deer Creek and operated by the participating entities in the Deer Creek and Tule River Authority. Said facilities lie adjacent to the Friant-Kern Canal and allow the participating districts, all CVP contractors, to introduce water from the Friant-Kern Canal into the spreading basin area for groundwater augmentation. A separate agreement exists between the participating entities as to the allocation of costs associated with the facilities.

The natural channel of Deer Creek downstream from the Friant-Kern Canal is also utilized by the Saucelito Irrigation District for recharge purposes. When spring contract flows are available to the Saucelito Irrigation District, in excess of irrigation demands, the supply is used for recharge with the Deer Creek channel being the principal facility which is utilized for said purposes.

On the White River channel, similar procedures are utilized by the Delano-Earlimart Irrigation District. As the overall recharge capabilities away from the Deer Creek and White River channels are limited due to geologic characteristics, the channels have become the primary focus for recharge activities. The Delano-Earlimart Irrigation District has augmented the White River channel capabilities with the purchase of property adjacent to White River at its intersection with Road 72 and has constructed approximately 80 acres of recharge facilities at that location. Water can be introduced into the groundwater recharge basin either by gravity flow from White River or by introduction from one of the entity's distribution laterals which historically delivered supplemental surface water supply from the Friant-Kern Canal to the property when it was farmed.

Due to the limited recharge capabilities within the area, the Friant Division CVP contract issued to the Delano-Earlimart Irrigation District obligated a significant quantity of water on a firm basis to the area. Said district currently has underway an evaluation of alternative strategies to further optimize the management of available supplies.

Groundwater Trends

The Pixley Irrigation District, the Alpaugh Irrigation District and the Atwell Island Water District are all Cross Valley contractors located in the Deer Creek/White River Watershed. Participation in this CVP contracting program was to be supplemental to participation in the Mid-Valley Canal program, which is currently in an inactive status due to the lack of available supply for long-term contracting. These entities utilize long-term relationships with existing long-term Friant Division CVP contractors located in the area, whose principal purpose in contracting with these entities is to reduce the impact of groundwater withdrawals by adjacent non-Friant Division contractors on their landowners. The delivery of temporary supplies available on a surplus basis from the yield of the San Joaquin River assists in abating further groundwater decline in this area. Out migration of the groundwater supply from entities like the Lower Tule River Irrigation District to the north, the Porterville Irrigation District and the Saucelito Irrigation District to the east and the Delano-Earlimart Irrigation District to the south is also reduced.

There also exists a fairly substantial percentage of the Deer Creek/White River Watershed which receives no surface water supply allocation. This area extends generally from Road 120 on the east to the easterly boundary of the Alpaugh Irrigation District and from the County line on the south to the Pixley Irrigation District boundary on the north. Agricultural development within this area has been sporadic depending on commodity returns. An increasing number of acres in this area have been purchased by the state and federal governments for habitat preservation and restoration purposes. For the most part, species targeted to benefit from these efforts are not dependent on the existence of significant quantities of water, as would be migratory waterfowl. Given the focus of the federal government in the Alpaugh area, it is anticipated that, should this trend continue, demand for a significant reliable surface water source will continue to diminish.

Groundwater Quality

The groundwater quality characteristics appurtenant to the Deer Creek/White River Watershed vary from east to west. In general, water quality on the east side of the valley floor of the County in this area is characterized by diminished quality where nitrates, phenols and salts are present in different

concentrations and in different locals. As a result, the Terra Bella Irrigation District has embarked on a program of initially installing a surface water treatment plant and then, on a continuing basis, constructing an ever expanding distribution system allowing for the capability of delivery of water meeting current federal and state drinking water standards to areas which previously did not have certified potable sources available or to augment limited groundwater supplies. South of this area, drilling and development of wells with a design capability to select water from identified aquifers meeting current drinking water standards is the common approach. Quantities are, however, limited under this paradigm, as taking water from too shallow of a zone, or from too deep a zone, results in significant diminishment of the quality to be delivered.

Water quality trends going to the west from this area improve considerable with communities systems along the axis of Highway 99, such as those of the Pixley Public Utility District and the Earlimart Public Utility District, experiencing no problems with the capability to deliver a potable supply of water. Other than elevated temperature conditions in Earlimart, the supply meets all current state and federal guidelines. The reliance of this area, as to safe yield of groundwater, on imported water supplies cannot be understated. In the early part of the last century, groundwater was available throughout the Highway 99 axis and westerly from there on an artesian basis. Tapping the confined aquifers below the deep clays yielded water which could be delivered to the surface without the assistance of mechanical means. Continued extractions of water eliminated the artesian characteristics and, with the development of the deep well turbine pump, the capability existed to draft water from ever increasing depths which have become characteristic of this area. Absent the imported CVP supplies, groundwater depths would reach levels where current commodity returns would not allow for economic recovery.

On the westerly side of the Deer Creek/White River Watershed, groundwater quality again declines into unacceptable conditions. Principal among these conditions are elevated levels of arsenic and microsand conditions requiring special drilling techniques and/or well head treatment to allow compliance with applicable standards. Many of these wells produce various gases including hydrogen sulfide, methane and natural gas, further aggravating the capability to deliver a potable supply. Recent efforts in the Alpaugh area have demonstrated that the microsand and hydrogen sulfide characteristics can be successfully managed through controlled drilling techniques. The reduction in the allowable level of arsenic appears to require treatment facilities to be installed as all arsenic characteristics of intercepted aquifers appear to exceed the new drinking water standard for the arsenic parameter. Continued research is occurring into a determination of whether or not an affordable method of arsenic reduction can be developed.

Project Development Considerations

As previously noted, the Delano-Earlimart Irrigation District, initially in cooperation with the Metropolitan Water District of Southern California, has initiated an evaluation of alternative water management strategies. These strategies are designed to allow the District to address the lack of capability of groundwater recharge on a District-wide basis, as well as to address the continuing conversion of lands from annual crops to permanent crops. The reliability of supply required by permanent crops is obviously more significant than that associated with annual crops.

Considerable planning is underway relative to development proposals along the Highway 99

corridor in the Deer Creek/White River Watershed. The maintenance of the groundwater reservoir through this area is dependent, as previously noted, on the continued capability to have available surface water sources available for delivery into the area. The impact of current litigation on the availability of surface water to the area remains in question at the time of the preparation of this chapter. Natural recharge of the groundwater reservoirs underlying the communities of Earlimart and Pixley is insufficient to sustain the agricultural plantings in the area and the community water systems. This was the case prior to the introduction of the Friant Division CVP water to the subject area. The case would even be stronger today as additional plantings exist in proximity to the communities, the plantings are predominantly permanent in nature as compared to annual crops and the community demands are greater than existed prior to the delivery of Friant Division CVP supplies. As the outcome of the litigation is currently unknown, the development of a response plan to address reduction of surface water deliveries to the area remains to be developed, if necessary.

LEGISLATIVE DRIVERS

Several issues related to water resources are currently in early stages of development which are principally legislatively driven. Additional legislation is not only currently being proposed, but is anticipated to continue to be proposed in the future, all of which have influence with respect to General Plan efforts. At the current time, there are three (3) topics which are in this category. These topics are those of integrated regional water management planning, water quality and reliability of supply for subdivisions greater than 500 units. A discussion of each follows.

Integrated Regional Water Management Plans

Aside from the stratospheric an inconsequential water resources planning which takes place at the state level, the vast majority of water resources planning has been accomplished at the local level. Given the ever increasing population of California and the shifting of population concentrations to arid and semi-arid areas of the state, attention is now being given to planning on a more regional basis. The state is directing these efforts and is controlling the process utilizing the grant proceeds of state bond actions to affect that control. Funds have been offered for both the development of Integrated Regional Water Management Plans, as well as for implementation of projects in areas where plans have already been developed. Historically, these funds were administered by the Department of Water Resources with a developed set of criteria and an evaluation process designed to balance allocation of funds statewide. A planning grant has been awarded to the Kings River Watershed to develop and Integrated Plan for areas covering the Kings River Watershed in the counties of Fresno, Kings and Tulare. An application for development of a similar plan has been submitted by the entities in the Tule River Watershed; however, they were unsuccessful with their application in the last round. The Kaweah River Watershed has been determined to have in place, an acceptable Integrated Regional Water Management Plan. Their application for program implementation ranked high in the evaluation performed by the Department of Water Resources. A supplemental evaluation process was imposed on these applications, however, with the evaluation being performed by the State Water Resources Control Board. The results of their evaluation prevailed over those of the Department of Water Resources and no implementation funds were awarded in Tulare County. This was due to a determination that there were no “Issues of State Concern” incorporated into the proposed programs. The topic of Integrated Regional Water Management Plan is noted herein as this appears to be the pathway for the award of state-based

funding related to water resources for the coming years. The fact that a determination has been made at the state level that high priority issues on a local level are of no significant consequence on a state-wide level is of significant importance. The absence of any infusion of state bond money related to water resources into the county will significantly curtail both planning and implementation efforts as the county strives to deal with the demands imposed by increasing population on the available water resources. Attempts are currently being made to attempt to understand the criteria of the State Water Resources Control Board and to work at the legislative level to remedy priorities which appear to be tailored to only discreet areas of the State.

WATER QUALITY

The issue of water quality has been noted several times previously in this chapter, most notably related to established state and federal drinking water standards. Considerable legislative activity is currently taking place with respect to water quality issues related to agriculture, municipal and industrial consumptive demands.

On the agricultural side, the Regional Water Quality Control Board has taken action to terminate the 20 year agricultural water quality waiver for the Central Valley and has replaced the long-term waiver with a short-term waiver. As a result of the revisiting of this issue, individuals with both agricultural discharges and storm water discharges from agricultural lands and confined animal facilities have found themselves in a position of a choice of compliance between requesting an individual waiver, requesting individual discharge requirements or joining with other participants in watershed coalition efforts. The majority of the valley floor portion of the county is covered by the Southern San Joaquin Valley Agricultural Water Quality Coalition. Sub-watersheds of the Coalition exist for all areas of the County, with exception of the southwesterly corner. Whether the Coalition and the designated sub-watersheds can survive the significant modifications which are proposed to the Waiver program remains to be seen. Water quality sampling, testing and reporting are now all required at identified points on waterways within the County as a result of the short-term Waiver compliance requirements. Current participation levels do not include all potential dischargers and the question remains whether or not the Waiver format will survive into the future. When combined with storm water requirements, compliance efforts are expensive on a Coalition basis, however, are even more expensive on an individual basis. Regulatory compliance is mandated and the decision pathway afforded to agricultural operators within the County is fought with compliance pitfalls and expensive testing and reporting requirements. At the current time, the legislative push related to agricultural compliance appears to be in the favor of increased testing and reporting.

With respect to municipal and industrial criteria, legislative and regulatory requirements are also tending to dictate decreasing quantities of allowable constituents and increased testing and reporting requirements. As an example, the Maximum Contaminant Level for the Arsenic parameter was recently reduced from 50 ppb to 10 ppb. This has caused noncompliance in communities such as Alpaugh where two wells were recently drilled with the most current technology, both in compliance with the old standard and both out of compliance with the new standard. Compliance brings increased costs related to construction of removal facilities, operation of those facilities and for compensation for trained and licensed operators qualified to oversee the operations of such removal facilities. Similar impacts exist for the DBCP parameter where the historic standard was 2.0 ppm and a change in standard brought about a reduction to 0.20 ppm. This has resulted in a number of

communities within the County having facilities out of compliance with the required standard and seeking alternative ways of dealing with the compliance requirement.

The planning efforts of the County should recognize the water quality implications related to the parameters noted above and the nitrate parameter in planning for the maintenance of an expansion of cities and unincorporated communities which are the topic of this General Plan.

Water Quantity Requirements

As a direct result of legislation, local planning agencies are required to obtain proof of availability of an adequate water supply for any subdivisions which are proposed in excess of 500 units. While different methodologies exist for providing he compliance assurance, the philosophy behind he legislation has taken hold within the County with the City of Visalia taking proactive steps to abate the decline in available groundwater and the associated overdraft conditions which are demonstrated by a review of Figure 4-8. Similar steps are being initiated by the City of Tulare to address groundwater conditions existing beneath their planning area. These efforts are in addition to the efforts which historically have taken place in conjunction with the Kaweah Delta Water Conservation District. These efforts extend the intent of the legislation applicable to subdivisions of greater than 500 units to all levels of development. It remains to be seen whether the philosophy exhibited by the cities of Tulare and Visalia will extend to other cities within the County with respect to overdraft mitigation requirements.

SAN JOAQUIN RIVER RESTORATION

The following section of this appendix is designed to address the potential impacts of alternative outcomes to the San Joaquin River restoration litigation. An examination of the tables in this appendix gives indication of the importance of the Friant Division of the CVP to the lands within the County. Class 1 contractual supplies available to contractors located within the County total 404,900 acre-feet annually. Class 2 supplies total 565,200 acre-feet annually. Of the average annual yield of the San Joaquin River allocated to Friant Division contractors, approximately 1,000,000 acre-feet is delivered to lands and municipalities within the County.

In 1988, a lawsuit was filed by the National Resources Defense Counsel (NRDC), representing an environmental coalition, alleging, amongst a multitude of issues, that the U.S. Bureau of Reclamation was in violation of Section 5937 of the Fish and Game Code of the State of California. The basis of the argument was that the historic adronamous fishery below Friant Dam had not been maintained, as prescribed by the referenced statute, in a good condition and, in fact, had been extirpated. The case, now referred to as NRDC v Rodgers, with Mr. Kirk Rodgers being the recently retired Regional Director of the Mid-Pacific Region of the U.S. Bureau of Reclamation was to proceed to trial in Federal District Court on February 14, 2006. The action was delayed to June 19, 2006, to allow for settlement discussions to continue. The principal issues to be dealt with in this phase of the trial were the compliance requirements associated with Section 5937 and the remedy associated with the restoration of the San Joaquin River if the judge determined that course of action was required. Judge Karlton is the federal magistrate who has heard the case, thus bringing rise to continued references to the potential "Karlton decision." Decisions made to date based on motions for summary judgment by the plaintiffs have, for the most part, been decided in their favor,

including issues related to Endangered Species Act and National Environmental Protection Act compliance procedures related to the Friant Division longterm renewal contracts. Judge Karlton has ruled that the actions taken precedent to entering into the long-term contracts were inadequate, but has yet to rule on the disposition or the remedy related to the contracts.

Restoration of the San Joaquin River, as called for in the plaintiff's pleadings, was to be based on the restoration of a spring run salmon fishery to the San Joaquin River extending to the foot of Friant Dam. Experts on each side of the litigation differed in their opinion with respect to both the quantity of water which will be necessary to restore a spring run salmon fishery to the San Joaquin River and the resulting impacts which the withdrawal of water from the Friant Division contractors will have if the decision is rendered in favor of San Joaquin River restoration. Information contained in the Expert Report of Richard M. Moss, P.E., in his representation of the Friant Division contractors in the referenced litigation provides estimates of the degree to which water deliveries could be potentially reduced to County lands as a result of a decision to provide flows for San Joaquin River restoration purposes. While it should be recognized that the quantity impacts noted in said testimony are but one scenario of several, their purpose is to provide information related to the litigation and its potential impacts. In this fashion, a more informed basis can exist on which to make land use planning decisions. It was estimated that, through trial and appurtenant appeals, a decision may not be final for a period of five (5) to seven (7) years.

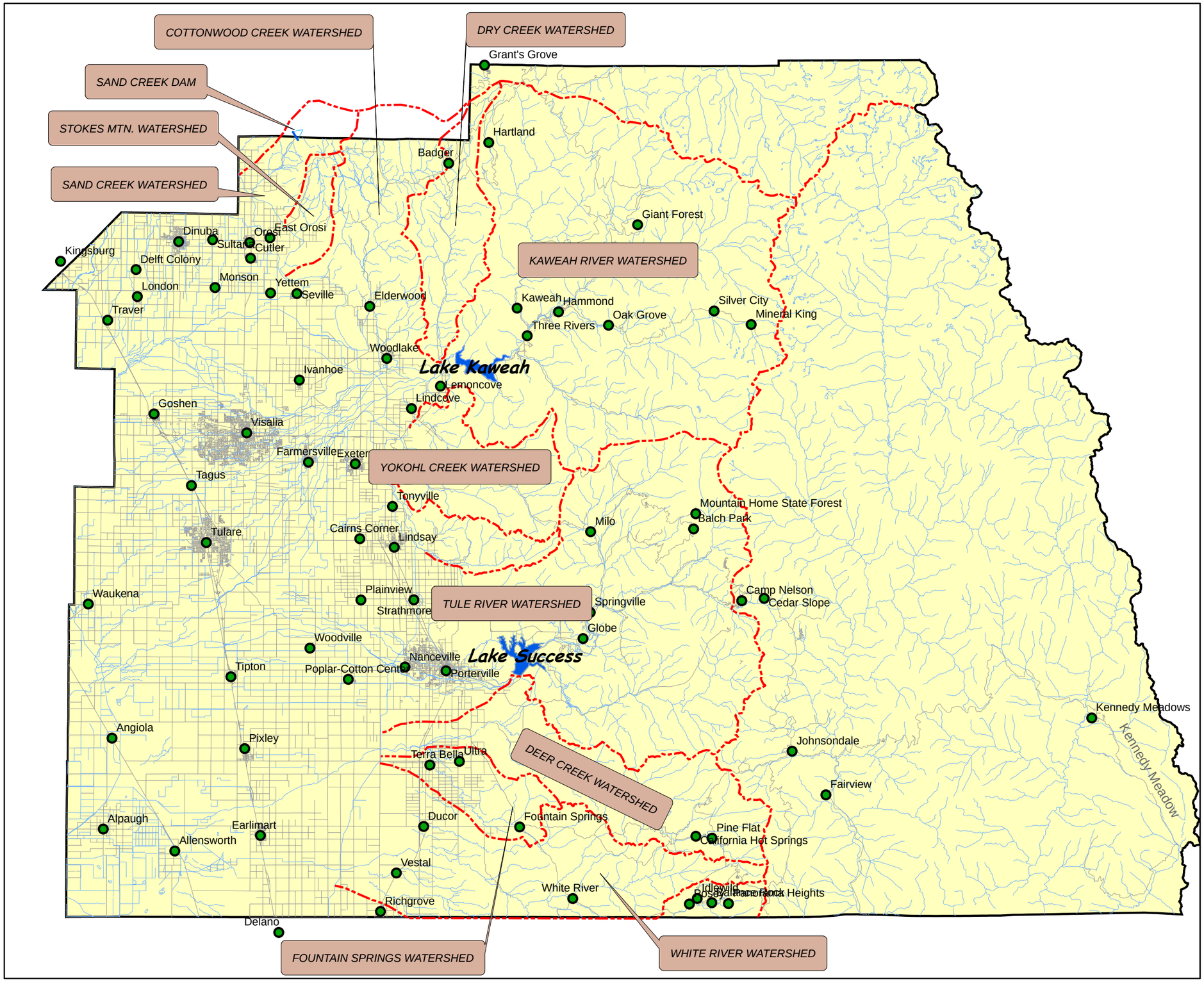
Parallel to the litigation process, settlement discussions were conducted based on an invitation from Congressman George Radanovich and Senator Diane Feinstein. Two (2) representatives from both the plaintiff and Friant Division contractor perspectives have negotiated a settlement which requires federal legislation to be implemented. It should be noted that the settlement process, if implemented, will have some degree of impact on the available water supply to Friant Division contractors in all but above-normal years. The degree of impact will be in direct response to the success in implementing the water management goal. Impacts on lands located within the County will still be experienced, even in the above-normal years, as the allocation of water to the San Joaquin River will result in the reduction in surplus water deliveries to those entities located within the County who traditionally contract for and take delivery of such surplus supplies.

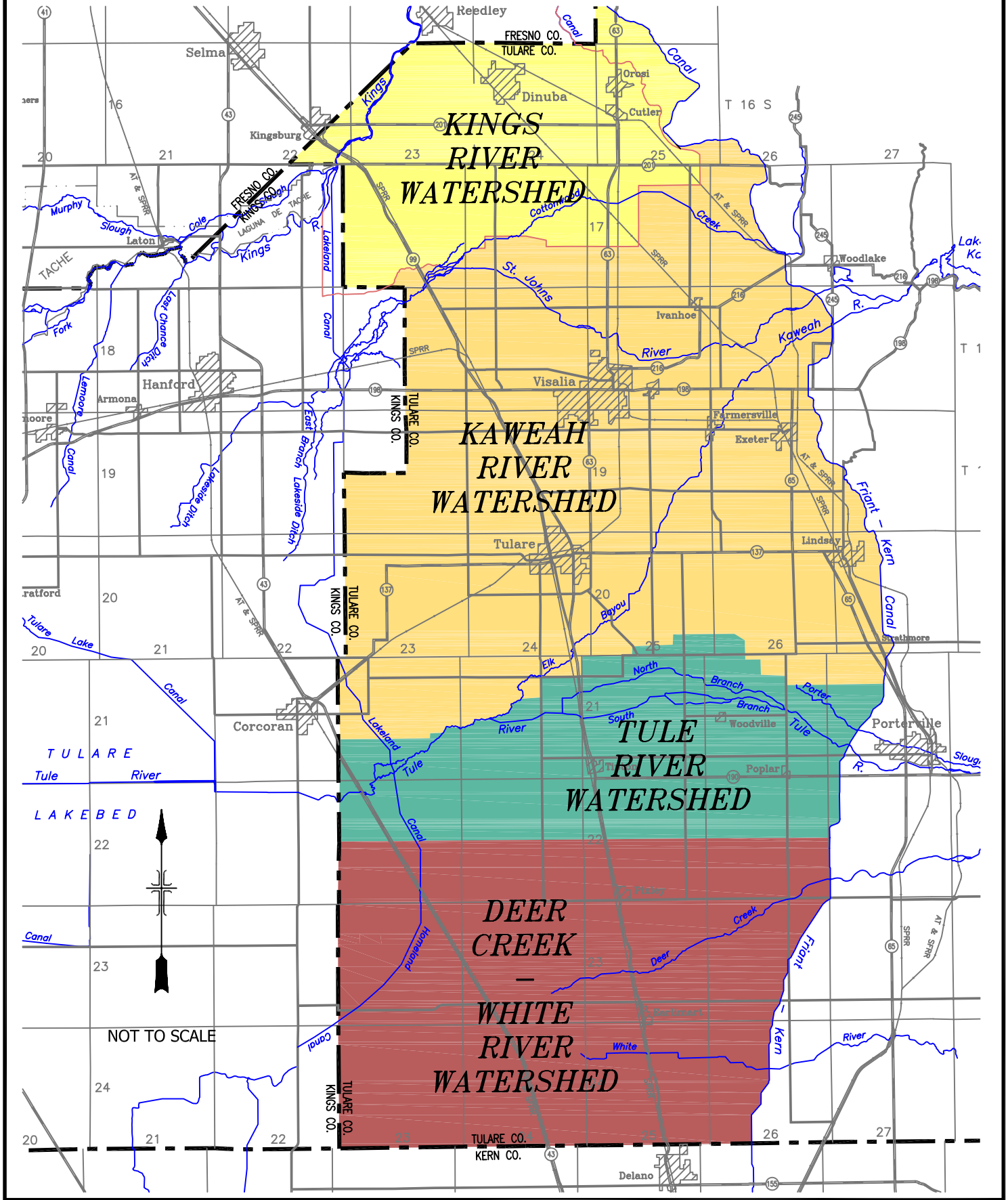
From a planning perspective, the potential impact on the surface water resources available to the lands within the County will be, on one extreme, directed impact, should the settle pursuant to the existing Settlement Agreement. On the opposite end of the spectrum, a judgment bringing rise to release of water down the San Joaquin River for anadromous fisheries restoration purposes could bring about a reduction in available surface water supplies with a potential initial reduction in contract supplies in an average year of 450,000 acre-feet, plus the elimination of surplus water deliveries to temporary contractors located within the County. This bookend could move further in an adverse direction with respect to impact over time, if the decision is made by the court to include adaptive management provisions in the restoration program. Such action could eventually require more water to be released for restoration purposes than the initial bookend.

Due to the fact that the litigation has yet to run its course, the exact outcome is currently unknown, as are the resulting impacts. The potential exists for a court decision to impact projected development and to potentially and completely undermine the existing population projection basis. Future refinement of the impact conclusions will be required at such time that a final court decision

is entered. Rendering of an adverse opinion or implementation of settlement will bring rise to dramatically different conclusions. Given that a decision has yet to be rendered, it is not possible at the current time to determine the ripple effect which an adverse court opinion may have on communities not otherwise impacted by the degree of surface water importation. There is no possible way of providing an estimate of those impacts at the current time other than to indicate that both settlement and an adverse court decision will considerably modify the status quo.

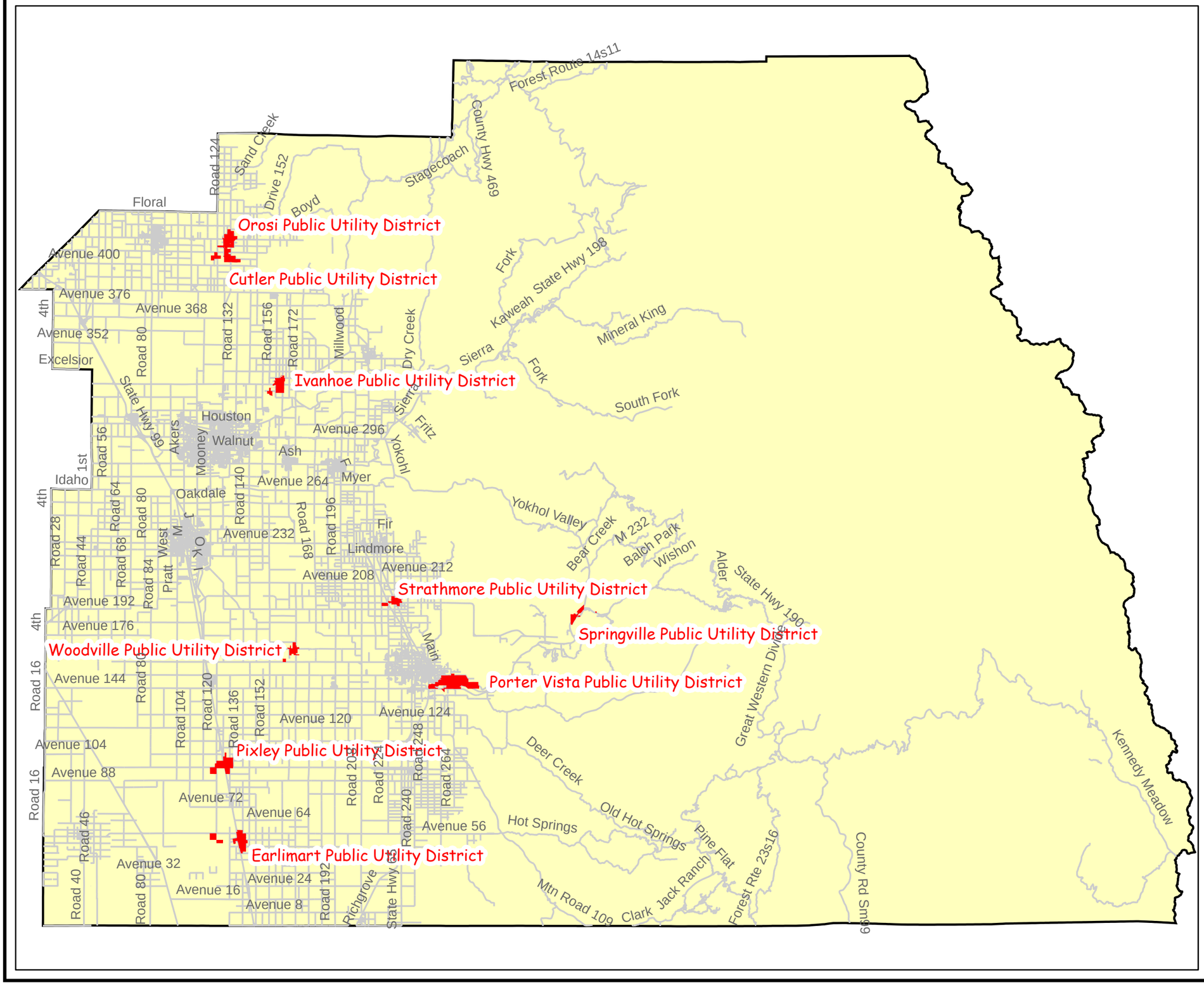
WATER RESOURCES GENERAL PLAN UPDATE COUNTY OF TULARE





VALLEY WATERSHED BOUNDARIES

PUBLIC UTILITY DISTRICTS
GENERAL PLAN UPDATE
COUNTY OF TULARE

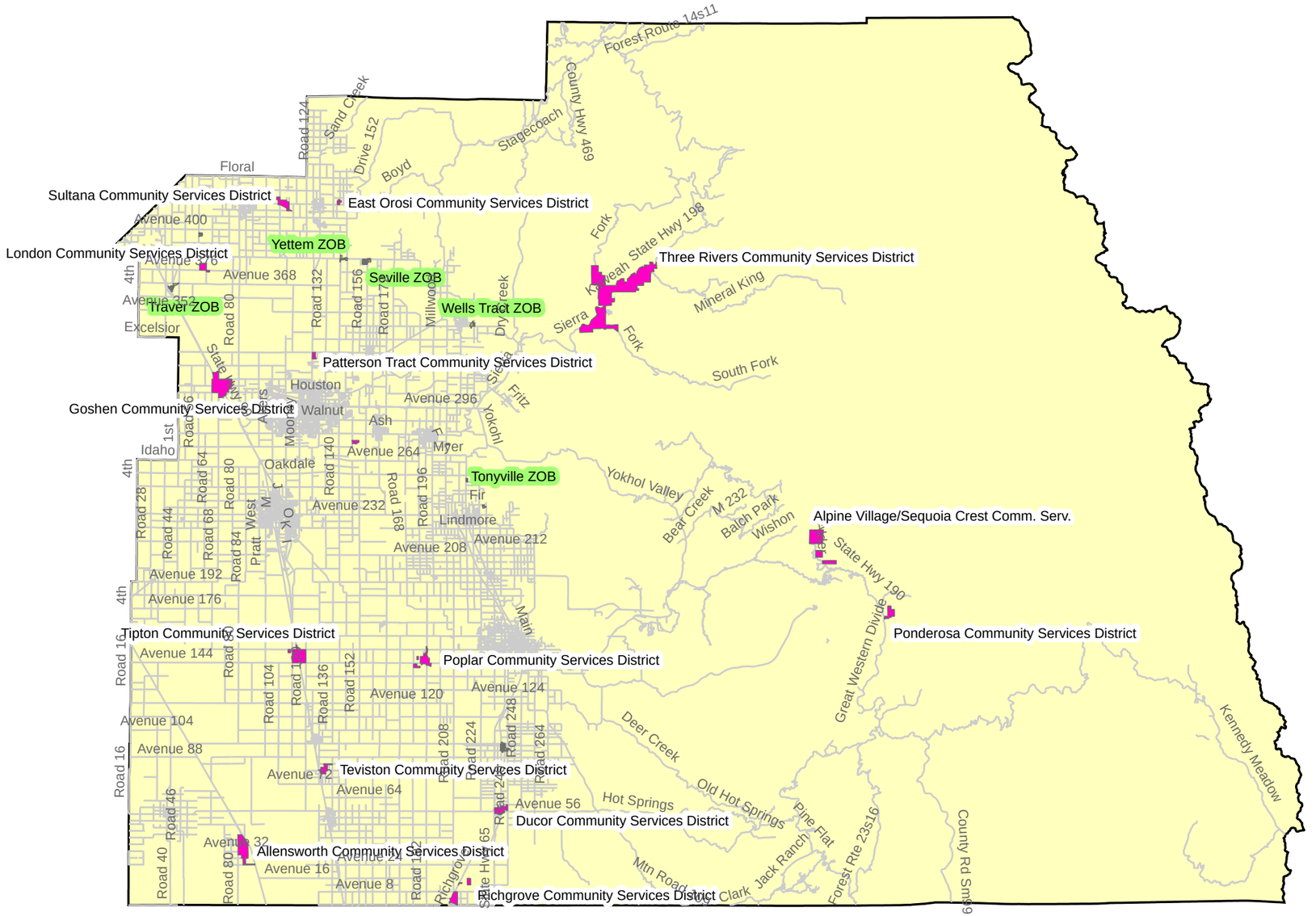


Legend

- Public Utility Districts
- Roads
- County of Tulare

0 4.5 9 18 Miles

ZONES OF BENEFIT AND COMMUNITY SERVICES DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE



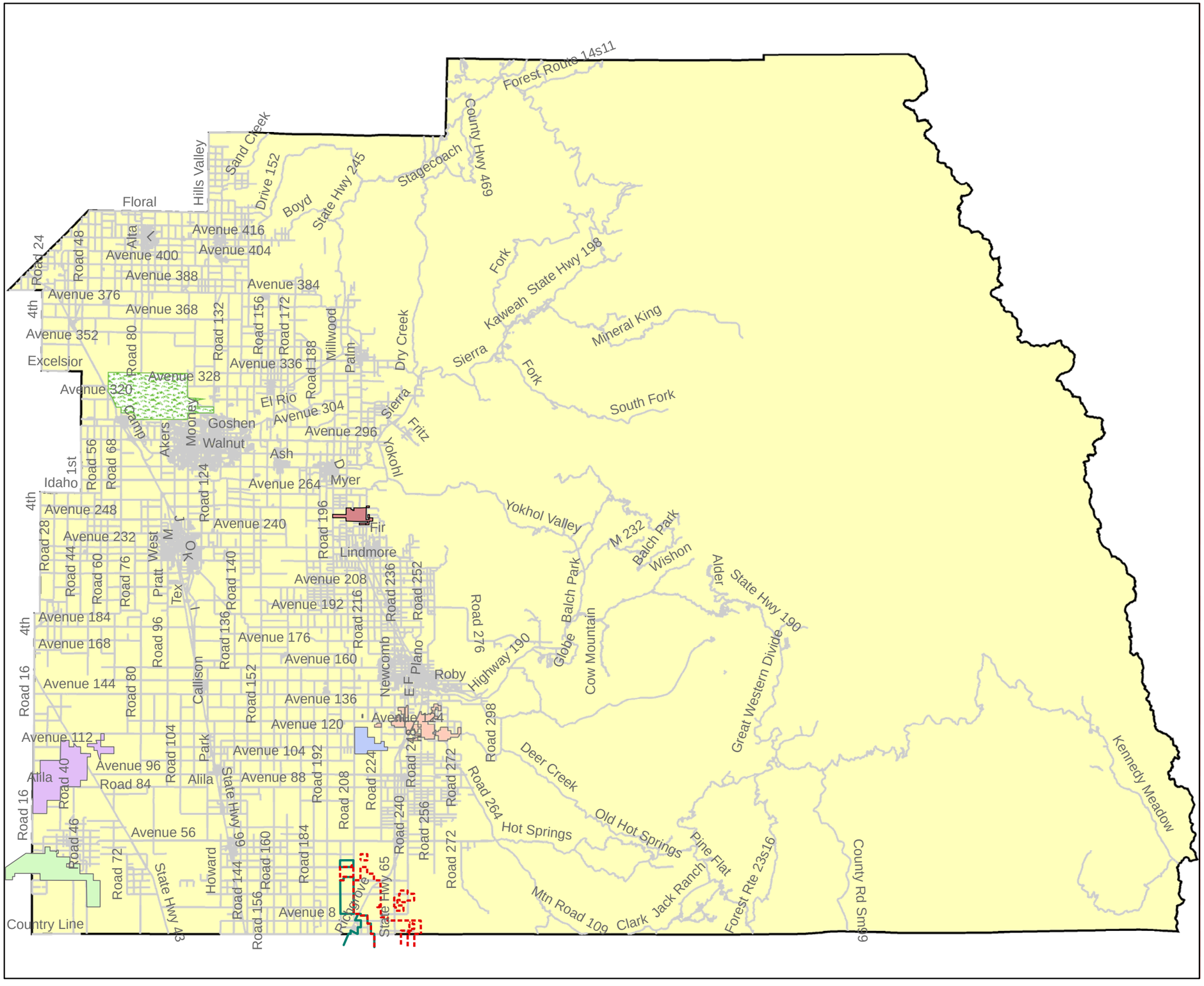


Legend

- Roads
- County of Tulare
- Zone of Benefit
- Community Services District

0 5 10 20 Miles

WATER DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE

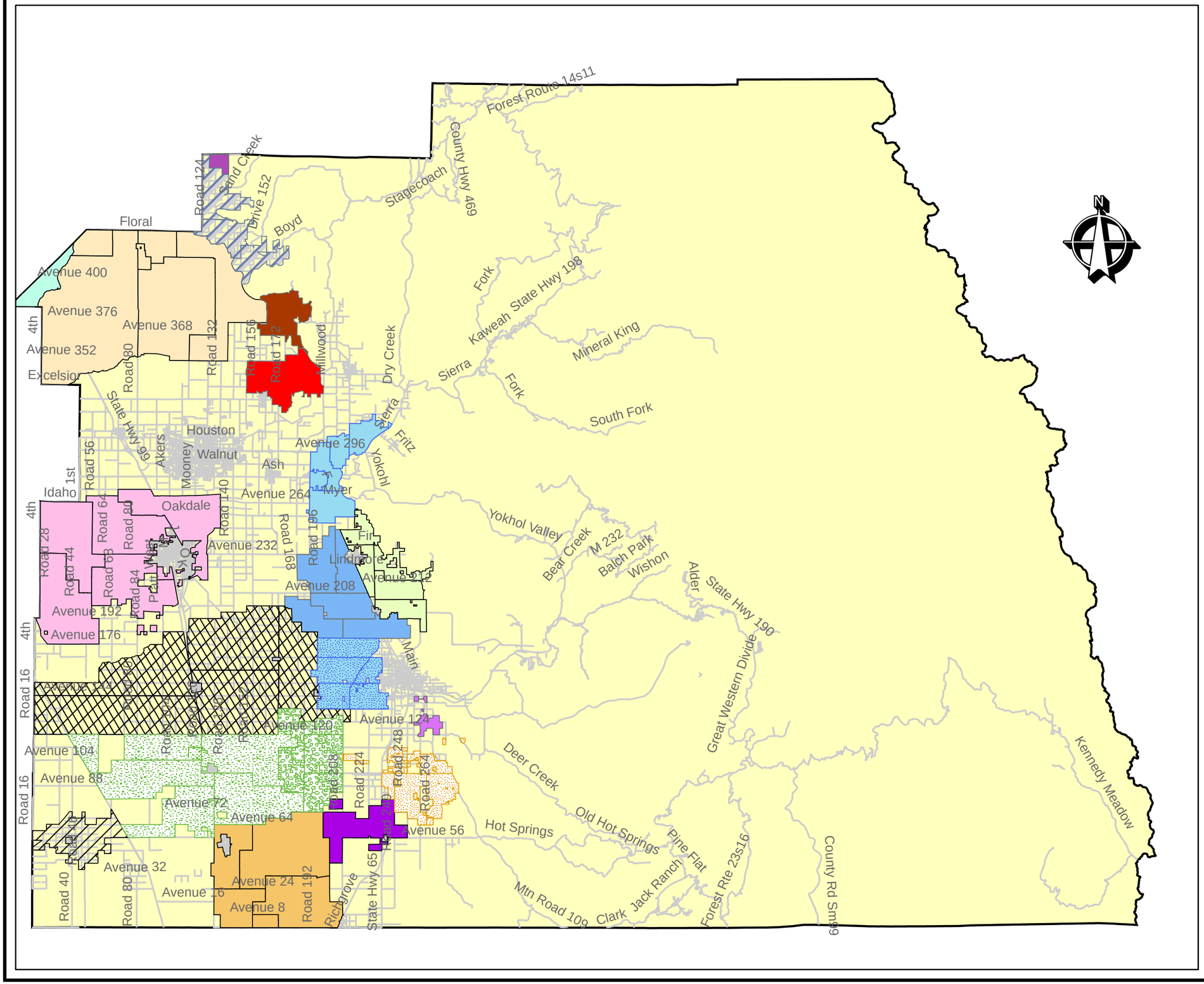


Legend

- Angiola WD
- Atwell Island WD
- Hope WD
- Kern-Tulare WD
- Lewis Creek WD
- Rag Gulch WD
- St Johns WD
- Tea Pot Dome WD
- Roads
- County of Tulare

0 4.5 9 18 Miles

IRRIGATION DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE



Legend

Irrigation Districts

- Alpaugh Irrigation District
- Alta Irrigation District
- Consolidated Irrigation District
- Delano/Earlimart Irrigation District
- Ducor Irrigation District
- Exeter Irrigation District
- Hills Valley Irrigation District
- Ivanhoe Irrigation District
- Lindmore Irrigation District
- Lindsay/Strathmore Irrigation District
- Lower Tule River Irrigation District
- Orange Cove Irrigation District
- Pixley Irrigation District
- Porterville Irrigation District
- Saucelito Irrigation District
- Stone Corral Irrigation District
- Terra Bella Irrigation District
- Tulare Irrigation District
- Vandalia Irrigation District
- Roads
- County of Tulare

0 4.5 9 18 Miles

GROUNDWATER ELEVATION CONTOURS GENERAL PLAN UPDATE COUNTY OF TULARE

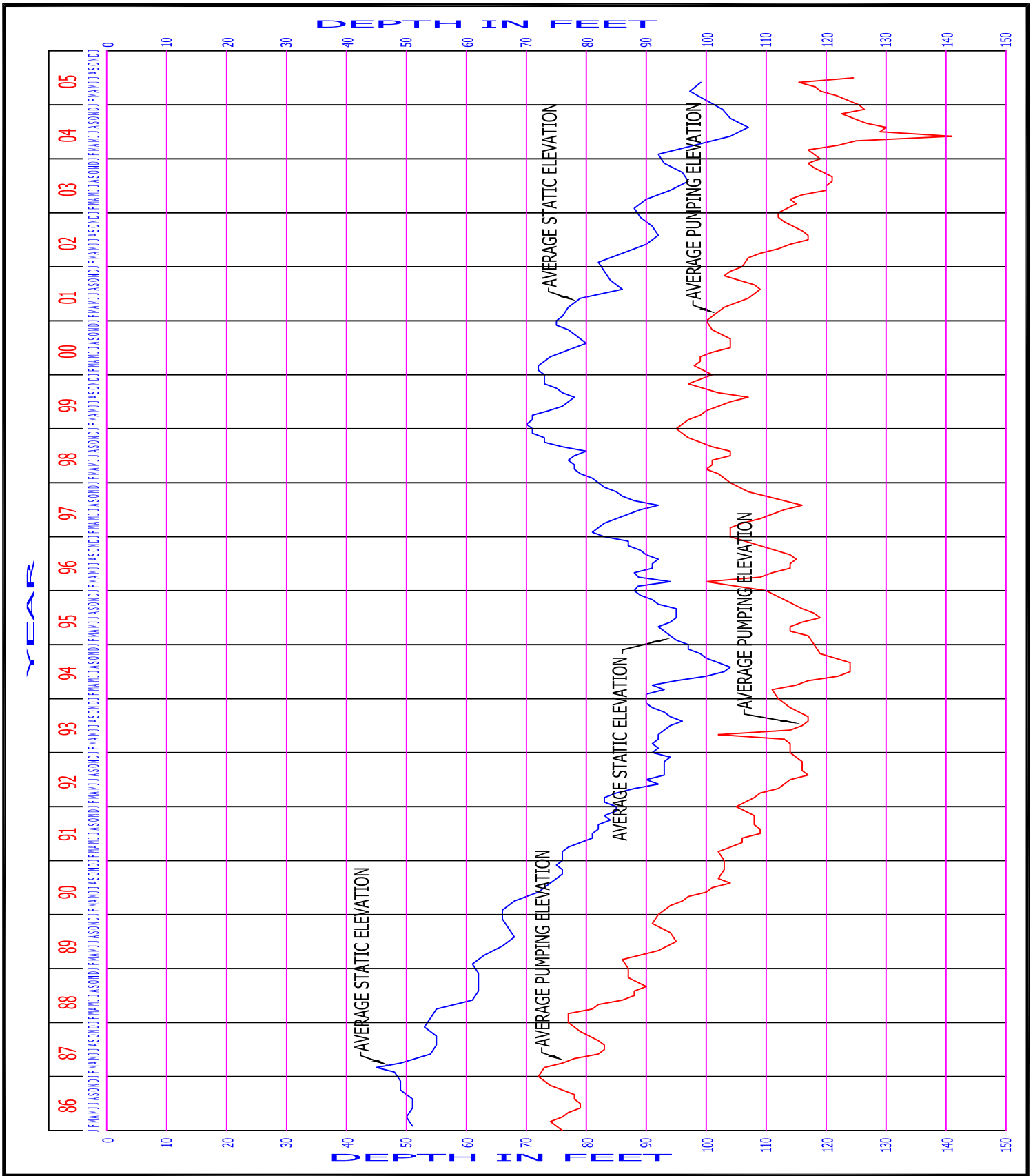
Contours from Kaweah and Tule Groundwater Basin Maps for Spring 2004, Lines of Equal Elevation of Water in Wells, Unconfined Aquifers published by California Department of Water Resources

Legend

- Roads
- Unconfined Groundwater Elevation Contour
- 160 Contour Elevation
- County of Tulare

0 4.5 9 18 Miles

FIGURE 4-8



AVERAGE GROUNDWATER ELEVATIONS

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CITY OF VISALIA

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GENERAL PLAN
COUNTY OF TULARE