City of Woodland

General Plan Background Report

Adopted by the City Council
on February 27, 1996

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CHAPTER 1

LAND USE, COMMUNITY DESIGN, AND ECONOMIC DEVELOPMENT

1.1 INTRODUCTION

Land use is the principal focus of the General Plan. This chapter provides a context for the General Plan by describing existing land use conditions, summarizes housing, population, and employment data and projections, community form and design issues, and describes the agricultural setting and resources.

1.2 REGIONAL SETTING

Woodland is located in central Yolo County 20 miles northwest of the City of Sacramento on Interstate 5. It is seven (7) miles north of Davis on State Route 113. Figure 1-1 depicts Woodland's location within Yolo County and the state of California.

1.3 CITY LIMITS, PLANNING AREA, AND GENERAL PLAN AREA

As of January 1994, Woodland encompassed approximately 10.2 square miles, or 6,560 acres, of incorporated territory. Approximately 5,875 acres of this area is subdivided or approved for development. The remaining 679 vacant acres includes 157 commercial acres, 418 industrial acres, 71 public/semi-public areas and 33 residential acres. Figure 1-2 shows Woodland's city limits.

The General Plan Area is bounded by the Cache Creek on the north, County Road 27 on the south, County Road 93 on the west, and the Yolo Bypass on the east (see Figure 1-2). This General Plan Area was established in the 1979 General Plan. The General Plan Area is intended to serve as a large area which includes land that is generally affected by the City of Woodland. The General Plan Area includes two unincorporated communities (Willow Oak and Monument Hills) and agricultural areas, in addition to Woodland and its expanded

area. In addition, as part of the General Plan Update process, Woodland established a Planning Area that includes all land to be considered for future development in Woodland. This area is also shown in Figure 1-2.

1.4 HISTORY OF LAND USE PLANNING IN WOODLAND

The City of Woodland was originally laid out by Major F.S. Freeman in 1858 and incorporated 1871. For a detailed description of Woodland's history, see Chapter 6, Historic Preservation.

The railroads played an important role in the development of the community for they brought improved means for transporting agricultural crops to market and for obtaining goods needed by local residents. The first railroad connecting Davisville (City of Davis) and Woodland was constructed in 1869. Gradually, the railroad expanded and was acquired by the Southern Pacific Railroad.

By 1930, the City had increased in area and population to 1.63 square miles and 5,542 persons. The decade presented new attitudes toward land use and development. In 1931, the first Uniform Building Code was adopted; in 1937, the first Planning Commission was appointed; and in 1938, the first Zoning Ordinance was adopted.

The 1940's saw the continued growth of Woodland but activities were somewhat slowed during the war years. At the close of this decade the City had reached a population of 9,386 and had expanded in area to encompass 1.89 square miles.

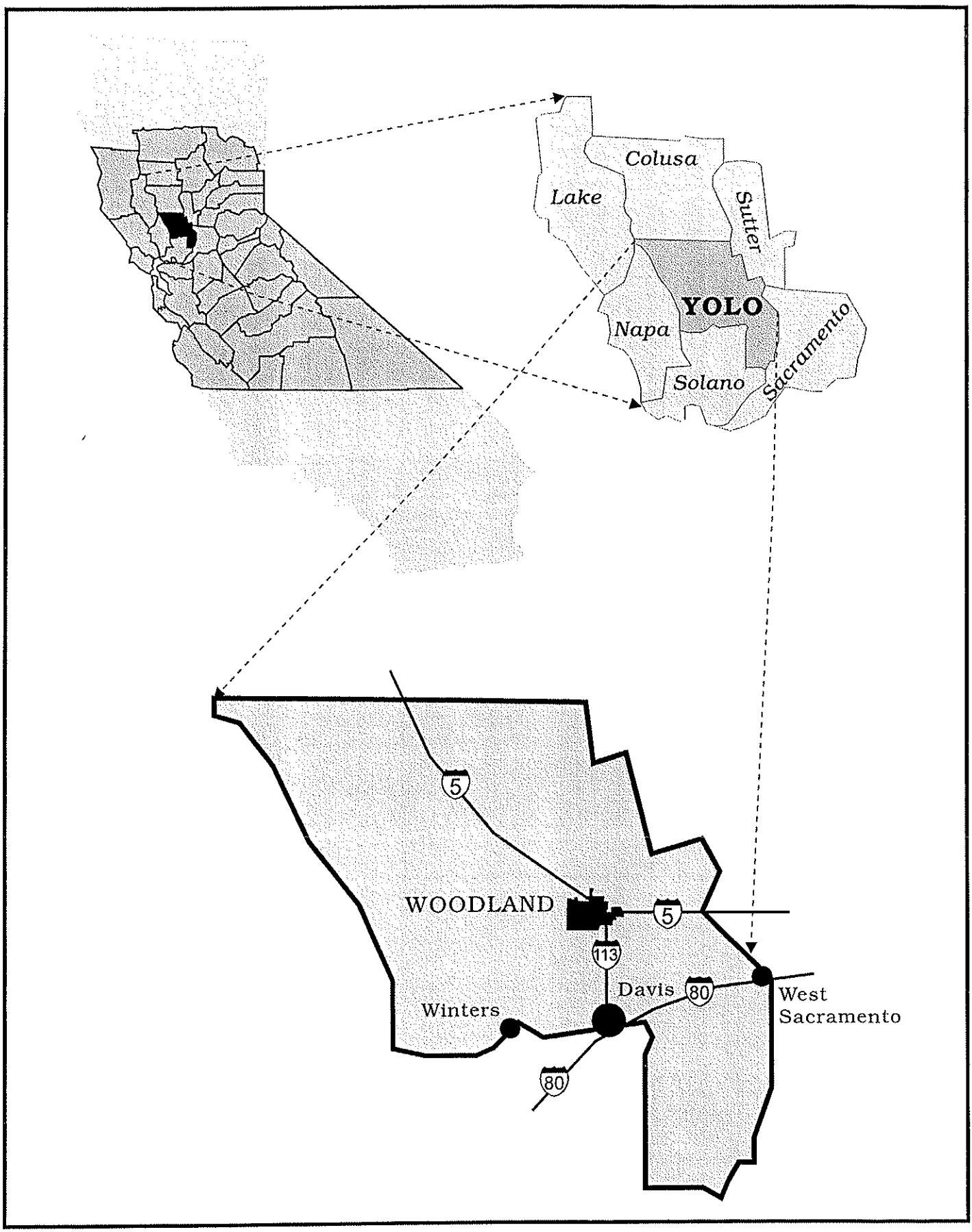
The City of Woodland, as did the rest of the State, experienced extensive growth in the 1950s. The population increased during this decade by 4,000 persons to a population of 13,524 in 1960.

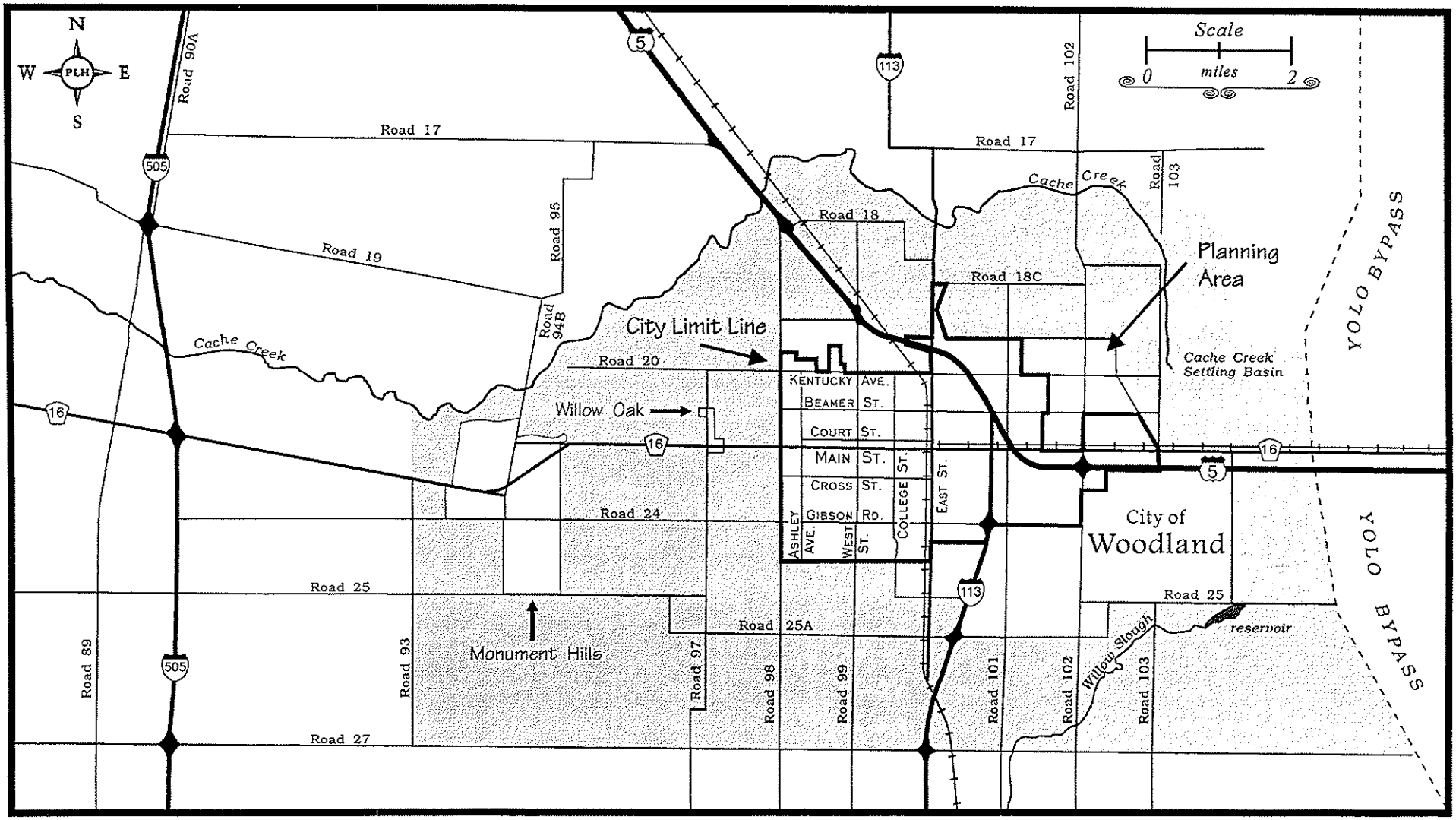
With the promise of new and increasing growth the Yolo County Planning board was formed in 1955 to oversee the preparation of a Master Plan. The Master Plan was prepared for the County as a whole with separate section for each of the incorporated cities and their surrounded areas. The City of Woodland adopted the Woodland Master Plan on August 4, 1958.

In 1974, the City Council appointed a 38-person citizen's committee called the Woodland Area General Plan Citizen's Advisory Committee (WAGPCAC) to assist the Staff in the preparation of a new General Plan. After 170 meetings over a five-year period the Plan was adopted on August 7, 1979.

Regional Location Map

Figure 1-1





Woodland General Plan Area, Planning Area and 1995 City Limits

Figure 1-2

A new Zoning Ordinance was adopted in 1983 to implement the 1979 General Plan. Density and development standards were modified and several new zoning categories were created and others were eliminated.

The Redevelopment Agency was reactivated in 1985. The Redevelopment Plan has been adopted by the City Council and the Agency.

In 1988 the City Council updated the General Plan to accommodate a population of 60,700. Residential development was to be divided into three (3) phases.

In 1990 the City adopted the Southeast Area Specific Plan which provided guidance for development of 470 acres south of Interstate 5 between County Roads 101 and 102. In 1993 the City adopted the Downtown Specific Plan which provided a blueprint for the development of the older business area of the City.

The City initiated the General Plan Update in 1994, based on new information on flooding from Cache Creek to the north, revised growth projections, and major development proposals.

1.5 RELATED PLANS

Several plans affect land use in the General Plan Area, including specific plans for smaller areas of Woodland and county and regional plans that address larger areas but affect Woodland.

The City has adopted specific plans for geographic areas within the city that have special planning concerns, and continues to pursue the development of specific plans to address more localized planning concerns. The Southeast Area Specific Plan and Downtown Specific Plan are discussed in the following paragraphs. This section also discusses countywide and regional plans.

SOUTHEAST AREA SPECIFIC PLAN

The Southeast Area Specific Plan was adopted in November 1990, and was the largest residential area ever approved by the City. The Specific Plan covers 470 acres east of County Road 101, south of I-5, west of County Road 102, and north of Gibson Road. The plan calls for a mix of residential uses along with a school and parks. A Neighborhood commercial area is designated at the northeast corner of Gibson Road and Pioneer, one highway commercial area is designated at I-5 and Gibson Road and a General Commercial

Area is located at the Southeast corner of Pioneer and East Main Street. The plan will accommodate approximately 2,500 dwelling units.

DOWNTOWN SPECIFIC PLAN

The City adopted the Downtown Specific Plan in August 1993 to address issues related to Downtown. The state intention of the Specific Plan is "to revitalize the "heart" of the city thereby reestablishing it as the specialty retail, business, entertainment, and cultural center of the community and to enhance its role as the governmental center for both the City and Yolo County."

The Specific Plan includes a vision of pedestrian-oriented Downtown reflecting its unique historic buildings with well-landscaped and attractive streets and sidewalks. A more detailed summary of the Downtown Specific Plan is included in Section 1.10 of this chapter, "Urban Design Districts."

YOLO COUNTY GENERAL PLAN

The Yolo County General Plan was adopted in July 1983, and is the guide for all development in the unincorporated areas within the General Plan Area. The Plan contains 42 goals, which generally call for the following five major objectives:

- Preserve prime and other agricultural land
- Create urban open spaces, greenbelts, and scenic highways
- Discourage urban sprawl
- Focus new urban development in existing cities and planned urban areas
- Conserve natural resources

The emphasis of much of the Plan is to conserve and preserve agricultural land by encouraging contiguous urban development. Together in the Woodland Area General Plan, the City and County adopted the Urban Development Policy.

The Yolo County General Plan designates the areas outside Woodland's 1988 Urban Limit Line for agricultural uses, and designates two smaller unincorporated areas (Monument Hills and Willow Oak) for rural residential development.

REGIONAL PLANS

Several other regional plans in the area will affect land use and development in Woodland. These are described in other chapters of this document. The County prepared a countywide Congestion Management Plan as described in Chapter 3, Transportation and Circulation. As of August 1995, the County and all the cities in the county are participating in the

preparation of a countywide Habitat Management Plan. This is discussed in Chapter 7, Environmental Resources. The Yolo-Solano Air Quality Management District also prepared an Air Quality Attainment Plan to achieve attainment of federal air pollutant health standards. This is also discussed in Chapter 7 in the "Air Quality" section.

1.6 HOUSING AND POPULATION

If a city is to effectively establish land use patterns and set policies regarding housing and public facilities and services, it must first have a clear understanding of who lives in the community and how the population has changed and is expected to change in the future. This chapter reviews historical population trends, current demographics, and population projections for the City of Woodland and summarizes population in Yolo County. Most of the information contained in this chapter is taken from the 1990 Census and the California Department of Finance. This chapter also cites studies conducted by Sacramento Area Council of Governments (SACOG).

CURRENT HOUSING AND POPULATION

Housing is discussed at length in the background data for the Housing Element (adopted 1994). Current housing stock characteristics are summarized here for reference.

According to the California Department of Finance (DOF), the City of Woodland had a 1994 population of 42,474, accounting for 28 percent of Yolo County's total population of 150,813. In 1994, DOF estimated that Woodland had 15,578 housing units, with an overall housing vacancy of 3.42. Of the total units, 10,401 (67%) were single family, 4,583 (29%) were multi-family, and 594 (4%) were mobile homes. The average household size was 2.774 persons per household.

HISTORICAL POPULATION GROWTH

Woodland's population increased by 32% in the decade from 1980 to 1990, from a population of 30,235 in 1980 to 39,802 in 1990. Woodland experienced its highest growth rates of the decade during the late 1980's. The City's population increased by 12% during the two year period from 1987 to 1989, adding over 4,000 new residents. Table 1-1 and Figure 1-3 show the population and growth rates from 1980 to 1994 for Woodland, Yolo County, and California. As Table 1-1 and Figure 1-3 show, Woodland's 1988-90 growth rate exceeded countywide and statewide growth rates. Since 1991, the City's growth rate has slowed, averaging about one percent (1%) growth annually.

TABLE 1-1

POPULATION GROWTH RATES
Woodland, Yolo County and California
1980 - 1994

	Woodland		Yolo County		California	
Year	Population	% Change	Population	% Change	Population	% Change
1980	30,235		113,374		23,668,145	
1981	30,993	2.5	114,420	0.9	24,038,711	1.6
1982	31,324	1.1	116,139	1.5	24,546,566	2.1
1983	31,739	1.3	117,935	1.5	25,075,581	2.2
1984	32,627	2.8	119,196	1.1	25,578,254	2.0
1985	33,034	1.2	121,630	2.0	26,112,632	2.1
1986	33,971	2.8	124,024	2.0	26,741,621	2.4
1987	34,862	2.6	126,853	2.3	27,388,477	2.4
1988	36,941	6.0	132,596	4.5	28,060,746	2.5
1989	38,980	5.5	136,985	3.3	28,771,207	2.5
1990	39,802	2.1	141,092	3.0	29,760,021	3.4
1991	41,184	3.5	145,347	3.0	30,321,416	1.9
1992	41,615	1.0	146,995	1.1	30,989,009	2.2
1993	42,051	1.0	149,553	1.7	31,551,554	1.8
1994	42,474	1.0	150,813	0.8	31,961,000	1.3

Sources: U. S. Bureau of the Census, 1980 and 1990; California Department of Finance, 1981 - 1989 and 1991 - 1994

REGIONAL POPULATION GROWTH

Woodland, along with other Yolo County communities, is a part of the Sacramento Metropolitan Area. The region grew rapidly from 1980 to 1990. In 1990 there were 1,375,920 people in the SACOG area (Sacramento, Sutter, Yuba, Yolo and southern Placer Counties). In the 1980's the region's population increased by 341,363, reflecting a 33% increase during the decade; an average annual increase of 34,000 persons per year and an annual growth rate of three percent (3%).

At the center of the region is Sacramento County which grew by nearly 258,000 people during these years. This accounted for 75% of the region's growth. Woodland was one of five smaller (Rocklin, Roseville, Folsom, Davis were the others) that grew by more than 9,000 residents during the 1980's.

POPULATION GROWTH RATES

Woodland, Yolo County, and California

1980 - 1994

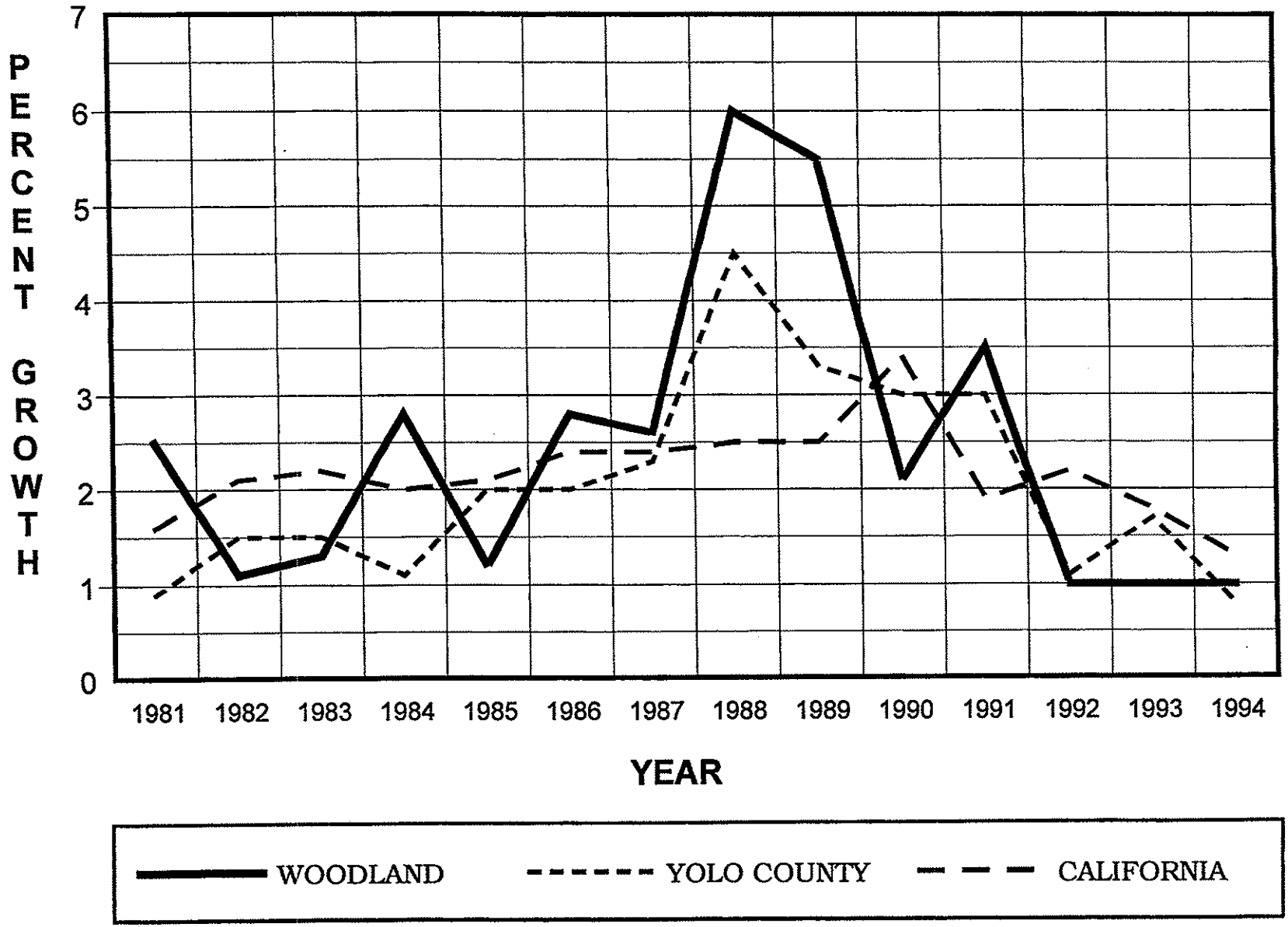


Figure 1-3

POPULATION CHARACTERISTICS

This section summarizes 1990 Census information on age, gender, and ethnicity for Woodland, Yolo County and California.

Age Distribution

Age structure is a particularly important planning consideration because different age segments of the population require different kinds of services. A younger population will likely demand more opportunities for active recreation, whereas an older population will likely call for more passive recreational facilities. Different age groups also require different consideration when it comes to housing. An older population will generally have less need for the type of large housing units that a population with a large number of residents of child-bearing age will need. Table 1-2 shows the age distribution of Woodland's population in 1990, as compared to that of Yolo County and California.

Table 1-2 shows that in 1990, Woodland had a higher proportion of young and old than the countywide average. Woodland had a higher proportion of children under the age of 17 (29%) than Yolo County (24%) and the State (26%). Woodland had a lower proportion of adults aged 18 to 64 (60%) than Yolo County (66%) and the state (64%). Woodland and the state have a similar proportion of adults over 65 (11%) that is slightly higher than the county with 9.5%. The median age of Woodland residents was 33.4, higher than the Countywide average of 31.4 and statewide average of 31.5. Woodland's median age increased by four years in the last decade, from 29.3 in 1980 to 33.4 in 1990.

TABLE 1-2

AGE DISTRIBUTION
Woodland, Yolo County and California
1990

Age Group	Woodland		Yolo County		California	
	Population	% Change	Population	% Change	Population	% Change
Under 5	3,576	9.0	10,308	7.3	2,376,474	8.0
5 to 17	8,060	20.5	23,696	16.8	5,363,005	18.0
Subtotal, 0 to 17	11,636	29.2	34,004	24.1	7,739,476	26.0
18 to 24	3,805	9.6	26,472	18.8	3,325,043	11.2
25 to 34	7,131	17.9	24,924	17.7	5,739,293	19.3
35 to 44	6,128	15.4	20,139	14.3	4,646,815	15.6
45 to 54	3,772	9.5	12,525	8.9	2,955,981	9.9
55 to 64	2,864	7.2	9,570	6.8	2,231,551	7.5
Subtotal, 18 to 64	23,700	59.5	93,630	66.4	18,893,683	63.5
65 to 69	1,372	3.4	4,455	3.2	1,055,906	3.5
70 to 74	1,047	2.6	3,421	2.4	809,511	2.7
75 and over	2,047	5.1	5,582	4.0	1,256,442	4.2
Subtotal, 65 and over	4,466	11.2	13,458	9.5	3,121,859	10.5
TOTAL	39,802	100.0	141,092	100.0	29,760,021	100.0

Source: U. S. Bureau of Census, 1990

Racial And Ethnic Composition

Table 1-3 shows the breakdown of the ethnic subgroups of the population for Woodland, Yolo County, and California as of 1990.

As Table 1-3 shows, Woodland had a similar percentage of whites as Yolo County (68.6%) but a higher percentage than the State (57.2%). Woodland had a higher Hispanic percentage (26.1%) that the County (20.0%) and a similar percentage to the State (25.8%). Woodland and the County had a lower percentage of Blacks than the state. In the case of Asian/Pacific Islanders fewer (2.9%) live in Woodland that the County (8.1%) and the State (9.1%).

Woodland ethnic composition changed somewhat between 1980 and 1990. Woodland had a lower proportion of whites in 1990 than reported in the 1980 Census, down from 72.8% in 1980 to 68.6% in 1990. The percentage of blacks residing in Woodland stayed the same in 1990. The percentage of Hispanics in Woodland increased between 1980 and 1990, from 23% to 26%.

TABLE 1-3

ETHNIC COMPOSITION
Woodland, Yolo County and California
1990

Ethnic Group	Woodland		Yolo County		California	
	Total	% of Total	Total	% of Total	Total	% of Total
White	27,318	68.6	96,825	68.6	17,029,126	57.2
Hispanic	10,413	26.1	28,182	20.0	7,687,938	25.8
Black	445	1.1	2,975	2.1	2,092,446	7.0
American Indian/ Eskimo/Aleut	390	1.0	1,363	1.0	184,065	0.6
Asian/ Pacific Islander	1,138	2.9	11,455	8.1	2,710,353	9.1
Other	98	0.2	292	0.2	56,093	0.2
TOTAL	39,802	100.0	141,092	100.0	29,760,021	100.0

Source: U. S. Bureau of Census, 1990

Household And Family Composition

Table 1-4 shows a breakdown of Woodland composition according to the 1990 Census for Woodland. As the table indicates, Woodland had a higher percentage of married couple families with children (30.3%) than did Yolo County (24.7%) and state (26.5%). Woodland also had a higher percentage of female families with children than the state (12%) in Woodland, compared to 6.4% statewide. The percentage of single male families without children (8.3%) was higher than the statewide average (2.4%). Woodland had a lower proportion of nonfamily households (6%) than either Yolo County (14%) or the state (31%).

The percentage of married couples in 1990 (57%) was lower than in 1980 (62%).

Place Of Residence

As would be expected with Woodlands growth during the 1980s, the 1990 Census indicated that the many of Woodland's residents were relatively new. Less than half of Woodland's population (44%) had lived in the same home for at least five years in 1990. This was higher than the countywide and same as the state. In the last five years, 15% of Woodland's 1990 population had moved from another county in California, compared to 27% countywide and 12 % statewide. Very few (2%) of Woodlands' residents had moved from another country. Table 1-5 shows the residential movement patterns of the local population between 1985 and 1990.

TABLE 1-4

FAMILY COMPOSITION
Woodland, Yolo County and California
1990

FAMILY TYPE	Woodland		Yolo County		California	
	Total	% of Total	Total	% of Total	Total	% of Total
Married Couple with Children	4,303	30.3	12,608	24.7	2,752,645	26.5
Married Couple Without Children	3,784	26.7	12,528	24.6	2,850,982	27.4
Single Male With Children	584	4.1	1,864	3.7	200,612	1.9
Single Male Without Children	1,179	8.3	5,291	10.4	252,964	2.4
Single Female With Children	1,713	12.0	5,184	10.2	661,698	6.4
Single Female Without Children	1,794	12.6	6,504	12.8	499,976	4.8
Non-Family Households	841	5.9	6,993	13.7	3,180,823	30.6
TOTAL	14,198	100.0	50,972	100.0	10,399,700	100.0

Source: U. S. Bureau of Census, 1990

Other Characteristics

Other population characteristics reported by the Census include income, labor force characteristics, housing value, and community travel patterns. These are summarized below.

Median family income in Woodland in 1990 was $37,000 compared with $46,000 for the state. Twenty-three percent (23%) of Woodland's labor force described themselves as managers and professionals which under the state figure which is 29%. The production work force (operators, fabricators, and laborers) in Woodland accounted for 16% of the City's occupations which is higher than the state's percentage of 13%. There were fewer people living below the poverty level in Woodland (9.4 %) than statewide (12.5%).

TABLE 1-5

RESIDENTIAL PATTERNS
Woodland, Yolo County and California
1985 to 1990

Place of Residence in 1985	Woodland		Yolo County		California	
	Total	% of Total	Total	% of Total	Total	% of Total
Same House	15,993	43.9	51,288	39.1	12,146,574	44.4
Different House in Same County	11,785	32.3	29.126	22.2	8,525,70	31.1
Different County in California	5,306	14.6	34,855	26.6	3,237,662	11.8
Different State	2,629	7.2	10,231	7.8	1,974,833	7.2
Different Country	723	2.0	5,667	4.3	1,498,608	5.5
TOTAL	36,436	100.0	131,167	100.0	27,383,547	100.0

Source: U. S. Bureau of Census, 1990

POPULATION PROJECTIONS

The Sacramento Area Council of Governments (SACOG) makes and periodically revises population projections for jurisdictions within the SACOG region. In Fall, 1995, SACOG released population projections for Woodland indicating that Woodland's population will increase from a 1995 population of 42,474 to 64,500 by the year 2015 and 71,400 by 2020. SACOG also projects that Yolo County will increase from a 1995 population of 153,688 to 247,400 people by the year 2015 and 272,800 by 2020. Table 1-6 indicates SACOG's projections for Woodland and Yolo County every five (5) years from 1995 to 2020.

These revisions are lower than SACOG's previous projections for Woodland, that indicated the City would increase to 68,800 by the year 2015. The lower figures are largely a result of the economic recession lasting longer and the housing market recovering more slowly than previously expected.

TABLE 1-6

SACRAMENTO AREA COUNCIL OF GOVERNMENTS POPULATION PROJECTIONS FOR WOODLAND AND YOLO COUNTY

	1995	2000	2005	2010	2015	2020
Woodland	43,402	47,900	52,700	58,150	64,500	71,400
Yolo County	153,688	175,300	198,700	221,300	247,400	272,800

Source: SACGO, OCTOBER, 1995

Table 1-7 indicates the population changes from 1980 to 1994 for Yolo County and its cities. Table 1-8 shows population change projected from 1995-2005 and 2005-2015 for Yolo County and its cities.

TABLE 1-7

POPULATION CHANGE YOLO COUNTY AND CITIES 1980 TO 1994

JURISDICTION	1980	1994	CHANGE	PERCENT CHANGE 1980-94
Woodland	30,235	42,474	12,239	40.5
Davis	26,640	51,366	24,726	90.0
Winters	2,652	4,982	2,330	87.9
West Sacramento	Not Inc.	30,542	-0-	
Unincorporated*	48,847	21,449	-22,398	51.1
Total County	113,374	150,813	37,439	33.0

*Note that the unincorporated population declined as a result of the incorporation of West Sacramento

TABLE 1-8

POPULATION CHANGE PROJECTIONS 1995 TO 2015

Jurisdiction	1995	2005	Change	Percent Change 1995-05	2005	2015	Change	Percent Change 2005-15
Woodland	43,402	52,700	9,300	21.4	52,700	64,500	11,800	22.4
Davis	52,992	62,700	9,708	18.3	62,700	72,300	9,600	15.3
Winters	5,127	8,900	3,773	73.6	8,900	12,500	3,600	40.4
West Sacramento	30,775	48,700	17,925	58.2	48,700	68,400	19,700	40.5
Unincorporated	21,400	25,700	4,300	20.1	25,700	29,700	4,000	15.6
Total County	153,688	198,700	45,012	29.3	198,700	247,400	48,700	24.5

Source: SACOG, October 1995.

1.7 EMPLOYMENT

Woodland has about 15,300 jobs in 1994, according to SACOG estimates. Most of these were in retail, office, and government. Manufacturing and medical were also major employment categories. Woodland's largest employers are listed in Table 1-9.

SACOG revised its employment projections in April 1995. SACOG's projections, included in Table 1-10, estimated Woodland's job base to increase by 19,680 jobs between 1994 and 2015, equivalent to a 4.0 % annual increase.

TABLE 1-9

MAJOR EMPLOYERS
CITY OF WOODLAND
1993 and 1994

COMPANY	Address	Number of Employees 1994	Number of Employees 1993
Ames Company	1485 Tanforan Ave.	85	96
Blue Shield	435 Sixth Street	141	156
City of Woodland	300 First Street	242	250
Coen Company	1510 Tanforan Ave.	118	130
Cotter and Company	215 N County Road 10	110	119
Exel Logistics	1685 Tide Court	111	125
Fleetwood Enterprises	18 N County Road 101	241	235
Kmart Corporation	1388 East Main St.	123	115
Leer West	1686 Beamer St.	118	93
Mobil Chemical Co.	1351 East Beamer St.	223	276
Nugget Market	157 Main St.	136	150
Payless Drug Stores Distribution Center	1755 East Beamer St.	390	419
Pacific Grains Products	351 Hanson Way	104	120
Raleys Superstore	367 West Main St.	120	
Skyline Homes, Inc.	1720 East Beamer St.	151	139
St. John's Retirement Village/Stollwood	135 Woodland Ave.	104	121
Target Distribution Center	2050 East Beamer St.	104	121
Walgreens	2870 East Main St.	150*	
WJUSD	526 Marshal Ave	977	938

*Figures reflects 1995 employment; Walgreens Distribution Center began operating in 1995

TABLE 1-10

1994 EMPLOYMENT AND PROJECTED EMPLOYMENT IN 2015

Employment Category	1994 Employment	Projected Employment in 2015
Retail	3,698	6,183
Office	3,075	8,711
Medical	1,389	2,285
Education	805	1,141
Manufacturing	1,583	7,606
Other*	4,776	9,080
Total	15,326	35,006

*Other employment includes: construction, transportation, communications, and utilities; wholesale trade; hotels/motels; personal, business, and legal services; automotive and miscellaneous repair; engineering, accounting, research and development, and related services; City, County, and other government services.

Source: Sacramento Area Council of Governments, April 1995

1.8 EXISTING LAND USE

Table 1-11 indicates the land use designations in the General Plan Area of the General Plan. Agriculture is the dominant land use in the General Plan Area as it accounts for 79% of the land in the area. Residential land use amounts to 10% of the land. It is divided into two categories--urban and rural. Urban is the land designated for residential use by the City of Woodland General Plan and rural is the land outside of the City that includes such areas as Hillcrest Estates.

TABLE 1-11

DESIGNATED LAND USE IN WOODLAND PLANNING AREA

LAND USE	ACRES DESIGNATED	PERCENTAGE
Agriculture	44,095	79%
Rural Residential	1,647	3%
Urban Residential	4,047	7%
Commercial	656	1%
Industrial	2,618	5%
Public/Semi-Public	2778	5%
TOTAL	**55,841**	**100%**

Table 1-12 shows that within the City limits over half of the land is designated for residential land use, almost a third is designated industrial and the remaining land is split between commercial and public/semi-public uses.

Outside of the City of Woodland approximately 500 acres are designated for industrial land use, and 500 acres are scheduled for Urban Residential. There are 93 acres shown for open space and 23 acres are indicated as commercial.

Table 1-12 also indicates that 80% of land within the City is developed. Development within the land use categories ranges from 88% in residents to 76% in commercial.

TABLE 1-12

DESIGNATED LAND USE IN CITY OF WOODLAND

LAND USE	AREA DESIGNATED	PERCENTAGE	DEVELOPED %	VACANT %
Urban Residential	3504	54%	3067 88%	*437 12%
Commercial	617	09%	468 75%	157 25%
Industrial	2034	31%	1602 79%	418 21%
Public/Semi Public	405	06%	334 82%	71 18%
TOTAL	**6560**	**100%**	**5471 83%**	**1083 17%**

*404 acres of the vacant residential acreage has been approved for development.

1.9 URBAN FORM AND DESIGN

The form and structure of cities is the result of physical factors as well as economic, social, and political forces. This section describes the form, structure, and appearance of Woodland's physical environment, including both natural and manmade elements. This chapter considers the positive attributes and elements that make the city distinctive, as well as elements that constitute liabilities. Topics addressed include urban design, urban form and structure, scenic resources, city entrances, and the visual quality of major roadways.

SETTING

Woodland is located in California's lower Sacramento Valley, a large, relatively flat depositional plain dominated by agriculture. The surrounding landscape is characterized by row crops, pastures, orchards, and vineyards. Interstate 5 (a limited-access freeway) runs diagonally from the northwest to southeast across the city, dividing the community into two distinct areas, with most of the residential and commercial development on the southeast and industrial development in the northwest quadrant of the city. State Route 113 further divides the eastern part of the city in a north-south direction.

The Sacramento River and Yolo Bypass constitute a major barrier roughly three miles to the east, as does Cache Creek, approximately two miles to the north. Willow Slough, located one mile to the southeast, is another important element in the city's setting.

URBAN PATTERN - ORIGIN AND EXPANSION

The original townsite, incorporated in 1871, occupied a section of land defined by East Street on the east, by West Street on the west, by Beamer Street on the north, and Pendegast Street on the south. Main Street divided this original city configuration into two roughly equal northern and southern areas, and the Southern Pacific Railroad tracks along East Street reinforced a clear edge on the east.

Virtually all development occurred within the original townsite over the first 60 years of the city's history, as no annexations occurred until 1930, when a modest amount of land was added along the southern edge and to the northeast. No annexations occurred for another 30 years, but starting in 1960, city expansion began to accelerate. The post-war period led to explosive growth throughout California, and urban growth in Woodland began to occur in larger increments, with major areas annexed during the 1960s, 1970s, 1980s and the early 1990s.

City population more than quadrupled from 9,300 in 1950 to 39,000 in 1990, as new subdivisions and smaller shopping centers began to define the entire perimeter of the city. Although expansion since 1960 has not occurred in highly regular patterns, the resulting form of the city is generally square and quite compact. The city's developed edge is remarkably well-defined, as the surrounding agricultural lands abut urban/suburban land uses continuously along the western and southern city perimeter.

Unlike many cities that have been divided or bypassed by major freeways, Woodland's historic downtown area remains largely intact and continues to serve as a commercial center as well as the civic core of the city. An impressive stock of historic residences and some commercial structures link this core area with the city's past.

CIRCULATION

The intersection of two primary roads--(Old) State Route 113 and State Route 16--combined with rail lines shaped the initial settlement of Woodland and continued to shape city form for nearly a century. These primary routes were eventually overshadowed by the construction of Interstate 5, and to a lesser degree, the "bypass" alignment of Route 113 off of East Street.

Outside the historic civic and commercial core, the dominant organizing circulation elements are major boulevards, located along old township and section lines, forming a one-mile grid over the urban pattern. There are three primary east-west streets--Kentucky

Avenue (County Road 20) on the north, Main Street (State Route 16) through the center, and Gibson Road (County Road 24) in the south. There are also five primary north-south streets--County Road 98 on the west, West Avenue, East Street, County Road 101, and County Road 102 on the east. These eight streets, along with Interstate 5 and State Route 113, serve as the skeleton of the urban pattern.

North of Main Street the two primary east-west streets bridge Interstate 5, linking the residential areas on the west of the highway to the industrial district on the east. South of Main Street, I-5 curves in an east-west direction, and cross-town travel is more limited and complex, as only County Road 102 provides north-south access across the freeway. Although the post-war subdivision pattern is characterized by an increasingly curvilinear and discontinuous street pattern, the major streets and boulevards have remained regular and continuous, thus all parts of the city, with the exception of the industrial area to the northeast, are well served by a clearly-defined circulation system. Nonetheless, there are some awkward access and egress points along Interstate 5.

The local street system within the larger framework formed by these major streets follows several different patterns. The historic townsite and the expansion that occurred in the 1930s is characterized by grid street patterns. Older residential areas contiguous to the historic residential area are also characterized by a rectangular street pattern, but the urban form is dominated by typical post-war subdivision patterns, characterized initially by cul-de-sacs within a rectangular street pattern, and then by curvilinear streets. This pattern becomes more pronounced along most of the southeastern, southern, and southwestern edges of the city.

CITY ENTRANCES

The I-5 corridor provides the major access for north- and south-bound traffic into Woodland; State Route 113 also provides a major link to Davis. State Route 16 connects the city to the Capay Valley and Colusa County to the west, as well as access to the Route 505 alternate linking I-5 to I-80 via Winters and Vacaville. A series of county roads provide regular access to the surrounding agricultural lands as a result of their section-line alignments.

The railroads played an important historic role in the development of Woodland and remain an important element in the regional transportation system. Where the rail lines parallel major streets, namely Main Street and East Street, there are corresponding land use and visual discontinuities that diminish the vitality and access along these important corridors.

The clear break between the city and contiguous agricultural lands creates distinctive gates along most of these roads and highways, providing a clear sense of arrival into Woodland. Within the city, the sense of arrival into the Downtown area along State Route 16/Main Street is less well-defined, because of the near continuous strip of commercial uses along the entire street. This is particularly true for the eastern segment linking the Downtown to

I-5. The segment of Main Street between I-5 and SR 113 creates a natural point of entry, yet there is no sense of arrival other than the presence of typical highway commercial uses. Entrance to the Downtown from the south along East Street is characterized by mixed quality industrial and commercial uses along north East Street. There are a number of points along major roadways where the development of city gateways would serve to create a more distinctive sense of arrival into Woodland, particularly from I-5, and could serve to differentiate the Downtown area from the more highway-oriented commercial uses along Main Street.

VISUAL DEFINITION AND QUALITY

The Yolo Bypass to the east, Cache Creek one to two miles to the north, the Willow Slough system on the southeast constitute subtle but significant influences on the settlement pattern. Further, the municipal sewage treatment facilities currently define the eastern urban edge.

Within the city, Woodland has no distinctive natural feature such as a major river, lake, or landform. Therefore, the built environment, combined with the surrounding cultivated agricultural lands, constitute the primary visual attributes of the city. With few exceptions, the quality of the built environment, buildings and surrounding landscape, is positive and consistent with the small-town character that is highly valued by the residents. The strong and clear differentiation of urban development and surrounding agricultural lands creates a sense of order and containment within the larger landscape.

Due to the relatively flat agricultural landscape, tall buildings and other structures tend to be particularly visible and thus dominant in terms of the city "skyline." Tall objects such as water towers, industrial silos, and freeway overpasses take on added importance in visually defining the city. High tension power lines that cross the eastern part of the city are also visually dominant. The tree cover is also an important visual element in Woodland since there are few tall buildings and virtually no topographic features. The regular street pattern along major streets and boulevards, combined with the canopy created by the abundance of mature trees, provides a strong internal image of the city.

1.10 URBAN DESIGN DISTRICTS

To a large degree, the types of development within Woodland define the character of the city. With the exception of the views from I-5 overcrossings, virtually all views of the city, and hence the visual image of Woodland, is derived from views of the immediate urban landscape--streets, trees, and buildings. Accordingly, this section is organized in terms of development types. Except for the historic downtown commercial area and the north-east industrial area, the city's development pattern consists of large blocks of residential areas

defined by the eight major boulevards, and commercial areas in the forms of strip commercial along the Main Street corridor or modestly-scaled outlying centers.

Combined, the elements identified above organize the urban pattern of Woodland into a well-defined, coherent, and compact complex. They also give structure to the city through a clear circulation system and a strong pattern of uses. This framework presents both constraints and opportunities for shaping the further growth of the city, and suggests precedents for containing, expanding, and modifying the urban fabric.

For the purposes of describing and discussing urban design issues, the Planning Area has been divided into the following eight major districts:

- Historic Downtown Area
- Outlying Main Street Commercial Corridor (Beyond Downtown)
- Residential Areas
- Outlying Commercial Areas
- Northeast Industrial Area
- I-5 Corridor
- Kentucky Avenue
- East Street

Each of these districts is briefly described in the following subsections.

HISTORIC DOWNTOWN AREA

The historic downtown area is centered along Main Street for roughly ten blocks from East Street to Cleveland Street. Within this area, the sense of arrival into the Downtown's core occurs at Third Street on the east and Elm Street on the west, resulting in a perceived Downtown Main Street segment of four to five blocks in length. Most of the area is concentrated along the Main Street corridor, and forms a regular pattern ranging from one and one-half to two and one-half blocks in depth, as defined by properties along North Street and Lincoln Street. This area corresponds to Area "A"--governmental and office buildings, and Area "B"--widely defined as "Downtown Woodland" in the City's 1993 *Downtown Specific Plan*. Although the *Specific Plan* boundary delineation of the Downtown extends well beyond this more strictly historic "Downtown" district, it is useful to use this *Specific Plan* boundary, particularly since the *Specific Plan* defines five sub-areas, each with a set of permitted uses and development standards.

The stated intention of the *Downtown Specific Plan* is to revitalize the "heart" of Woodland's historic downtown, re-establishing it as the specialty retail, business, entertainment, and cultural center of the community and enhancing its role as the governmental center for both Woodland and Yolo County. As such, the Downtown is

important both as an economic center and as a source of identity--a special place for residents of the city.

The block pattern in the older portion of the Downtown is characterized by a variety of sizes and configurations, although the segment between Cleveland and Fourth Streets is quite regular. Along the historic Downtown segment of Main Street the block faces range in length from 300 to 1,300 feet, 19 of the 22 block faces are 300 to 500 feet in length, with 300 feet the most common. Block depths range from 300 to 600 feet, except along East Street where the railroad right-of-way creates an 1,100-foot depth.

The current stock of historic commercial or mercantile buildings in the Downtown area constitute an important resource, not only in terms of commercial space, but as a vital historic and aesthetic resource. The buildings Downtown create a well-scaled, inviting pedestrian environment. The distance between the building facades along Main Street defines a wide public corridor, providing adequate vehicular circulation and generous pedestrian sidewalks. The area, however, lacks overall coherence, and due to the extent of commercial development along the entire Main Street corridor, the historic Downtown area is not clearly differentiated. These observations are confirmed in the *Downtown Specific Plan*, which notes the lack of "aesthetic cohesiveness and definition" and the lack of "effective streetscaping."

There is a superb stock of historic residences in the Downtown area as identified in the *Woodland Historical Resource Inventory Handbook*, and the *Downtown Specific Plan*. The City has issued a *Walking Tour of Historic Woodland* that organizes a tour or historic buildings (primarily residences) along a north-south corridor (College, First, and Second Streets south of Main Street, and First, Second and Third Streets north of Main Street). Many of the historic residences are located outside the boundaries of the *Downtown Specific Plan.*

In general, the *Downtown Specific Plan* provides a thorough description of existing conditions as well as an appropriate set of prescriptive actions to conserve and enhance the Downtown area. There are, however, four areas that warrant greater attention: (1) the absence of a clear and coherent landscape concept (there are street trees identified and prescribed, but no overall "concept" governing their selection and use); (2) an incomplete circulation and parking concept and plan; (3) a more comprehensive strategy to give better definition to the entries into the core of the Downtown area and to create clear and coherent "edges" to subareas; and (4) attention to the East Street corridor (via a Specific Plan), including, but not limited to issues of coherence, character, scale, access and circulation.

OUTLYING MAIN STREET COMMERCIAL CORRIDOR

The Main Street corridor outside the historic Downtown area constitutes a second district for addressing urban design issues. The predominance of "highway" or "strip" commercial development along the eastern and western ends of the Main Street corridor creates a distinctly linear commercial core, discouraging pedestrian circulation by virtue of the excessive length of the "perceived" street. Absent a clear delineation and separation of the "Downtown" Main Street and the "outlying" Main Street, the street appears to be a single, undifferentiated corridor stretching for nearly three miles from Route I-5 to the western edge of the city.

The block scale of these outlying segments with the distinctly vehicular character of the access to the businesses adds to the perception of length; block lengths beyond the historic Downtown area range in length from 800 to 1400 feet (with the exception of two 300-foot blocks), with nine blocks of 1,200 feet or longer.

Although most businesses are well-maintained along this corridor, the predominance of parking in front of buildings, combined with the street width, creates a "strip" quality. A number of properties have landscape improvements that greatly increase their aesthetic appeal; the disjointed nature of these landscape improvements, however, does not yet create an overall appealing character to the district.

Railroad tracks along the northern edge of the eastern segment of Main Street create a particularly complex set of urban design concerns. Vehicular and pedestrian access is limited, and the absence of commercial vitality along the northern face of this segment of the Main Street corridor poses questions about appropriate alternative land uses, circulation, and landscape character.

RESIDENTIAL AREAS

Woodland's residential neighborhoods range from the older historic neighborhoods adjacent to the Downtown to the newer subdivisions, primarily to the west and south and those developing on the southeast. The quality of these neighborhoods is reflected in an unusually high level of maintenance of residences and extensive landscaping.

This high quality is apparent in neighborhoods of all ages. There are three rather distinct periods of subdivision patterns:--a historic urban residential period (from the city founding to World War II); an older, mature suburban residential period (primarily post-World War II to 1970s); and a newer strictly suburban period (1980 to present). These three periods and their differentiating characteristics are described briefly in the following subsections.

Founding To World War II: Much of this area was contained in the initial settlement boundary, thus the street and block patterns in this area have been in place for many decades. Residences in this area, however, have been built over many years,

gradually filling in the established block pattern. The earliest homes in this area date to the 1870s, although some have been built within the past two decades. This area also contains various architectural styles of the late 19th century, giving this area a picturesque quality.

The distinctive block pattern is defined by a regular street pattern, predominated by north-south streets--particularly between Cleveland and East Streets, perpendicular to and thus leading to Main Street. Most of the subsequent development during this historic period aligned in an east-west direction, thus shifting the primary orientation 90 degrees.

The parcelization pattern is quite regular, with most residential parcels of similar size and proportion. Nonetheless, variations in housing types and periods of construction have kept these neighborhoods rich in character. The overall housing pattern is aesthetically pleasing with individual dwellings adding articulation and aesthetic diversity.

Mature trees line the streets throughout these neighborhoods. These trees provide an important scenic amenity, provide environmental tempering from the hot summer sun, and also play an important role in unifying the aesthetic character of the neighborhoods in this historic area.

World War II To 1970s: This older "suburban" development pattern is also characterized by a fairly regular street pattern, although the subdivisions of the 1960s and 1970s contain curvilinear streets, unlike the earlier period where all streets were laid out in a grid pattern. In the 1960s, cul-de-sac configurations begin to appear (characteristic of suburban development throughout the country), and in the 1970s, street patterns in general begin to diverge from the regular north-south or east-west orientation, as subdivisions began to contain limited entry points and to "turn inward", thus severing a regular connection to the greater urban area. This circulation pattern marks a major difference from the historic street pattern and its regular and direct connection to the commercial and civic core, and as a result, appear to exist somewhat independent of the larger urban pattern.

Homes in these older suburban neighborhoods resemble many of the homes in the historic districts, particularly in terms of the high level of maintenance of structures and landscapes. The tree cover is mature, and except for changes in architectural styles and the less formal and more internalized circulation patterns, are quite similar to the character of the older historic residential neighborhoods.

1980 To Present: The city also contains a substantial amount of more recent residential development. These areas have a discernibly different urban pattern and aesthetic character from the older development patterns. The clearly organized grid pattern of the historic period gives way to a more informal curvilinear street pattern, with numerous cul-de-sacs. Although many of these areas contain more regular lot patterns situated on fairly regular

street patterns, there is greater emphasis on separation from and limited access to the balance of the city.

Site planning in these areas also tends to orient the housing to the center of the subdivision, with walls and fences defining the limits of the neighborhood units, thus reinforcing the appearance of detachment from the rest of the city.

Many of these newer neighborhoods do not yet benefit from the mature landscape of the older parts of the city, but the extensive new tree plantings and landscaping will enhance these newer areas over time.

MULTI-FAMILY HOUSING

Multi-family housing is located in small areas throughout the city, although not in the newest neighborhoods. The quality of multi-family housing in the city ranges from excellent to poor. There is much variation in site planning, architecture, density, parking, and usable open space. Higher quality multi-family complexes in Woodland are characterized by the following:

a. Sufficient outdoor privacy for each unit (i.e., patios and/or decks)

b. Covered off-street parking

c. Parking sited off the primary access street and frequently screened with landscaping

d. High site and building maintenance

e. Building massing broken into smaller units, including some one-story elements

f. Pitched and varied rooflines

g. Generous setbacks

h. Generous, functional, and accessible interior site open space

i. Attractive landscaping, including larger trees

j. Easily identified and sheltered entrances to units space

k. Recreational areas for children

Poorer quality multi-family developments in the city are characterized by the following:

a. Flat roofs and/or small roof overhangs

b. Large blank walls

c. Long blocks of undifferentiated and identical units

d. Large, single buildings

e. Poorly-maintained sites and/or buildings

f. Little or poor open space

g. Monotonous color schemes or large developments without variation in building color

h. Absence of architectural distinctiveness

i. Highly visible, uncovered off-street parking or inadequate off-street parking

OUTLYING COMMERCIAL AREAS

Woodland has not diluted the city's commercial core through allowing extensive development of outlying commercial shopping centers. Thus, with the exception of the County Fair Mall and the Granada Street Shopping Center, outlying commercial areas are modestly-scaled and primarily neighborhood serving. The two primary commercial areas are themselves well-maintained and relatively attractive in terms of industry standards. The Granada Street Center is particularly well-integrated into the surrounding suburban landscape, and the County Fair Mall is among the most appealing developments along East Street.

NORTHEASTERN INDUSTRIAL AREA

Annexations in the 1980s and 1990s have created a substantial industrial complex in the northeastern quadrant of the city. Since much of this development has occurred in the past 15 years, the overall character is relatively high, although landscaping varies in terms of quality and extent of plantings. If this industrial area continues to develop in an orderly and appealing manner, the city will be able to boast an exemplar industrial complex to prospective tenants, as well as providing a coherent and relatively contained employment center for residents.

There are, however, some small, but unsightly pockets of older industrial uses that occur outside the boundary of this recent industrial development.

I-5 CORRIDOR

The I-5 corridor is defined by the larger structures and the overall "image" created by the larger industrial buildings and uses that line Interstate 5.

In most cities, industrial areas tend to be among the least-appealing and least-attractive parts of the urban fabric. Thus, when visitors are exposed primarily to industrial areas along the major circulation corridor, the image of an otherwise attractive city can be seriously compromised. In Woodland, there is some relatively high-quality landscaping along the I-5 frontage; there are, however, notable gaps where equipment and construction materials are stored directly adjacent to the highway right-of-way.

KENTUCKY AVENUE CORRIDOR

Kentucky Avenue is a small industrial/commercial corridor of mixed quality. There are some poorly-maintained buildings, poorly paved parking areas, storage yards adjacent to the street, and some instances where there are long walls at the rear of residential properties. There is also a clear presence of agricultural-related uses, thus the street is obviously important to the economic base, and there are likely opportunities to make this corridor more attractive and at the same time more coherent and oriented specifically toward agricultural uses and services.

EAST STREET

East Street is Woodland's principal north-south street in terms of commercial and industrial uses, and may well become an important link between new residential areas in the southern part of the city and the central business district. At present, the street is of mixed quality, due in large part to the railroad right-of-way that extends along the street's entire length. There are landmark buildings, tall rice silos, on both the northern and southern segments of the street. Both north and south segments contain smaller commercial operations, with some poorly-maintained motels located in the southern area. The County Fair Mall and the County Fairgrounds are important uses and visual amenities along much of south East Street, and some newer commercial and industrial uses have created the higher quality environment in the northern portion. The City of Woodland 1994 *Economic Development Strategy* calls for preparation of a specific plan to address the East Street corridor.

1.11 AGRICULTURAL RESOURCES

SOIL RESOURCES

The United States Department of Agriculture's Soil Conservation Service (SCS) completed the *Soil Survey for Yolo County* in 1968. The description and classification of soils in this section provides guidance in evaluating the suitability and limitations of soils for agricultural purposes and other land uses, including identification of the lands best suited for agricultural use. This information includes descriptions of soil series and phases, land capability classification, and Storie index ratings for soils within the General Plan Area.

Soil Series Descriptions

The Soil Conservation Service (SCS) classifies soils according to various properties using a system that groups similar soil types into *soil series*. Each series is named for a town or other geographic feature near the place where a soil in that series was first observed and mapped by the SCS. Within each series, soils that differ in ways that affect their use are further divided into *soil phases*. The *Soil Survey of Yolo County* identifies 16 soil series and 28 soil phases within the General Plan Area. The following paragraphs describe the general characteristics of each series and Table 1-13 lists each series and phase along with the SCS capability class and Storie index rating. Figure 1-4 shows the soil types by phase for the entire General Plan Area.

Brentwood: The Brentwood series consists of well-drained silty clay loams on alluvial fans on slopes ranging from 0 to 2 percent. The soil is used mainly for irrigated orchards, row crops, forage crops, and dryfarmed small grain. Other uses include wildlife habitat and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classification for Brentwood soils is capability class I.

Capay: The Capay series consists of moderately well-drained silty clays that occupy basin rims on slopes ranging from 0 to 2 percent. The soil is used principally for irrigated row crops, field crops, dryfarmed grain, and wildlife habitat. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classifications for Capay soils range from capability class II to IV. Capay soils in the General Plan Area are concentrated in the area east of the city along County Road 101.

Laugenour: The Laugenour series consists of poorly-drained very fine sandy loams on alluvial fans with slopes of less than 1 percent. The soil is used for orchards, forage crops, truck crops, row crops, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classifications for Laugenour soils are capability classes I and IV. Laugenour soils in the General Plan Area are concentrated in

the area east of the city, with most being capability class IV, although some areas immediately adjacent to Cache Creek are classified as capability class I.

Maria: The Maria series consists of poorly-drained silt loams on alluvial fans with slopes of 1 percent. The soil is used for row crops, forage crops, orchards, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classifications for Maria soils are capability classes I, II, and IV. Maria soils are concentrated in the northeastern part of the General Plan Area, with the areas near Cache Creek classified as capability class I.

Marvin: The Marvin series consists of somewhat poorly-drained silty clay loams on basin rims. These soils have a subsoil of silty clay and range in slope from 0 to 2 percent. The soil is used for row crops, field crops, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classifications for Marvin soils are capability classes I, II, and IV. Marvin soils are concentrated in the southeastern part of the General Plan Area, and all are classified as capability class II.

Merritt: The Merritt series consists of poorly-drained silty clay loams on alluvial fans ranging in slope from 0 to 2 percent. The soil is used for row crops, forage crops, truck crops, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classifications for Merritt soils are capability classes II, III, and IV. Merritt series soils are concentrated in the northeastern General Plan Area and are classified mostly as capability class II, although there are small areas of capability class IV.

Myers: The Myers series is made up of well-drained clays on alluvial fans on slopes of less than 1 percent. Myers soils are used for irrigated row crops and field crops, dryfarmed field crops, wildlife habitat, and recreation. Where soils are not cultivated, the vegetation is annual grasses and forbs. The only Myers soil in the General Plan Area is located in the eastern part of the city near the intersection of Beamer and West Streets. It is classified as capability class II.

Pescadero: The Pescadero series consists of poorly-drained silty clays in basins with slopes of less than 1 percent. Pescadero soils are used for irrigated row crops, field crops, and irrigated pasture where reclaimed and for dryland pasture, wildlife habitat, and recreation. Vegetation in uncultivated areas is saltgrass, pickleweed, and other plants that tolerate salt. Pescadero soils are concentrated in the southeastern part of the General Plan Area and are mostly classified as capability class IV.

Reiff: The Reiff series consists of well-drained very fine sandy loams on alluvial fans with slopes of less than 1 percent. Reiff soils are used for orchards, irrigated row crops, forage crops, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. There several areas of Reiff soils in the General

Plan Area, including some within and immediately adjacent to the existing city limits, all of which are classified as capability class I.

Rincon: The Rincon series consists of well-drained silty clay loams on alluvial fans ranging in slope from 0 to 2 percent. The soil is used for irrigated row crops, forage crops, orchards, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. The SCS classification for Rincon soils in the General Plan Area is capability classes II. Rincon series soils are concentrated in the northern part of the General Plan Area and are classified mostly as capability class II.

Riverwash: Riverwash is a land type consisting of excessively drained, sandy, gravelly, or stony stream and river deposits that occupy stream channels and are subject to overflow. Riverwash is used mainly as a source of sand and gravel, but is also used as wildlife habitat and for recreation. Natural vegetation is scattered and consists mostly of cottonwood, willow, and saltcedar. In the General Plan Area, Riverwash is found along the banks of Cache Creek. It is classified as capability class VIII.

Riz: The Riz series consists of poorly drained loams on old terrace remnants with slopes of less than 1 percent. Riz soils are used for rice, irrigated row crops, field crops, and pasture, for dryfarmland small grain, as wildlife habitat, and for recreation. In uncultivated areas, the vegetation is annual grasses, forbs, and perennial grasses that tolerate salt. Riz soils, which are classified as capability class IV, can be found in isolated areas in the southeastern part of the General Plan Area.

Sehorn: Sehorn series soils consist of well-drained clays on dissected uplands with slopes ranging from 2 to 50 percent. Sehorn soils are used for dryfarmed grain, pasture, range, wildlife habitat, and recreation. In uncultivated areas, the vegetation is annual grasses and forbs. Sehorn soils in the General Plan Area are isolated to a very small area to the west of the city with a Capability Class of III.

Soboba: The Soboba series consists of excessively drained very gravelly loamy sands on alluvial fans with slopes of less than 1 percent. Soboba soils are used for irrigated row crops, irrigated pasture, dryland pasture, wildlife habitat, and recreation. Vegetation in uncultivated areas consists of annual grasses, forbs, scattered oaks, saltcedar, and willow. Soboba soils, which are classified as capability class IV, are located in several small areas in the western part of the General Plan Area.

Sycamore: The Sycamore series consists of somewhat poorly drained silty clay loams on alluvial fans with slopes of less than 1 percent. Sycamore soils are used for irrigated row crops, forage crops, truck crops, orchards, pasture, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, vegetation is annual grasses and forbs. Sycamore soils fall into capability classes I, II, III, and IV and are located throughout the General Plan Area.

Willows: The Willows series consists of poorly drained clays in basins with slopes of less than 1 percent. Willows soils are used for row crops, field crops, pasture, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, vegetation is annual grasses and forbs. The Willows series consists of soils in capability classes III and IV. Willows soils are used for row crops, field crops, pasture, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, vegetation is annual grasses and forbs. Willows soils are scattered in fairly large areas in the western part of the General Plan Area.

Yolo: The Yolo series consists of well-drained silt loams and silty clay loams on alluvial fans on slopes of between 0 and 2 percent. Yolo soils are used for orchard, row crops, forage crops, truck crops, irrigated pasture, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, vegetation is annual grasses and forbs. All soils in the Yolo series are classified as capability class I. Yolo soils are used for row crops, field crops, pasture, dryfarmed grain, wildlife habitat, and recreation. In uncultivated areas, vegetation is annual grasses and forbs. Yolo soils are the most prominent in the General Plan Area, covering most of the are within the city limits, as well as large areas to the south and west.

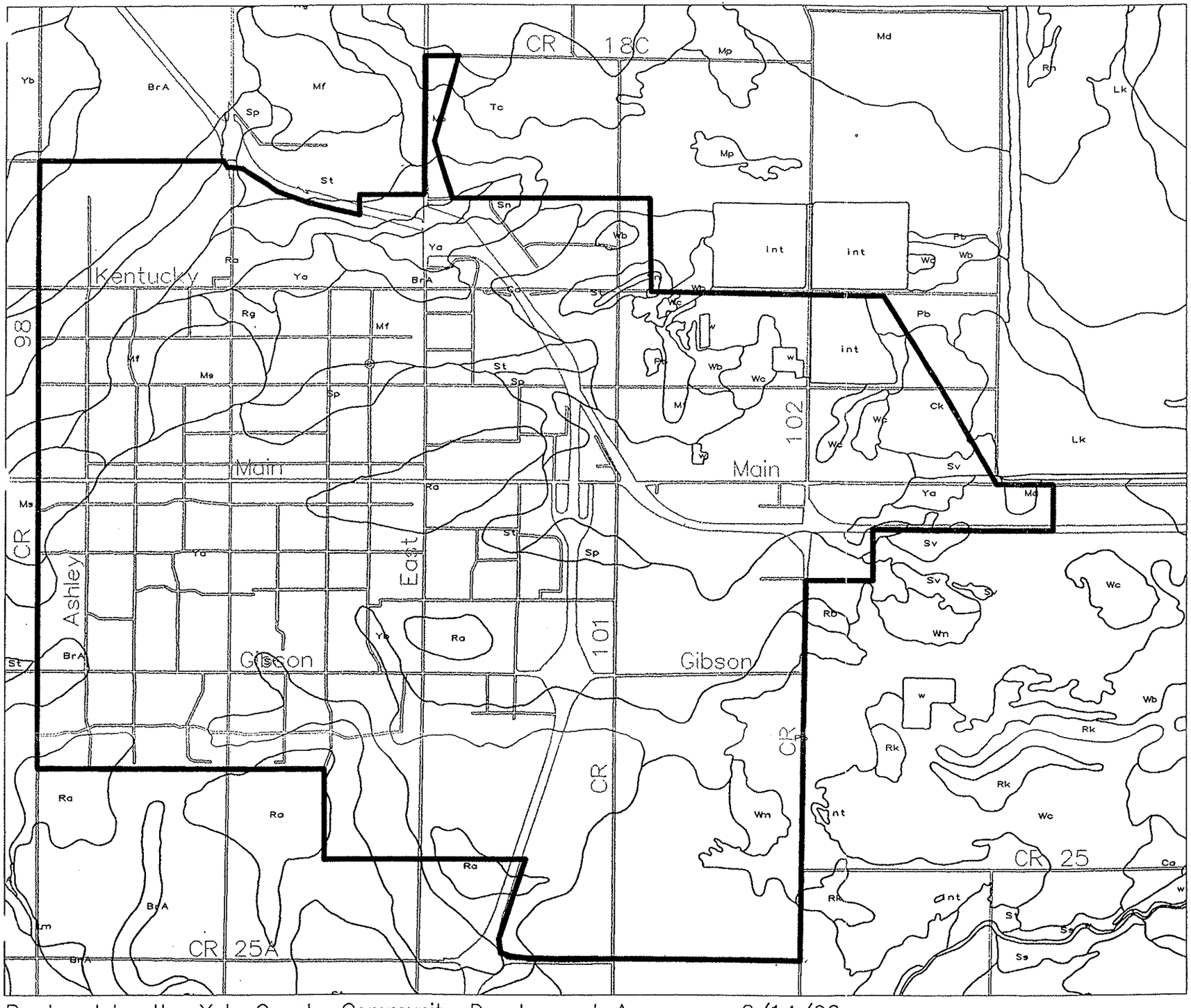
TABLE 1-13

SOILS SERIES AND PHASES
Woodland General Plan Area

Series	Symbol	Phase Name	Capability Unit	Storie Index Rating
Brentwood	BrA	Brentwood silty clay loam, 0 to 2 % slopes	I-1	81
Capay	Ca	Capay silty clay	IIs-5	50
Hillgate	HcA	Hillgate loam, 0 to 2 % slopes	IVs-3	54
Laugenour	Lh	Laugenour very fine sandy loam, flooded	IVw-2	41
	Lk	Laugenour very fine sandy loam, deep, flooded	IVw-3	36
Maria	Mc	Maria silt loam, flooded	IVw-2	43
	Md	Maria silt loam, deep	IIs-3	81
Marvin	Mf	Marvin silty clay loam	IIs-3	65
Merritt	Mo	Merritt silty clay loam, deep, drained	IIs-3	65
	Mp	Merritt complex, saline-alkali	IVw-6	27
Myers	Ms	Myers Clay	IIs-5	51
Pescadero	Pa	Pescadero silty clay	IIIw-5	35
	Pb	Pescadero silty clay, saline-alkali	IVw-6	14
Reiff	Ra	Reiff very fine sandy loam	I-1	100
Rincon	Rg	Rincon silty clay loam	IIs-3	73
Riverwash	Rh	Riverwash	VIIIw-4	
Riz	Rk	Riz loam	IVs-3	45
Sehorn	SmD	Sehorn-Balcolm complex, 2 to 15 % slopes	IIIe-5	41
Soboba	Sn	Soboba gravelly sandy loam	IVs-4	25
Sycamore	Sp	Sycamore silt loam, drained	I-1	90
	Ss	Sycamore silty clay loam	IIw-2	65
	St	Sycamore silty clay loam, drained	I-1	77
	Sv	Sycamore complex, drained	IIs-3	61
Willows	Wb	Willows clay	IIIw-5	29
	Wc	Willows clay, alkali	IVw-6	10
	Wm	Willows clay, marly variant	IIIw-5	34
Yolo	Ya	Yolo silt loam	I-1	100
	Yb	Yolo silty clay loam	I-1	90

Source: United States Department of Agriculture Soil Conservation Service, Soil Survey of Yolo County, Issued June 1972.

Soils Within The Woodland Area



— Soils

— Urban Limit Line

— Roads

N

Scale in Miles

0 .5 1

1 : 35 000

Figure 1–4

Produced by the Yolo County Community Development Agency – 2/14/96

Storie Index Rating

The Storie Index is a rating system that classifies soils according to their agricultural suitability based on four factors that represent the inherent characteristics and qualities of the soils. Each factor is rated or evaluated separately in terms of percentage of the ideal, or 100 percent (SCS 1964). Following are explanations of each of the factors used to determine the Storie index rating:

Factor A -- Profile Characteristics. Factor A expresses relative favorability of the profile to the growth of plant roots. Soils that have a deep, friable profile are rated 100 percent. Soils that have a dense clay layer or a hardpan or are shallow over bedrock are rated less than 100 percent. The rating depends upon the extent to which root penetration is limited.

Factor B -- Texture of the Surface Soil. Factor B is rated according to the texture of the surface soil, which is important in determining how easily the soil can be worked and how easily crops can be established. The moderately coarse and medium textured soils (fine sandy loam, loam and silt loam) are the most favorable and are rated as 100 percent. The coarser and finer textures are rated less than 100 percent.

Factor C -- Slope. Factor C is particularly important if the soil is irrigated. Smooth, very gently sloping soils are rated 100 percent. The rating decreases as the slope increases.

Factor X -- Other Conditions. Factor X is used to evaluate any limitations on the use of the soil, such as imperfect or poor drainage, salts or alkali, erosion, low natural fertility, or unfavorable microrelief. If more than one limitation exists, the values for each are multiplied together to get the rating for the X factor.

The ratings for the four soil suitability factors are used to calculate one general rating on a scale of 10 to 100, with the rating representing a percentage of the ideal soil. Soils that are rated near 100 are better suited for agriculture than soils rated near 10. This soil rating number is then assigned to one of six general categories or grades. Table 1-14 shows the six grades and their corresponding Storie Index ranges, while Table 1-13 shows the ratings for soils in the General Plan Area.

TABLE 1-14

STORIE INDEX RATINGS

Grade	Storie Index	Soil Characteristics
1	80 to 100	Few or no limitations that restrict their use for crops
2	60 to 80	Suitable for most crops, but with minor limitations that narrow the choice of crops; few special management needs
3	40 to 60	Suited to a few crops or to special crops and require special management
4	20 to 40	Severely limited for crops, and, if used for crops, require special management
5	10 to 20	Not suited to cultivated crops, but can be used for pasture and range
6	less than 10	Generally not suited to farming

Source: United States Department of Agriculture Soil Conservation Service, *Soil Survey of Yolo County*, Issued June 1972.

Soil Conservation Service Capability Classification

The Soil Conservation Service uses a system that classifies the suitability of soils for field crops according to eight capability classes. These classes, which are designated by Roman numerals I through VIII, indicating progressively greater limitations and narrower choices for practical uses, are shown in Table 1-15.

TABLE 1-15	
SOIL CONSERVATION SERVICE CAPABILITY CLASSES	
Class I	Soils having few limitations that restrict their use.
Class II	Soils having moderate limitations that reduce the choice of plants or that require moderate conservation practices.
Class III	Soils having severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV	Soils having very severe limitations that reduce the choice of plants, require very careful management, or both.
Class V	Soils that are not likely to erode, but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife.
Class VI	Soils having severe limitations that make them unsuited for cultivation and limit their use largely to pasture or range, woodland, or wildlife.
Class VII	Soils having very severe limitations that make them unsuited for cultivation and limit their use largely to pasture or range, woodland, or wildlife.
Class VIII	Soils and landforms having limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to aesthetic purposes.
Source: United States Department of Agriculture Soil Conservation Service, *Soil Survey of Yolo County*, Issued June 1972.	

For each capability class, the SCS also defines capability subclasses and units that further characterize the suitability of soils for agricultural uses. Land capability subclasses are subdivisions of the capability class that show the kinds of limitations or hazards inherent in a particular soil. These subclasses are subdivided by adding a letter denoting the subclass. Four subclasses are used:

e	Erosion
w	Wetness
s	Soil Limitation
c	Climatic Limitations

The land capability unit is a group of soils that are similar in use and management and provides the more specific information in Land Capability Classification. The capability unit is symbolized by a combination of the capability class, subclass, and unit. The unit, which is

denoted by an Arabic numeral, reflects a secondary major limitation or supplements the major limitation and is defined in terms of a significant soil property. These capability units include:

0	Coarse underlying material
1	Erosion hazard
2	Drainage or overflow
3	Slowly permeable sub-soils
4	Coarse textures
5	Fine textures
6	Salinity or alkali
7	Stony or rocky
8	Bedrock
9	Low Fertility

Figure 1-5 shows the distribution of soils in the General Plan Area according to capability class. As the figure shows, the soil within the city limits of Woodland area is mostly Class I and Class II. Beyond the city limits and within the urban limit line, the capability classes range from Classes I and II to the north, south, and west, to Classes III and IV to the east.

AGRICULTURAL RESOURCES

Department Of Conservation Important Farmland Mapping

In 1980, the California Department of Conservation, Division of Land Resource Protection, began work to supplement the SCS conservation programs. Specifically, the Department began a Farmland Mapping Monitoring Program in 1982. This program was designed to inventory important farm and grazing lands by preparing a series of Important Farmland Series maps. Its purpose is to monitor conversion of the state's agricultural land to and from agricultural use, and to report such conversion to the State Legislature, local governments, and the public.

The important farmland inventory (IFI) guidelines identify five categories of farmlands: Prime Farmlands, Farmlands of Statewide Importance, Unique Farmlands, Farmlands of Local Importance, and Grazing Lands. The Department of Conservation defines these five categories as follows:

Prime Farmland is land which 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 reduce sustained yields of crops when treated and managed, including water management, according to current farming methods. Prime Farmland must have been used for the production of irrigated crops within the last three years. It

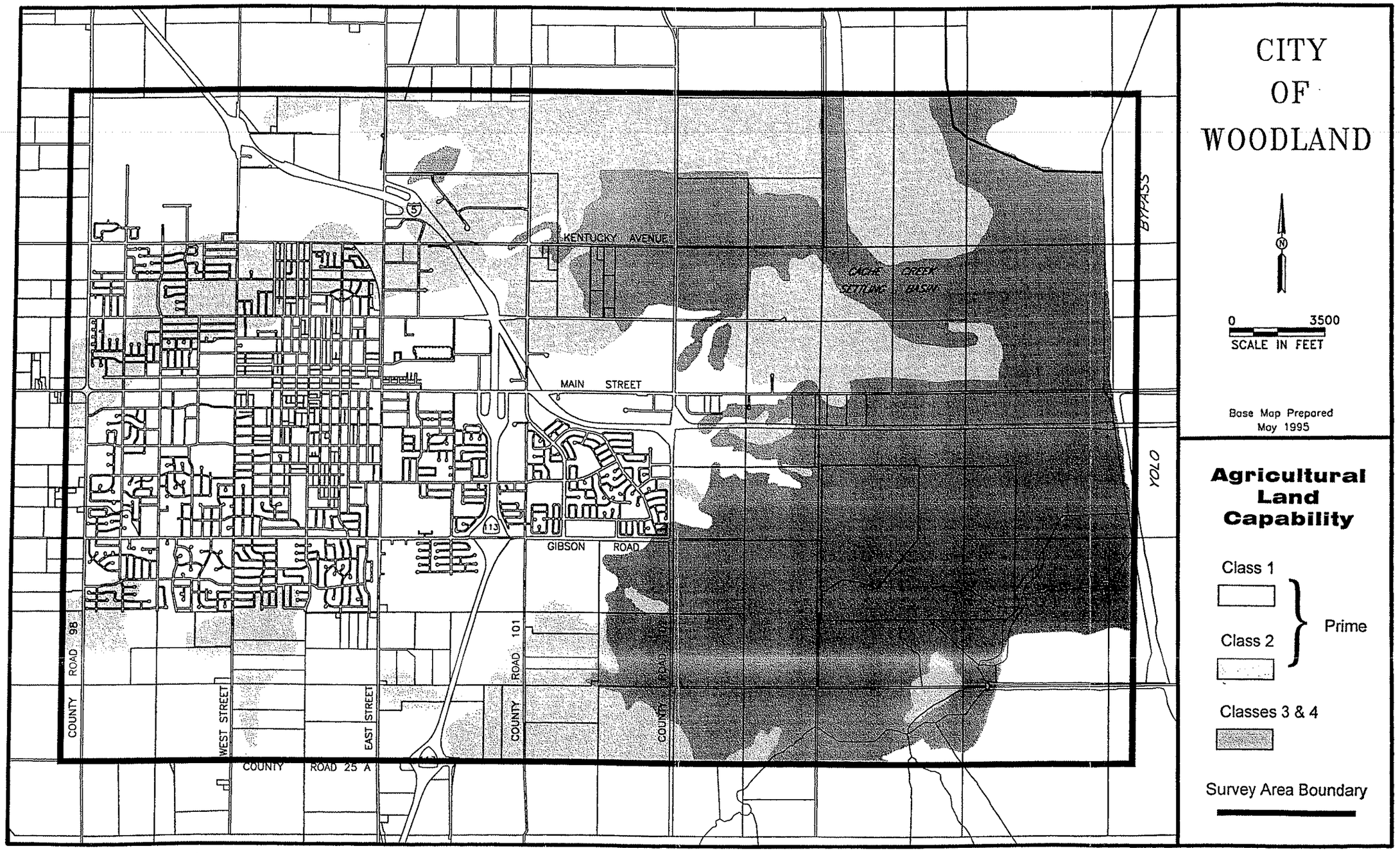

CITY OF WOODLAND
0 3500
SCALE IN FEET
Base Map Prepared May 1995
Agricultural Land Capability
Class 1
Class 2
Prime
Classes 3 & 4
Survey Area Boundary
KENTUCKY AVENUE
MAIN STREET
GIBSON ROAD
CACHE CREEK SETTLING BASIN
BYPASS
YOLO
COUNTY ROAD 98
WEST STREET
EAST STREET
COUNTY ROAD 25 A
COUNTY ROAD 101
COUNTY ROAD 102

Figure 1-5

does not include publicly-owned lands for which there is an adopted policy preventing agricultural use.

Farmland of Statewide Importance is land other than Prime Farmland which has a good combination of physical and chemical characteristics for the production of crops. 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 an adopted policy preventing agricultural use.

Unique Farmland is land which does not meet the criteria for Prime Farmland or Farmland of Statewide Importance, that is currently used for the production of specific high economic value crops. It has the special combination of soil quality, location, 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. Examples of such crops include oranges, olives, avocados, rice, grapes, and cut flowers. It does not include publicly-owned lands for which there is an adopted policy preventing agricultural use.

Farmland of Local Importance is either currently producing crops, or has the capability of production. Farmland of Local Importance is land other than Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. This land may be important to the local economy due to its productivity. It does not include publicly-owned lands for which there is an adopted policy preventing agricultural use.

Grazing Land is defined in California Government Code Section 65570(b)(2) as "... 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.

The Department of Conservation completed an inventory for Yolo County in 1992. As Figure 1-6 shows, the inventory indicated that most of the land in the General Plan Area is classified as Prime Farmland (P). The exception is the area to the east of the city, which includes a significant amount of land classified as grazing land (G) and Unique Farmland (U), as well as pockets of land classified as Farmland of Statewide Importance (S).

Agricultural Land Use and Production

According to the Yolo County Agricultural Commissioner's *1993 Agricultural Crop Report*, over 478,000 of Yolo County's approximately 662,000 acres of land area was used for agricultural crop production. This represents approximately 72 percent of the county. Table 1-16 shows how Yolo County's agricultural crop acreage was distributed by crop types in 1992 and 1993. As the table shows, over 78 percent of the county's cropland was dedicated to field crops in 1993, a 4.4 percent decrease from 1992. Overall, however, the county's cropland increased by 0.5 percent, with the most significant increase being in land used for organic product (179.7 percent). As with the county as a whole, most of the agriculturally-used land in the General Plan Area is planted in field crops.

TABLE 1-16

AGRICULTURAL CROP ACREAGE
Yolo County
1992 and 1993

Crop Type	1992		1993		Change from '92 to '93	
	Acreage	% of Total	Acreage	% of Total	Acreage	% of Total
Field Crops	391,339	82.3%	374,095	78.2%	-17,244	-4.4%
Vegtable Crops	48,888	10.3%	65,959	13.8%	17,071	34.9%
Fruit and Nut Crops	19,136	4.0%	19,464	4.1%	328	1.7%
Seed Crops	15,504	3.3%	17,022	3.6%	1,518	9.8%
Organic Production	444	0.1%	1,242	0.3%	798	179.7%
Nursery Products	441	0.1%	430	0.1%	-11	-2.5%
TOTAL	475,752	100.0	478,212	100.0%	2,460	0.5%

Source: Yolo County Agricultural Commissioner, 1993 Agricultural Crop Report

Table 1-17 shows the production value of Yolo County's agricultural commodities for 1992 and 1993, along with the change between the two years. As the table indicates, total production value increased by 7.8 percent.

TABLE 1-17

AGRICULTURAL PRODUCTION VALUE
Yolo County
1992 and 1993

Commodity	1992		1993		Change from '92 to '93	
	Value	% of Total	Value	% of Total	Value	% of Total
Field Crops	$78,991,000	36.1%	$84,556,000	35.9%	$5,565,000	7.0%
Vegetable Crops	$81,187,000	37.1%	$90,833,000	38.5%	$9,646,000	11.9%
Fruit and Nut Crops	$31,443,000	14.4%	$33,131,000	14.1%	$1,688,000	5.4%
Seed Crops	$12,649,000	5.8%	$10,814,000	4.6%	($1,835,000)	-14.5%
Organic Production	$1,153,467	0.5%	$2,674,800	1.1%	$1,521,333	131.9%
Nursery Products	$3,753,000	1.7%	$3,746,000	1.6%	($7,000)	-0.2%
Livestock and Poultry	$7,677,000	3.5%	$8,025,000	3.4%	$348,000	4.5%
Apiary, Livestock, and Poultry Products	$1,977,039	0.9%	$2,025,191	0.9%	$48,152	2.4%
Total	$218,830,506	100.0%	$235,804,991	100.0%	$16,974,485	7.8%

Source: Yolo County Agricultural Commissioner, *1993 Agricultural Crop Report*

Agricultural Economy

Agricultural activities are important to the overall economy of Yolo County. Through the process known as "multiplier effect," direct agricultural production results in additional economic activities through two effects:

- Purchases of goods made by agricultural producers from establishments in the Sacramento Region and Yolo County . This is the *indirect* effect.

- Purchases made by households support by direct agricultural activities and by their indirect purchases. This is the *direct* effect.

Table 1-18 presents multiplier factors for the Sacramento Region based on the U.S. Department of Commerce's Regional Industrial Multiplier System (RIMS).

TABLE 1-18

GROSS OUTPUT MULTIPLIERS FOR AGRICULTURAL PRODUCTION
Sacramento Region

	Agricultural Sector	Multiplier
02	Poultry and eggs	2.886
05	Food, feed grains, and grass seeds	2.254
07	Fruits and nuts	2.714
08	Vegetable, sugar, crops	2.842
10	Forest, greenhouse, and nursery products	3.022

Source: *Industry-Specific Gross Output Multipliers for BEA Economic Areas*, Regional Economic Analysis Division, Bureau of Economic Analysis, United States Department of Commerce, January 1977.

The gross output multipliers for these selected agricultural activities range from about 2.2 to 2.9. This means that for every dollar of direct agricultural production in Yolo County, an additional $1.20 to $1.90 in output is generated in the Sacramento Region (Sacramento, Yolo, El Dorado, Placer, Sutter, Yuba, and Nevada Counties). The result is total output ranging from $2.20 to $2.90.

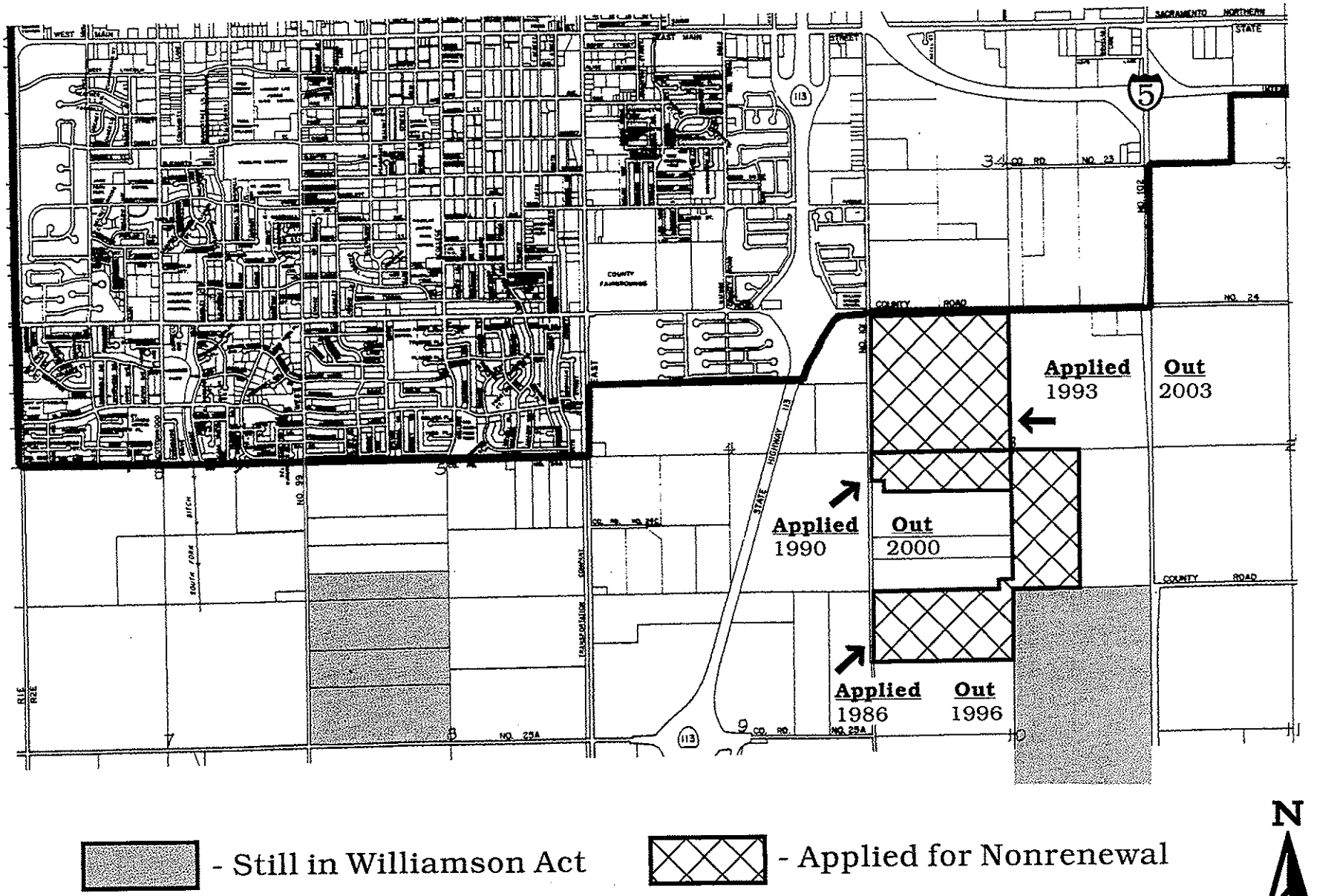
Across all sectors of the economy, the gross output multipliers range from a low of 1.587 for petroleum and coal products to a high of 3.134 for meat products. Most of the gross output multipliers are in the range of 1.5 to 2.5, so the agricultural multipliers in the range of 2.2 to 2.9 are comparatively high.

Williamson Act Contracts

The California Land Conservation Act (Williamson Act) encourages conservation of agricultural lands. The act allows cities and counties to create agricultural preserves and offer tax incentives to farmers who agree not to develop their agricultural lands. A contract, signed by a property owner, indicates that contracted land will not be developed for a 10-year period. The tax assessment on the contracted land is based on its agricultural use value rather than on

Figure 1-7

Status of Williamson Act Property



- Still in Williamson Act

- Applied for Nonrenewal

market value. Each year the contract is automatically renewed for an additional 10-year period unless a termination is requested.

A Williamson Act contract may be terminated in three ways:

1. The landowner or local jurisdiction may file a notice of nonrenewal, and the land is phased out of the program over the remaining years, so that after ten years the land is "out of contract."

2. The landowner may petition the local jurisdiction for cancellation, which results in the immediate payment of penalties. In approving a cancellation, a city or county must find that the cancellation is either (1) consistent with the purposes of the Williamson Act or (2) in the public interest. For purposes of section (1), in order to find that the cancellation is consistent with the Act, the board or council must make all the following additional findings:

   (1) That the cancellation is for land on which a notice of nonrenewal has been served;

   (2) That the cancellation is not likely to result in removal of adjacent lands from agricultural use;

   (3) That the cancellation is for an alternative use that is consistent with the applicable provisions of the city or county general plan;

   (4) That the cancellation will not result in discontiguous patterns of urban development;

   (5) That there is no proximate, non-contracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

3. A state or local government agency may terminate contracts by eminent domain if the contracted land is needed for a public purpose.

Figure 1-7 shows that a significant amount of the land in the Planning Area is currently under Williamson Act contract, including several properties for which notices of non-renewal have been filed.

1.12 SOURCES

City of Woodland, Economic Development Strategy.

City of Woodland, Downtown Specific Plan.

City of Woodland, Historical Stroll.

City of Woodland, Annexation Map.

Woodland General Plan Land Use Element and Data Base, 1988.

Sacramento Area Council of Governments Population Projections, October, 1995.

U.S. Department of Agriculture Soils Survey for Yolo County, 1968.

CHAPTER 2

HOUSING

The Housing Element is subject to specific statutory requirements for periodic updates. The City adopted a revised Housing Element in 1994. Because the City devoted extensive recent effort to updating the Housing Element and processing it through certification, it was not updated as part of this General Plan Update.

CHAPTER 3

TRANSPORTATION / CIRCULATION

3.1 INTRODUCTION

This chapter describes the transportation system and services. The discussion includes the street and roadway system, parking, transit services and facilities, bicycle facilities, pedestrian facilities, rail facilities, and air transportation. It also discusses levels of service, and the congestion management system.

3.2 STREET AND ROADWAY SYSTEM

The predominant feature of Woodland's roadway system is its grid pattern of major streets, which is bordered by State Route 113 on the east and Interstate 5 to the north. The street pattern allows a high degree of land access but has some limitations for mobility, especially in the east-west direction where the number of high speed through streets is limited.

The community and the street system has grown outward from the center and is now facing important questions about the direction of development and how to serve new areas with transportation facilities. With continued growth pressure, the answers to these questions will face close scrutiny to ensure that interests of Woodland's citizens are protected and promoted throughout the planning process. As one of the first steps in the planning process, this evaluation is aimed at developing a clear understanding of existing travel patterns and conditions in the City.

EXISTING ROADWAY SYSTEM

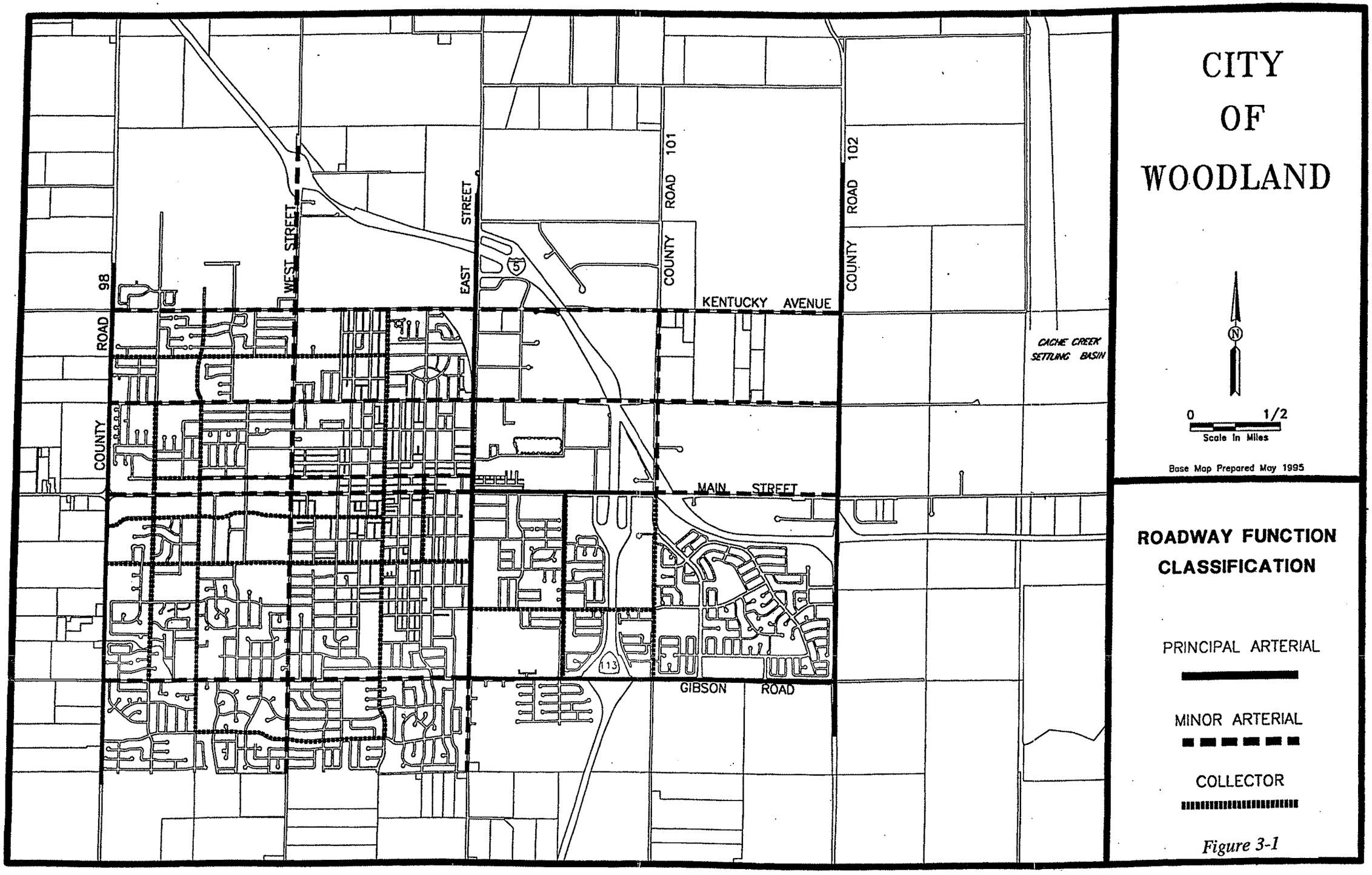
Woodland's major street pattern was developed on a grid system oriented in north/south and east/west directions. The roadways that make up the grid system have two functions: to provide mobility and to provide land access. High speeds are desirable for mobility, while low speeds are more desirable for land access. To identify the functional specialization of roadways in meeting the access and mobility requirements, a functional classification system is used that is based on the following premises:

- Local facilities emphasize the land access function;
- Arterials emphasize a high level of mobility for through movement; and
- Collectors offer a more balanced service for both functions.

In general, major arterial streets in Woodland are located at one mile intervals and collector streets are generally located at half-mile intervals. The hierarchy of the functional classifications in the City consists of principal arterials (for main movement), minor arterials (distributors), collectors, and local roads and streets as described below:

- **Principal arterials** emphasize mobility with limited access (these include freeways, expressways and those arterials that are specifically designed to provide a high level of mobility with limited access to adjoining properties).
- **Minor arterials** interconnect with and augment the principal arterial system while providing a somewhat lower level of travel mobility due to less stringent access limitations;
- **Collectors** provide a balanced function of land access and mobility within residential neighborhoods and commercial and industrial areas;
- **Local Roads and Streets** primary function is to provide direct access to abutting lands and connections to the higher order functional classifications.

Figure 3-1 illustrates the roadway system in Woodland (local streets not shown). As shown in Figure 3-1, arterial streets are located at one mile intervals with the exception of Court Street. Collector streets are generally located at the half-mile intervals between the arterial streets, although additional collector streets have been designated at approximately quarter mile intervals in most areas of the City. Table 3-1 lists the collector and arterial streets.


CITY
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WOODLAND
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Scale In Miles
Base Map Prepared May 1995
ROADWAY FUNCTION
CLASSIFICATION
PRINCIPAL ARTERIAL
MINOR ARTERIAL
COLLECTOR
COUNTY ROAD 98
WEST STREET
EAST STREET
COUNTY ROAD 101
COUNTY ROAD 102
KENTUCKY AVENUE
MAIN STREET
GIBSON ROAD
CACHE CREEK
SETTLING BASIN
5
113

Figure 3-1

Table 3-1

Arterial and Collector Streets

Principal Arterials	Collectors
County Road 98	Ashley Avenue
East Street (Gibson to I-5)	Cottonwood Street
County Road 102	College Street
Main Street (East to I-5)	Cross Street
Gibson Road (East to CR 102)	Third Street
Minor Arterials	Matmor Road (south of Main Street)
West Street	Beamer Street (East to CR 102)
County Road 101/Pioneer Avenue	Lincoln Avenue
Kentucky Avenue	Maxwell Avenue
Beamer Street (CR 98 to East)	East Gum Avenue
Court Street	El Dorado Drive
Main Street (CR 98 to East) and (I-5 to CR 102)	Farnham Avenue County Road 101 (Gibson to Main)
Gibson Road (CR 98 to East)	Ogden Street
East Street (Gibson to CR 24A)	

EXISTING OPERATING CONDITIONS

To measure existing operating conditions of the roadway system, both roadway segments and intersections were analyzed. The specific analysis procedures rely on qualitative levels of service (LOS) to describe the operating performance of the analysis locations. Service levels vary qualitatively from "A" (the best) to "F" (the worst). It has been the City's policy to maintain an average level of service of "C" or better for all City streets and intersections.

Roadway Segments

Since service levels are measured differently for roadway segments and intersections, it is important to identify the specific criteria for each type of facility. Table 3-2 shows the average daily traffic volume thresholds for each roadway functional classification by service level according to the number of travel lanes. The level of service thresholds for arterials are based solely on physical capacity. The thresholds for collectors and local roads reflect the fact that they have fronting residences, on-street parking, and generally narrower widths.

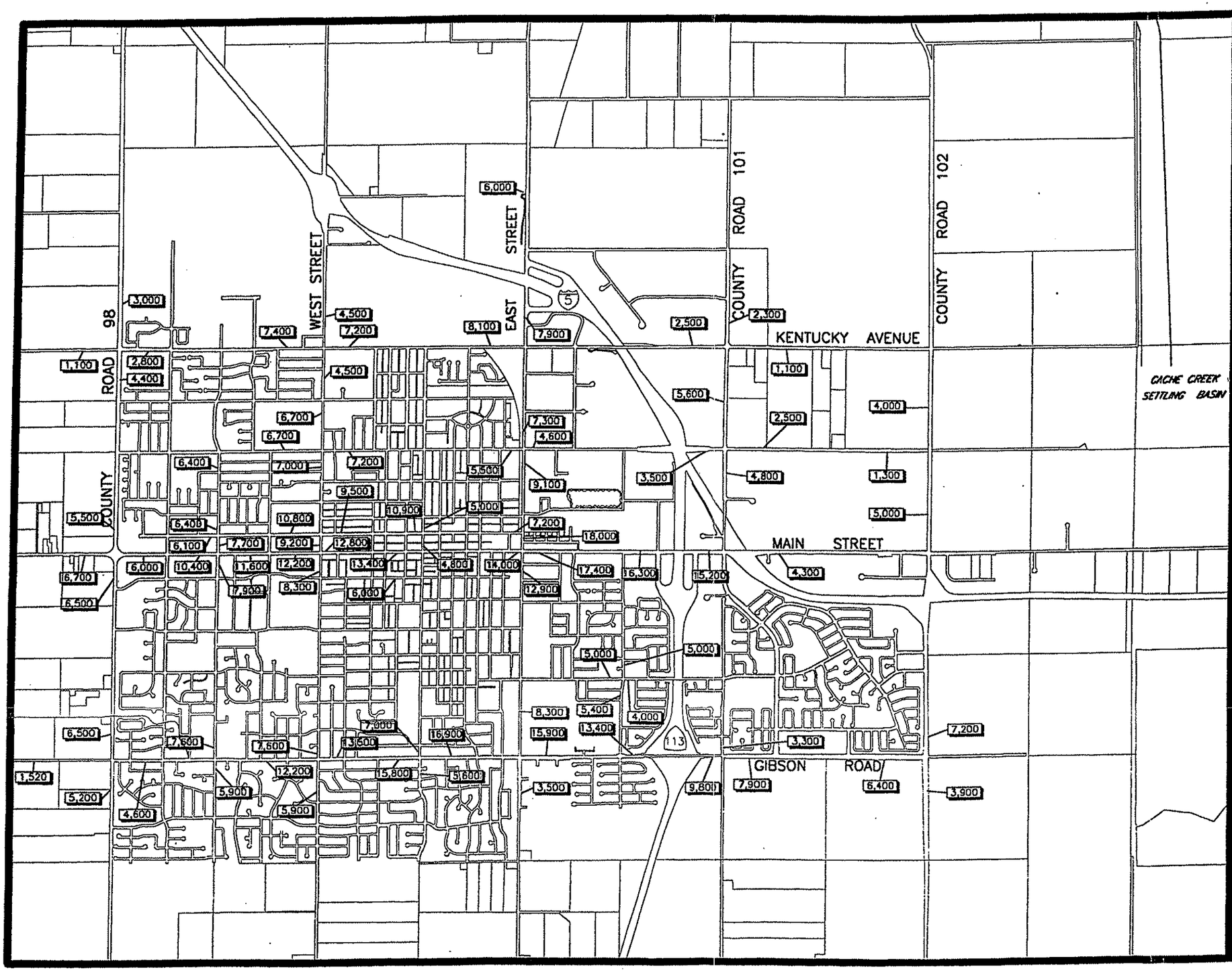
Table 3-2

Roadway Segment Service Level Criteria

Roadway Segment Classification	Lanes	Level of Service				
		A	B	C	D	E
Local	2	3,800	4,400	5,000	5,600	6,300
Collector	2	7,500	8,750	10,000	11,250	12,500
Arterial	2	9,000	10,500	12,000	13,500	15,000
	4	18,000	21,000	24,000	27,000	30,000

Source: Fehr & Peers Associates, Inc. 1995

For the purposes of this study, roadway segments were analyzed by comparing average daily traffic volume counts conducted in January 1995 to the capacity thresholds contained in Table 3-2. The average daily traffic volumes and level of service analysis results for roadway segments are shown on Figure 3-2 and Figure 3-3, respectively.



CITY OF WOODLAND

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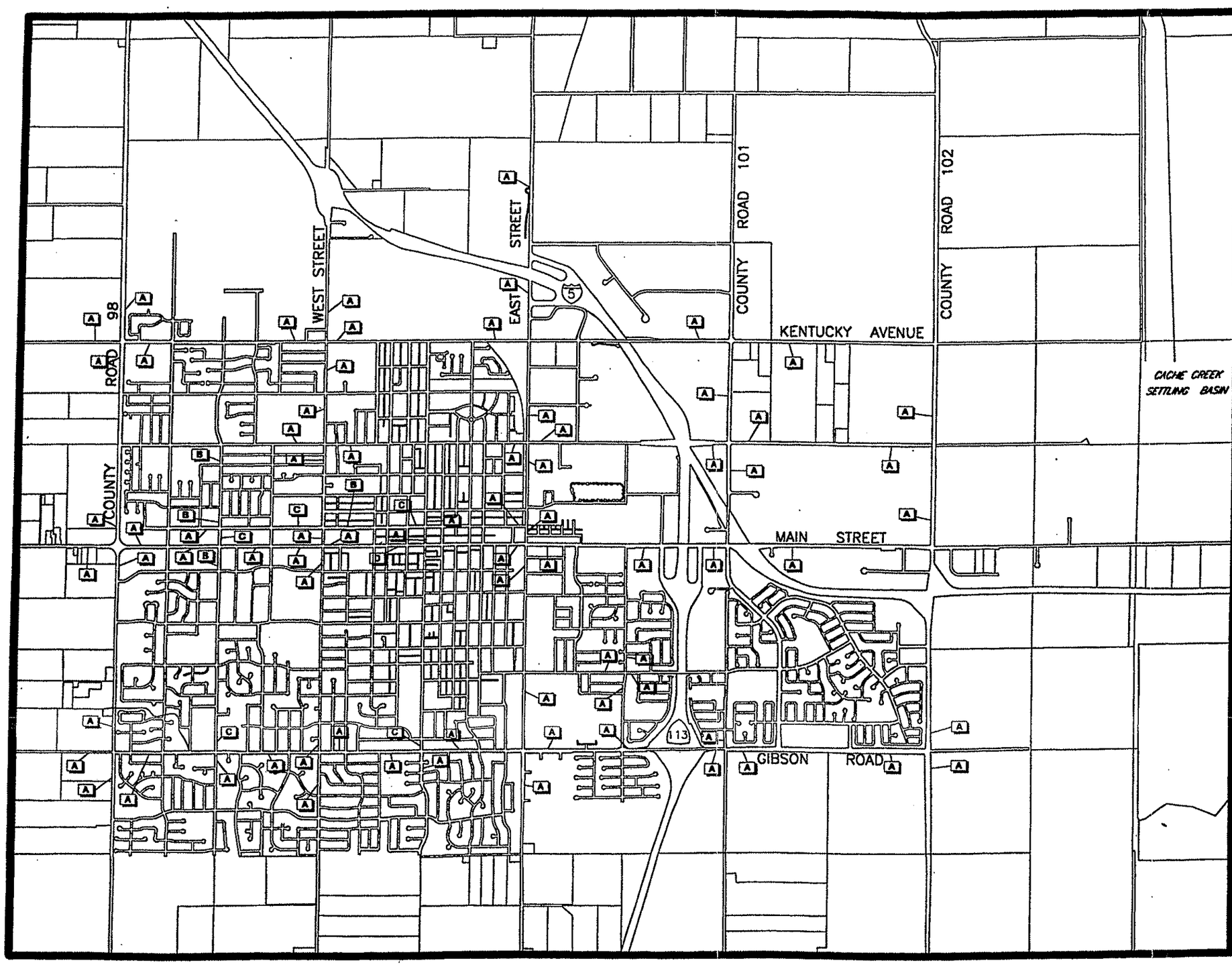
Scale In Miles

Base Map Prepared May 1995

AVERAGE DAILY TRAFFIC VOLUMES

Figure 3-2



CITY OF WOODLAND

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Scale in Miles

Base Map Prepared May 1995

ROADWAY LEVELS OF SERVICE

Figure 3-3

The daily roadway volumes shown on Figure 3-2 were compared to the daily threshold volume criteria to determine the levels of service on roads throughout the City (Figure 3-3). As Figure 3-3 shows, all locations currently operate at or better than Level of Service C, except for one location which operates at LOS D. This location is the two-lane section of Main Street between Third Street and Walnut Street.

The state highway system in the Woodland area includes Interstate 5 (1-5), State Route 113 (SR 113), and State Route 16(SR16). Existing (1995) daily traffic volumes on these facilities are as follows:

- SR 16 Approximately 5,000 to 6,000 vehicles per day between Kentucky Avenue and Main Street;
- SR 113. Approximately 14,000 vehicles per day between County Road 25A and Main Street.
- 1-5 Approximately 24,000 vehicles per day between West and East Street, approximately 25,000 vehicles per day between East Street and SR 113, and approximately 33,000 vehicles per day between SR 113 and County Road 102.

Intersections

Unsignalized and signalized intersections were analyzed using the methodology described in Circular 212, Interim Materials on Highway Capacity (Transportation Research Board, 1980) and the Highway Capacity Manual, Special Report 209 (Transportation Research Board, 1985), respectively. For unsignalized intersections, the peak hour signal warrant, as defined in the Manual of Uniform Traffic Control Devices, Federal Highway Administration, 1988, was also reviewed to determine the need for signalization.

Morning (7-9 a.m.) and evening (4-6 p.m.) peak hour traffic counts were taken in January 1995. Existing lane geometrics and traffic control types were also obtained for each intersection. This information was used to calculate the a.m. and p.m. peak hour service levels shown in Table 3-3.

The table above shows a.m. and p.m. peak hour service levels for 36 major intersections in the City of Woodland. A shaded service level cell indicates an exceedance of the City's level of service "C" policy. This only occurred at the East Street / Court Street and West Street/Kentucky Avenue intersections during the p.m. peak hour. It should be pointed out that all-way stop controlled intersection level of service only indicates whether an intersection is operating above or below the level of service "C" threshold. All other stop controlled or signalized intersections are measured by a range of service levels from "A" to "F".

The "Worse than C" service level for West Street/Kentucky Avenue intersection is a function of the shared turning movements at each approach. Minor widening and striping could provide for dedicated turn-lanes, which would improve the intersection operations to

C or better". The Court Street/East Street intersection is more difficult to improve because it already contains adequate turn lanes and any improvements such as signalization may adversely affect traffic operations at the closely spaced intersection of East Street and Main Street. Specific improvements to this intersection should be studied in detail in the Streets Master Plan.

Table 3-3

Existing (1995) Intersection Level of Service

Intersection	Type of Control	Level of Service	
		A.M. Peak Hour	P.M. Peak Hour
County Road 98/Gibson Road	All-Way Stop	C or better	C or better
County Road 98/Main Street	All-Way Stop	C or better	C or better
County Road 98/Kentucky Avenue	Two-Way Stop	B	A
Cottonwood Street/Court Street	Signal	A	A
Cottonwood Street/Main Street	Signal	A	A
West Street/Gibson Road	Signal	A	A
West Street/Main Street	Signal	A	A
West Street/Court Street	Signal	A	A
West Street/Beamer Street	Signal	B	A
West Street/Kentucky Avenue	All-Way Stop	C or better	Worse than C
College Street/Gibson Road	Signal	A	A
College Street/Main Street	Signal	A	A
College Street/Court Street	Signal	A	A
East Street/Gibson Road	Signal	A	A
East Street/Main Street	Signal	A	B
East Street/Court Street	One-Way Stop	B	D
East Street/Beamer Street	Signal	A	A
East Street/Kentucky Avenue	Signal	A	A
East Street/Southbound I-5 Ramps	Signal	A	A
East Street/Northbound I-5 Ramps	Signal	A	A
Matmor Road/Gibson Road	Signal	A	A
Matmor Road/Gum Avenue	All-Way Stop	C or better	C or better
SR-113 Southbound Off-Ramp/Gibson Road	Signal	A	A
SR-113 Northbound Off-Ramp/Gibson Road	Signal	A	A
SR-113 Southbound Ramps/Main Street	Signal	A	A
SR-113 Northbound Ramps/Main Street	Signal	A	A
County Road 101/Gibson Road	All-Way Stop	C or better	C or better
County Road 101/Gum Avenue	One-Way Stop	A	A
County Road 101/Beamer Street	Signal	A	A
County Road 101/Kentucky Avenue	Signal	A	A
I-5 Northbound Off-Ramp/Main Street	Signal	A	A
I-5 Southbound On-Ramp/Main Street	No Control	N/A	N/A
County Road 102/Gibson Road	Two-Way Stop	C	C
County Road 102/I-5 Southbound Ramps	One-Way Stop	A	A
County Road 102/I-5 Northbound Ramps	Two-Way Stop	A	C
County Road 102/Beamer Street	Signal	A	A

Source: Fehr & Peers Associates, Inc.

ACCIDENTS

Accident data provides some insight to the operational conditions of the street system as it relates to safety. The City of Woodland collects and maintains accident data annually that includes location, type of accident, accident rate, and traffic control devices for intersection locations. This information was provided for the years 1992, 1993 and 1994, and included the following data:

- Intersection Location;
- Type of Control (e.g., signal, multi-way stop, minor-street stop or no control);
- Type of Intersection (e.g., 4-Leg, "T" or 3-Leg);
- Average Daily Traffic Volume;
- Number of Accidents (classified by property damage only and injury); and
- Actual Accident Rate (accidents per million vehicles entering intersection).

Actual Accident Rates

While the absolute number of accidents can be helpful in determining locations which may pose a safety problem, it is of more use to look at the accident rate. The actual accident rate for an intersection or spot location is a measure of the number of accidents occurring at a given location per million vehicles entering the location over a given time period. This approach leads to a more meaningful indication of accident-prone locations since it is based on the total number of accidents as well as the volume of traffic utilizing the facility.

Expected Accident Rates

As discussed above, the accident rate is the actual number of accidents per million vehicles entering a particular intersection. The expected accident rate was developed based on Statewide average accident rates which would be expected to occur at a particular intersection and are based on intersection type, intersection control and area type (urban, suburban or rural). Therefore, a good indication that a location may need further examination is to compare the actual accident rate with the expected accident rate. Locations where the actual accident rate is greater than the expected accident rate is a general indication that the location should be denoted for further study.

Critical Accident Rates

Solely because a location is experiencing a higher accident rate than would be expected from statewide data does not necessarily indicate that there is an associated safety problem. In order to determine whether a particular accident rate is unusually high in reference to the expected accident rate, a statistical significance test is applied. This involves determining the critical accident rate at which there is a reasonable level of confidence that the accident rates above the critical rate are significant and have not resulted by chance.

The fifteen highest accident rate locations in the City were identified for the years 1992, 1993 and 1994, respectively. This information is contained in the appendix and includes the stratification of accident locations by type of control and intersection. Also presented are the intersection's actual accident rate, expected accident rate and critical accident rate, as well as a determination of whether the intersection experienced an accident rate above the critical rate. Locations where the critical accident rate was exceeded for any given year from 1992 through 1994 are listed below in Table 3-4.

Table 3-4

Intersection Locations Where Actual Accident Rate Exceeded Critical Accident Rate

1992	1993	1994
Woodland/Walnut	**Woodland/Walnut**	Marshall/Second
North/College	Court/First	**Woodland/Walnut**
Lincoln/Ashley	**Oak/East**	Elliot/West
NB I-5 Ramp/Co. 102	Cross/California S.	North/East
Oak/East	Gibson/Co. Rd. 102	**Lincoln/Ashley**
Cross/California N.	**Main/NB I-5 Ramp**	Dubach/East
Cross/East		**Cross/East**
Main/NB 113 Ramp		Beamer/Ashley
		NB I-5 Ramp/East
		Main/NB I-5 Ramp

Intersections in bold type indicate locations where the critical accident rate has been exceeded in two or more of the three years.

The following five intersections were found to have higher than critical accident rates for two or more of the years from 1992 to 1994:

- Woodland / Walnut;
- Lincoln / Ashley;
- Oak / East;
- Cross / East;
- Main / NB I-5 Ramp

These locations should be given the highest priority for evaluating possible measures to improve safety and reduce the frequency of accidents.

FREEWAY ACCESS

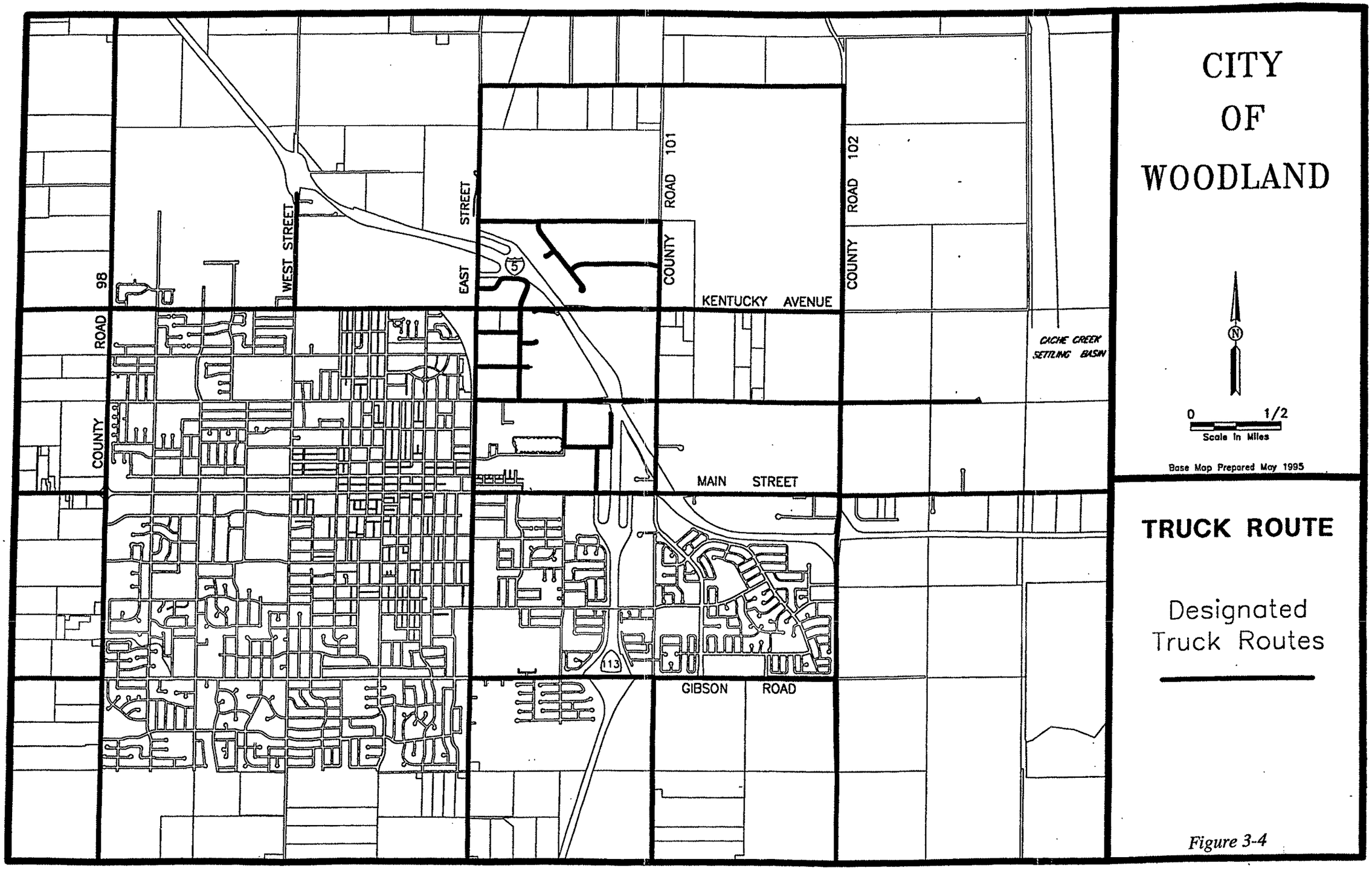
Freeway access to Interstate 5 is provided at County Road 102, East Main Street near Pioneer Avenue, North East Street, West Street, and at County Road 98 north of the planning area. State Route 113 connects to Interstate 5 in the north-bound direction only; south bound traffic must use East Main Street. Caltrans and the City have discussed a number of preliminary alternatives that would provide a direct link from State Route 113 to south-bound Interstate 5. Access to the State Route 113 Freeway is provided at County Road 25A Gibson Road, and East Main Street.

TRUCKS

Trucks are the major mode for the transport of goods to and from Woodland. Woodland is the primary trucking center for the agricultural and warehousing industry in Yolo County and generates high volumes of truck traffic during the harvest seasons. In addition, many large distribution warehouses have located in the City which generate significant amounts of traffic. Figure 3-4 shows truck routes within the City.

EXISTING STREET SYSTEM NEEDS

The existing street system needs stem from intersection operating conditions that are characterized by service levels worse than "C" or actual accident rates that exceed critical accident rates. Intersections operating worse than LOS "C" included the Court Street/East Street intersection and the West Street/Kentucky Avenue intersection. Minor widening and striping could provide for dedicated turn-lanes at the West Street/Kentucky Avenue intersection, which would improve the intersection operations to "C or better". The Court Street/East Street intersection is more difficult to improve because it already contains adequate turn lanes and any improvements such as signalization may adversely affect traffic operations at the closely spaced intersection of East Street and Main Street. Additional analysis of this intersection should be conducted before recommending specific improvements.


CITY
OF
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Scale In Miles
Base Map Prepared May 1995
TRUCK ROUTE
Designated
Truck Routes
COUNTY ROAD 98
WEST STREET
EAST STREET
COUNTY ROAD 101
COUNTY ROAD 102
KENTUCKY AVENUE
CACHE CREEK
SETTLING BASIN
MAIN STREET
GIBSON ROAD
5
113

Figure 3-4

3.3 PARKING

Private and public off-street parking areas and curb side parking provide parking facilities for the automobile. These facilities include parking in commercial areas, adjacent to places of employment and amusement, and in residential areas. The City's Zoning Ordinance presently requires off-street parking facilities for any new structure or for locations where major alterations are proposed for existing structures. The minimum and maximum number of required spaces is dependent upon the size and use of the structure. Structures within the parking district area identified in the Downtown Specific Plan are exempt from parking requirements. Parking facilities for this area are provided by City parking lots. Figure 3-5 shows the Downtown Specific Plan parking district area and the location of the City parking lots. A committee is currently (1995) revising the City's Parking Management Plan and studying ways to finance additional parking spaces in the Downtown; this is an implementation measure of the Downtown Specific Plan.

3.4 TRANSIT SERVICES AND FACILITIES

Public transit in Woodland is primarily provided by the Yolo County Transit Authority's Yolobus system. Figure 3-6 shows the Yolobus routes within Woodland. Yolobus' services in Woodland include the following:

Local: Yolobus operates fixed route service within Woodland. Lines 210 and 211 operate within Woodland and serve the major shopping areas (including County Fair Mall), Downtown, Woodland High School and Yuba College. A variation of the Line 210 is the "Wolf Pack Run", which is a free lunch hour shuttle between Woodland High School and several fast food restaurants.

Yolobus has two buses which operate in Woodland. Line 210 operates Monday through Friday and has a ½ hour headway. Line 211 operates Monday through Saturday and has a one hour headway. From July 1993 through June 1994, there were 75,370 passengers on the two local routes. The farebox recovery for the two Woodland routes is approximately 10 percent. Areas currently underserved include all areas ¼ mile or further from the current bus route.

Rural: Yolobus operates fixed route rural service between several of the unincorporated communities in Yolo County and Woodland. Most of these communities are served by transit either one or two days per week.

Inter-City: Yolobus operates fixed route inter-city services. Line 45 is an express route between Woodland and Sacramento that operates during commute hours. Lines 42 and 242 is a route linking Woodland, Davis, West Sacramento, and Sacramento. Line 220 links Woodland, Davis and Winters.

Paratransit: Yolobus Special Transit operates two demand responsive services in Woodland, the Handi Van service and the taxi subsidy program. These services are offered to residents of Woodland who have a qualifying disability under the Americans with Disabilities Act. The Woodland Handi-Van service provides door to door transportation. In the event that the Handi-Van cannot accommodate a request for service, referrals are transferred to a local taxi provider. Under the taxi subsidy program, the cost to the rider is subsidized so that the trip costs the same as a Handi-Van ride.

The Community Care Car is an on-call transportation service for senior citizens and handicapped persons in the Woodland area. This system operates as a dial-a-ride service for which a call must be placed one day in advance. It is a volunteer system - the bus is donated and the drivers unpaid. No fare is charged but donations are accepted.

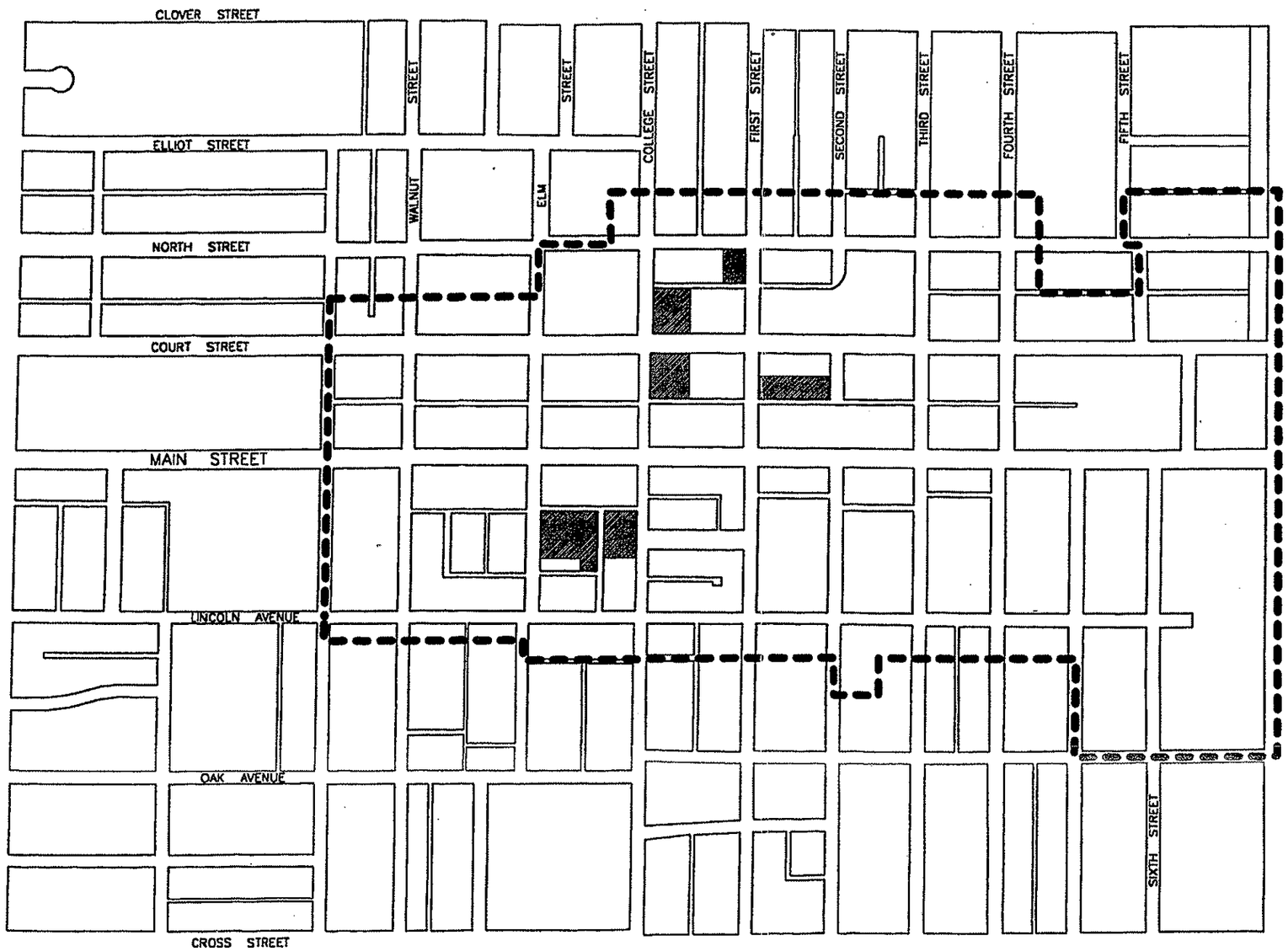
3.5 BICYCLE FACILITIES

The use of the bicycle is becoming more and more popular as an alternate mode of transportation for commuter and recreational uses within the City of Woodland. As a mode of transportation, it has advantages in terms of cost, maintenance, noise, air pollution, energy conservation, and improving the physical health of the rider.

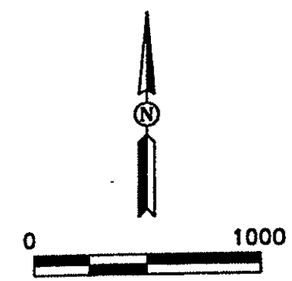
In 1993, the City of Woodland Bikeway Master Plan (BMP) was adopted. This plan sets forth goals, policies, recommended actions and financial options for a City-wide bikeway facility system to respond to the needs of bicyclists. The BMP designates existing and proposed routes and categorizes these routes as either Class I, Class II, or Class III bikeways. Figure 3-7 shows the location of existing and proposed bike routes in Woodland.

In 1994, the City received federal grants to assist in the installation of the bikeway system called for in the BMP. These improvements were completed in 1995.

Bike racks provide parking area for bikes. These are generally available at schools and parks and are provided at other recreation and commercial facilities in the community. New commercial and industrial development is typically required to install bike racks. The City recently purchased and installed about 20 bike racks, primarily in the Downtown area. The Yolobus system received approval of a grant that will allow them to install bike racks on buses to facilitate intermodal transportation.



CITY OF WOODLAND



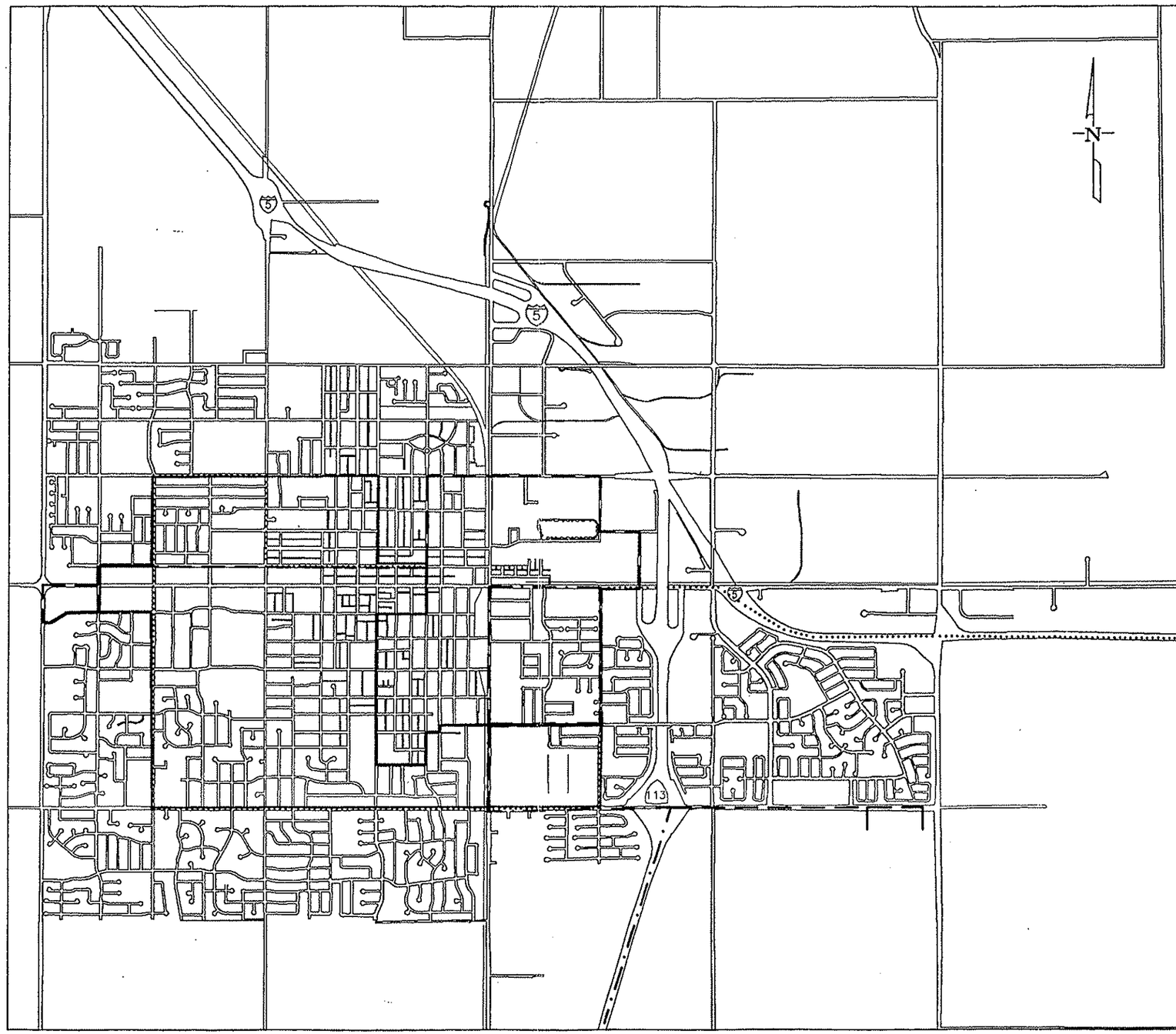
Base Map Prepared May 1995

PARKING DISTRICT

Parking District

City Parking Lots

Figure 3-5



Transit Routes

Figure 3-6

0 1

Scale in Miles

Legend

Yolobus Routes

Route 45

Route 210

Route 211

Route 42

2/15/96
dwg\gen_plan\transit.dwg

BIKEWAY MASTER PLAN

EXISTING BIKEWAYS

LEGEND

CLASS I BIKEWAY (OFF STREET)

CLASS II BIKE LANE (ON STREET MARKED AND SIGNED)–W/ PARKING

CLASS II BIKE LANE (ON STREET MARKED AND SIGNED)–W/O PARKING

CLASS III BIKE ROUTE (ON STREET, SIGNED ONLY)

YOLO COUNTY BICYCLE ROUTES

WOODLAND CITY LIMITS

REVISED: JANUARY 1996

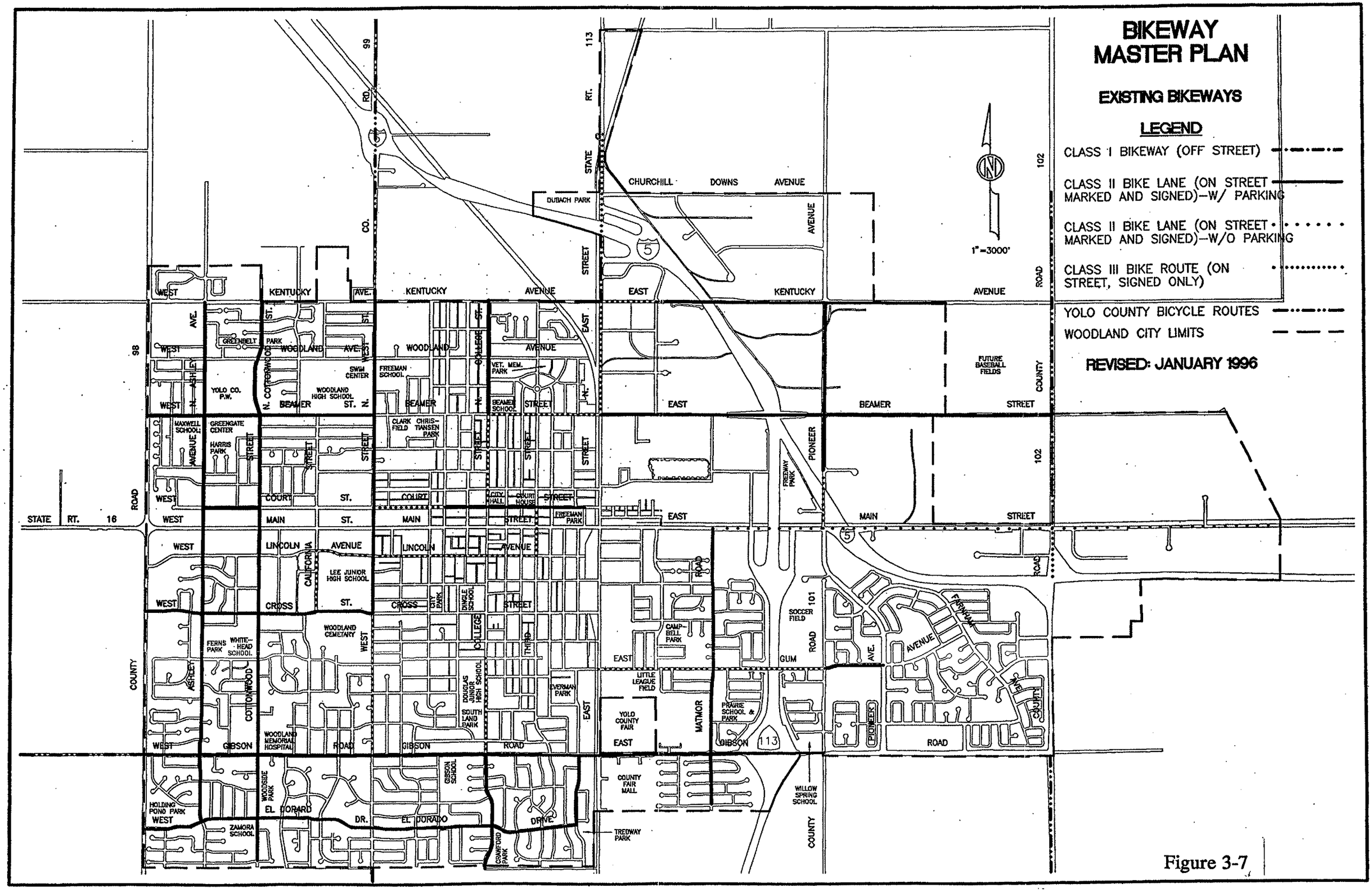


Figure 3-7

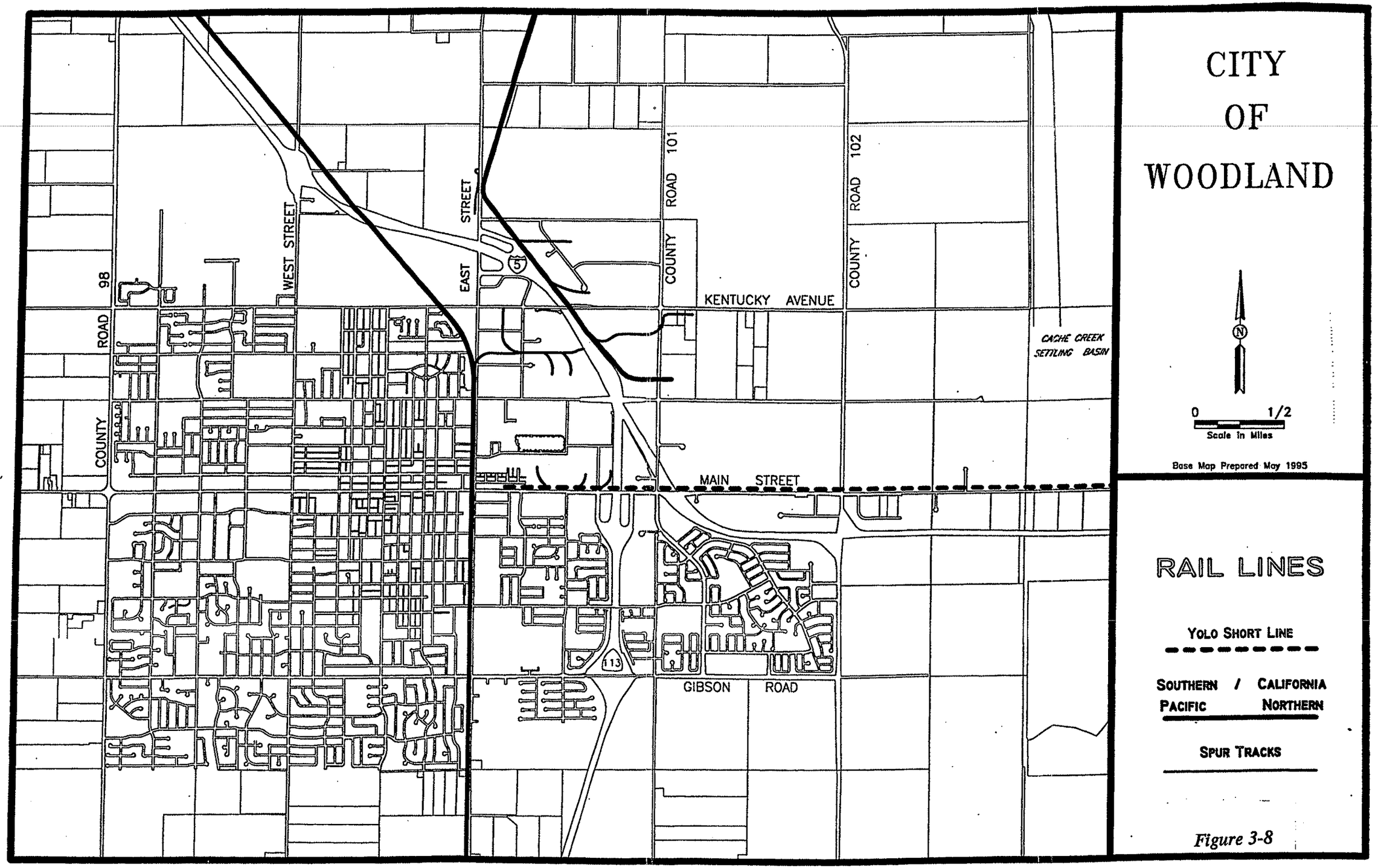

CITY
OF
WOODLAND
N
0
1/2
Scale In Miles
Base Map Prepared May 1995
RAIL LINES
YOLO SHORT LINE
SOUTHERN PACIFIC / CALIFORNIA NORTHERN
SPUR TRACKS
COUNTY ROAD 98
WEST STREET
EAST STREET
5
COUNTY ROAD 101
COUNTY ROAD 102
KENTUCKY AVENUE
CACHE CREEK SETTLING BASIN
MAIN STREET
113
GIBSON ROAD

Figure 3-8

3.6 PEDESTRIAN FACILITIES

This mode is most often used in conjunction with the automobile or another mode of transportation. The path of the pedestrian is generally along sidewalks within street right-of-ways and crosswalks. Pedestrian walkways separated from the street right-of-ways, such as through parks, provide paths for pedestrians.

The City standards require sidewalks along all improved streets except in the industrial areas. The width of the sidewalk depends on the zoning of the adjacent property. Residential zones typically have a sidewalk width of 5 feet; in the older parts of town and in portions of the Southeast area, a planter strip separates the sidewalk from the street. The commercial zones typically have a sidewalk width of 8 feet to 10 feet. Curb ramps are required (at intersections) in new subdivisions and the City has retrofitted them at intersections in the older part of town.

3.7 RAIL FACILITIES AND SERVICES

The railroad provides transportation for goods in the Woodland area. Passenger rail service is not available in Woodland. As shown in Figure 3-8, there are two main rail lines in Woodland. These rail lines are owned by Southern Pacific and the Yolo Shortline Railroad Company:

Southern Pacific / California Northern: Southern Pacific owns the rail lines which run in a north/south direction parallel to East Street. Southern Pacific leases these tracks to the California Northern Railroad Company. This line generally serves industrial and agricultural uses in Woodland and the surrounding area. The principle commodities hauled are grain, sugar, sugar beets, plastics, building materials, rice, canned goods, and lumber. The adjacent land uses along the tracks are mostly light industrial with residential uses adjacent to the tracks south of Gibson Road. East Street and its commercial and industrial land uses lie to the east of the tracks. North of Beamer Street the railroad spurs extend into the industrial area. Southern Pacific has a small switching yard at the southwest corner of Main and East Streets. Because the switching of trains at this location creates a barrier to east-west traffic along Main Street, the City is currently working with Southern Pacific to relocate the switching yard to the industrial area, where its impact on the City's circulation patterns will be minimal.

Yolo Shortline: The Yolo Shortline railroad company operates the rail lines which run in an east-west direction, parallel to Main Street. Yolo Shortline actually owns the rails from Hanson Way eastward. From Hanson Way to East Street, Yolo Shortline has an easement to use the rail lines from its owner, Union Pacific. The main commodities hauled on this line are canned goods, bulk cannery products, grain, ethanol alcohol, and bulk carloads of gypsum. Yolo Shortline also operates excursion passenger trains on occasion between Woodland and West Sacramento. The adjacent land uses to this line are primarily industrial and agricultural. The area at the northeast corner of Main and East Streets is the end-of the-line for this rail line.

Separated grade crossings at the north-south railroad lines need to be considered. Kentucky Avenue, Beamer Street, Main Street and Gibson Road are the major streets that could incorporate separated grade crossings at the north-south railroad lines to provide east-west traffic flow for the City. A future major street south of existing City Limit should also be considered as a separated grade crossing.

In 1994, the Davis - Woodland Rail Study was completed. This study recommended an implementation strategy for rail transit service between Woodland and Davis. The study evaluated route alignments, patronage estimates, rail vehicle type, station locations, alternative service plans, costs estimated, financial options, and implementation requirements. The study indicated that the rail service would be too costly to implement at this time.

3.8 CONGESTION MANAGEMENT PROGRAM

In 1990, California voters approved Propositions 111 and 118 which increased funding for the state's transportation system. With this legislation came new requirements for the transportation planning process. A key part of this new process is the Congestion Management Program (CMP).

The Yolo County CMP includes the following City streets as part of the county-wide congestion management system: East Street, Gibson Road, Main Street, County Road 98 and County Road 102.

The CMP also includes a trip reduction and travel demand element. This requirement led the City of Woodland to adopt a Trip Reduction Ordinance (TRO) in 1992. The purpose of the TRO is to reduce the number of commute trips in order to improve congestion and air quality. All businesses in Woodland with 25 or more employees are subject to the requirements of the TRO.

3.9 AIR TRANSPORTATION

Air transportation includes the use of general aviation, commercial and military aircraft. General aviation meets both recreation and business needs. Commercial air transportation provides transportation for people and goods. Military aircraft operate in capacities related to national defense. Crop-dusting operations are common in the agricultural area surrounding the City.

Terminal facilities for air transportation are airports, landing strips, hangers and tie-down areas. In the Woodland area, the general aviation airports are the Watts airport five miles west of Woodland on State Route 16 and the Yolo County Airport in the vicinity of County Roads 95 and 29. A number of small landing strips primarily serving agricultural crop duster bases are located around the Woodland area.

Sacramento Metropolitan Airport is located 11 miles east of Woodland. This is the major jet terminal facility in the Sacramento area. The nearest military airports are McClellan Field in Sacramento, Travis Air Force Base in Fairfield and Beale Air Force Base in Marysville.

3.10 SOURCES

1. Woodland General Plan, Transportation/Circulation Element and Data Base, 1989

2. Street Master Plan Final Report, September 1989

3. Conversation with Martie Dote, Yolo County Transit Authority, November 1994 and March 1995

4. Telephone conversation with John McMahon, November 1994

5. City of Woodland Bikeway Master Plan, July 1993

6. Fehr & Peers, Technical Memorandum to Bruce Pollard, March 14, 1995

APPENDIX

Tables A-1, A-2 and A-3 identify the LOS evaluation criteria for signalized and unsignalized.

Tables A-4, A-5, and A-6 contain Woodland Accident Data.

TABLE A-1

Signalized Intersection Level of Service Criteria

LOS	Volume/Capacity	Description
A	0.00 - 0.60	Insignificant Delays: No approach phase is fully utilized and no vehicle waits longer than one red indication
B	0.61 - 0.70	Minimal Delays: An occasional approach phase is fully utilized. Drivers began to feel restricted.
C	0.71 - 0.80	Acceptable Delays: Major approach phase may become fully utilized. Most drivers feel somewhat restricted.
D	0.81 - 0.90	Tolerable Delays: Drivers may wait through more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.
E	0.91 - 1.00	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long queues of vehicles form upstream.
F	N/A	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.

Sources: *Highway Capacity Manual, Special Report 87*, Washington, D.C., 1965. *Interim Materials on Highway Capacity*, Circular 212, Transportation Research Board, 1980.

TABLE A-2

Two-Way Stop Controlled Intersection Level of Service Criteria

LOS	Reserve Capacity (passenger cars/hr)	Description of Delay to Minor Street Traffic
A	> 400	Little or no delay
B	300 to 399	Short traffic delays
C	200 to 299	Average traffic delays
D	100 to 199	Long traffic delays
E	0 to 99	Very long delays
F	*	Severe congestion

Note: * = Demand exceeds capacity.

Source: Highway Capacity Manual, Special Report 209, Federal Highway Administration, 1985.

TABLE A-3

Multi-Way Stop Controlled Intersection Level of Service Criteria

	LOS C Service Volume (Vehicles/hour) Number of Lanes		
Demand Split	**2 x 2**	**2 x 4**	**4 x 4**
50/50	1,200	1,800	2,200
55/45	1,140	1,720	2,070
60/40	1,080	1,660	1,970
65/35	1,010	1,630	1,880
70/30	960	1,610	1,820

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 1985

The reader should note that the criteria for the evaluation of multi-way stop controlled intersections only determines whether or not an intersection operates above or below LOS C.

TABLE A-4

Woodland Accident Data
(1992 Highest 15 Accident Location)

Type of Control	Location	Actual Accident Rate(1)	Expected Accident Rate(2)	Critical Accident Rate(3)	Actual > Critical Accident Rate?
Side-Street Stop (4-Leg)	Woodland/Walnut	1.37	0.36	0.73	Y
	North/College	1.10	0.36	0.75	Y
	North/East	0.59	0.36	0.63	N
	Lincoln/Ashley	2.07	0.36	0.75	Y
	Lincoln/Fourth	0.68	0.36	0.76	N
	NB I-5 Ramp/Co. Rd. 102	0.98	0.36	0.71	Y
	Oak/East	0.72	0.36	0.63	Y
Side-Street Stop ("T")	Cross/California (N)	0.73	0.25	0.52	Y
	Cross/East	0.63	0.25	0.47	Y
All-Way Stop (4-Leg)	Lincoln/Cleaveland	0.63	0.71	1.26	N
	Cross/Ashley	0.51	0.71	1.36	N
Signalized (4-Leg)	Main/Walnut	0.54	0.70	1.09	N
	Main/First	0.66	0.70	1.13	N
	Main/Co. Rd. 101	0.67	0.70	1.09	N
Signalized ("T")	Main/NB 113 Ramp	1.07	0.45	0.77	Y

Notes:
(1) Accident Rate = Number of accidents per million vehicles entering intersection.
(2) Expected Accident Rate = Statewide expected accident rates based on type of intersection and control.
Source: 1991 Accident Data on California State Highways, Caltrans.
(3) Critical Accident Rate = Accident rate, which if exceeded, may indicate a statistically significant safety problem.

TABLE A-5

Woodland Accident Data
(1993 Highest 15 Accident Rate Locations)

Type of Control	Location	Actual Accident Rate (1)	Expected Accident Rate (2)	Critical Accident Rate (3)	Actual > Critical Accident Rate ?
Side-Street Stop (4-Leg)	Woodland/Walnut	1.37	0.36	.73	Y
	North/College	0.55	0.36	.75	N
	North/Third	0.55	0.36	.75	N
	North/Fourth	0.68	0.36	.76	N
	Court/First	0.71	0.36	.68	Y
	Lincoln/Fourth	0.68	0.36	.76	N
	Oak/East	0.87	0.36	.63	Y
Side-Street Stop ("T")	Cross/California S.	0.69	0.25	.52	Y
	Gibson/Co. Rd. 102	1.25	0.25	.50	Y
All-Way Stop (4-Leg)	Beamer/Third	0.62	0.71	1.26	N
	Cross/College	0.58	0.71	1.24	N
	Cross/Third	0.78	0.71	1.31	N
Signalized (4-Leg)	Woodland/West	0.55	0.70	1.22	N
	Main/California	0.65	0.70	1.06	N
Signalized ("T")	Main/NB I-5 Ramp	1.03	0.45	.87	Y

Notes:
(1) Accident Rate = Number of accidents per million vehicles entering intersection.
(2) Expected Accident Rate = Statewide expected accident rates based on type of intersection and control.
Source: 1991 Accident Data on California State Highways, Caltrans.
(3) Critical Accident Rate = Accident rate, which if exceeded, may indicate a statistically significant safety problem.

TABLE A-6

Woodland Accident Data
(1994 Highest 15 Accident Rate Locations)

Type of Control	Location	Actual Accident Rate (1)	Expected Accident Rate (2)	Critical Accident Rate (3)	Actual > Critical Accident Rate ?
Uncontrolled (4-Leg)	Marshall/Second	3.65	0.25	.35	Y
Side-Street Stop (4-Leg)	Woodland/Walnut	2.74	0.36	.73	Y
	Elliot/West	0.87	0.36	.70	Y
	North/East	0.74	0.36	.63	Y
	Lincoln/Ashley	1.55	0.36	.75	Y
Side-Street Stop ("T")	Dubach/East	0.55	0.25	.53	Y
	Cross/East	0.78	0.25	.47	Y
All-Way Stop (4-Leg)	Beamer/Ashley	1.69	0.71	1.28	Y
	Beamer /Cottonwood	0.54	0.71	1.23	N
Signalized (4-Leg)	Court/Cottonwood	0.52	0.70	1.13	N
	Main/California	0.43	0.70	1.06	N
	Main/First	0.50	0.70	1.13	N
	Main/Second	0.50	0.70	1.13	N
Signalized ("T")	NB I-5 Ramp/East	1.99	0.45	.91	Y
	Main/NB I-5 Ramp	1.03	0.45	.87	Y

Notes:
(1) Accident Rate = Number of accidents per million vehicles entering intersection.
(2) Expected Accident Rate = Statewide expected accident rates based on type of intersection and control.
Source: 1991 Accident Data on California State Highways, Caltrans.
(3) Critical Accident Rate = Accident rate, which if exceeded, may indicate a statistically significant safety problem.

CHAPTER 4

PUBLIC FACILITIES AND SERVICES

4.1 INTRODUCTION

City development is dependent on an elaborate network of public facilities and services. Each type of service has a unique set of constraints and must adapt to growth and change differently. This chapter focuses primarily on water service, wastewater collection and treatment, drainage, schools, fire protection, and law enforcement, describing the various systems and their capacities and discussing their implications for the general plan.

Transportation facilities and services are discussed separately in Chapter 3, and parks, recreational facilities, and schools are discussed in Chapter 5, Recreation, Education, and Community Services.

4.2 WATER

The City of Woodland (City) maintains a potable groundwater supply to meet the needs of the City. Several documents have been prepared which describe the groundwater supply availability and conditions as well as alternative supply options to meet future needs. The 1985 supply and distribution system, as well as improvements recommended at that time to meet future growth, are described in the 1985 *Water System Master Plan*.

Several studies have been conducted to look at the possibility of a supplemental surface water supply. These analyses were initiated by the City and the City acting jointly with other agencies. The supplemental water supply studies include *Supplemental Surface Water Supply Development Program*, June 1990, and *Yolo-Solano Supplemental Water Supplies, Reconnaissance-Level Investigation of Alternatives,* May 1992.

The City is currently preparing an update to the 1985 water system master plan. This new document will provide information on current and projected water demands, supply availability, system conditions and deficiencies; present an analysis of alternative elements to meet future needs; and recommend supply and demand management actions and system improvements.

EXISTING DEMANDS

The City system serves essentially all developed lands within the existing City limits although there are some residences and businesses on private wells. The majority of lands within the City contain single-family residential uses. Single-family homes and some public uses, such as parks, pay a flat fee for water service. Schools are metered. Single-family homes built after January 1, 1992 are required by Federal and State law to have meters installed; however, these meters are not currently read by City staff. Many multi-family residences are metered, although not all; multi-family residences pay either a flat fee or a metered rate. Commercial and industrial customers are metered and pay a metered rate.

Water Consumption

Because not all service connections are metered, estimates of water consumption are made based on well production records. In 1994, the City produced a total of 4,113 million gallons (mgal) from 18 wells to meet the demands throughout the City. This represents an average of 11.26 million gallons per day (mgd). Figure 4-1 presents the total annual production from 1975 through 1994 which is compared with the City population estimates for years 1980 through 1994.

The mean monthly production patterns for years 1990 through 1994 are presented in Figure 4-2. In the City of Woodland, the month of August typically has the highest monthly demands: water production for August 1994 was approximately 570 mgal. The month of February typically has the lowest water demands: in February 1994, production was approximately 180 mgal. The peak month usage is typically due to landscape irrigation requirements during summer months and could also represent an increase in industrial production if the water usage is related to agriculture, e.g. food processing. The winter months usually represent minimum water demands representative of that required for indoor usage.

Conservation Efforts

As early as 1985, the City has been implementing conservation techniques to reduce the demands on the system. Conservation measures which have been underway during the last decade include the following:

- Keep distribution system pressure below 50 pounds per square inch (psi)
- Develop and apply the City's Water Waste Ordinance
- Use visual leak detection, and
- Provide brochures on drought resistant vegetation.

Total Annual Production and Population
1975 through 1994

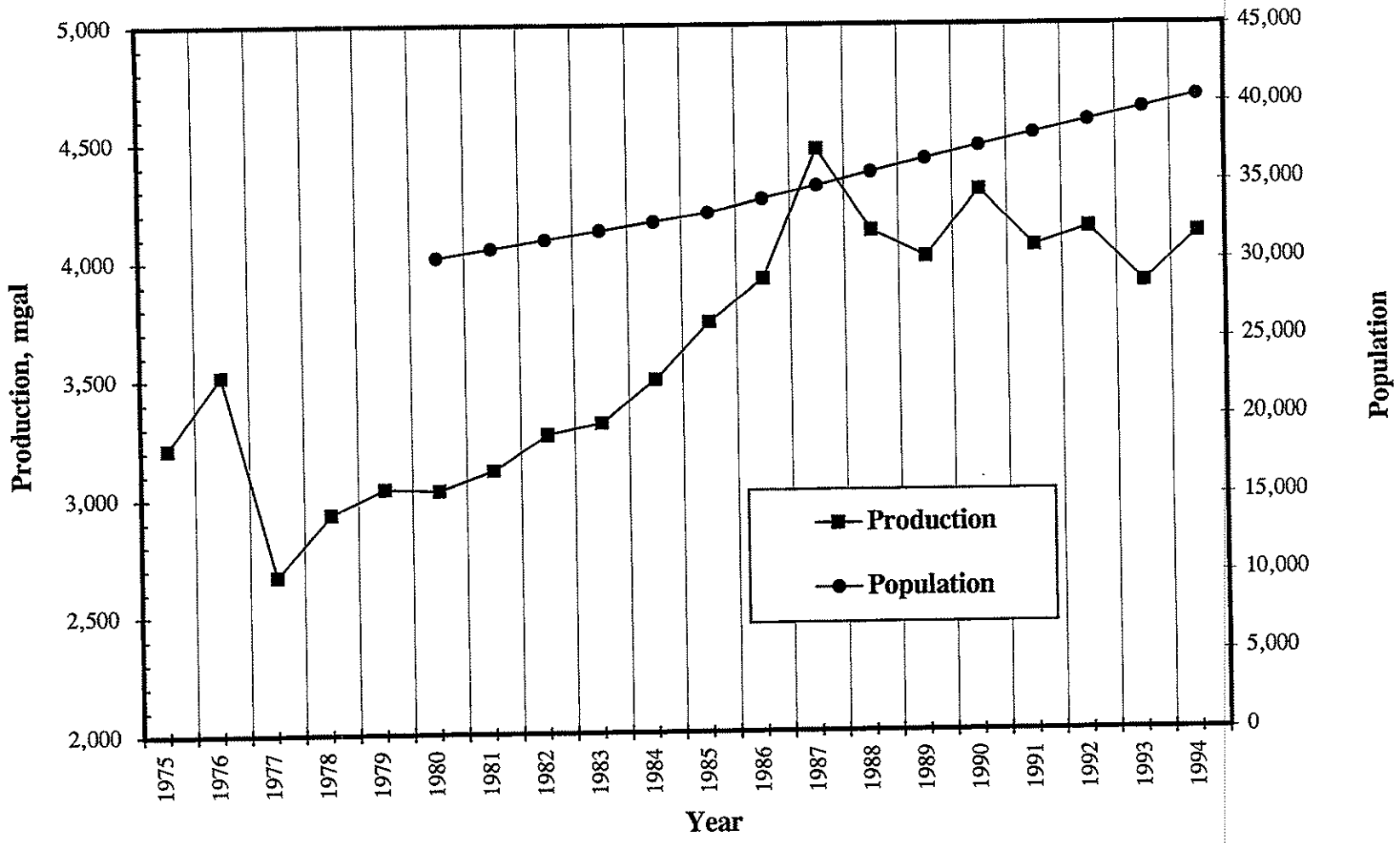


Figure 4-1

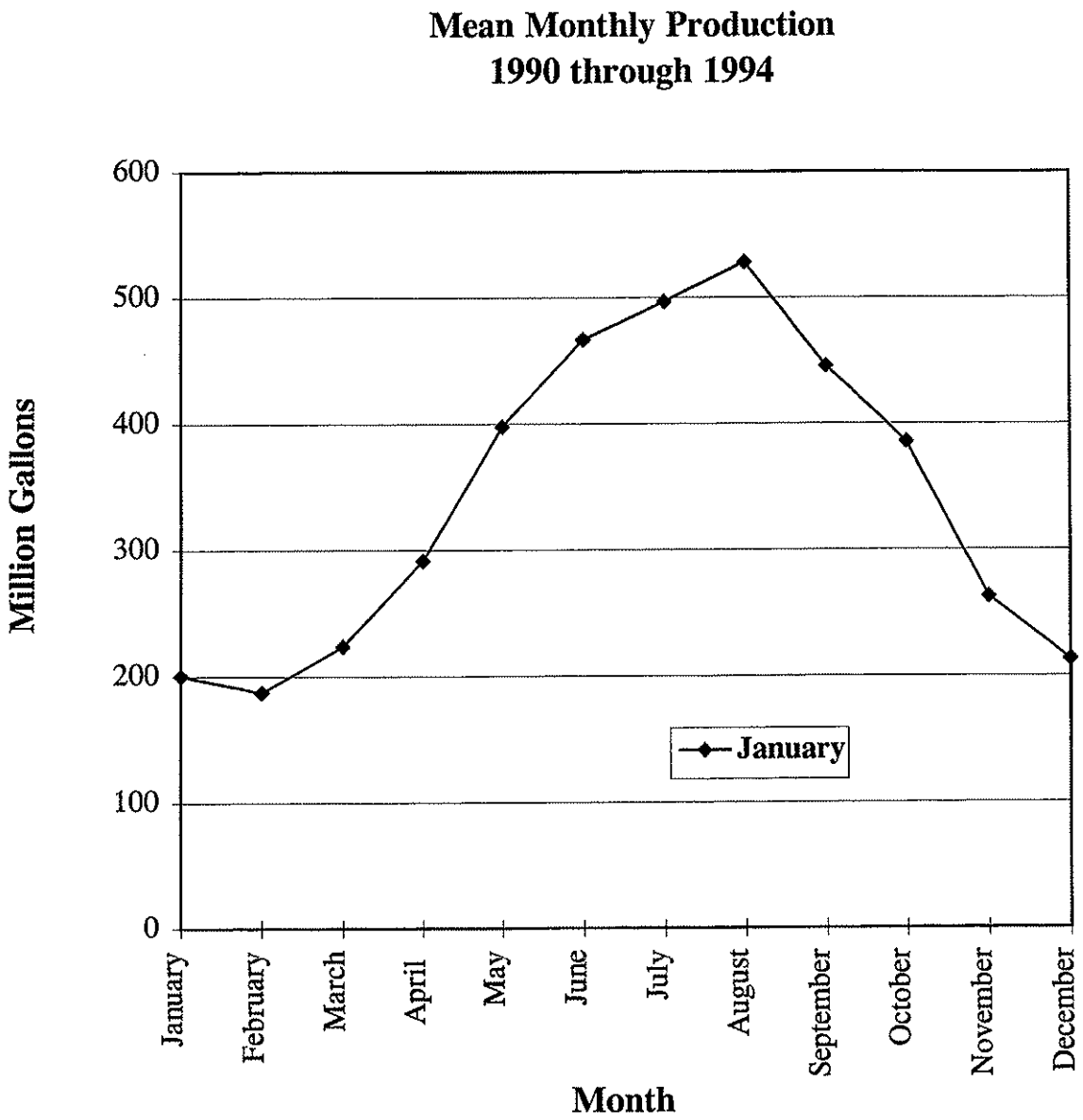

Mean Monthly Production
1990 through 1994
Million Gallons
600
500
400
300
200
100
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
January

Figure 4-2

Based on recommendations in the *City of Woodland Urban Water Management Plan Update* (May 1991), the City has implemented the following additional conservation measures.

- Implement a rebate program for ultra low-flush toilets, and provide free of charge ultra low-flow shower heads
- Recommend water efficient landscaping for new construction, and
- Increase public awareness and education of water conservation needs and techniques including providing grade school education curriculum materials.

The City has also implemented the federal Energy Policy Act of 1992 and its companion state law, requiring single-family homes constructed since January 1, 1992 to have meters installed. However, single-family residences still pay a flat-rate for water. In January 1992, the City prepared a Water *Shortage Contingency Plan* to aid in responding to emergency drought conditions.

As a result of these conservation measures implemented during the recent drought, the City realized significant water savings. As presented on Figure 4-1, the City population continued to steadily increase during the drought but the water production requirements, on average, did not increase at the same rate.

WATER SUPPLY SYSTEM

Groundwater is currently the only source of water supply for the City. Eighteen wells located throughout the City pump groundwater into the distribution system. The wells and the backbone distribution system (pipelines greater than 10-inches in diameter) are presented in Figure 4-3.

Water Supply

Groundwater recharge of the aquifer results from rainfall and irrigation water from the adjacent agricultural lands, and Cache Creek surface water recharge of aquifiers in Cache Creek north of the City, infiltrating into the soils. The groundwater travels through the aquifers in a northwest to southeast direction.

The pumping depth of groundwater in the City varies between wells but the average depth from the ground surface around June of each year is 100 feet; June 1994 averaged 119 feet below ground surface. The water levels are greatly influenced by agricultural activities surrounding the City. The groundwater supply continues to meet the demands.

Differential settling from subsidence has occurred in the City which can result in well casing collapse, piping misalignment, distribution system pipeline breaks, and other facility problems. Lands centrally located within the City have subsided approximately one foot over the past 25 years and at least five of the wells and some pipelines have experienced subsidence-related problems. The subsidence is basically believed to be due to increased pumping/decreased water tables.

Nineteen wells have been constructed since 1954 and two were constructed prior to that date. There are 18 wells currently in service. The newest well in the system went into operation in 1981. A new well (Well No. 22) will be on-line in 1995 to accommodate fire flow pressure requirements in the southeast area. With all 18 of the well pumps running, total production is approximately 31,000 gallons per minute (gpm). During winter months, five of the wells pump most of the required water; during the summer months, approximately 14 wells provide most of the supply. The remaining wells act as backup to maintain adequate flows and pressure throughout the system. Of the 18 pumps, six have standby power to allow for minimal disruption during a power outage.

Groundwater Quality

Overall, the water quality meets all State and Federal requirements and flows are adequate. Average total dissolved solids levels are slightly higher than that recommended by the State but the highest detected level is significantly below the Department of Health Services' upper limit. Boron is present in the water at concentrations which may adversely affect landscaping. In addition, the water is very hard which may limit soap sudsing and add other minor inconveniences. The City periodically receives taste and odor complaints which may be due to private plumbing fixtures (eg., hoses), chlorine disinfectant, and the high mineral content of the water. There were six call-in complaints in 1994.

Non-fecal coliform bacteria were detected in seven wells in January 1993. In response, the City began a disinfection program at these seven wells. The City uses a liquid disinfectant - sodium hypochlorite, because it does not pose a safety concern to adjacent residents in event of a leak, like gaseous forms of chlorine. The disinfectant is injected into the wellhead discharge pipeline.

Storage and Transmission

The City has one elevated water tank, located in Camerena Park at Beamer and Walnut Streets. It was built in 1954, is 115 feet high, and has a capacity of 300,000 gallons. The vented tank does not contribute significant storage to the system, but rather is used to stabilize water pressures throughout the distribution system. The City water distribution system is within one pressure zone.

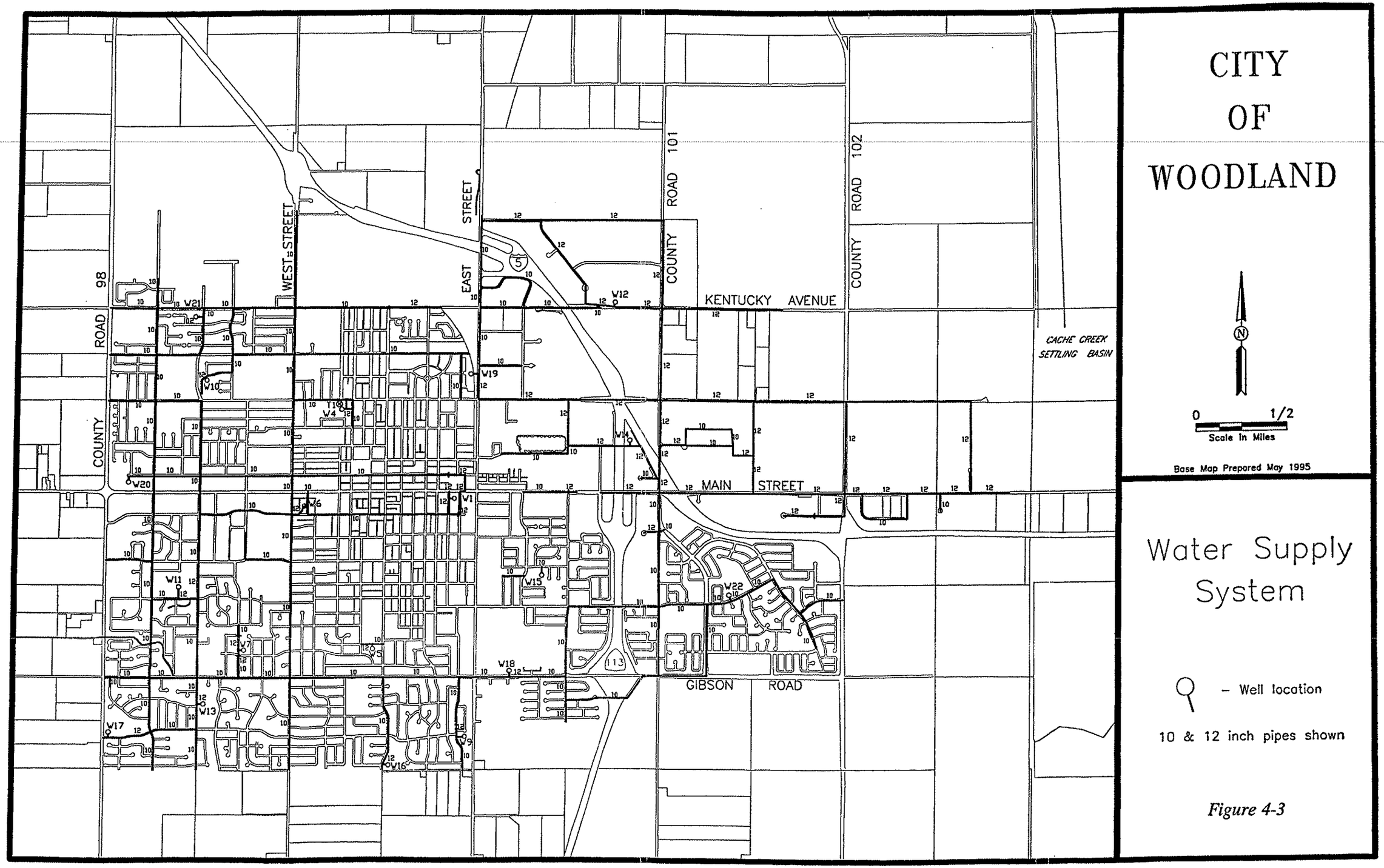

CITY
OF
WOODLAND
Water Supply
System
- Well location
10 & 12 inch pipes shown
0
1/2
Scale In Miles
Base Map Prepared May 1995
N
KENTUCKY AVENUE
MAIN STREET
GIBSON ROAD
WEST STREET
EAST STREET
COUNTY ROAD 98
COUNTY ROAD 101
COUNTY ROAD 102
CACHE CREEK
SETTLING BASIN
W1
W4
W6
W7
W10
W11
W12
W13
W14
W15
W16
W17
W18
W19
W20
W21
W22

Figure 4-3

The City water is served through pipelines ranging in size from 2- to 12-inches in diameter. As mentioned above, the backbone water distribution system is presented in Figure 4-3 and consists of pipelines 10- and 12-inches in diameter. The City serves most of the residential areas with 2-, 6-, and 8-inch lines. The service lines that connect directly to the homes range in size from 3/4- to 2-inches in diameter. The vast majority of the distribution pipes are made of cast iron or ductile iron.

4.3 SEWER

WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

Background

The City of Woodland provides municipal wastewater collection, treatment, and disposal facilities for residential, commercial, and industrial development within the city limits. Woodland's wastewater system consists of a network of pipelines, lift stations, and the Woodland Wastewater Treatment Plant (WWTP). Treated effluent from the WWTP is discharged to the Tule Canal within the Yolo Bypass. In addition, process water from the Contadina tomato cannery in Woodland is pumped to a city-owned industrial land application treatment site immediately adjacent to the wastewater treatment plant. Figure 4-4 shows the major facilities in the City's wastewater system.

Collection System

Most of the gravity sewers and trunk lines are vitrified clay pipe, with some reinforced concrete pipe. In the older part of town, some terra cotta pipe is still in use. The previous *Wastewater Facilities Master Plan* (1986, CH2M HILL) recommended installation of 6,700 feet of parallel overflow pipe and 15,700 feet of new or replacement pipe. Since that time, the City has implemented a portion of these recommendations. Additional analysis will be required to determine the location and sizes of trunk lines to serve additional growth, and to assess the potential to send additional flow through parts of the existing collection system.

There is one existing pump station in the collection system, located at the northwest corner of Gibson Road and County Road 102. This pump station was brought on-line in the summer of 1995, and is a wet pit type with submersible pumps. There is also an influent pump station at the WWTP headworks.

Treatment Facilities

Current WWTP facilities went into operation in 1989, and are designed to handle 6 million gallons per day (mgd) of average dry weather flow (ADWF) and 21 mgd of peak flow. The WWTP was designed to allow capacity expansion to an ADWF of 16 mgd and a peak flow of 35 mgd. At the WWTP, wastewater is first biologically treated in three oxidation ditches, then settled in two secondary clarifiers and disinfected in a chlorination/dechlorination facility prior to discharge. A series of ponds is available to store high influent flows during storm events, to store effluent that does not meet current National Pollution Discharge Elimination System (NPDES) permit requirements, and to handle solids production from the WWTP. Fifty acres of land immediately south of the WWTP site currently can not be used because of the presence of an endangered plant species.

The Industrial Wastewater Treatment Site, adjacent to the WWTP, is only used to treat wastewater from the Contadina tomato processing facility, located in Woodland near East Main Street and State Highway 113. The site is owned by the City of Woodland, and leased and operated by Contadina. A pipeline carries cannery flows to the 890 acre site, which consists of aerated treatment ponds and land for wastewater application.

Disposal Facilities

Treated effluent from the WWTP is pumped approximately 4.5 miles to a discharge point in the Tule Canal, which in turn can drain to the Sacramento River. Discharge is regulated by the California Regional Water Quality Control Board, Central Valley Region through the NPDES permit. The current NPDES permit was adopted on May 29,1992 and expires in May 1997. As required in the permit, the City is currently implementing a pretreatment program which includes development of technically-based local limits and a pollution prevention program.

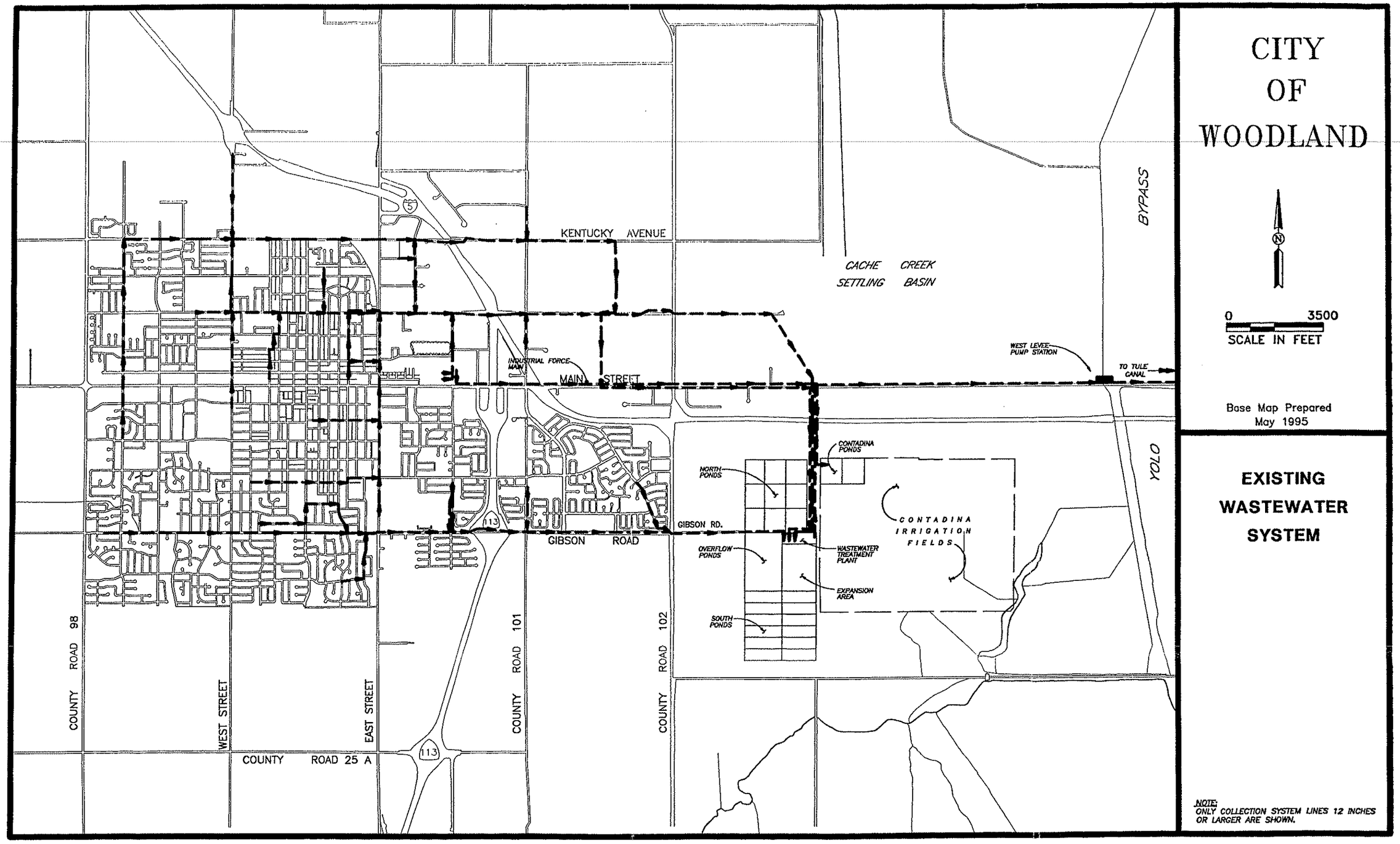

CITY OF WOODLAND
0 3500
SCALE IN FEET
Base Map Prepared May 1995
EXISTING WASTEWATER SYSTEM
NOTE:
ONLY COLLECTION SYSTEM LINES 12 INCHES OR LARGER ARE SHOWN.
KENTUCKY AVENUE
CACHE CREEK SETTLING BASIN
BYPASS
YOLO
INDUSTRIAL FORCE MAIN
MAIN STREET
WEST LEVEE PUMP STATION
TO TULE CANAL
CONTADINA PONDS
NORTH PONDS
CONTADINA IRRIGATION FIELDS
GIBSON RD.
GIBSON ROAD
OVERFLOW PONDS
WASTEWATER TREATMENT PLANT
EXPANSION AREA
SOUTH PONDS
COUNTY ROAD 98
WEST STREET
EAST STREET
COUNTY ROAD 101
COUNTY ROAD 102
COUNTY ROAD 25 A
5
113

Figure 4-4

4.4 STORM DRAINAGE AND FLOOD PROTECTION

STORMWATER DRAINAGE

The City of Woodland's (City) existing storm drainage system consists of collection, conveyance, storage, and pumping facilities. The primary facilities are delineated on Figure 4-5.

The conveyance system consists of pipelines (laterals and trunk lines) and open channels. In the newer portions of the City, runoff is collected by a storm drain lateral system. In these areas, the lateral system generally consists of regularly spaced drain inlets and pipes ranging from 12 to 24 inches in diameter. The lateral system delivers storm runoff to the storm drain trunk system.

Older portions of the City are not directly served by a lateral system. Runoff from these areas is conveyed through intersections in valley gutters, gutter culverts, or inverted siphons. Flow must travel relatively long distances to reach a drain inlet. As such, drain inlets serve relatively large areas and their capacities are exceeded during frequent storm events.

The storm drain trunk system generally conveys flow from west to east through the City by means of four main trunk lines. The trunk lines consist of pipes ranging from 30 to 84 inches in diameter. The trunk lines discharge into open channels which convey the flow to three pump stations located at East Main Street and the extension of County Road 103.

Two pump stations are located north of East Main Street and one is located on the south side of East Main Street. The stations discharge into a channel located between the new and the original south levee of the Settling Basin. The channel flows from west to east and discharges directly into the Yolo Bypass.

The City's Storm Drainage Master Plan is presented in the report entitled "Storm Drainage Master Plan," Final Report Revised October 1987, prepared by Brown and Caldwell. The master plan identifies problems with the existing storm drainage system and recommends improvements to solve existing problems and to provide service to future development.

The problems were grouped into the following types:

1. Lack of adequate trunk capacity. This causes high hydraulic grade lines on the trunks which prevents local low-lying areas from draining.

2. Lack of storm drains to pick up flows from agricultural areas tributary to the city system. This causes street flooding along the study area boundary in several locations

3. Clogging of pumping station trash racks.

4. Unlined and unfenced open channels which are subject to clogging at culvert crossings due to plugging with tumbleweeds and other debris. The channels require extensive maintenance, but in some places they are not provided with adequate maintenance access.

5. Plugging of drop inlet grates.

6. Lack of an adequate lateral storm drain system.

The City convened a Blue Ribbon Committee composed of area residents to address existing local flood problems identified in the 1987 Storm Drainage Master Plan. This committee concluded that the flood problems within the Phase 1 recommended improvement area of the 1987 Storm Drainage Master Plan are primarily nuisance in nature and that the high costs to correct the problems are not warranted by the resulting benefits. In general, during periods of intense rainfall, there is localized flooding that encroaches on private property, but does not endanger structures. This flooding subsides within several hours after the storm passes.

At the time that the 1987 master plan was being prepared, stormwater quality was not an issue requiring attention. However, in 1987, Congress enacted the Clean Water Act (CWA). Section 402 (p) of the CWA requires communities with a population of over 100,000 to have a National Pollution Discharge Elimination System (NPDES) permit for the discharge of stormwater.

Communities with populations less than 100,000, such as the City, are not currently required to have a NPDES permit. However, this may change in the future. The EPA and the Senate are moving toward bringing the smaller communities into the NPDES program however, the current position of the House is to continue to exclude these communities from the program.

The State administers the NPDES program for stormwater discharges. The State Water Resources Control Board (SWRCB) and the Regional Water Control Board have used their discretionary powers to bring smaller communities into the NPDES program. These communities have generally been part of a larger area wide permit as co-permittees. The City is not part of such an area wide permit.

In addition to the NPDES program, the federal legislation known as the Coastal Zone Act Reauthorization Amendments (CZARA) could impact the City with respect to the

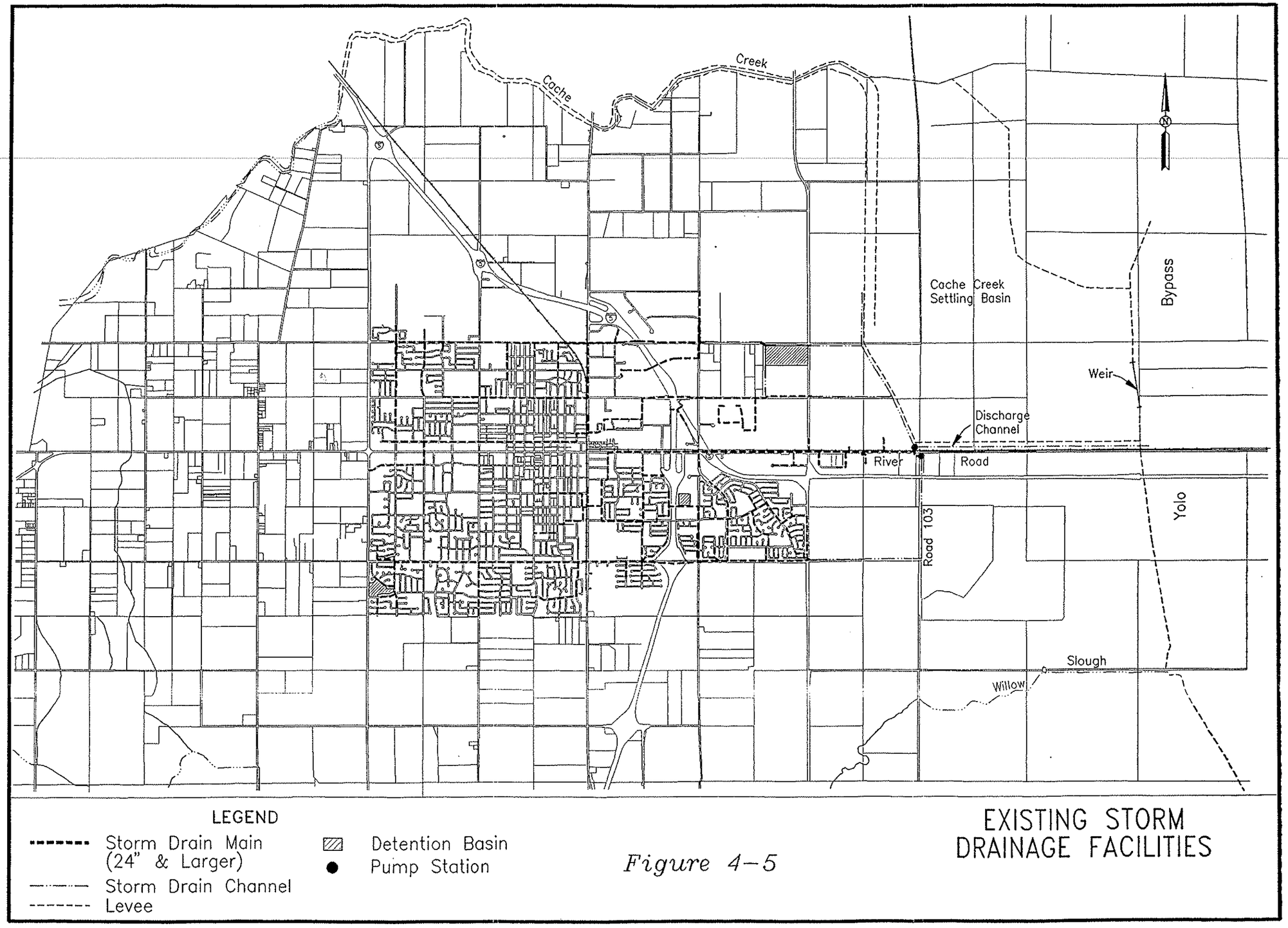


Figure 4–5

EXISTING STORM DRAINAGE FACILITIES

stormwater quality considerations. The CZARA requires states to implement best management practices to control nonpoint source pollution including urban runoff. Although the CZARA is directed at coastal communities, the SWRCB in conjunction with the Coastal Commission have expanded the application to the entire state. To comply with this law the State has developed a set of guidance documents identifying control measures for urban runoff. These guidance documents are not restricted to large communities and include all municipalities, regardless of size.

In view of the uncertain future application of the NPDES program to the City and of the application of the CZARA to the entire state, it may be prudent for the City to begin incorporating stormwater quality controls into the planning and construction of new developments. The control measures identified in the SWRCB/Coastal Commission guidance document could be used for this purpose.

FLOODING

Historically, the City and surrounding area have been subject to flooding. The primary sources of flooding have been Willow Slough, Cache Creek, and the Sacramento River. The U. S. Army Corps of Engineers' (Corps of Engineers) Sacramento River Flood Control Project (SRFCP) provides the area with varying levels of flood protection from these sources. The levees of the SRFCP are delineated on Figure 4-6.

The SRFCP was authorized by the Flood Control Act of 1917 and the State Reclamation Board was the local sponsor. Construction began in 1918, and most facilities were completed by 1958. The SRFCP consists of a comprehensive set of levees, leveed bypass floodways, and improved channels. The design flows for the SRFCP were not based upon a specific level of protection so the level of flood protection afforded by the project varies throughout the system.

SRFCP facilities located in the proximity of the City include levees along the Willow Slough Bypass, portions of Cache Creek, the Cache Creek Settling Basin (Settling Basin), and the Yolo Bypass (Figure 4-6). Under the SRFCP, flows are diverted from the Sacramento River into the Yolo Bypass where levees provide protection against overbank flooding. Levees along the lower reaches of the Willow Slough Bypass and Cache Creek also provide some protection from overbank flooding. The primary function of the Settling Basin is to remove a significant portion of the sediment load from Cache Creek to avoid its deposition in the Yolo Bypass, thereby preserving its integrity for conveying flood flows.

In the late 1950's, the Corps of Engineers enlarged and extended the levees along both banks of Cache Creek. The design flow for the work was 30,000 cfs having a recurrence interval of approximately ten years. This low level of protection was provided at the

request of the Yolo County Board of Supervisors. It was their desire to minimize the amount of levee work with the expectation that the Wilson Valley Dam and Reservoir Project, which was being proposed on Cache Creek at that time, would fully satisfy the flood protection needs of the area. The Wilson Valley Dam and Reservoir Project was never constructed.

There are no current proposals to resurrect the proposed Wilson Valley Dam and Reservoir Project. However, the Corps of Engineers, under authorization from the Cache Creek Environmental Restoration Reconnaissance Study, is re-evaluating the proposed Blue Ridge Dam and Reservoir Project on Cache Creek. The Yolo County Flood Control & Water Conservation District (YCFCWCD) investigated the proposed multi-purpose Blue Ridge Project in the late 1980's.

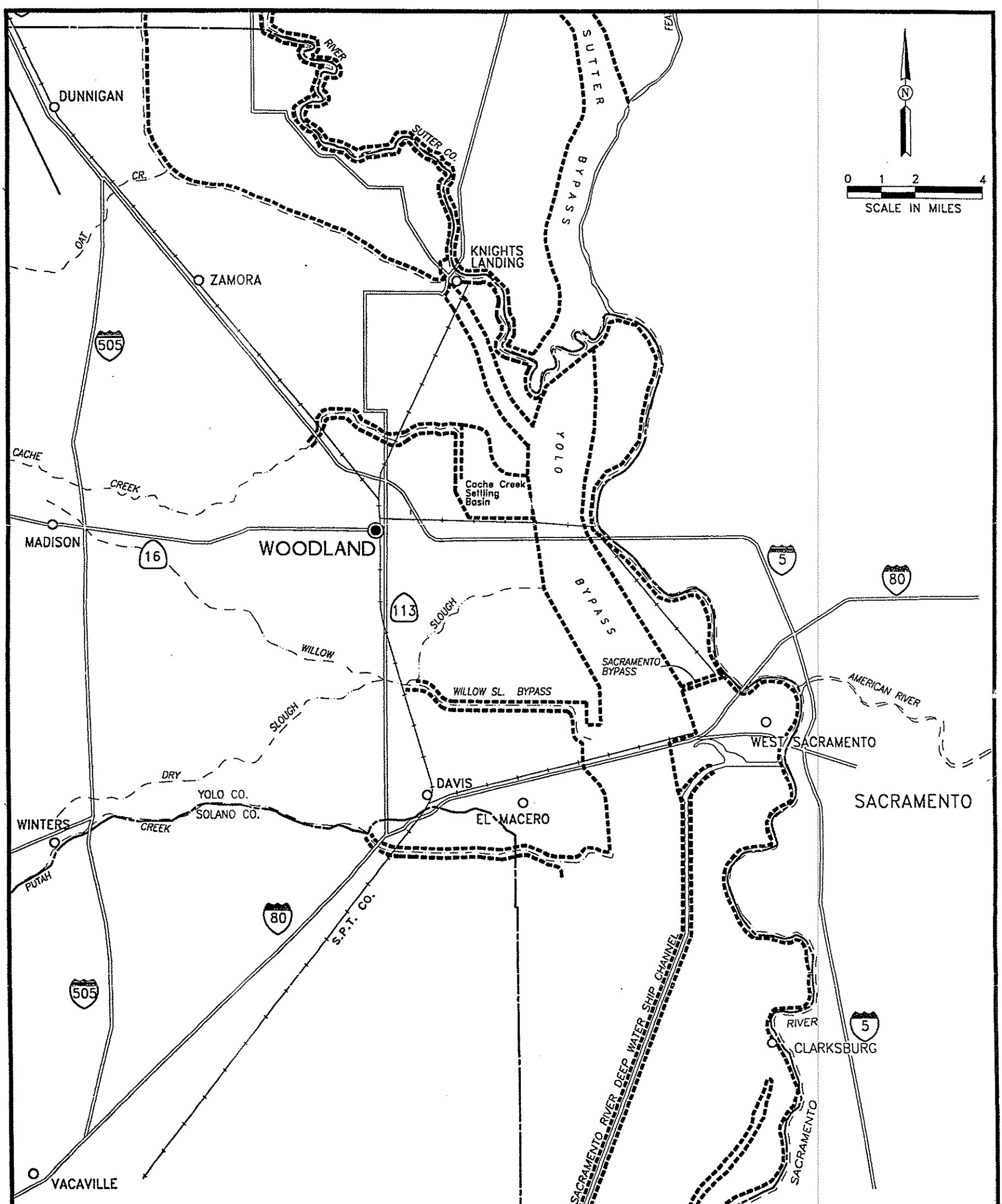
In addition to the SRFCP, some flood protection is provided to lands along Cache Creek by the Indian Valley Dam and Reservoir, which is located on the North Fork of Cache Creek. This project is owned and operated by YCFCWCD. Construction of the project began in 1971 and was completed in 1976.

Indian Valley Reservoir is operated primarily for irrigation water supply. It has a gross storage capacity of 300,600 acre-feet, of which 40,000 acre-feet is allocated for flood control. The Indian Valley Dam and Reservoir only controls approximately twelve percent of the Cache Creek watershed and, therefore, provides a limited amount of flood protection to the lower reaches of Cache Creek.

The Settling Basin was modified by the Corps of Engineers in 1992 to increase its sediment storage capacity. The estimated useful life of the enlarged Settling Basin is 50 years. The design flow for the modifications was 30,000 cfs and the primary modifications included raising the existing east, west, and north levees, relocating the south levee, constructing a training channel and levee, and raising and lengthening the overflow weir.

Prior to the modifications being made to the Settling Basin, stormwater runoff from the City was pumped into the Settling Basin. However, when the modifications were made to the south levee of the Settling Basin, a new south levee was constructed approximately 300 feet to the north of the original levee. Runoff from the City is now isolated from the Settling Basin and, instead, flows to the Yolo Bypass through the channel formed by the old and the new south levees of the Settling Basin. This channel flows from west to east and discharges directly into the Yolo Bypass. Because this channel is directly connected to the Yolo Bypass, with no means of isolation it is an extension of the Yolo Bypass. However, the Corps of Engineers and the Department of Water Resources have proposed to isolate this channel from the flood flows in the bypass by installing flap gates on the discharge structure at the east end of the channel.

The Corps of Engineers has recently been involved in three investigations that relate to flood protection from the Willow Slough Bypass, the Yolo Bypass, and/or Cache Creek. These investigations are the Sacramento River Flood Control System Evaluation, December



LEGEND

Project Levee

SACRAMENTO RIVER FLOOD CONTROL PROJECT

BORCALLI & ASSOCIATES, INC.
SACRAMENTO, CALIFORNIA

4-11-95

Figure 4-6

1991, (System Evaluation), the Yolo Bypass Reconnaissance Study, March 1992, (Bypass Study), and the Westside Tributaries Reconnaissance Study, March 1994, (Westside Study). Also, the Corps of Engineers is currently conducting the Cache Creek Environmental Restoration Reconnaissance Study (Environmental Study) in which flood protection for the City of Woodland is being addressed. Each of the above noted investigations are summarized below:

- The System Evaluation was conducted to determine the feasibility of restoring the Sacramento River Flood Control Project to the designed conditions. The analysis identified deficiencies with respect to the elevation of portions of the levees of the Willow Slough Bypass and Cache Creek. These deficiencies have been attributed to land subsidence resulting from the extraction of groundwater. As a consequence, the Corps of Engineers concluded that there was no federal interest in participating financially in restoring these deficiencies.

- The Yolo Bypass Study was conducted to evaluate the feasibility of increasing the level of flood protection provided by the SRFCP above that provided under the original design. The level of protection provided by the original design is approximately 20 years and 10 years, respectively, for the Willow Slough Bypass and the Cache Creek levee system. This study concluded that it was not economically feasible to increase the level of flood protection provided by the respective levee systems.

- The Westside Study was conducted to determine if there is a federal interest in increasing the level of flood protection along the Willow Slough Bypass and Cache Creek. The study determined that Cache Creek poses a significant flood threat to the town of Yolo and the City of Woodland, and that there is a federal interest in increasing the level of flood protection along Cache Creek. The City of Woodland and Yolo County must now decide if they are interested in participating in a detailed feasibility study to evaluate flood control projects. This decision has been on "hold" pending completion of the Environmental Study and identification of other alternatives that may be more acceptable to the community.

- The Cache Creek Environmental Study is to determine if there is an opportunity for federal interest in environmental restoration along the reach of Cache Creek located below the Capay Diversion Dam. Also, the study is to examine alternatives for providing flood protection for the City of Woodland other than those evaluated in the Westside Study. This study is scheduled for completion by November, 1995.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) in which the City participates. The purpose of the NFIP is to provide previously unavailable flood insurance protection to property owners in flood-

prone areas, provided that the community meets certain floodplain management regulations. FEMA has identified areas of special flood hazard in the vicinity of the City. These areas are designated by flood zones on published Flood Insurance Rate Maps (FIRM) for Yolo County and the City, refer to Figure 4-7. The recent Corps of Engineers studies have confirmed that Cache Creek poses a flood threat to the City and to the lands east of the City.

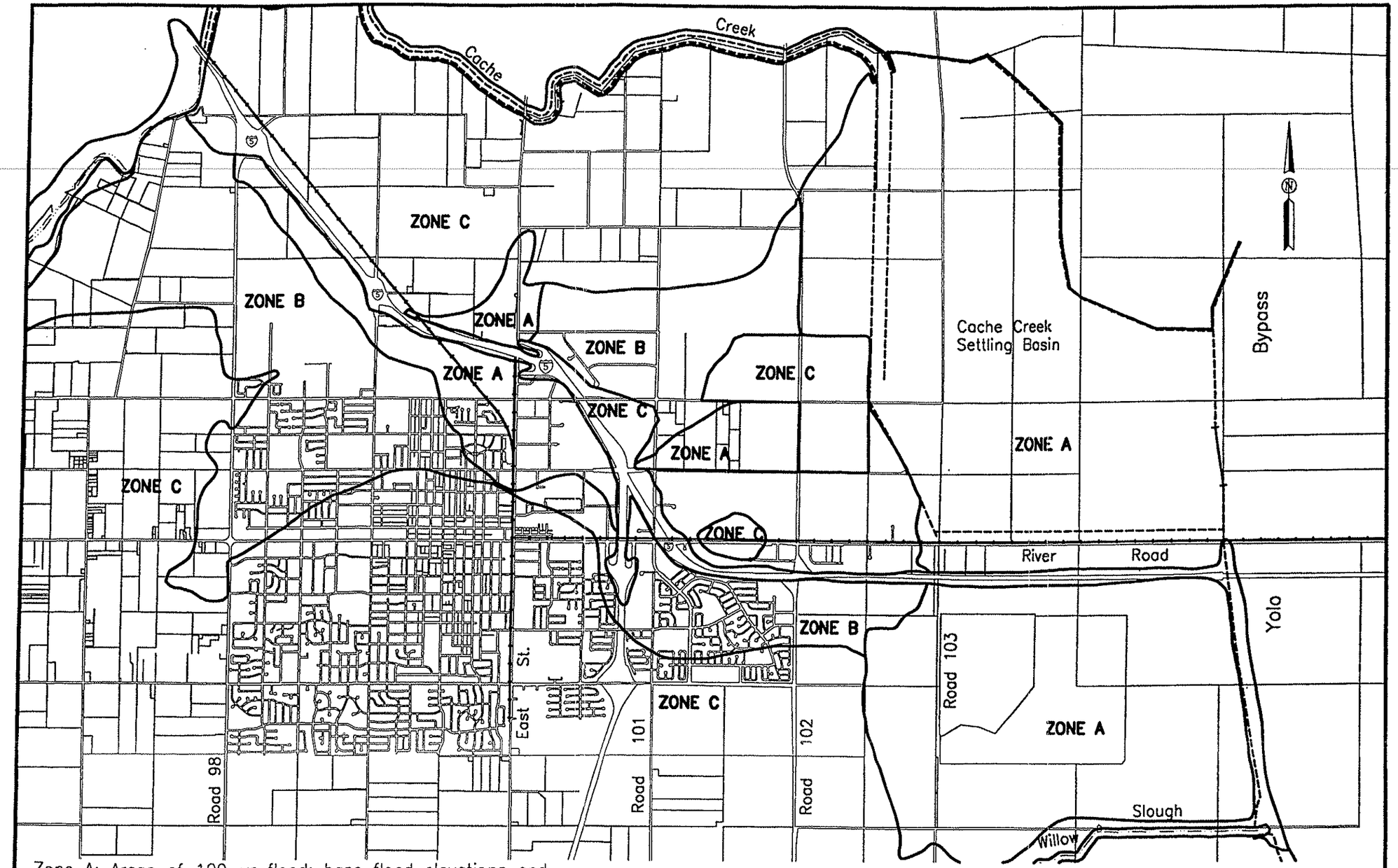
FEMA plans to conduct a flood insurance restudy of the City in fiscal year 1996. FEMA Guidelines and Specifications dated March 1993, require that a levee system meet certain minimum requirements that are set forth in the Code of Federal Regulations (No. 44), in order to be considered as providing 100-year level of protection. In lieu of these requirements, FEMA will accept certification from a federal agency, which is responsible for levee design, that the levee system is designed and constructed to provide 100-year level of flood protection.

The levee system protecting the City and vicinity is not necessarily designed and constructed to provide 100-year level of protection. Cache Creek levees provide less than 100-year level of protection. Therefore, it may be difficult to obtain the certification needed in order to reflect the levees in the floodplain mapping. If the levees are not reflected in a FEMA Flood Insurance Restudy, the resulting FIRM's could be significantly different than the current maps.

Although the likelihood is remote, the City and the lands located to the east are subject to flooding in the event there was a failure of Indian Valley Dam. From the standpoint of public safety and emergency preparedness, the Indian Valley Dam Break Analysis was updated in December 1994, consistent with the latest criteria of the Federal Energy Regulatory Commission. The analysis provided the base information from which the YCFCWCD developed an Emergency Action Plan for the project, which has been distributed to and reviewed by federal, state, and local agencies having responsibility during emergency events.

The lands located to the east of the City could potentially be subject to deep flooding from overflows from the Willow Slough Bypass, Cache Creek or the Yolo Bypass, depending upon the particular flood event or levee failure, and the associated volume of overflow. The deep flooding could occur as a result of water "ponding" against levees of the Yolo Bypass and the Willow Slough Bypass. The proposed method of assessment for operation and maintenance of RD 2035, states that lands located to the east of Woodland would be subject to 6.5 to 16 feet of inundation should the bypass levee fail.

The potential for deep flooding can be illustrated by comparing the ground elevations in the area with the top of levee elevations of the Yolo Bypass. The ground elevations range from approximately 30 feet mean sea level (msl) in the vicinity of the City's sewage treatment plant to approximately 20 feet msl near the Yolo Bypass Levee. The top of levee elevations of the Yolo Bypass range between 37 feet msl and 33 feet msl at the Settling Basin and the Willow Slough Bypass, respectively.



Zone A: Areas of 100-yr flood; base flood elevations and flood hazard factors not determined.
Zone B: Areas between limits of 100-yr & 500-yr flood; or certain areas subject to 100-yr flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

LEGEND

Zone C: Areas of minimal flooding.

Source: F.E.M.A. Flood Insurance Rate Maps, Dec.,1980, Oct.,1981, Mar.,1990

FLOODPLAIN ZONE OVERLAYS

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SACRAMENTO, CALIFORNIA

Figure 4-7

4.5 LAW ENFORCEMENT

The City of Woodland's general planning area is policed primarily by three agencies: the Woodland Police Department, the Yolo County Sheriff's Department, and the California Highway Patrol.

WOODLAND POLICE DEPARTMENT

The Woodland Police Department is a full service police department managed by the Chief of Police. There are three major divisions within the department: Administration, Patrol, and Investigations.

ADMINISTRATION is responsible for developing and administering policies and procedures, in addition to the following programs: Crime Prevention, Truancy, Training and Personnel, Support Services and Youth Services.

- Crime Prevention is responsible for developing, coordinating, and implementing a City-wide crime prevention unit.
- Truancy consists of one uniformed officer coordinating through the Woodland Joint Unified School District to reduce truancy.
- Training and Personnel is responsible for the development and coordinating of all department training. The Personnel function coordinates recruitment and testing of department personnel and is responsible for background investigations.
- Support Services consists of the Records Department, Property and Evidence, and Warrants. This program also provides support services to the department in the areas of vehicles, equipment, facility implementation and review.
- Youth Services is responsible for developing, coordinating and implementing programs designed to educate school age children on good citizenship and children victimization. This program is also responsible for juvenile referrals, dispositions, diversion and community relations involving youth and the Woodland Police Department, and also directs the DARE program.

PATROL consists of uniformed police officers, traffic, the police reserve program, and training. Uniformed patrol provides 24-hour uniformed services for emergencies, traffic control, preliminary investigations, arrests and other called-for services from the community. The traffic function consists of one sergeant and two officers assigned to

motorcycle traffic enforcement and investigation responsibilities. Additionally, the Patrol unit directs the SWAT and K-9 specialty teams.

INVESTIGATIONS is responsible for evaluating all reported crimes and conducting follow-up investigations to determine solvability factors, the potential for criminal apprehensions, recovery of stolen property and other related clearances. Investigators prepare cases for prosecution in court and provide crime scene identification services in those instances where major crimes have occurred. In addition to these functions, the Investigative Unit includes the YONET division (the Yolo Narcotics Enforcement Team with two Woodland police officers assigned to the county-wide narcotics task force), Crime Analysis (charged with collecting and directing the flow of information regarding all aspects of crime within the community), and Crime Suppression (the two-police officer unit charged with targeting property crime and serious offenders).

The current population of the City of Woodland is approximately 42,500. Total personnel at the Woodland Police Department is seventy two, comprised of fifty four sworn police officers, fourteen non-sworn personnel, and four civilian employees. Based on officer-population ratios -- in addition to the new development of numerous residential communities including the Southeast area -- the department has projected the addition of five new police officers in the coming year, and plans are continuing for a new police station facility.

YOLO COUNTY SHERIFF'S DEPARTMENT

Presently and for the near future, there will generally be three (3) patrol units per shift, twenty-four (24) hours a day, serving the general planning area. These same patrol units will cover the area surrounding Woodland, north to Knights Landing, east to the Sacramento River, south to the Davis area and Clarksburg, and west to Madison and Esparto. There are also resident deputies assigned to Knights Landing, Esparto, Clarksburg, Dunnigan, and Guinda (Capay Valley).

The Yolo County Sheriff's Department and Detention Division is presently located south of Gibson Road, between County Road 101 and 102 (near Yuba College).

The Sheriff's Department estimates their response time, depending on the patrol unit's location, to be from two minutes to 15 minutes. An average of 10 minutes would be a conservative estimate of their response time.

The Sheriff's Department is budgeted for approximately $6 million plus. No funds are budgeted to the City of Woodland. The Animal Control Division and Detention Transportation Services are provided to the city on a contractual basis.

The Sheriff's Department has jurisdiction anywhere within the county, but traditionally, do not routinely exercise those powers when the incorporated areas have their own law enforcement agencies. This agency does not respond to calls within the City of Woodland's jurisdiction unless requested. The Woodland Police Department and Yolo County Sheriff's Department have a good working relationship.

The Yolo County Sheriff's Department does not provide any direct services to the City of Woodland other than those contractual services previously mentioned. Services such as Detention and Transportation, Civil Division and Coroner's Division are available to members of the community.

CALIFORNIA HIGHWAY PATROL

The Woodland Area office of the California Highway Patrol is currently staffed by 22 road patrol officers and three sergeants. The Area Commander is a Lieutenant. During typical day and afternoon shifts two patrol cars cover I-5 from the Sacramento River to the Colusa-Yolo County line, I-505 from Dunnigan to Winters, and all other roadways in the northern half of Yolo County. After 11:00 P.M. a total of two cars patrol all of Yolo County. So it is fair to say they serve the planning area with one patrol car at most times.

The CHP's office is located off County Road 102 just south of I-5. Response times to the different planning sections would be from one to six minutes. However, it should be noted that it would be rare for a patrol car to respond from the office, as the officers are usually in the office only during the first and last 15 minutes of each shift.

The jurisdiction of the Woodland Area office of the California Highway Patrol includes traffic law enforcement and related services on all freeways in Yolo County plus all public roadways outside the limits of the incorporated cities. As allied agencies, the California Highway Patrol and the Woodland Police Department enjoy a cooperative relationship, frequently providing mutual protection, other types of assistance, and the sharing of information.

As a major statewide law enforcement agency, the California Highway Patrol provides a variety of services to the general Woodland area. The primary mission is management and regulation of traffic in an effort to achieve safe, lawful, and efficient use of the highway transportation system within Yolo County. The California Highway Patrol has a secondary mission of supporting local law enforcement by assisting in emergencies which exceed local capabilities. There are other services offered to local law enforcement agencies, such as the use of the Valley Division Multi-Disciplinary Accident Investigation Team (MAIT), use of the regional helicopter based at Auburn Regional Airport, the inspection of large commercial vehicles involved in accidents, by a commercial enforcement officer, a motor carrier inspection specialist, and the determination of speed from skidmarks by an accident investigation follow-up officer.

Increased development in and around Woodland will cause an increase in demand for CHP services in accident investigation, drunk driving enforcement, other traffic law enforcement, other traffic management services, and assistance to motorists. This will eventually result in the addition of more traffic officers. It is not possible to estimate how much growth CHP would experience, when it would occur, or how much it would cost.

The California Highway Patrol has never used a staffing formula to maintain a certain ratio of officers to population. Instead, personnel strengths have been adjusted for a variety of factors, such as the number of accidents, the number of injuries and fatalities, miles of roadway patrolled, response distances and times, millions of miles driven by the public, percentage of accidents caused by drinking drivers, and how many miles of Interstate highways there are to patrol (Federal law mandates 24-hour coverage on these roadways).

4.6 FIRE PROTECTION

FIRE PREVENTION AND SUPPRESSION

The Woodland Fire Department not only provides fire protection to the City but also the Springlake Fire District (Figure 4-8). There is also a countywide agreement which calls for automatic emergency aid when requested from all the cities, the county and other fire districts within the County.

Within the planning area the average response time from the nearest fire station within the different planning sections is approximately two to four minutes.

There currently is a staff of 1 Fire Chief, 3 Assistant Chiefs, 36 Suppression Personnel, 3 Support Staff and 30 Volunteers. There are three fire station sites (Figure 4-9): Station One is located in the downtown area and Station Two is located in the southern portion of the community. One new station nearing completion is located on the east side of SR 113. The new station will replace Station 3 which is on East Street immediately north of the County Fairgrounds. The new station will contain the training facilities for the Fire Department. The City also owns a site in the northwest corner of the city which would be large enough for a fourth station as development warrants it.

As future development occurs, additional equipment and personnel will be needed. Due to the cost of building and supplying personnel for a new fire station, the city has vigorously pushed for built-in fire protection systems in new construction and to maintain an aggressive ongoing inspection program throughout the City.

Woodland - Springlake Fire District

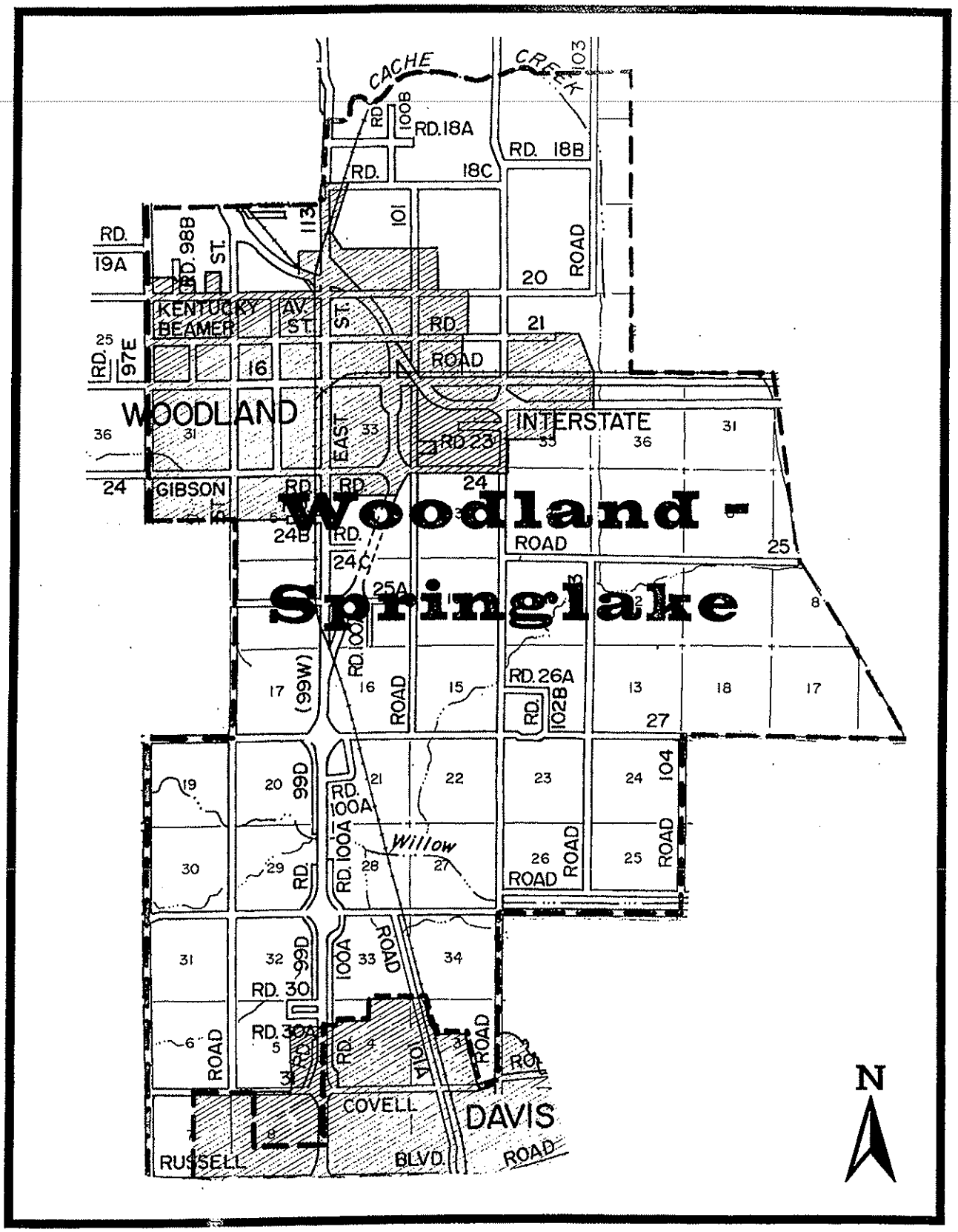

Figure 4-8

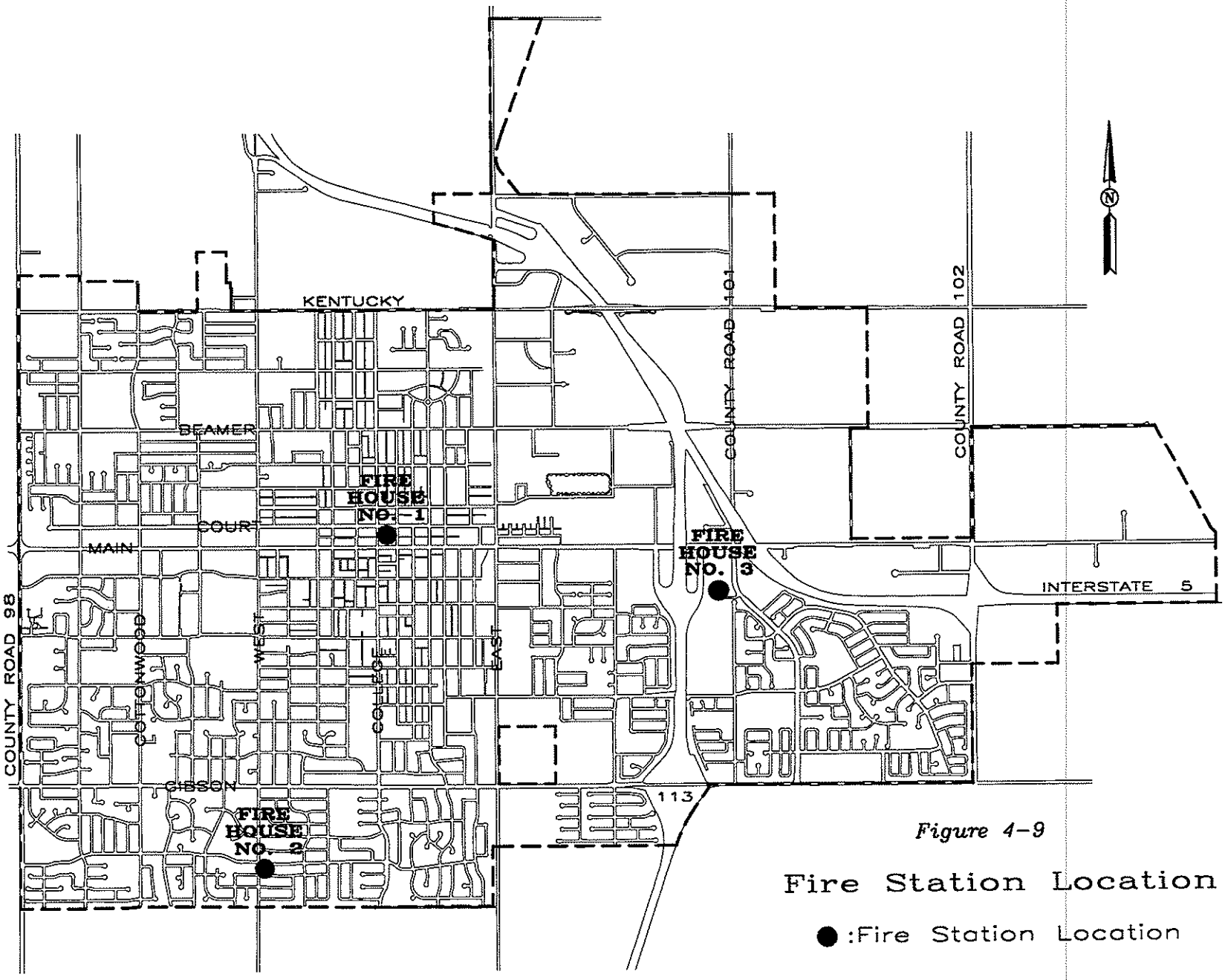

Figure 4-9

Fire Station Location

● :Fire Station Location

The major fire prevention programs carried out by the Fire Department include:

- Review and analysis of all development projects and subdivision maps.
- Weed Abatement Program
- Community Education Programs
- Systematic inspection of all institutional, commercial and industrial buildings.

The role of the Fire Department is also changing as building improvements are made with built-in fire protection. Last year, the Fire Department responded to 2742 calls, 1791 were for medical aid. Due to the high number of medical aid calls, all fire personnel are Emergency Medical Trained certified. The change in the type of call for service may result in future changes for the role and the staffing of the Fire Department.

The City's Public Improvement Standards address fire hydrant installation by requiring fire hydrants every 300 feet along streets throughout the city. On-site fire hydrants may also be needed depending on the size and use of the building and the distance from the street hydrants. The City has a water supply system with a flow capacity of approximately 3500 gallons per minute. This system is adequate to maintain water service when needed for fire protection.

4.7 SOLID WASTE COLLECTION AND DISPOSAL

The City of Woodland contracts for refuse collection services with Waste Management of Woodland. Refuse collection services include the following:

- Weekly collection services for single-family dwellings with automated refuse collection vehicle for toter collection routes. Only a few households receive regular can collection service.
- Bin service for multi-family units and commercial businesses at least once each week or as frequently as necessary. Roll-off containers and bins are provided for large commercial waste generators.
- Annual citywide cleanup programs for City residents. Items targeted for collection include general household waste, furniture, and appliances.
- Weekly collection of residential yard waste at curbside, including leaves, grass clippings, and tree and shrub prunings. Street pickup is performed with a claw-equipped front loader and packer trucks with follow-up street sweeping.

In addition, the City contracts with Waste Management of Woodland for weekly curbside collection of recyclable materials to all single-family and several multi-family units in the city. Materials collected include newspapers, recyclable glass containers, PET, HDPE, and aluminum and bimetal cans. Commercial and industrial recycling is also provided by Waste Management of Woodland. These private sector programs target corrugated cardboard and metals.

These services are funded through refuse service fees which are adjusted annually based on the annual percentage increases in the Consumer Price Index (CPI). In the event that increases in landfill disposal fees exceed the CPI, service rates are adjusted by service category based on corresponding waste volume criteria for the incremental disposal cost difference.

According to the *Source Reduction and Recycling Element*, the City generated 84,557 tons of solid waste in 1991. Of that amount, approximately 20.6 percent was recycled, reused, or composted. The remainder is disposed of at the Yolo County Central Landfill. Table 4-1 summarizes the composition of Woodland's solid waste stream.

TABLE 4-1

SUMMARY OF SOLID WASTE DISPOSAL, DIVERSION, AND GENERATION
City of Woodland 1990

Waste Type	Disposed (tons per year)	Diverted (tons per year)	Total Generated (tons per year)	Diversion Rate (% of total waste generated)
Paper	16,793	2,428	19,221	2.87%
Plastic	5,293	26	5,319	0.03%
Glass	1,411	707	2,118	0.84%
Metal	3,656	443	4,099	0.52%
Yard waste	13,416	0	13,416	0.00%
Other organic waste	12,982	2,296	15,278	2.72%
Other non-organic waste	10,784	11,487	22,271	13.59%
Special waste	2,832	0	2,832	0.00%
Total	67,169	17,388	84,554	20.57%

Source: City of Woodland Source Reduction and Recycling Element, March 1992

Waste is generated in Woodland from residential, commercial, industrial, and other sources, as well as self-haul by residents or businesses in Woodland to the landfill. Table 4-2 summarizes the waste disposal by source, as estimated by the 1992 *Source Reduction and Recycling Element.*

TABLE 4-2

WASTE DISPOSAL SUMMARY BY SOURCE
City of Woodland
1990

Source	Tons per Year	Percent
Residential single family	10,597	15.78%
Residential multi-family	3,697	5.50%
Commercial	30,750	45.78%
Industrial	7,577	11.28%
Other sources (separate yard waste collection)	9,993	14.88%
Self-haul	4,555	6.78%
Total	**67,169**	**100.0%**

Source: City of Woodland Source Reduction and Recycling Element, March 1992

As shown in Table 4-2, Woodland's residential sources generate approximately 36 percent of waste disposed of. The most common types of wastes include newspaper, cardboard, mixed waste paper, glass, tin, yard waste, and food waste. Based on waste sampling data, the average quantity of waste disposed of per household was approximately 40 pounds per week, not including separate yard waste collection. Commercial and industrial sources account for 46 percent and 11 percent, respectively, of the total disposed stream. Waste types include cardboard, mixed waste paper, yard waste, metals, and wood waste.

Wastes are disposed of by the City at the Yolo County Central Landfill located off County Road 28H, near the intersection with County Road 104. The landfill is owned and operated by the Yolo County Department of Public Works and Transportation. Daily refuse placement and cover is provided by Earthco through a contract with the County. The landfill is located on a 722-acre parcel, of which 640 acres are permitted by the State for waste disposal. According to the *Source Reduction and Recycling Element*, as of January 1991 the landfill had a remaining capacity of 11,250,000 and is projected to reach capacity in the year 2025 with no reduction in the future waste stream. Recycling, composting,

source reduction, and other programs are expected to lengthen the projected life of the facility. Under the landfill's existing permit, the facility is allowed to receive up to 1,500 tons per day for 360 days a year. In 1991, the landfill received approximately 750 tons per day of refuse, 35 percent of which was imported from Sacramento County.

Local solid waste management planning is governed by the Integrated Waste Management Act of 1989. The Act established strict mandates for local agencies to achieve a 25 percent reduction in solid waste disposed of by 1995 and a 50 percent reduction by 2000. Each city is required to prepare, adopt, and submit to the county a source reduction and recycling element. Counties must prepare source reduction and recycling elements for unincorporated areas. Source reduction and recycling elements must include the following components:

- Waste characterization
- Source reduction
- Recycling
- Composting
- Solid waste facility capacity
- Education and public information
- Funding
- Special waste
- Household hazardous waste

Woodland adopted its *Source Reduction and Recycling Element* in March 1992. Each county must also prepare and submit to the State Integrated Waste Management and Recycling Board a countywide integrated waste management plan which includes the cities' and county's source reduction and recycling elements, a countywide siting element, and a summary of significant waste management problems for the county. Yolo County is in the process of preparing its countywide siting element as of January 1995.

4.8 OTHER PUBLIC UTILITIES

GAS SERVICE

The City of Woodland is served by line 220, an 8" gas transmission line and line 172, a 20" gas transmission line. These transmission lines feed two 6" high pressure main feeders in Woodland.

One feeder starts at East Main and County Road 101 and goes west to East Street, the second feeder starts at Gibson and County Road. 101 and goes west to East Street. From these feeders, the City of Woodland is served with 6", 4", 3" and 2" mains throughout the city.

The present transmission is sufficient for any future growth within the planning area. However, PG&E does anticipate a need to reinforce their existing distribution mains on a small scale on an as-needed basis.

Number of Customers	11/93
Residential	13,819
Commercial	957
Industrial	5

ELECTRIC SERVICE

The City of Woodland is served by a 96 mega watt substation with twelve 10 mega watt circuits radiating from it. This capacity is insufficient for future growth, especially for large scale projects. Plans will be developed on an as-needed basis to upgrade this capacity.

Number of Customers	11/93
Residential	5,111
Commercial	1,607
Industrial	6

TELEPHONE SERVICE

Pacific Bell is the authorized provider of distribution telephone service within the City of Woodland, franchised by the State of California through Section 7901 of the Public Utilities Code. A Central Office is located within the City for provisioning such service, however a profile of the present and future telephone network is of a proprietary nature and cannot be disclosed.

Pacific Bell is required to provide telephone service for growth and future development in accordance with the requirements of, and at the rates and charges specified in its scheduled tariffs on file with the California Public Utilities Commission.

CABLE TELEVISION SERVICE

Sonic Cable Television provides information and entertainment to Woodland in the form of basic (off-air broadcast, local origination and satellite programming) and premium (HBO, Showtime, Pay-Per-View, etc.) cable television services.

Sonic currently serves 9,500 subscribers in Woodland.

The subscriber capacity of the system is approximately 16,000. About 60% of the houses currently served by the cable system are subscribers.

SCT continuously adds to the system as new housing stock is constructed. Individual projects are considered based upon the distance from existing plant. density of homes, construction costs, and projected subscribers.

SCT does not anticipate a problem meeting subscriber demand.

4.9 SOURCES

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5. City of Woodland Water Shortage Contingency Plan, 1992.
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7. Lt. Humes, California Highway Patrol, 1995.
8. Capt. Rommel, Yolo County Sheriff's Dept., 1995.
9. Woodland Police Dept., 1995.
10. City of Woodland Source Reduction and Recycling Element, 1992.
11. Brain Sweeney, PG&E New Services Representative, 1995.
12. Ray Guenther, Pacific Bell Right-of Way Office, 1995.
13. John Adams, Sonic Cable TV General Manager, 1995.

CHAPTER 5

RECREATIONAL, EDUCATIONAL, AND COMMUNITY SERVICES

5.1 INTRODUCTION

The City of Woodland has a variety of recreational, educational, and cultural resources. These resources take numerous forms, ranging from parks and open space, to the City's schools, libraries, child care resources, and arts and cultural events.

5.2 PARKS AND RECREATION

Parks in Woodland are operated and maintained by the City. The City had 127.32 acres of recreation land within the city limits and 164 acres outside of the City as of 1995. The City has also considered available Woodland Joint Unified School District property to assist in meeting the demand for parks and athletic facilities. It has been the City's policy to locate park facilities adjacent to public school sites whenever possible to use the school open space. The City coordinates the park and recreational needs of the community with the Woodland Joint Unified School District. The School District works with the City to provide for joint use of athletic facilities.

PARK CLASSIFICATIONS

The following paragraphs summarize the City's existing park classification system.

Mini Parks: Mini Parks are smaller versions of the classic neighborhood park, with children's playground and picnic areas. Mini Parks range in size between five (5) and nine (9) acres.

Neighborhood Parks: Neighborhood parks should fulfill recreation needs by providing open space, playing fields, play courts picnic facilities, and playground apparatus. Neighborhood parks should be ten (10) to fifteen (15) acres in size.

Special User Parks: Special User Parks are playing fields, swimming pools and special activities. Special User Parks range in size from one (1) to sixteen (16) acres.

Community Parks: Community parks are where members of the entire community can congregate. The facilities include the typical neighborhood park facilities plus covered picnic areas, restrooms, and lighted softball fields and tennis courts. Community parks should be thirty (30) to fifty (50) acres in size.

Regional Parks: Regional parks are developed to serve more than one community. They should provide as many diverse recreational facilities as possible. They should also make use of the areas unique natural resources. Regional parks should be a minimum of more than fifty (50) acres.

INVENTORY OF EXISTING PARK FACILITIES

The City operates 31 recreation facilities, comprising a total of approximately 309 acres. The following lists the City parks by category.

NEIGHBORHOOD PARKS

Woodland's neighborhood parks are listed in Table 5-1. The City is also currently (1995) in the process of purchasing a ten-acre site for development of a new neighborhood park in the Southeast Area.

Table 5-1

WOODLAND NEIGHBORHOOD PARKS

NAME	LOCATION	ACREAGE
Beamer Park	Palm Avenue and Woodland Avenue	2.18
Campbell Park	Thomas St. and Henderson Street	6.65
Christiansen Park	Beamer St. and Walnut Street	4.13
City Park	Cross Street and Cleveland Street	3.92
Crawford Park	College Street and El Dorado Dr.	10.00
Everman Park	Fourth, Sixth, Cottage and Gum Ave	3.39
Ferns Park	W Southwood Dr. and Ashley Ave	10.00
Freeman Park	Fifth, Main and Court Street	2.25
Greenbelt Park/Schuler Ranch Park	179 Schuler Ranch Drive	3.85
Harris Park	Imperial St. and Ashley Avenue	3.06
Southland Park	College St. and Casa Linda Drive	2.67
Tredway Park	Sixth Street	1.57
Woodside Park	Cottonwood and W El Dorado Dr.	10.00
Prairie School/Park	Matmor Road and Stetson Street	3.00
Traynham Park	Falcon Drive and N Ashley Ave	3.20
	TOTAL ACRES	**66.02**

Special User Parks

Woodland's Special User Parks are listed on Table 5-2.

Table 5-2

WOODLAND SPECIAL USER PARKS

NAME	LOCATION	ACREAGE
Buchignani Field	East Gum Avenue	1.50
Camarena Field	Beamer Street	2.59
Clark Field	Beamer Street and Grand Avenue	3.56
Dubach Ball Park	I-5 and SR 113	15.00
Holding Pond Park	West El Dorado Drive	15.00
Recreation Field*	Douglass Junior High School	2.6
Senior Center	Second Street and Lincoln Ave	1.00
Storz Soccer Field	County Road 101	16.00
Woodland Comm. Swim Cntr.	West Street	2.40
Harris Field	Imperial St. and Ashley Avenue	3.05
Packer Creek	Sierra County	4.00
Streng Park Pond	Columbia Drive and Ashley Ave	2.50
Woodland West Greenbelt	Quail Drive and Dove Drive	.50
Grace Hiddleson Municipal Pool	Elm Street	1.00
Yolano Recreation Area	Yolano Drive and Lemen Ave	6.50
	TOTAL ACREAGE	**78.45**

*City maintained and operated, located on school district property.

Community Parks

There are no Community Parks in the City of Woodland.

Regional Parks

There is one (1) Regional Park owned by the City of Woodland. The site of the former City landfill, it is located at the southeast of the City at the southeast corner of County Roads 25 and 102 and is 160 acres in size. It is partially developed for recreational uses, but is not fully developed for regional park uses.

Cemetery

There is one cemetery located at 800 West Street owned, maintained, and operated by the City of Woodland.

RECREATIONAL PROGRAMS

The City of Woodland has active participation in adult and youth recreation programs, as summarized in Table 5-3.

Table 5-3

1995 RECREATIONAL PROGRAMS IN WOODLAND

PROGRAM	PARTICIPANTS
In-Line Hockey	165
Youth Baseball	1680
Youth Soccer YMCA	600+
Adult Softball	4464
Adult Softball Tournaments	1344
Youth Football Jr. Wolves	100
Youth Basketball (City)	330
Youth Softball YMCA	600
Adult Baseball	117
Adult Soccer	54
YMCA Basketball	600+
YMCA Volleyball	60
Swim Team	1380
Swim Lessons/Recreational Swim	17,605
Recreation Program/Packer Creek	121
Senior Citizens	2,225
Training-coaches, referees, staff	124
Program X	100
After School Program-Lee/Douglas	250
Nite Hoops	100
Yolano	100
Summertime Fun Club	300
Discovery Playground	100
Boxing	150
Special Interest - Healthy Start	550
Trips	235
Santa Train	250
Summer Day Camp	100
Easter Camp	70
Christmas Camp	70
Red Ribbon Week	300
Family Fun Day	200
Contract Programs	2,300
Folklorico	80
Woodland Gymnastics	200
Special Events	12,000
Freeman Park Special Events	200
TOTAL	49,224+

5.3 LIBRARIES

The library is the major provider of information that remains free and accessible to everyone. The mission of the Woodland Public Library is "to inform, to enhance the quality of life, and to foster lifelong learning". The staff and Board of Trustees are planning for the future while maintaining the level of traditional library service that Woodland has come to expect.

Currently the Woodland Public Library serves residents of the City of Woodland as well as Yolo County residents and residents of the surrounding counties. Almost 34,000 people hold library cards and check out over 205,000 volumes per year. The library is open 50 hours a week, including six days and four evenings. The building expansion completed in 1988 has allowed the library to consolidate public services on one floor, with offices, work space, Friends Room, Literacy Office, and community meeting rooms on the lower level. Staff includes four professional librarians (one part-time) and 11 full and part-time support staff, equivalent to 11.2 full-time equivalency. The Literacy Service has a separate staff of 2 half-time employees.

The regular library staff provides all public services, i.e., reference, children's services, readers advisory, programming for all age levels, access to non-print and electronic resources, a Spanish language collection, and circulation of library materials, as well as the technical work necessary to order, catalog and process approximately 7,000 items per year. The library owns over 78,000 books, over 1,200 microfilms, 16,000 microforms, over 900 special interest videos, over 200 books on tape, and almost 2,000 Spanish language items. The library subscribes to 237 magazines and newspapers. Materials are circulated to the public using a computerized automated system shared with Sacramento Public Library, Sutter County Library, and Sierra College Library. All materials in each library collection are available to Woodland borrowers. Through the IMPACT CD-ROM catalog produced by the Mountain Valley Library System, the library can obtain materials which belong to other MVLS member libraries. Materials from other California libraries or libraries outside the state are available through the OCLC Interlibrary Loan system. Staff is currently using the Internet to supplement and enhance reference and circulation services. In 1995, public access to Internet resources will be available at the Woodland Public Library.

Recent reductions in funds available for collection development make it increasingly difficult to meet the needs of the growing Woodland community. Technology is a two-edged sword-it may mitigate the necessity to purchase expensive print resources, but the technology itself can be prohibitively expensive. Cooperation is a key element in planning for library services into the 21st Century-especially cooperation with schools. Another key component is a realization on the part of the community and its leaders that the well-supported public library is an "essential service" in terms of an informed, literate, and productive citizenry.

5.4 SCHOOLS

PUBLIC ELEMENTARY AND SECONDARY SCHOOLS

The Woodland Joint Unified School District provides public education services to the residents of the City of Woodland. The District currently operates eleven elementary schools which serve the children of Woodland. It also operates two middle schools, two high schools, one of which is a continuation school. There are a total of 8,988 students enrolled within the district which encompasses the City of Woodland and the three rural communities of Knights Landing, Yolo and Zamora.

In recent years the Woodland Joint Unified School District has been experiencing rapid enrollment growth. In a period of seven years, the district's enrollment increased from 7,434 students in October 1987 to 8,988 students in October 1995 representing a 20.9% increase. The 1995 student yield study indicated each new single-family residential would be expected to generate

	.416 K-6	student unit,
	.168 7-9	student unit,
	.178 10-12	student unit
TOTAL	.762	student unit

The District Facilities Master Plan identifies a total capacity for each school based upon state loading standards as follows:

TABLE 5-4

Map Number*	School Name	Construction Date	Capacity	95-96 Enrollment	Site Size Acres
1	Beamer Elementary	1941	507	497	5.5
2	Dingle Elementary	1948	431	364	4.0
3	Freeman Elementary	1958	509	507	9.5
4	Gibson Elementary	1953	687	639	10.0
**	Grafton Elementary	1940	172	197	14.0
5	Maxwell Elementary	1970	580	565	9.8
**	Plainfield Elementary	1955	198	207	9.0
6	Whitehead Elementary	1969	464	496	10.0
7	Willow Spring Elementary	1949	366	383	4.0
8	Woodland Prairie Elementary	1988	736	761	7.0
9	Zamora Elementary	1986	451	438	9.8
	Total Elementary Capacity		5,101	5,054	
10	Douglass Junior High	1930	1,042	942	23.1
11	Lee Junior High	1962	1,108	1,074	23.0
	Total Junior High Capacity		**2,150**	**2,016**	
12	Woodland High	1971	1,592	1,671	47.4
	Community High*	1929	1500	139	
	Total High School Capacity		**1,742**	**1,810**	
	9-12 Independent Learning Center		79		
	K-8 Home Independent Study		29		
	Total Independent Study		**108**		
	Total Capacity		**8,993**	**8,988**	

* Map Number corresponds to school location on Figure 5-1

** Not in the City

The District has minimal capacity left within its schools. A new K-6 school will be constructed in the Southeast Area of the City and will be designed as a year round school to achieve maximum capacity.

Currently none of the schools in the District are on a year-round education track. In July, 1996, Woodland Prairie will be the first school in the District to operate on a multi-track year-round schedule. Year-round education, when operated on a multi-track schedule can increase the capacity of a school facility by approximately 20%. The Master Plan identifies 4 schools which serve the Woodland population which may have the ability to become year round schools. Each of these schools would require modernization of the facility.

According to the enrollment projections and the district's existing facility capacity, it is clear that the District will have to provide additional school facilities to adequately house its future enrollments. The cost of the new school facilities will require the district to pursue several funding strategies. These strategies include developer fees, Mello-Roos Community Facilities districts, General Obligation Bonds, and the Leroy-Greene Lease/Purchase Program. In June of 1995, a General Obligation Bond was placed on the ballot to provide for the modernization of all the schools. The measure failed just 50 votes short of the necessary 2/3rds requirement needed for passage. Additionally, the district will need to acquire portables as needed to accommodate additional enrollments at existing sites until new construction occurs.

YOLO COUNTY SUPERINTENDENT OF SCHOOLS

The Yolo County Superintendent of Schools Office is located in Woodland. It serves as a regional agency which provides three types of services to support the educational system in Yolo County. The Administrative Services Division functions as the immediate agent for the Yolo County Office of Education (YCOE) and other State agencies in providing fiscal, personnel, payroll and facilities services to school districts and provides all non-instructional support services to the educational programs operated by YCOE. Its mission is to meet current and future needs of Yolo County of Education and meet current and future needs of Yolo County by serving as a regional resource to students, parents, school districts, agencies, and businesses through collaborative leadership, support and services. The Instructional Services Division coordinates county-wide collaboration in curriculum, professional growth and coordinated children's services programs as well as administering the County of Education's student programs including Court and Community Schools, Teen Parent Centers and Regional Occupational Program (ROP). The Special Education Services division serves over 1,100 students with disabilities at 40 sites throughout the county, the majority of which are at district school sites. Special Education provides diagnostic and counseling services to students with hearing and speech impairments, as well as those with visual and orthopedic handicaps, psychological disturbances, and/ or mental retardation. The YCOE operates the Greengate School in Woodland which serves 170 students.

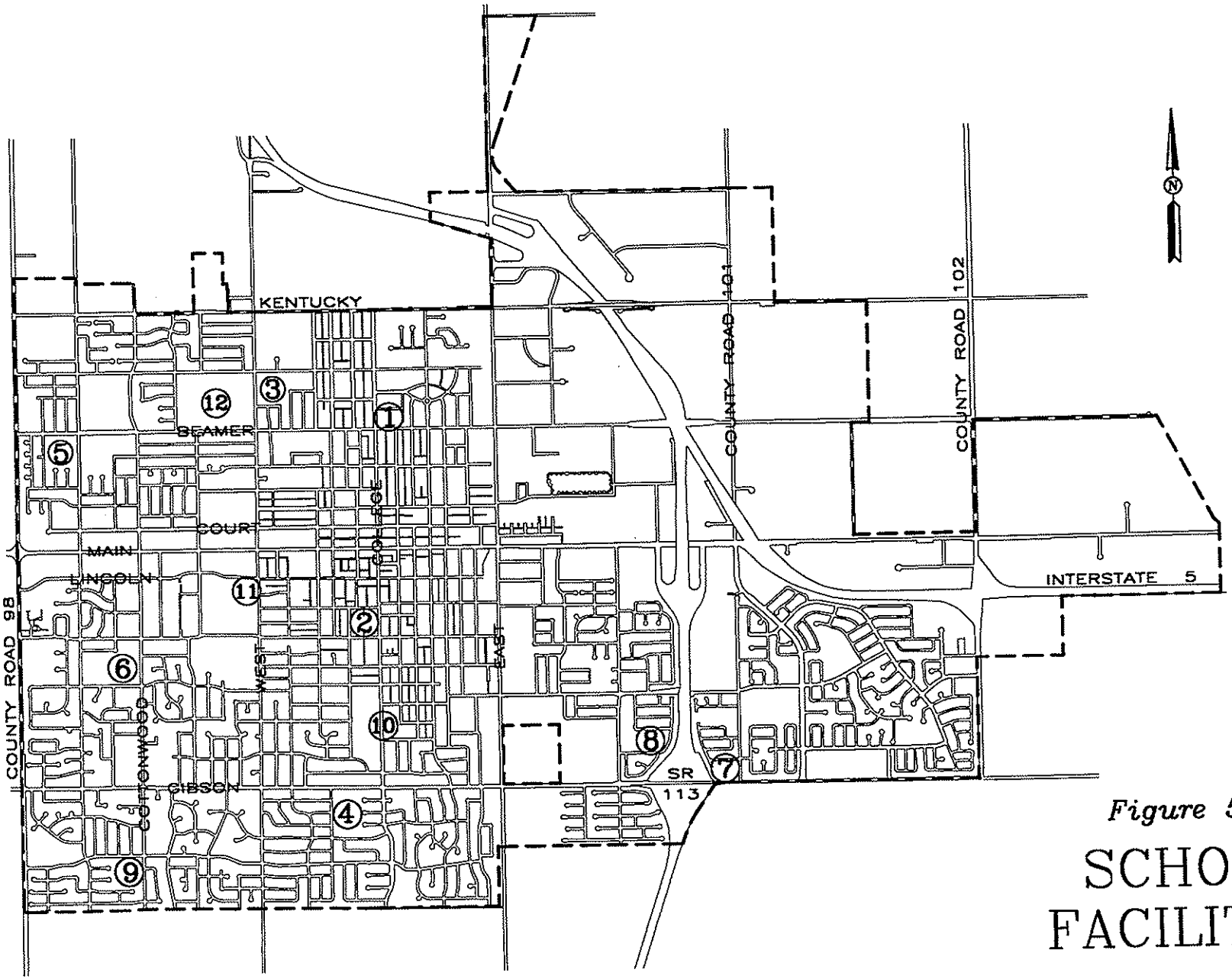

Figure 5-1

SCHOOL FACILITIES

See Table 5-4

The Yolo County Office of Education Administrative offices are currently located in leased space at 1240 Harter Avenue. The YCOE would like to own their own facility in which to operate all of their programs. The site will need to be large enough to handle expansion as the population of the County increases. The YCOE is not eligible to charge development fees or use other conventional financing methods such as Mello Roos, General Obligation Bonds, or State Leroy Greene Facilities like the Woodland Joint Unified School District so other accommodations and financial creativity is needed to provided the YCOE with their needed space.

PRIVATE SCHOOLS

The City of Woodland is home to five private schools: Woodland Christian School (462 students), Holy Rosary School (292 students), Liberty Christian Academy (45 students), Montessori Children's House (57 students), and Woodland Adventist School (33 students). These schools service grades ranging from kindergarten through ninth grade depending on the individual school curriculum. There are approximately 889 students enrolled in the private schools in Woodland.

COLLEGES

Yuba Community College provides community college services to Woodland residents. A Woodland Center of Yuba College is located on Gibson Road approximately 1/4 mile west of County Road 102. It is located on 120 acres. There are presently 2,033 students enrolled at Yuba College.

The University of California at Davis is located approximately 10 miles south of Woodland. The University not only provides educational services to over 21,000 students but also has several research facilities located on the campus. These research facilities have resulted in the spin off of industries which need research opportunities to operate their business and expand. In addition, there are over 1000 employees of the University that reside in Woodland.

5.5 CHILD CARE

In California, both parents work in 80% of two-parent families, and the number of single parent families have doubled in the last decade. The 1990 census indicates that there are about 9,456 children age 13 years or younger in Woodland. Child care is a major concern for many Woodland families. It is estimated that the average annual cost per child for child care in Woodland is $4,012 (Child Action , March 1992).

The City of Woodland established a Child Care Commission in 1990. In 1993, the Child Care Commission conducted a Needs Assessment Survey of Woodland families. About 350 families completed the survey. Major findings of the Needs Assessment include the following:

- Child care is provided to at least 46% of these children by someone other than a family member.
- Almost one-fifth of the families consist of a single, female head of household.
- Nearly 70% of respondents indicated they that finding child care is "somewhat difficult" or "very difficult".
- Thirty-six percent of respondents indicated a preference for the child care center to be located closer to home. Twenty two percent indicated they prefer the center to be located closer to the child's school, while 11% prefer the center to be closer to their workplace.
- Twenty five percent of the surveyed families indicated that before school child care is a problem for them.
- Many families indicated that the transportation of children between child care, school and home is a major issue to them.

In 1994, the Child Care Commission completed the Child Care Master Plan. This Master Plan is intended to be utilized in the preparation of the General Plan. The Master Plan contains policies that are recommended to be included in the General Plan. It includes policies related to Circulation, Land Use, Housing, and Safety.

The City of Davis has been designated as the agency to provide information and referral service for child care. Funding is provided through a state grant.

In 1994, there were 136 licensed day care providers in Woodland. Of these licensed providers, 125 of the facilities are located in private homes.

5.6 CULTURAL EVENTS AND ACTIVITIES

WOODLAND OPERA HOUSE STATE HISTORIC PARK

The Woodland Opera House was established in 1885. Most of the building, along with an entire city block, was destroyed in the great fire of 1892. After its reconstruction at the turn-of-the-century, it became the cultural hub of the region. In 1976, the Woodland Opera House was declared a state park. The Opera House was restored in 1989 and is now a functioning facility for the performing arts. It is open to the public for tours Tuesdays 10:00 a.m. to 3:00 p.m. Appointments for tours can also be made two weeks in advance, Tuesday-Friday between the hours of 9:00 a.m. and 5:00 p.m. The Woodland Opera House is a charter member of the League of Historic American Theaters.

YOLO COUNTY HISTORICAL MUSEUM

The Museum, situated on two and a half acres of towering trees, historical plantings and lawn is the former home of William Byas and Mary Gibson. The rooms of the mansion exhibit different periods of western American culture from 1850 through 1948. Adjacent to the mansion is a wash house, dairy shed, and root cellar. Included with the permanent exhibits, the museum has a program of changing exhibits on varying topics. Past exhibits have shown period costumes, antique toys, and local Indian culture. Attendance at the museum averages 3,000 people per year, and has attracted a number of groups and individuals worldwide who wish to authenticate California history. The facility and property are owned by Yolo County. The museum is operated by the non-profit Yolo County Historical Museum Association. Located at 512 Gibson Road, the museum is open to the public on Monday and Tuesday, from 9:00 a.m. to 5:00 p.m., and Saturday and Sunday from noon-4:00 p.m.

Yolo County Historical Museum Events and Activities:

- May Festival-annual event held on the third Sunday in May. Featuring homemade crafts from local artisans, entertainment, games, and displays.
- Christmas Bazaar and Open House-annual event featuring homemade foods and crafts, decorated trees and wreaths, bazaar items, and gift shop merchandise.
- The grounds are open during regular museum hours for picnicking, and are also available, on a fee basis, for weddings, receptions, family reunions and other group activities.

HAYS ANTIQUE TRUCK MUSEUM

The Hays Antique Truck Museum, a privately-owned facility, houses the largest collection of antique trucks in the United States. More than 100 restored vintage vehicles representing more than 93 makes are on display. Visitors can see solid rubber tires and other unusual items dating from 1901 to 1950, as well as exhibits tracing the history of the trucking industry. The museum is open daily, from 10:00 a.m.- 5:00 p.m.

STROLL THROUGH HISTORY

The Stroll Through History is an annual event sponsored by the "Neighbors for Historic Preservation" a committee of the Woodland Downtowners Association. The event includes a walking tour through beautiful historic neighborhoods and business areas. The historic homes featured in the Stroll consist of Victorian homes: Queen Annes, Eastlakes, Italianates, bungalows, and working-class vernacular residences. The Stroll Through History is an eventful day with many activities which include:

- Paid tours of 6 to 8 Victorian and Period homes and gardens.
- Antique car show and antique fire engines.
- Horse and Carriages, antique bicycles and people dressed in Period costumes.
- Demonstrations of historic crafts, dancers, brass bands and other musical entertainment.
- Crafts fair and Antique-Renovator's Show.

OKTOBERFEST

The Oktoberfest is jointly sponsored by the Rotary Club of Woodland and the Woodland Opera House. The event is held at the Heritage Plaza area in downtown Woodland. Entertainment includes German bands and Bavarian dancers performing throughout the day and evening. A Burgermeister presides over the two-day event and encourages audience participation in the "chicken dance" as well as many other activities. A craft fair provides "hand made only" crafts for display and purchase. Activities available for children include bounce houses, hot air balloon rides, carnival games, face painting, and much more. Food and refreshments are authentic German fare such as bratwurst, sauerkraut, and strudel.

WOODLAND CHAMBER OF COMMERCE ANNUAL EVENTS

- Annual Meeting-Yearly event, held in January, designed to install and introduce the Chambers' Board of Directors to our members and the community. The Chamber's Member-of-the-Year is also acknowledged as are area businesses.

- Crab Feed held in February at the Yolo County Fairgrounds.

- Trade Show and Business Expo-Held in conjunction with the monthly Business After Hours Mixer. Woodland area businesses come to showcase their wares and advertise their business. Function is held at the Yolo County Fairgrounds in the Exhibition Hall.

- Woodland on the Grow Tour, held in early Fall, designed to inform regional developers, decision makers and members on Woodland's continued growth. The event also includes, a walking tour through one of the local manufacturing or distribution centers and a lunch meeting with a celebrated speaker.

- Business Education Day-Event structured to allow local educators an opportunity to view and experience first hand the changing workplace by touring local businesses.

- Industrial BBQ-A long standing Chamber event and community tradition celebrating industry and business throughout Northern Central California. This informal event acknowledges the community's industrial and service firms. It is held the 1st Thursday in June.

- Golf Tournament-This sell-out event is held on the last Friday in July. The tournament is followed by a dinner and awards ceremony.

- BET BBQ - Business and Education Together is held in early March. Teachers and business people participate in the event. It welcomes educators and also recognizes specific businesses for their long standing commitment to education.

- Farm City Banquet designed to honor agriculture and its importance to the community. Awards are given to the Agri-Business Person of the Year, the County's Outstanding Young Farmer and the Future Farmers of America Leader of Tomorrow. Various businesses provide an arcade of agricultural games to play prior to dinner. The event is held on the fourth Thursday of October.

- Board of Directors/Committee Chairs Planning Session - An annual weekend meeting in November, conducted to review current Chamber programs, plan constructive changes and explore new ideas for the Chambers' growth and development.

- Harvestfest, Wine Train Trip - An annual event promoting rural tourism in Yolo County. Includes tasting of local wines, musical entertainment, and products of the burgeoning microbrewery industry.

- Christmas Parade- Woodland's invitational Christmas Parade is held in December and is supported by local businesses. The parade route runs down Main Street with over 200 floats, military units, horses, antique vehicles, marching bands, and Santa Claus. Over 18,000 people view the festive Woodland Christmas Parade.

HISPANIC CHAMBER OF COMMERCE

- Noche De Ronda - Annual cultural event in March held at the Woodland Opera House. The event features the Mariachi Los Arrieros band and young talent performing Hispanic dance, and songs.
- Co-sponsor of the Hispanic Student Leadership Recognition event - This dinner event is held in May.
- Fiesta De La Familia - An annual event held on the last Sunday in June. The event features Folklorico Dancers, Mariachi, food, demonstrations of boxing, and Martial Arts. In addition, the Hispanic Chamber of Commerce awards $500 scholarships to sixteen deserving students at this event.
- In August the Hispanic Chamber sponsors the Hot August Cruise Night best model car competition.
- Christmas Baskets in December are given to five needy families. The baskets include food, toys, and clothing.
- The Hispanic Chamber is also involved in the Woodland Beautification project. Several young people, under the guidance of Chamber members, have taken to painting over graffiti. A vast mural depicting the Virgin de Guadalupe has been painted on the north wall of Contadina, facing Lemon Street.

YOLO COUNTY FAIR

The Yolo County Fair is a five-day event held during August at the Yolo County Fairgrounds in Woodland. The history of the Yolo County Fair goes back to the late 1800s and is somewhat unusual in that it is one of less than half a dozen fairs in California that operates with a free gate. More than 140,000 people attend the Yolo County Fair which continues to preserve a rural old-fashioned atmosphere. Activities include amusement rides, concerts, horse shows, rodeo, pig racing, various demonstrations, judging in livestock, craft, art, cooking, agriculture produce, and quilts, Body Building Contest, Destruction Derby, and the Miss Yolo County Pageant.

HOT AUGUST CRUISE NIGHT

The Hot August Cruise Night is an annual event held on the first Saturday in August. The first August Cruise Night started in 1979 as an informal gathering of a few friends and their custom cars and hot rods. The Cruise Night is one of Woodland's biggest event, bringing in 30,000-35,000 people and approximately $1 million dollars in revenue to Woodland. In 1995 the event was extended from a two to a three-day event. The Cruise includes a Prom held at the Hotel Woodland on Friday, the car show, cruise, concerts, craft faire, custom bicycle and motorcycle show held at Freeman Park on Saturday, and on Sunday a pancake breakfast at Crawford Park and a Poker Run. Local charities, fund raising groups and service clubs all participate by providing volunteers. Money raised from this event is distributed to local charities and City programs.

5.7 ARTS AND CULTURE

YOLO COUNTY ARTS COUNCIL

The Yolo County Arts Council, YCAC, is dedicated to expanding the arts more fully into community life. YCAC provides information and a network of communication among artists and the citizens of Yolo County.

Yolo County Arts Council Events and Activities:

- Arts Update!--a monthly newsletter featuring a Visual and Performing Arts Calendar of events in Yolo County.

- Art in Public Places--YCAC provides technical assistance to cities and the county in their pursuits of Percent for the Arts Ordinances.

- Year 'round Exhibitions in the Yolo County Administration Building in Woodland including the annual Yolo County Quilts Exhibit each March in honor of Women's History Month.

- Arts in Education--YCAC places artists in the schools as visiting professionals who also support students' art career choices and provide valuable one-on-one contact. The council also supports the California State Summer School for the Arts by hosting information meetings and the annual recognition ceremony for Yolo County students.

- Art Workshops and Lectures--Throughout the year, YCAC sponsors workshops, lectures, and panel discussions on a variety of art disciplines, techniques, and issues.

- Art in Woodland--The Woodland Opera House features performing Arts; Dance, Theatre, and Music. The Art Effects Gallery, Bev's Frame Shop and Gallery, and the North Street Gallery provides a location for artist to display and sell their work. The Krellenwork's Restaurant presents live music regularly and displays locally-made artwork through contracts with artists that YCAC facilitate.

- The Yolo County Fair is well known for its art displays and has art auctions to raise funds for art students and community art projects.

- Arts Resources--YCAC is a referral service and important resource for the community, artists, and art organizations.

WOODLAND PUBLIC LIBRARY

For several years the Board of Trustees of the Woodland Public Library had perceived an unfortunate lack of programming and activities in the humanities in Woodland. They agreed that this was a gap that should be filled, but knew that if the library were to undertake the project, it would have to wait until the expansion of the library building and addition of community meeting rooms were complete.

In 1990, the Director was given the green light to apply for a demonstration grant from the American Library Association in cooperation with the National Endowment for the Humanities. It was called "Voices & Visions", and it was a reading, viewing, and discussion series on modern American poetry. We became a demonstration site (one of only 45 in the country), hosted five programs, and the rest is history...

Since the spring of 1991 the library has hosted or developed a wide range of humanities programming, all well-received by the Woodland community: National Book Award finalist Diane Middlebrook (on Sylvia Plath and again on Anne Sexton), "The Remembered Past: 1920-1945," "The Journey Inward: Women's Autobiography," "The American Cowboy: Image vs. Reality" (funded by a grant from the California Council for the Humanities), "The Journey Inward Continues: Keeping Diaries & Journals," "An Evening with Karen Kijewski" as a kickoff event for a discussion series called "Mystery She Wrote," "We Got There on the Train," "An Evening with Max Byrd" as kickoff event for a sequel to "Mystery She Wrote" called "Mystery They Wrote," a "Bookbinding for Beginners" workshop as an outgrowth of our program on diaries and journals, all the programming surrounding "The Golden Gyre", the successful benefit for the library held in May 1994, and an ongoing series called "Brown Bag Videos," which screens videos from our collection during the lunch hour.

The library has also hosted exhibits in the library public areas: award winning quilts from Quilts & Other Comforts, locally made quilts for Women's History Month 1994, and an annual student art show from Woodland High School.

5.8 SOURCES

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7. Mark Ullrich, Oktoberfest , 1995.
8. Charlene Shaffer, Woodland Chamber of Commerce Director , 1995.
9. Ron Maraviov, Yolo County Fair Manager, 1995.
10. Manuel Arteche, Co-founder Hot August Cruise Night, 1995.
11. Lisa Henderson, Program Assistant Arts and Culture, 1995.

CHAPTER 6

HISTORIC PRESERVATION

6.1 INTRODUCTION

This chapter provides a summary of the legal basis for preservation planning and criteria for evaluating the significance of the City's historical and cultural resources. It includes an overview of the history of the City, including its physical development. This overview helps to define the historic character and historical contexts of the community which are important in terms of establishing historical significance and developing specific preservation goals and activities. Other sections include an overview of the City's historical resources inventory and some of the incentives and tools that are available for the preservation of important historical resources.

6.2 HISTORIC AND CULTURAL RESOURCES

Authority to include a Historic Preservation Element in the General Plan as an optional element is found in the California Government Code, Section 65303 which specifically defines a historic preservation element as follows:

> "A Historical Preservation Element for the identification, establishment and protection of sites and structures of architectural, historical, archaeological or cultural significance, including significant trees, hedgerows and other plant materials. The Historical Preservation Element shall include a program which develops actions to be taken in accomplishing the policies set forth in this element."

Woodland has many significant historic buildings, districts, and artifacts that relate to the development of the community. Public awareness of historic preservation has increased remarkably in recent years. The Woodland community has shown a concern for preserving its heritage of architecturally and historically significant buildings believing these buildings are an essential part of City life. Recognition that several old landmarks have already been demolished has stimulated local interest in a preservation program to restore the City's older and select districts.

It is necessary to present a framework for the development of specific criteria for structures, sites and areas for architectural, historical and cultural significance. Basic criteria provide methods of evaluating significant resourcees within urban areas. The following guidelines may be considered in developing criteria for determining the significance of cultural resources and areas.

ARCHITECTURAL SIGNIFICANCE

1. Buildings and Structures that embody distinguishing characteristics of an architectural style, period, method of construction or architectural development in a city.

2. Notable works of a master builder, designer or architect whose style influences the city's architectural development or structures showing the evolution of an architect's style.

3. Rare structures displaying a building type, design or ingenious building form.

4. Structures which embody special architectural and design features.

5. Outstanding examples of structures displaying original architectural integrity, structures and/or style.

6. Unique structures or places that act as focal or pivotal points important as a key to the character or visual quality of an area.

Woodland has a wide range of buildings built between 1860 and 1940 that exhibit architectural styles ranging from a Classical Revival farm house through the Victorian Gothic era and the Queen Anne style to the Modern and International styles.

HISTORIC SIGNIFICANCE

1. Buildings and structures connected with events significant in the economic, cultural, political or social history of a community, state or nation.

2. Buildings and structures identified with the lives of historic personages of a community, state or nation.

3. Sites and groups of structures and buildings representing historic development (urbanization railroads, agricultural settlements, canals, etc.). Locally, Dead Cat Alley is an area of historical significance because of its relationship to the Chinese people and the development of the downtown area.

CULTURAL SIGNIFICANCE

Places that provide information concerning social and cultural trends may reflect beliefs, skills, and institutions of a given period. Examples are the Opera House, schools, museums, and religious structures.

Additional evaluation factors of importance are the capacity of the structure for public use and enjoyment, its adaptability to other uses and planning considerations (i.e., current zoning, adequacy of property boundaries and parking, conformance with land use in the General Plan and endangered status).

PRESERVATION

Preservation of Woodland's significant buildings and areas has largely relied on individual interest. The Yolo County Historical Society is one organization which strives to save historic structures and to educate local residents about the history of the City and the County. A nonprofit, private organization with several hundred members, the Society exists to research, interpret and disseminate information about Yolo County's history.

Through a system of committees, historic sites are identified; displays are arranged and prepared; and programs, tours and publications are scheduled and published. Various fund-raising activities are organized to support the cost of the Society's operations. The Yolo County Historical Society has been instrumental in the restoration and preservation of the Woodland Opera House, Springlake School and the Gibson House Museum. The YMCA has actively participated in the preservation of Nelson's Grove, a 13.5 acre grove of native oak trees once used for recreation and social gatherings by area residents. The grove is located northeast of County Road 99E and County Road 18B.

There are many ways in which the City and County can promote preservation. In 1971, the City adopted an ordinance providing for the creation of a Historical Landmarks Advisory Committee and Historic District Zoning. This ordinance was promulgated through the efforts of the County Historical Society, the Yolo County Historical Landmarks Advisory Committee and the City Planning Commission. This ordinance was replaced in 1981 by the current ordinance which reconstituted the Historical Landmarks Advisory Committee as the Historical Preservation Commission but eliminated all references to residential properties.

The Historical Preservation Commission is composed of seven members appointed by the City Council. The Commission considers applications for non-residential Historical Districts and Historical Landmarks. They also review building permits authorizing demolition or exterior alterations, additions or modifications to designated historic buildings.

There are currently three City Historic Districts, four City Historic Landmarks, three State Historical Landmarks and nine National Register structures in Woodland. The Commission has instituted a program of awarding Heritage Home Awards to individuals who do an outstanding job of maintaining and/or restoring their historic homes. Forty-five have been awarded to date. Figure 6-1 and Tables 6-1 and 6-2 provide a list and location of these historic buildings.

In 1981 the City obtained a Federal grant through the California Office of Historic Preservation to prepare a historical resource inventory of structures in Woodland built prior to 1940. The inventory was completed in 1982 and 1,000 sites were surveyed and photographed. A detailed survey form was prepared for 364 sites. In 1993 the City authorized the completion of a historical resource inventory of commercial and industrial structures within the Redevelopment District. This survey is nearing completion and will supplement the 1982 inventory.

Easements can be another tool used to further historical preservation purposes. An easement does not affect the ownership of property but only certain rights that go along with it. For example, there are facade or architectural easements by which the exterior of a structure may be controlled by the holders of the easement.

Several tax relief benefits are available for preservation activities. Charitable contributions to preservation programs are tax deductible as is the value of a dedicated historic or facade easement. The California Revenue and Taxation Code, Sections 50280 - 50289 (Mills Act) provides for a reduction in local tax assessments for designated State and national landmarks. To qualify for the reduced assessment, the owners of landmarks must agree to maintain the site. In some areas, non-profit groups have purchased and restored historical structures and then, prior to their sale, placed deed restrictions on the property which prevent demolition or significant alterations of the structure.

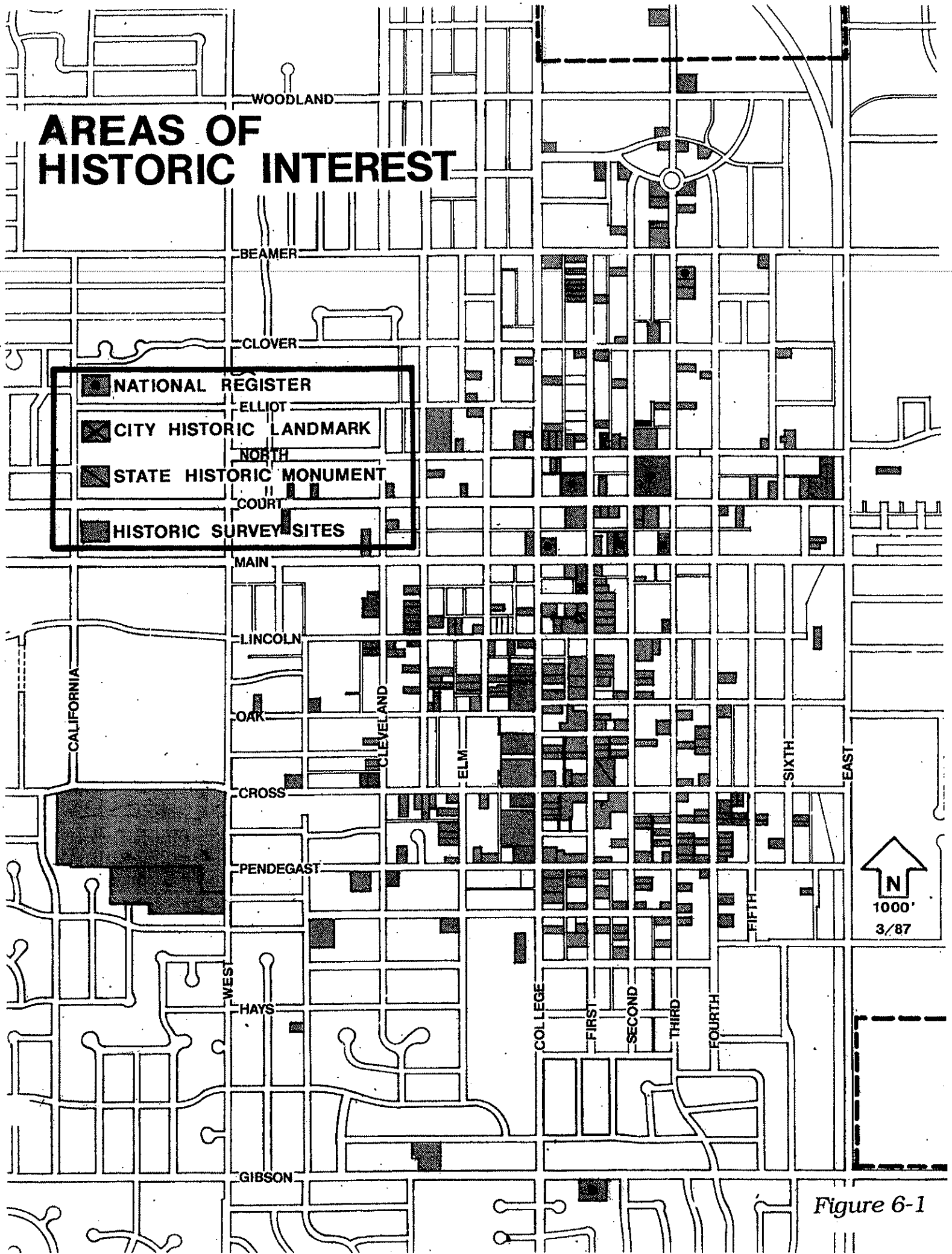
AREAS OF HISTORIC INTEREST
NATIONAL REGISTER
CITY HISTORIC LANDMARK
STATE HISTORIC MONUMENT
HISTORIC SURVEY SITES
WOODLAND
BEAMER
CLOVER
ELLIOT
NORTH
COURT
MAIN
LINCOLN
OAK
CROSS
PENDEGAST
HAYS
GIBSON
CALIFORNIA
WEST
CLEVELAND
ELM
COLLEGE
FIRST
SECOND
THIRD
FOURTH
FIFTH
SIXTH
EAST
N
1000'
3/87

Figure 6-1

TABLE 6-1

CURRENT NATIONAL REGISTER PROPERTIES

Yolo County Historical Museum	512 Gibson Road	11/7/76
I.O.O.F. Building	723 Main Street	2/25/82
Porter Building	511 Main Street	11/30/78
Woodland Opera House	320 Second Street	11/5/71
Woodland Public Library	250 First Street	9/28/81
Yolo County Courthouse	725 Court Street	2/26/87
R.H. Beamer House	19 Third Street	7/29/82
Jackson Apartments	426 First Street	
Hotel Woodland	436 Main Street	10/21/94

CURRENT STATE POINT OF HISTORICAL INTEREST

Christian Science Church	450 First Street

CURRENT STATE HISTORICAL LANDMARKS

Gable Mansion	659 First Street
Woodland Opera House	320 Second Street
Yolo County Historical Museum	512 Gibson Road

CURRENT CITY HISTORIC DISTRICTS

Gibson Mansion Historic Museum Property	512 Gibson Road
Woodland Opera House Property	320 Second Street
Yolo County Courthouse Block	725 Court Street

TABLE 6-2

CURRENT CITY HISTORIC LANDMARKS

Coleman House	611 North Street
Jackson Building	426 First Street
Traughber House	163 Second Street
St. Lukes Episcopal Church	515 Second Street

1989 - 1995 Heritage Home Awards

1989	
Barrow	640 College Street
Bourn	9 Palm Avenue
Johnson	638 First Street
McWhirk	659 First Street
Nicolson	610 First Street

1990	
Blevins	618 First Street
Geer	704 Elm Street
Hildebrand	754 First Street
Lawson	742 First Street
Marks	458 First Street

1991	
Epperson	520 Cross Street
Ernst	41 Palm Avenue
Hansen	734 College Street
Laugenour	311 Gibson Road
Nassie/Crowhurst	422 Lincoln Avenue

1989 - 1995 Heritage Home Awards (cont.)

1992	
Day	914 First Street
Fisher	667 College Street
Harvey-Keith/Davis	515 First Street
Joule	756 First Street
Van Hoecke	19 Third Street

1993	
Buckingham	449 Pendegast Street
Dougherty	750 Second Street
Geist	714 West Keystone Avenue
Reimer	656 College Street
Tinsley	712 Second Street

1994	
Ott	708 College Street
Mullen	815 College Street
Cairns	540 Cross Street
Leake	911 First Street
Brownson	55 Pershing Avenue

1995	
Ebell	106 Bartlett Avenue
DeMaria	703 College Street
Scibienski	803 College Street
Arteche	725 Hollister Road
Pritchard	930 Second Street

Incentives can be developed to allow mixed uses of the interior of buildings restored to their former condition. The Historic Preservation Commission, working in cooperation with many of Woodland's private businesses, could explore new uses which can be made of the older commercial buildings in the downtown area.

Although often thought of as the nemesis of historical preservation, small development projects have provided the financial and legal framework for a number of historical preservation projects throughout the United States. In California, redevelopment projects in Sacramento and Napa have utilized the redevelopment process as a method of furthering historical preservation. Federal funding limitations, however, make this alternative less viable than those previously mentioned.

Building codes often presented physical and economical obstacles to the restoration and preservation of historical structures until the State Historical Building Code was adopted in 1979. These alternative regulations are now mandatory for qualified historic structures and they recognize the unique construction problems inherent in historic buildings.

An increasing number of private and public groups are providing a wide variety of incentives to historical preservation.

The National Trust for Historic Preservation was chartered by Congress in 1949 to further the national policy of preserving for public use America's heritage of historic districts, sites, buildings, structures and objects. The objective was to facilitate public participation in the historic preservation movement and to serve that movement through educational and advisory programs. In addition, the Trust was intended to accept and administer for public benefit and use significant historic properties. The Historic Preservation Act of 1966 provide funds to the states on a matching basis so that states can administer federal programs such as the National Register of Historic places, the federal tax credit for rehabilitation, and envioronmental review of federally-assisted projects.

The National Endowment for the Arts has funded a number of restoration projects of unique architectural structures, private foundations such as the Rockefeller Foundation and the America the Beautiful Funds also provide financial assistance to interested communities. The primary prerequisite for receiving such assistance is an adopted plan for historical preservation and the establishment of an Historic Advisory Commission with authority in this area. In short, if the community is seriously pursuing the goal of preservation, it is more likely to receive outside assistance.

The State office of Historic Preservation monitors local, state, and federal registered historic resources and administers historic resource programs.

Local assistance is perhaps the most effective means of furthering an historical preservation program. Although funds may be limited, the City of Woodland, through a number of innovative programs, can provide a source of financial assistance. One of the most feasible methods would be participation in a revolving fund to purchase and restore historical

structures. Once restored, these structures could be sold with appropriate deed restrictions and the funds used in other restoration projects. Other possible methods include fix-up loans, tool loans and similar self-help assistance. It is significant to note that, in the proposed Federal Housing Community Development Act of 1974 Grant Program, funds may be used for historic preservation programs.

Perhaps most important, throughout Woodland numerous small projects are undertaken each year by owners of older houses to maintain their beauty and utility. In the end, it is this private effort which can be the most meaningful because it is uncomplicated and direct. The City's Historical Preservation Commission could assist in this process by encouraging lending institutions and other groups to provide loans and other forms of assistance to these individual efforts.

OPERA HOUSE

The Opera House, opened originally in 1895, is a large brick structure representing turn of the 19th Century institutional architecture. Closed in 1913, the Opera House stood dormant for 57 years when it was reopened in 1970 to serve as a part-time community center and theater. From 1980 to 1983 the Opera House went through partial restoration. It has since reopened and operates on a temporary basis providing local community theater. The final phase of restoration, completed in 1989 has enabled the theater to attract varying types of performing groups, from local as well as regular resources. The theater seats 550 patrons and has an updated heating and cooling system to ensure the comfort of performers and the audience.

YOLO COUNTY HISTORICAL MUSEUM

The museum located on Gibson Road in the City is housed in the former home of the locally prominent Gibson family. The rooms of the house exhibit different periods of western American culture from 1850 through 1948. Adjacent to the house is a wash house, dairy room, and root cellar.

The land and house is owned by Yolo County; the museum is operated by members of the non-profit Yolo County Historical Museum.

The museum has exhibits of native California plants, trees, and shrubs and also includes an early California herb garden. Included with the permanent exhibits, the museum has a program of changing exhibits on varying topics. Past exhibits have shown period costumes, antique toys, and local Indian culture. Attendance at the museum averages 3,000 people per year, and has attracted a number of groups and individuals worldwide who wish to authenticate California history.

CITY HISTORY

General

Woodland today is still largely a "City of Homes" as it was known in the early 1900's. Factors contributing to Woodland's prosperity have been a rich soil and good climatic conditions, the relocation of the County Seat to Woodland and the establishment of good transportation systems. A brief history of Woodland helps in understanding the natural and man-made influences that created the unique character of the City.

In the winter of 1853, Henry Wyckoff settled in a dense grove of oak trees and opened a small store in Yolo City (now Woodland). Within a couple of years other businesses were established in the area. The favorable soil attracted other settlers who found farming a profitable venture.

Among the early settlers was Major F.S. Freeman, who also opened a store. Later Major Freeman offered free lots to persons who would clear the land and build a home. Before long the settlement of Yolo City grew around what is now Main Street. In 1858, Major Freeman gained permission for a Federal Post Office to be built in the town and Yolo City was renamed Woodland.

In 1862, by a vote of 968 to 778, the Yolo County Seat was transferred from Washington (today known as Broderick in the City of West Sacramento) to Woodland. The courthouse was first located in Henry Wyckoff's store. In 1862, a combination courthouse and jail was built. This was damaged by an earthquake in 1902. A new courthouse was completed in 1918 and is still used for County business and the Superior Courts.

On June 25, 1863, Major Freeman recorded the first plat of the City. The northern portion of present-day Woodland was divided into blocks, lots and streets and this plat was the basis for future locations of buildings and streets. Sixth Street was designated as the eastern boundary; College Street was the western; North Street was the northern border and South Street (now Main Street) was the southern City limit. By 1870, the population of Woodland was estimated to be 1,600 residents but most of the oaks for which the town was named had disappeared. The City was incorporated in 1871.

In the late 1860's, the California Pacific Railroad Company constructed a rail line between Davisville and Marysville with a Woodland station in the vicinity of College Street and Lincoln Avenue. The rail line was later moved to its present location along East Street and became a part of the Southern Pacific Railroad System. The Sacramento Northern Electric Railroad Company began direct freight and passenger service to Sacramento from Woodland in 1912. In the 1920's, this line was acquired by Western Pacific. The depot was located at the corner of Main and Second Streets until it was demolished in the 1960's. The building was replicated in 1987. Today, both the Southern Pacific and the Sacramento Northern provide freight service to the industrial areas of Woodland.

Wood was the primary building material until approximately 1870. Two local brickyards began production of a soft brick in the mid-1860's. This resulted in a changeover of major building materials from lumber to brick as builders found it less expensive to use than imported lumber.

The period between 1880-1890 saw the initiation of City and utility improvements. The construction of an electric lighting plant and the installation of a locally-run telephone system occurred during this decade. Five gas lights were installed along Main Street and an official grade for streets and sidewalks was adopted to provide for level streets within the City. A contract was negotiated with R.H. Beamer for the construction of a municipal building to be used for City offices, the Fire Department and a jail. The City Hall, located at First and Court Streets, was completed in 1891. The building was reconstructed in 1936, enlarged in 1960 and 1975, and still serves the City.

The City of Woodland acquired the water works system and built a sewer system in 1891. In the mid-1950's, sewer capacity was reached. This resulted in a moratorium on all new building from 1957 to 1958. A bond issue was passed in 1959 which extended the sanitary and storm sewer system to serve the southern portion of the City. A similar bond issue was approved in 1963 to serve the northern part of Woodland.

The 1890's began with the worst storm the City had experienced in 30 years. This started a series of misfortunes. In 1892, a fire destroyed two business blocks, including the Opera House and the Exchange Hotel and one block of homes. The property loss amounted to $200,000. In the early 1890's some local businessmen felt a streetcar line along Main Street to carry those who disliked the muddy street would be profitable. The system was one mile long and the streetcars were drawn by horses. The operation failed in 1896. A depression occurred between 1894 and 1896 causing other business failures and bringing the start of a railroad strike. This depression caused a decline in population from 4,523 to 4,392. By 1910, the population had climbed to 4,589.

By 1854, the Union Church building had been built in the cemetery. Little is known about this building except that it served as a meeting place for several churches and schools. The Christian Church, which organized in 1854, met in the Union Church until they dedicated the first church within the City Limits in 1866. A Roman Catholic Church was consecrated in 1869.

The Union Church building also served from 1855 to 1858 as the first public school. In 1858, a permanent school was built near the Southern Pacific Depot, The upper story of the school served as the Masonic Hall. In 1871, a new six-room brick school was started where Freeman Park now stands. The high school was located in the Hesperian College building until 1912 when a bond issue was passed to build a new high school. The Holy Rosary Academy was founded in 1884 and served as a boarding and a day school for girls in the primary and secondary grades.

Founders of the Christian Church also established Hesperian College in 1860. It was originally located south of Main Street on what is now Bush Street then later moved to a new facility near the northeast corner of College and Marshall. In its prime, it was a highly regarded institution of higher learning. The school, today known as Chapman College, is located in Southern California.

The first City Library in Yolo County was built with funds from the Carnage Foundation. The Library, which was privately organized in 1874, was given to the City in 1891. The present library, designed by George A. Dodge and J. Walter Dolliver, was built in 1905 with Carnage Funds, with subsequent additions in 1915, 1927 and 1988.

The Shakespeare Club of Woodland was organized in 1885 to study Shakespeare and plays and the development of the drama. This women's club is the second oldest women's club in the State.

During 1896, a new Opera House was opened on the same street as the one which had been destroyed by fire in 1892. This turn-of-the-century valley theater was the source of great local pride and became the center for recreation and culture in the Woodland area. However, after the filing of a personal injury suit in 1913, the Opera House was closed and remained unused until it was purchased in 1971 by the Yolo County Historical Society. It is now a part of the State Park System and is maintained and operated by the City of Woodland through the Opera House Board of Directors. Restoration is now complete.

The early 1900s were years of unusual building activity. In 1916, a building to house both the Bank of Woodland and the Yolo County Savings Bank was built at the northwest corner of College and Main Streets. This building with its Italian marble entry still stands but now houses a restaurant. Between 1909 and 1911 it has been estimated that about 200 homes were built in Woodland. A number of commercial and community buildings were also built. The Roth Building and St. Luke's Episcopal Church were constructed. The Physician's Building at Main and First Streets and the First National Bank Building were remodeled.

Wm. H. Weeks, one of the foremost architects of the time, designed a number of buildings in Woodland. These included:

1. Bank of Woodland and Yolo County Savings Bank, 435 Main Street, 1903
2. Carnegie Library Addition, 1915
3. County Hospital, 1920
4. County Jail, 1914
5. Dingle School, 1915
6. Elks Lodge, 500 Bush Street, 1926

7. High School, 1913-14, Auditorium and Gymnasium, 1925

8. Manual Arts Building, 1923

9. Hotel Woodland, 1928

10. McConnell Residence - 705 First Street, 1919

11. Old Maxwell School - 175 Walnut Street, 1916

12. Porter Building - 511 Main Street, 1913

13. Yolo County Courthouse, 1918

14. Yolo Fliers Country Club Clubhouse, 1920

He also designed a number of residences.

The Woodland Sanitarium, organized in 1911 by a nurse, was Woodland's first hospital. Physicians expanded the facility and by 1923, the Woodland Clinic Hospital was a functioning hospital. The Woodland Clinic Medical Group relinquished its proprietary interest in the hospital in the 1960's and the Woodland Memorial hospital became the City's first nonprofit community hospital.

Yolo General Hospital, the County Hospital designed by Wm. H. Weeks in 1920, is now the Yolo Health Alliance Peterson Clinic.

Woodland has benefited greatly from the success of the agricultural industry by serving as a center for banking, shops, education and in some instances by housing farmers and their help. Another important impact on the community and industry has been the invention and manufacturing of farming equipment. Local inventions included the centrifugal pump in the late 1800's and the Marvin Landplane in 1936 (Knights Landing). The Best Tractor was developed by the Best family who lived in Woodland although the tractor was actually manufactured in Oakland. Today several farm equipment dealers are located within Woodland and provide employment and tax revenues for the City while serving the outlying farms.

Irrigation was and still is a major contributor to the agricultural success of the area. The first irrigation canal was developed by James Moore in 1856 who owned exclusive water rights to Cache Creek which lies north of Woodland. Irrigation water today is provided by wells and the Yolo County Flood Control and Water Conservation District canals.

Money earned in the gold fields of California financed the purchase of much of the farm land around Woodland. A variety of crops were grown. These included: tobacco, peanuts, grapes, rice, sugar beets, various grains and row crops. Several wineries were located in the County producing wine, vinegar and brandy. The livestock industry also had an important role in the area. The Woodland Creamery was organized n the 1880's by citizens who recognized the local need for dairy products.

The opportunity for farming brought many nationalities to the area. The native Patwin Indian provided the first labor on the farms. They were replaced by Chinese laborers who came to Woodland in the 1860's during the building of the transcontinental railroads. After work on the railroads stopped, the Chinese labored on levee construction, fence building and truck farming. Some Chinese settled in Woodland and became prominent in the culinary and laundry services. Dead Cat Alley became the site of the Chinese community's homes and businesses. By the early 1900's, employment opportunities for the Chinese began to disappear and the Chinese population declined.

The Japanese were first brought to Byron Jackson's Yolano Ranch in the late 19th century as farm laborers, but eventually both Japanese men and women were employed as laborers throughout the county. Some Japanese started businesses in town such as barber shops and secondhand stores but a major handicap to the Japanese were the laws and public attitudes which made it difficult for them to own land or become citizens. Land was acquired by some Japanese who purchased it in their children's names. World War II saw the internment of Japanese families and their land leased to other people. For some Japanese, many years passed before they returned to Yolo County; others never returned.

Filipinos also provided farm labor and later the Bracero Program brought many Mexican Nationals into the area to work on the farms. Today, the Hispanic population has grown to approximately 20% of the City's residents.

As the City of Woodland grew, the need for city planning became evident. In the Spring of 1937, a City Planning Commission was created. A Zoning Ordinance was developed and adopted on July 18, 1938. In 1968, a new concern for aesthetics resulted in an ordinance requiring the undergrounding of utilities in new subdivisions. Since then, nine underground conversion projects have been completed. A General Plan was first adopted by the City in 1958 and underwent major review in 1962, 1967 and 1970. A new General Plan was adopted in 1979 following a five-year study and review process. It was updated in 1988. The City's land use history is included in Chapter 1 of this report.

ETHNOGRAPHIC OVERVIEW

The Woodland study area had initially been held by the Poo-e-win, a dialect group of the Patwin or Southeastern Wintun (Merriam 1966-67, 3:267). Our knowledge of these hill people is somewhat sparse compared to what is known about other neighboring Indian groups owing to several factors:

1. The proselytization and enslavement of the Poo-e-win by the Spanish missionaries, which had the effect of vastly reducing their numbers through hardship and disease. This practice also may have led to a virtual loss of ethnic memory due to near-complete loss of oral histories.

2. The malarial epidemic of 1830-33 and the smallpox epidemic of 1837 decimated much of the surviving population.

Thus, when the establishment of Woodland took place in the late 1850's, there would have been very few Native Americans occupying their traditional environments. One historical document does mention that the first laborers used by the earliest farmers of Woodland were the native Patwin peoples. This suggests that there may still be Patwin-speaking people resident in or around Woodland who might be able to provide first-hand accounts of White-Indian relations in the early American period.

What information we do have comes from Indian informants living around Colusa, Rumsey, Cortena, Stonyford, and Grindstone (Elk Creek) (Kroeber 1932:254). This data should be understood to reflect the remembered lifeways of a semi-acculturated people whose knowledge and understandings of their pre-contact culture has been diluted and altered through the loss of a major portion of their population as well as the enculturation of the Patwin to the lifestyle of Western European culture.

The Poo-e-win, as most Patwin groups, occupied the major river courses and tributary drainage's of their territory, such as the Sacramento River, Cache and Putah Creeks and in some instances, at springs. In these areas only places which had an elevation sufficient to keep them above the rising waters of seasonal floods would have been selected for permanent villages (Kroeber 1932:254-255). These permanent villages served as a base of a tribelet consciousness with which all its members identified. Even if the "mother" village were re-located, the people's identification stayed with the tribelet (Kroeber 1932:258-259). An example of this sense of community would be the Poo-e-win tribelet of the Yo'doi which at one time occupied a large village in the town of Knights Landing.

From these permanent villages, the various family groups could utilize (exploit) the varying resources of several environments. These environments are:

1. Streams and marsh lands for salmon, sturgeon, perch, water fowl, mussels, and tules as well as other vegetable products which served not only for food but also as construction materials.

2. The riparian zone from which vegetal as well as animal products and raw materials for building could be drawn.

3. The valley woodland and prairie communities offered antelope, deer, elk, rabbit, doves, and quail. From the vegetation standpoint, abundant harvests of wild seed from the family Composite (sunflower) in addition to Alfilaria, wild oak (an alien dating from 1779) and bunchgrasses. It was also from this valley woodland community that acorns were collected.

Although sufficient fresh water sources are presently lacking in the Valley, the valley woodland and prairie communities, which constitute much of Woodland's General Plan area, would have been a particularly attractive area for hunter/gatherers. It is more than likely that this area functioned as seed collecting tracts which would have been the personal property of individual families of the tribelet, as well as the gathering place for Valley oak acorns (Kroeber 1932:276). It also could have functioned as hunting territory for large terrestrial mammals as well as migratory fowl, who would have congregated in the tule swamps or at the edge of vernal pools.

Of an especial importance to the Poo-e-win and their neighbors was a main trading trail between the Clear Lake region of the Pomo and the Sacramento River of the Patwin and Nisenan, which followed the course of Cache Creek. Over this route the Patwin traded woodpecker scalp belts, cordage, shell beads, sinew backed bows and yellow hammerhead bands in return for shell and magnesite beads, salt, obsidian, fish, and clamshell. This trade route served an important means of cultural and social interchange in addition to a vital economic supply line for the Patwin and their neighbors to the north, the Nomlaki, to the east the Nisenan, and to the west the Pomo (Davis 1961:34-35).

The Plains provided an abundant source of seed plants and grasses. Principally, these plants are represented by members of the family Composite (sunflower), although such foodstuffs include buttercups, alfilaria, bunchgrass, and to a lesser degree, wild oats (Powers 1877; Kroeber 1932:276; Palumbo 1978:355). These plants were harvested either by beating or cutting the seeds from them into a gathering basket. Having prepared a smooth section of ground, the seeds were thrashed and then winnowed in the wind. These could then be either eaten unprepared or parched with hot coals in a basket or ground into a flour from which bread or soup could be made. (Powers 1877).

The acorn was gathered in the Fall from the valley oaks. Ground in a wooden mortar made of an oak bough, the flour was leached of its bitter tannin in a sand basin. This flour could then be cooked as bread in an earth oven or boiled with hot stones in a basket to make soup

(Kroeber 1932:275). Various herbs, seeds or meat could be added to create different types of soups or mush.

Acorns were stored in granaries seven to eight feet tall and six to seven feet in diameter. These were layered on tule mats and included dried salmon and various other dried meats (Kroeber 1976:275).

The dry lands of the plains were also used for hunting deer and antelope during the winter months (Powers 1877). Here a net about six feet wide and up to 400 feet long was stretched out and deer driven into it to be killed (Kroeber 1932:277-278).

Present day Woodland, although sitting on a slight elevation which afforded dry ground during seasonal flooding, does not have sufficient water resources, in terms of magnitude of streams or rivers, which would have been sufficient to permit permanent villages. It is important, however, to consider a thorough examination for possible natural springs or sinks and relict water courses which might have afforded SUI table living conditions for the earliest inhabitants of the Central Valley in this region. (A recent paleontological discovery along the south side of Cache Creek, that of a mastodon skeleton, suggests that megafauna may have been present in this region, and so too, Paleo-Indian big-game hunters. The implications of this find on archaeology in Woodland will have to await address in future documents, when data are more plentiful.)

The Woodland study area was most probably the locus of temporary hunting and seed gathering camps established for the harvesting of acorns among the oak stands and gathering of edible seeds from the plants of the prairie. In addition the area provided a likely source for hunting antelope, deer, rabbit, and quail. However, it is unlikely that any concentrated remains of these activities will be documented in the literature owing to the temporary nature of these encampments and the nature of the prevailing historic land use patterns (leveling and filling for cultivation). Had Native American structures been present (at least during the contact period), they would have been a simple rectangular roof held up by four poles, a summer structure later called a *ramada* by the Spanish (McKern 1923:171). Tools carried and used at such an encampment would be only those necessary to perform the required task (McKern 1923:171).

Historic land use, predominately cultivation, although grazing of livestock also took place, can be expected to have re-distributed aboriginal cultural materials within the study area unless deeply buried by alluvium. Historic accounts of both Spanish and later other European settlers in the study area fail to make special mention of Patwin informants, except to note that they served as farm laborers. Much more important to the early European visitors to this area, as indicated in the diaries and expedition notes, were the permanent villages situated along the major drainage, which would have served as labor and supplied (either willingly or through force) both Missionary and land owner alike. The Yolo County Historical Society had identified the need for research to be centered upon the

early Spanish diaries, in order to discover details of "the ancient Patwin Indian culture" (1970:I).

EXTANT PREHISTORIC RESOURCES IN THE STUDY AREA

Complete field examination of the Woodland study area was not carried out as a part of this report. Instead, this study involved a search in the literature for details on known or suspected potential prehistoric resources, which might be affected by any proposed change in land usage. A search of the records of recorded prehistoric sites for Yolo County, housed at the Regional Clearinghouse at the University of California at Davis, showed no recorded sites within the project boundaries. This however does not rule out their existence, either at unknown springs or possibly along the earlier shores of Cache or Putah Creeks. We feel that this lack may be due in great part to the very small sample of area surveyed within the study area. This lack of specific concern in this area on the part of the archaeological community may be due in part to the temporary nature of settlements potentially to be found in Woodland, whose physical remains are often less manifested in the record or extremely subtle.

Temporary encampments are poorly understood even today by the archaeological community. There is more information extant on the criteria for selection of permanent village than on temporary camps, particularly because researchers are often drawn to sites containing sizable quantities of aesthetically pleasing goods associated with burials of high statused individuals, rather than the often technologically simple, uni-purpose gathering or processing camp.

POTENTIALLY SENSITIVE AREAS TO PREHISTORIC RESOURCES

Without field examination, this study cannot empirically state where prehistoric resources should be found, if present. However, there do appear to be certain spots which potentially could contain prehistoric deposits, albeit potentially out of context due to historic land modification, which should be further investigated.

1. All areas where possible pre-Pleistocene and/or Holocene watercourses may be buried by alluvium. These areas can best be discovered through geological investigations, and their locations re-visited by an archaeologist, to check for buried paleosols, megafaunal fossils, or stone implements. If indications of buried drainage's are found in the study area, typical archaeological surface reconnaissance may be insufficient to observe them. A program of random monitoring of trenching activities in these potentially sensitive areas could be used to recover such finds and recommend future protective measures.

2. Any area where a grove of native oaks are present, or where stands of native grasses still remain, could be sensitive to prehistoric utilization. Recently proposed State legislation seeks to protect and preserve areas where Native Americans gather raw material such as grasses, seeds, quarry rock and shellfish for food, implements, or ornament. A precedent has been set with the establishment of a grove of native oak trees near the Nelson Ranch as a significant historic resource by the YMGA of Woodland. Examination of similar groves of oaks as well as certain kinds of ethnically significant trees such as the Tree of Heaven (to the Chinese) could help increase the data base appreciably.

The present White community in Woodland needs to be canvassed about their knowledge of prehistoric materials being recovered during plowing and other such activities in the Woodland area. During our brief physical examination of the study area, we failed to find any resident who had ever found prehistoric artifacts. This does not mean that isolated artifacts have not been found, or will not be found, in soils disturbed by agricultural or construction activities. It just means that research did not go deep enough. Particularly important would be an attempt to canvass the resident Native Americans, of which the 1975 census enumerated 39 households and 98 persons, to seek information on their tribal affinity and remembrances of Woodland or their past homelands. It appears that Native Americans constitute an unspoken resource in the search for data on potential cultural resources, or areas sensitive to such resources, in the Woodland study area. Their future involvement in cultural resource inventory programs and interpretation should be sought and incorporated to the fullest extent possible. We might add, other ethnic groups, who presumably entered Woodland during the historic, post-contact era also need to be better understood.

SOURCES

1. Woodland 1988 General Plan, Historic Preservation Element
2. Opera House, Louis Johnson, 12-28-87
3. Monica Stengart, 12-28-87, Yolo County Historical Museum

CHAPTER 7

ENVIRONMENTAL RESOURCES

7.1 INTRODUCTION

Woodland's environmental resources, its water, vegetation and wildlife, and air, contribute to the city's economy and are key elements in the quality of life of Woodland's residents. This chapter inventories and assesses conditions and trends affecting the area's environmental resources. These resources tend to be countywide or regional concerns, rather than affecting only Woodland.

7.2 WATER RESOURCES

Yolo County utilizes approximately one million acre-feet of water annually for agricultural and municipal purposes, depending on both surface and groundwater supplies. The County's water system has evolved in a very decentralized manner, with different interests functioning independently of each other. As a consequence of this historical water development pattern, surface and groundwater resources are largely developed, managed, and utilized independently of each other and by many different entities in the county.

To remedy the fragmented nature of water distribution and to develop an integrated approach to water stewardship in Yolo County, a Water Resources Management Program was developed as part of the Yolo County Water Plan in 1992. The Water Resources Agency of Yolo County (WRA) was established to coordinate implementation of the water policies contained in this document and to achieve the goals set forth in the Yolo County Water Plan. The WRA is a nonprofit mutual benefit corporation with agency members represented by all purveyors of water and major governmental entities in Yolo County. This includes the Dunnigan Water District, Yolo County Flood Control and Water Conservation District, UC Davis, Yolo County Board of Supervisors, and the Cities of Davis, Winters, West Sacramento, and Woodland.

The fundamental characteristics of the existing water supply system in Yolo County are the balance between agricultural and municipal/domestic and industrial water demands, and the mix of surface and groundwater resources available for these water uses. In the total county area, municipal/domestic and industrial water use is very small, representing only 4

percent of the total use and only about 9 percent of the groundwater pumped in an average year. Agriculture accounts for 96 percent of total water use and gets 57 percent of its supplies, in average years, from surface water and 43 percent from groundwater. The 9 percent of groundwater used in the municipal/domestic and an industrial sector is almost all measured and controlled by public agencies, while the remaining 91 percent of groundwater used, in agriculture is unmeasured and privately controlled by a multitude of individual farm enterprises.[1]

GROUNDWATER

Groundwater Quantity

Groundwater under Yolo County is the single most important supply source of water and provides 45 percent of the water demands under average supply conditions. In severe droughts, groundwater can be expected to supply more than 75 percent of the County's demand.[2] The groundwater basin in Yolo County is recharged from rainfall, excess applied irrigation water, seepage from canals, and recharge from Cache Creek, the Sacramento River, and Putah Creek.

Groundwater underlies approximately 68 percent of the County, with an estimated 447,000 acres having access to groundwater resources. Located within this groundwater zone are all of the County's irrigated agricultural lands and urban areas. The effects of droughts on groundwater pumping levels involve several competing and complicated agricultural trends, particularly for prolonged multi-year droughts. However, historical practices in Yolo County have shown that agricultural groundwater usage intensifies significantly during droughts.

The areas that rely entirely on groundwater are impacted most severely during periods of less than average rainfall. These areas include the lands along the east side of the Yolo County Flood Control & Water Conservation District from Cache Creek to Putah Creek, including the cities of Davis and Woodland. These areas have experienced up to four feet of subsidence that has aggravated flooding from the Colusa Basin Drain. Where the levees along Cache Creek are up to four feet lower than their design elevations, the risk of flooding, especially of Woodland, is substantially increased. To the extent that droughts extend for a longer period than that experienced thus far in this century, the cities of

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[1]Yolo County, California's Water Supply System: Conjunctive Use Without Management, UCD Ph.D. Candidate Mimi Jenkins, September 1992

[2]Yolo County, California's Water Supply System Conjunctive Use Without Management; UCD Department of Civil and Environmental Engineering Ph.D. Candidate Mimi Jenkins, Sept.1992.

Woodland and Davis in particular would be vulnerable to increased subsidence unless groundwater pumping in the surrounding areas was limited substantially.[3]

The Yolo County Flood Control and Water Conservation District has filed a water rights application with the State Water Resources Control Board to divert up to 95,000 acre feet of water per year from Cache Creek for groundwater recharge. As proposed, the water will be diverted into areas along the creek designated or designed and built for groundwater recharge during years when excess flows are available in Cache Creek. The water will be extracted out of the ground the following year to meet early season irrigation demands.

The Yolo County Flood Control and Water Conservation District is currently developing a three dimensional, finite difference, computer groundwater model for Yolo County. They are developing the model to simulate the operations of their proposed Cache Creek Groundwater recharge and recovery project and its potential impacts on groundwater resources in the county. The model is based on the USGS MODFLOW program, a well accepted program in the water resources community. It is linked to the Central Valley Aquifer program (CVAP) model developed by the USGS. The CVAP model has a uniform sell size of 36 square miles. If properly designed and calibrated, the model will be capable of providing valuable information regarding the groundwater resources in Yolo County.

Groundwater Quality

Groundwater quality in Yolo County is generally very good and expensive water treatment systems are generally not necessary for municipal/domestic use because the bacteria quality is low and the total dissolved solid (TDS) is acceptable. Groundwater quality contamination due to nitrates has occurred near Dunnigan east of Woodland and west of the University of California at Davis. In addition, pesticide contamination of the groundwater (shallow) exists near Mace Boulevard north of Putah Creek.

For agriculture, the quality of groundwater in Yolo County is generally good. The only exceptions are in those localized area having high boron levels, such as along Cache Creek where the boron concentrations in the groundwater are high, ranging from two ppm to four ppm, in comparison to background levels throughout Yolo County in the order of .6 to 1.0 ppm.[4]

SURFACE WATER

Surface Water Quantity

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[3]Yolo County Water Plan Update 1992

[4]Yolo County Water Plan Update 1992

Surface water resources available to the County come from three natural water courses: the Cache Creek watershed, the Sacramento River watershed, and the Putah Creek Watershed. Some water from Cache Creek is supplied from Clear Lake and Indian Valley reservoir. Sacramento River water is supplied directly from the river, and under Bureau of Reclamation contracts through the Tehama-Colusa canal, and indirectly via the Colusa Drain in the form of return flow from irrigation in Colusa and Yolo Counties. Lake Berryessa (Putah Creek) water is supplied almost exclusively to Solano County.

Unlike groundwater that is virtually available to anyone who owns land and installs a pump, surface water rights are very specific, legal agreements that are complicated and often highly controversial. The mechanisms to acquire rights to surface water are clearly defined in California law. Therefore, although there are sources of surface water available to Yolo County, such as the Sacramento River and Clear Lake and the Indian Valley Reservoir in the Cache Creek watershed, the right to use this water must be legally obtained.

An application has been submitted by the Yolo County Flood Control and Conservation District to the State Water Resources Control Board to divert up to 45,000 acre feet of water per year from the Sacramento River. This water is intended for use by the Cities of Woodland and Davis and the University of California, Davis, and is one of the programs proposed by the Yolo County Water Plan Update to ensure future supplies of water for municipal/domestic and industrial use.

Surface Water Quality

The various sources of surface water are of suitable quality for agricultural and, except for the Colusa Basin Drain, all could be used, with appropriate treatment, for municipal supplies. With respect to the use of water supples from Cache Creek for agriculture, boron is the single most significant constituent. The concentrations of boron vary depending upon the magnitude of flow in Cache Creek, since the concentration is affected primarily by dilution. Although the concentration of boron in the water supplies delivered by the Yolo County Flood Control & Water Conservation District could limit the range in crops that could grow, it does not appear that it has been a significant factor in crop selection in Yolo County.

Mercury continues to persist in Clear Lake and Cache Creek, as evidenced by data from the Regional Water Quality Control Board's toxic monitoring program.

WATER TRANSFER

Significant water transfers were first attempted in Yolo County in 1977 by ANDCO Farms. Following extensive hearings on the proposal before the State Water Resources Control Board, the decision was made to not allow the water transfer to occur.

In 1991, Governor Wilson declared a Water Bank Program as a principal feature of his Drought Emergency Plan. The program, which was administered thought the California Department of Water Resources, transferred 835,579 acre-feet of which 151,765 acre-feet were from Yolo County. Water transfers from Yolo County were the result of direct groundwater transfers; the transfer of water entitlement to exchange with groundwater pumping; and fallowing of land. The lands in Yolo County that participated in the 1991 Water Bank Program were the lands of the Conaway Ranch, Inc., located along the east side of Yolo County in the Yolo Bypass and between the Yolo Bypass and the Sacramento River.

Since groundwater extraction near the Yolo Bypass was being proposed to a greater extent than has occurred in recent years, Yolo County became concerned about the potential impacts, i.e., subsidence, resulting in lowering levees that are an integral part of the Sacramento River Flood Control Project, and the effects on groundwater supplies for neighboring areas including the cities of Woodland and Davis.

As a result of the water transfers agreements between Yolo County and Conaway Ranch, Inc., in cooperation with DWR, a very significant effort was devoted to formulating and implementing a groundwater/subsidence monitoring program. This program included the installation of 16 special test wells for monitoring water levels and water quality; establishing 16 benchmarks for subsidence monitoring and performance surveys using Global Positioning System technology; and the installation of one extensometer. With the network of subsidence benchmarks and the extensometer, if subsidence should occur, it will be possible to determine whether it is the result of groundwater extraction or the result of gas extraction from greater depths.

In other areas of California, subsidence from both gas/brine extraction and groundwater extraction is well documented. Since both groundwater and gas extraction do occur along the eastern portion of Yolo County, subsidence could be the result of one of the other or both. However, since the amount of water or brine removed with gas is small at this time, it is anticipated that the subsidence that has been documented is principally the result of groundwater extraction.[5]

7.3 BIOLOGICAL RESOURCES

The information in this section is based on information contained in a *Draft Yolo County Habitat Conservation Plan* (HCP), January 1995, prepared by EIP Associates, located on file at the City of Woodland Community Development Department, 300 First Street in Woodland.

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[5]Yolo County Water Plan Update 1992

The primary goal of the *Yolo County HCP* is the conservation of state and federally listed threatened or endangered species, or Category 1 candidate species for such status, that may occur within the spheres of influence of the eight urban areas of the county where future growth is anticipated.

TARGET SPECIES

One objective of the *HCP* is to conserve uncommon taxa of native Californian flora and fauna known from Yolo County *before* they become listed as threatened or endangered by the State of California or the U.S. Department of the Interior. Therefore, a broad definition of species that *might* be considered for inclusion in the *HCP* was adopted. These potential "target species" of flora and fauna were defined to include species, subspecies, or varieties of plants and animals that fell into one or more of the following categories:

Flora (Plants)

1. Taxa officially listed as threatened or endangered by the State of California or the U.S. Department of the Interior (California Department of Fish and Game 1994a; 50 C.F.R. § 17.12 (1994));

2. Candidate taxa in Categories 1 and 2 for listing as threatened or endangered by the state or federal governments (California Department of Fish and Game 1994a; 58 Fed.51,144 (1993));

3. Taxa which meets the criteria for listing, even if not currently included on any list, as described in the *State CEQA Guidelines* §15380 (State of California, Governor's Office of Planning and Research 1992);

4. Taxa listed in the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994);

5. Taxa that is biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation;

6. Population(s) in California that may be peripheral to the majority of a taxon's range, but are threatened with extirpation in California; and

7. Taxa closely associated with a habitat type that is declining in California at a high rate (e.g., wetlands, riparian habitats, native grasslands, vernal pools).

Fauna (Animals)

1. Taxa officially listed as threatened or endangered by the State of California or the U.S. Department of the Interior (14 Cal. Code Regs. §670.5; 50 C.F.R. §17.11 (1994);

2. Candidate taxa in Categories 1 and 2 for listing as threatened or endangered by state or federal governments (California Department of Fish and Game 1994b; 59 Fed. Reg. 58,982 (1991));

3. Taxa classified as "fully protected" pursuant to the following sections of the Fish and Game Code of California: §3511 (birds); §4700 (mammals); §5050 (amphibians and reptiles); and §5515 (fish);

4. Taxa protected pursuant to the federal Bald Eagle Protection Act (16 U.S.C. §668);

5. Taxa which meet the criteria for listing, even if not currently included on any list, as described in the *State CEQA Guidelines* §15380 (State of California, Governor's Office of Planning and Research 1992);

6. Taxa classified by the California Department of Fish and Game as "Species of Special Concern" (California Department of Fish and Game);

7. Taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation;

8. Population(s) in California that may be peripheral to the major portion of a taxon's range, but are threatened with extirpation in California; and

9. Taxa closely associated with a habitat type that is declining in California at a high rate (e.g., wetlands, riparian habitats, native grasslands, vernal pools).

Based on a screening process, the *HCP* identifies 29 target taxa in Yolo County that may be impacted by future land use activities. Table 7-1 lists these 29 species by scientific name, common name, and associated habitat. Some of these taxa are known from only a single locality in the Sacramento Valley or Delta regions of Yolo County (e.g., palmate bird's-beak); other species are more widespread (e.g., Swainson's hawk).

Descriptions of these species can be found in the *Habitat Conservation Plan*.

Table 7-1

OCCURRENCE OF TARGET HCP SPECIES AMONG HABITAT TYPES

	Riparian Habitats			Wetland Habitats				Woodland Habitats					Agricultural Habitats			
Common Name/*Scientific Name*	Stream Courses	Valley Oak Riparian	Riparian Forests	Marshes	Vernal Pools	Ponds/Lakes/ Open Waters	Alkaline Sinks	Oak Woodlands	Scattered Oaks in Agriculture	Wooded Savannahs	Elderberry Savannahs	Grassland Habitats	Alfalfa and Pastures	Annual Field Crops	Vineyards and Orchards	Rice
Heckard's peppergrass *Lepidium latipes* var. *heckardii*							▲					▲				
Brittlescale *Atriplex depressa*							▲									
San Joaquin saltbush *Atriplex joaquiniana*							▲									
Alkali milkvetch *Astragalus tener* var. *tener*					▲		▲									
Palmate bird's-beak *Cordylanthus palmatus*							▲									
Colusa grass *Neostapfia colusana*					▲											
Crampton's tuctoria *Tuctoria macronata*					▲											
Conservancy fairy shrimp *Branchinecta conservatio*					▲											
Longhorn fairy shrimp *Branchinecta longiantenna*					▲											
Vernal pool fairy shrimp *Branchinecta lynchi*					▲											
Vernal pool tadpole shrimp *Lepidrus packardi*					▲											
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*		▲	▲					▲	▲	▲	▲					
California tiger salamander *Ambystoma californiense*	▲				▲	▲		▲				▲				
Western spadefoot *Scaphiopus hammondi*					▲	▲				▲		▲				
Western pond turtle *Clemmys marmorata marmorata*	▲			▲		▲		▲				▲				

Table 7-1

OCCURRENCE OF TARGET HCP SPECIES AMONG HABITAT TYPES

Common Name/*Scientific Name*	Riparian Habitats			Wetland Habitats				Woodland Habitats					Agricultural Habitats			
	Stream Courses	Valley Oak Riparian	Riparian Forests	Marshes	Vernal Pools	Ponds/Lakes/ Open Waters	Alkaline Sinks	Oak Woodlands	Scattered Oaks in Agriculture	Wooded Savannahs	Elderberry Savannahs	Grassland Habitats	Alfalfa and Pastures	Annual Field Crops	Vineyards and Orchards	Rice
Giant garter snake *Thamnophis gigas*	▲			▲		▲										▲
Double-crested cormorant *Phalacrocorax auritus*						▲										
White-faced ibis *Plegadis chihi*				▲									▲			
Cooper's hawk *Accipiter cooperi*		▲	▲	▲												
Swainson's hawk *Buteo swainsoni*		▲	▲						▲	▲		▲	▲	▲		▲
Northern harrier *Circus cyaneus*				▲								▲	▲	▲		▲
Greater sandhill crane *Grus canadensis*				▲								▲	▲	▲		▲
Yellow-billed cuckoo *Coccyzus americanus*		▲	▲												▲	
Short-eared owl *Asio flammeus*				▲								▲	▲	▲		▲
Western burrowing owl *Athene cunicularia hypugea*												▲				
Bank swallow *Riparia riparia*	▲					▲						▲	▲	▲	▲	▲
Loggerhead shrike *Lanius ludovicianus*										▲		▲	▲	▲		
Tricolored blackbird *Agelaius tricolor*				▲									▲			
California yellow warbler *Dendroica petechia brewsteri*			▲													
Total occurrences	4	4	5	8	9	6	5	3	2	4	1	11	8	6	2	6

BIOTIC HABITATS

A critical element in the development of the *HCP* was the identification and description of the habitat types that may be impacted by future land use activities. Habitats are defined by physical and biological attributes. These biological and physical attributes are typically represented by specific plant communities. Thus, a habitat type is defined as a group of plant communities that have similar environmental requirements.

The *HCP* identifies and describes habitat types found in Yolo County, including the Woodland Planning Area. These habitat types were defined by analyzing the physical and biological characteristics of specific locations as well as climatic cycles, natural disturbances, and plant community secession. The five primary habitat types identified in Yolo County include: Riparian, Wetland, Woodland, Grassland, and Agricultural. These primary habitats are broken down into subcategories based on variations in the habitat such as soil series and the characteristics unique to the habitat type. Table 7-2 lists the 29 target species identified for the *HCP* according to their associated
habitat ypes and subtypes.

TABLE 7-2 Habitat descriptions for target HCP species.

Scientific Name	Common Name	Habitat Description
Lepidium latipes var. *heckardii*	Heckard's peppergrass	Alkaline flats in valley grassland
Atriplex depressa	Brittlescale	Playas or clay soils in valley grassland
Atriplex joaquiniana	San Joaquin saltbush	Alkali meadows and flats with alkali or clay soils.
Astragalus tener var. *tener*	Alkali milkvetch	Adobe playas and vernal flats in the Central Valley
Cordylanthus palmatus	Palmate bird's-beak	Valley sink scrub and alkali grassland on saline-alkaline soils
Neostapfia colusana	Colusa grass	Vernal pools; typically deep pools
Tuctoria maconata	Crampton's tuctoria	Vernal pools; typically deep pools
Branchinecta conservatio	Conservancy fairy shrimp	Vernal pools and temporary ponded waters without fish
Branchinecta longiantenna	Longhorn fairy shrimp	Vernal pools and temporary ponded waters without fish
Branchinecta lynchi	Vernal pool fairy shrimp	Vernal pools and temporary ponded waters without fish
Lepidrus packardi	Vernal pool tadpole shrimp	Vernal pools and temporary ponded waters without fish
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	Riparian and elderberry savannah
Ambystoma californiense	California tiger salamander	Oak woodland and annual grassland with ground squirrel and pocket gopher burrows in association with vernal pools or stream courses
Scaphiopus hammondi	Western spadefoot	Open treeless grasslands or mixed woodland and grassland with temporary ponds or intermittent streams
Clemmys marmorata marmorata	Northwestern pond turtle	Streams, rivers, ponds, lakes, and marshes with deep pools and cover
Thamnophis gigas	Giant garter snake	Freshwater emergent wetlands and agricultural water systems with cover
Phalacrocorax auritus	Double-crested cormorant	Dead tree branches offshore, considerable lengths of water
Plegadis chihi	White-faced ibis	Dense, shallow, fresh emergent wetland; alfalfa
Accipiter cooperii	Cooper's hawk	Dense tree stands or partly woodland habitat
Buteo swainsoni	Swainson's hawk	Large, valley oak woodlands, large individual oaks; riparian trees; alfalfa, grassland, and annual field crops
Circus cyaneus	Northern harrier	Non-forested grasslands, marshes and prairies; alfalfa and annual field crops

TABLE 7-2 continued). Habitat descriptions for target HCP species.

Scientific Name	Common Name	Habitat Description
Grus canadensis	Greater sandhill crane	Open, wet meadows and marshes; fields with cereal grain crops, corn stubble, irrigated pastures, rice stubble
Coccyzus americanus	Western yellow-billed cuckoo	Riparian areas, willow trees or walnut orchards next to riparian zones
Asio flammeus	Short-eared owl	Grasslands, marshes, meadows; agricultural fields
Athene cunicularia hypugea	Western burrowing owl	Deserts, open grasslands, prairies, savannah with ground squirrel burrows
Riparia riparia	Bank swallow	Steep sides of river banks, borrow pits, road cuts adjacent to open water, croplands and grasslands
Lanius ludovicianus	Loggerhead shrike	Open habitats with scattered shrubs, trees, posts, fences, utility poles, or other perches.
Agelaius tricolor	Tricolored blackbird	Fresh water marshes and croplands.
Dendroica petechia brewsteri	California yellow warbler	Riparian deciduous habitats: cottonwoods, willows, alders, and other shrubs and trees of low stature and open-canopy riparian woodland

The following describes the five types of habitat found in Yolo County and the vicinity of the Woodland Planning Area.

Riparian Habitat

In accordance with the Latin root of the word "riparian" (*ripa*, meaning bank), riparian habitat includes the entire range of vegetation types and other special elements (such as sand or mud) associated with the watercourses of Yolo County.

In contrast to some other familiar definitions of riparian habitats, riparian habitat is defined to incorporate not only vegetation and other elements that are observed at any one time, but also the continual process of localized habitat change that characterizes riparian areas. The recession of annual or flood-stage high waters often leaves behind newly exposed substrate, such as vertical eroded banks or bars of gravel, sand, and silt. The latter may be colonized by either herbaceous or woody vegetation that alters streamflow and erosion patterns as it grows and matures. These hydrologic changes may either enhance the growth of existing vegetation, or may destabilize or drown the root systems of mature trees. Death of branches or whole trees may create nest cavities for certain birds, perching snags for others, or downed dead logs or slash that provide habitat for other wildlife of several groups. Any given riparian area has the potential for supporting various specific riparian habitat types in the future.

The dynamic occurrence of sand and silt bars is accentuated by variability in the flooding regime. During periods of drought, as a consequence of natural metamorphosis of the stream channel morphology or as a result of flood control practices, channel banks or silt and sand bars may become vegetated over time and disappear as a microhabitat within a riparian system until a flood event occurs, redistributing the necessary sediment or creating scoured banks. Where a riparian area lacks a target species' habitat today, it might provide that habitat in 30 to 50 years.

Riparian habitat includes the following habitat subtypes: Stream Course; Valley Oak Riparian; and Riparian Forests.

Wetland Habitat

Wetland habitat types include natural wetland areas (whether rainfall or spring-supported), modified creeks and drainageways, irrigation and drainage ditches, excavated either in previously dry land or in wetlands, and various artificial impoundments, whether supplied with water by pumping or passively (flood control basins).

For the purposes of the *HCP*, wetlands are defined on a strictly functional basis, as habitats that are seasonally subject to either ponding or soil saturation. Accordingly, this habitat includes many areas that do not fall under federal wetland jurisdiction, which requires the presence of vegetation, soils, and natural hydrology that are characteristic of wetlands. On

the other hand, it does not include all areas where hydrophytic vegetation occurs, unless they are also regularly characterized by saturation.

Because *HCP* habitat types are defined for the purpose of multi-species habitat conservation, the definition of wetland habitat as used in this report differs from other commonly used definitions in two main respects. First, it does not include marginally hydrophytic moist grasslands such as wildrye or Mediterranean barley grasslands, which have habitat values much more akin to untilled upland grassland or fallow agricultural land. "Facultative" species, such as grasses, are defined by the U.S. Fish and Wildlife Service as being found in wetlands in only about half of their occurrences (Reed 1988); they are nevertheless regarded as hydrophytic in the context of federal wetland determination methodology (U.S. Army Engineer Waterways Experiment Station). Second, wetland habitat does include some areas whose topography or hydrology is artificial (that is, results from excavation or irrigation), as long as the areas in question offer wetland habitat values for target HCP species.

One regionally scarce habitat type that occurs within areas potentially subject to development, and which is critical to several HCP taxa, is very difficult to assign unequivocally to a defined HCP habitat type: saline/alkaline sinks. This habitat type intergrades almost imperceptibly between wetland and grassland, and some of its exposures within Yolo County are presently subject to agricultural activities. Inundation is rare or very limited in aerial extent, although saline soils may be subject to seasonal saturation. Moreover, the vegetation of this unusual habitat type varies from halophytic plants with little tolerance of saturation to species recognized as obligate wetland species by Reed (1988). Because the target species that are found on saline/alkaline soils are predominantly hydrophytic ones, for the present purposes, saline/alkaline sinks or playas are considered as a type of wetlands habitat.

Many wetland classification systems differentiate between perennial and seasonal habitat types, and between open water, submersed vegetation, and emergent vegetation. Recognition of these differences is important in determining habitat values, as some species require perennial water and others reproduce only in seasonal or ephemeral waters. However, different types may also occur within a single small wetland area. For example, a perennial water or wetland area may be surrounded by wetland vegetation supported by seasonal saturation. For this reason, one broadly defined habitat type with subtypes is defined for the mapping and analysis in the *HCP*.

Wetland habitat includes the following habitat subtypes: Marshes, Vernal Pools, Ponds/Lakes/Open Waters, and Alkaline Sinks.

Woodland Habitats

Woodland habitats include a continuously varying series of habitat types dominated, in height if not in areal cover, by trees. These types vary from closed-canopy oak forest, to open woodland (with canopy cover between approximately 10 and 70 percent), to savannah (conventionally defined as having canopy cover of 10 percent or less). For simplicity, and in

recognition of their common biological values, large mature planted trees are also considered woodland habitat. Such trees occur as windrows or along roadways, as clumps of trees planted in agricultural or rangeland settings, and individual trees occurring within other non-wooded habitat types or urban areas.

Woodland habitat includes the following subtypes: Oak Woodlands; Scattered Oaks in Agriculture; Wooded Savannahs; and Elderberry Savannah.

Grassland Habitats

Within Yolo County, grasslands occur almost exclusively on slopes steeper than two percent. It is likely that some areas have been tilled in the past, but are no longer regularly cultivated. Areas of ruderal vegetation that have been or are regularly tilled are included within agricultural lands, as tilling reduces the habitat value of such lands for certain species, just as it probably increases their values for other species.

At present, the majority of grassland in Yolo County is more or less heavily used as livestock pasture.

Agricultural Habitats

Agricultural lands are intensively used lands that may have supported other habitat types in the historical past. Many of their habitat values overlap with those of less intensively modified lands categorized as other habitat types. For example, many of the habitat values of rice fields and other cultivated lands that are regularly subject to inundation are similar to those of wetlands, which many ricelands formerly were. Dry-farmed or briefly flood-irrigated croplands used to grow cereal crops, tomatoes, or particularly alfalfa, share or exceed some of the habitat values of grasslands. Nevertheless, for conservation purposes, it is necessary to map regularly cultivated lands separately from other non-urbanized lands.

Agricultural habitats include the following habitat subtypes: Alfalfa and Pasture; Annual Field Crops; Vineyards and Orchards; and Rice.

HABITAT AND SPECIES IN WOODLAND PLANNING AREA

Figure 7-1 shows the distribution of habitat types within and surrounding the Woodland Planning Area. The map in Figure 7-1 was prepared by the Yolo County Community Development Agency based on information collected in conjunction with the *Habitat Conservation Plan* program. The map shows only two habitat types within the Planning Area. Riparian and grassland habitat are found just outside but not within the Planning Area. Woodland habitat in the form of scattered oaks in agriculture and wooded savannahs is found in the southern part of the Planning Area, but only in pockets too small to map given the scale

of Figure 7-1. More specific habitat mapping is available from the Yolo County Planning Department.

The predominate habitat type found in the Woodland area is agriculture, accounting for the vast majority of land subject to development under the *General Plan*. The other important habitat type found in the Planning Area is wetlands in the forms of alkaline sinks, vernal pools, and ponds/lakes/open waters. Alkaline sinks cover a fairly small area in the northeast industrial area, but account for a fairly large area in the southeast part of the Planning Area. Within this area, the City's wastewater treatment ponds, adjacent industrial wastewater treatment facility, and a small area of the old landfill appear as ponds/ lakes/open water habitat. Vernal pools have been mapped in conjunction with alkaline sinks in several areas near the intersection of County Roads 102 and 25.

Due to the presence of agricultural, wetland, and woodland habitat, most of the species listed in Table 7-2 are potentially found within the Woodland Planning Area.

FISHERIES

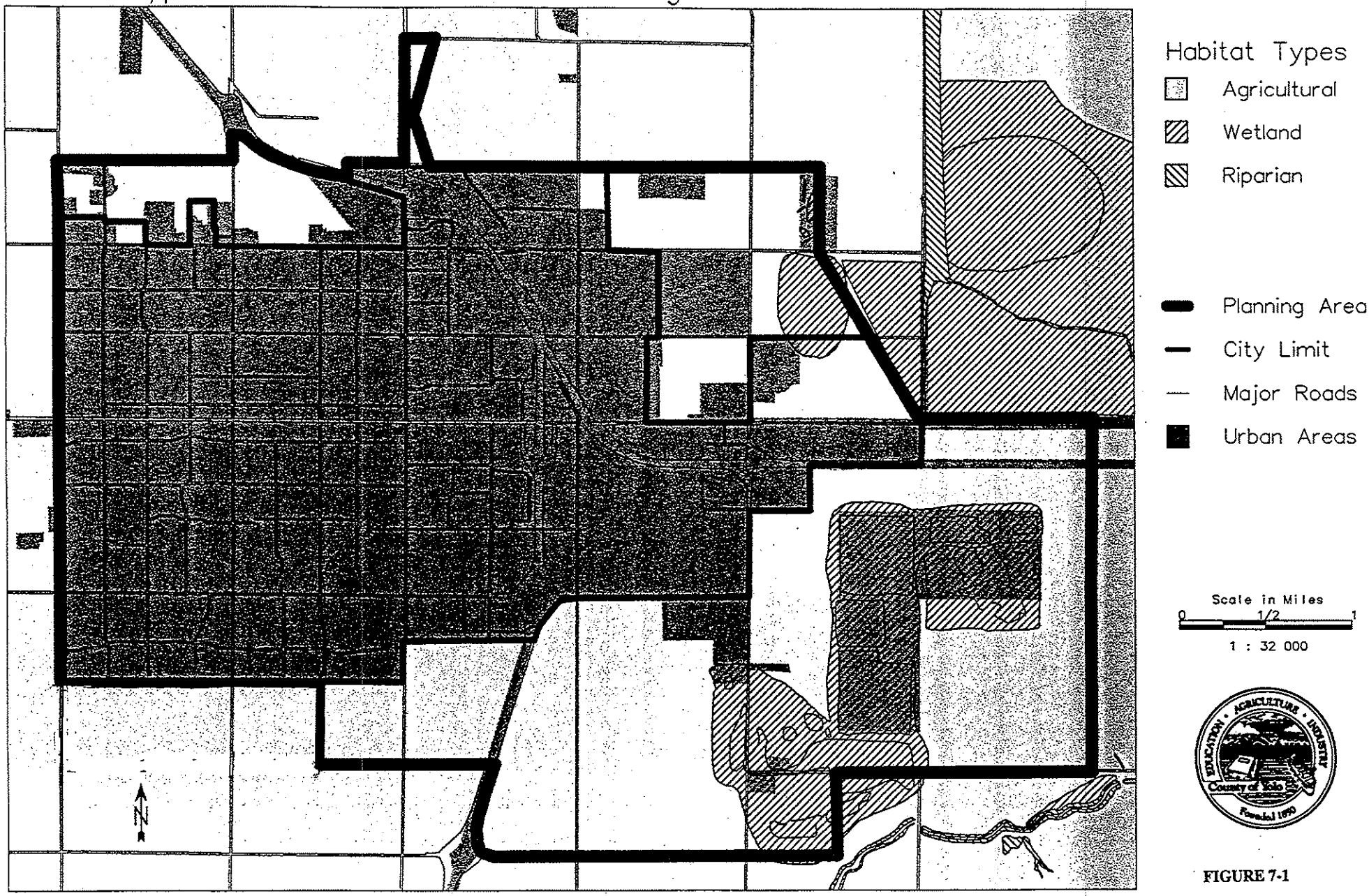
Woodland's Fisheries are located on the lower Cache Creek, adjacent canals, and the nearby east and west drains of the Yolo-Sacramento River.

Warm-water fish species can be found in local waters. They include:

GAME FISH	NON-GAME FISH
Largemouth Bass	Golden Shiner
Channel Catfish	Threadfin Shad
White Catfish	Sucker
Brown Bullhead (catfish)	Carp
Sunfish:	
a) Crappie	
b) Green Sunfish	
c) Bluegill	

Fish population studies in the Woodland area fisheries have not been conducted.

Habitat Types Within the Woodland Planning Area



Produced by the Yolo County Community Development Agency – 10/11/95

Data Sources: DWR, EIP Associates, Jones & Stokes Associates, Yolo County

FIGURE 7-1

7.4 MINERAL RESOURCES

There are two (2) mineral resources in the vicinity of the City of Woodland. One is the aggregate area of Cache Creek and the second is the gas wells that surround the City. This section describes those two (2) resources.

AGGREGATE AREA

Cache Creek extends from the town of Capay to the town of Yolo. The area encompasses approximately 17,200 acres (a little under 27 square miles).

In an Aggregate Report on Cache Creek provided by Yolo County a number of assumptions were made in calculating the amount of available aggregate within the identified area. Probably the most limiting factor was the theoretical thalweg, which represented the maximum depth to which mining in Yolo County could occur at that time. (Solano Concrete has been approved since 1978 to excavate below the theoretical thalweg at their Madison facility. It continues to remain the only exception.) The theoretical thalweg was established by the Yolo County Public Works Director in 1979, using the following definition:

Taking Corps of Engineers 1974 data on existing elevations 100 feet each side of each bridge within the project area; averaging each set for the bridge centerline; allowing reasonable added depth to adjust to 1978 elevations; and, connecting these centerline elevations with a single straight line.

As a result, even though PCC-grade aggregate extends below the theoretical thalweg depth, it was not considered to be available and was not included in the final estimates. Consequently, aggregate was generally estimated to range from 8 to 30 feet in depth. Most of the other assumptions were based on existing data gathered from the mining companies operating at the time. Density of the aggregate material was estimated at 2,662 tons/acre-foot, or 1.65 tons/cubic yard. The percentage of waste, that portion of the mined sand and gravel which is unsuitable for use as construction material, was judged to vary between 20 and 25 percent.

As of November 1982, the total PCC aggregate resources located within the mineral resource zone along Cache Creek were estimated at 838 million tons. Since excavation below the theoretical thalweg is not generally permitted within Yolo County, an additional 111 million tons that lie below the theoretical thalweg were not included in the estimate. Since 1982, approximately 31 million tons have been excavated from local mining operations, leaving resources of nearly 807 million tons (918 million tons included those deposits located below the theoretical thalweg).

Six (6) companies extract gravel from Cache Creek. The companies are Granite, Schwarzguber, Teichert, Solano, R. C. Collett and Syar. Yolo County regulates the mining operations of Cache Creek.

GAS WELLS

There are nineteen (19) gas wells in operation within five (5) miles of the City limits of Woodland. Seven (7) wells are southwest of the City, four (4) wells are south of the City and eight (8) wells are north of the City. Yolo County and the State regulate the gas wells.

7.5 AIR RESOURCES

Air quality is severely degraded in the Sacramento Valley. Locally generated pollutants from vehicles, manufacturing facilities, commercial establishments and agricultural operations, combined with the valley's meteorology and air pollutants transported into the air basin, result in contaminant levels within the Sacramento Valley that occasionally exceed the minimum health standards set by the state and federal government.

One of the major reasons that air quality continues to be a problem in the Sacramento Valley and California in general is a relatively high rate of population and economic growth. The major obstacle to improved air quality in the future is increasing population and vehicle use.

The most efficient and cost-effective technological or "hardware" controls have been implemented and additional technologies will continue to be implemented as they become available and feasible. The remaining technological controls, however, will be increasingly more expensive and are projected to be unable to reduce emissions to the point where all air quality standards would be met. Therefore, attention has been focused in recent years on the relationship of land use, community design and transportation as a means of reducing air pollutant generation.

Addressing air quality issues within the General Plan has become an important regional strategy for improving air quality in recent years. While air quality is often regarded as a regional problem, local land use and growth decisions by cities and counties will profoundly affect travel behavior, mode choice, and the success of whatever technology is available regionally to reduce air pollution.

AIR BASIN CLIMATOLOGY

The amount of a given pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major factors affecting transport and dilution are terrain, wind, atmospheric stability, and for photochemical pollutants, sunshine.

Woodland is within the boundaries of the Yolo-Solano Air Quality Management District (AQMD). The Yolo-Solano AQMD is located within the boundaries of the Sacramento Valley Air Basin. In addition to the Yolo-Solano AQMD, the Sacramento Valley Air Basin includes the counties of Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, and a portion of Placer County. The Sacramento Valley Air Basin in bounded by the North Coast Ranges on the west and the Northern Sierra Nevada Mountains on the east.

The mediterranean climate of the Sacramento Valley is characterized by hot dry summers and mild rainy winters. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90's and winter lows occasionally below freezing. Average annual rainfall is about 20 inches with snowfall being very rare. Prevailing winds are moderate in strength and vary from dry land flows from the north to moist clean breezes from the south.

The mountains surrounding the Sacramento Valley create a barrier to air flow which can trap air pollutants in the Valley when meteorological conditions are right. The highest frequency of air stagnation occurs in the autumn and early winter when large high pressure cells lie over the Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning or when temperature inversions trap cool air, fog and pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually this evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the 'Schultz Eddy' prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern to circle back south. Essentially this phenomenon causes the air pollutants to be blown southward back toward the Yolo-Solano AQMD. This has the effect of exacerbating the pollution levels in the district and increasing the likelihood of violating federal or state standards. This eddy will normally dissipate around noon if the delta sea breeze arrives.

CURRENT AIR QUALITY

The Environmental Protection Agency has set national ambient health standards for pollutants determined to be injurious to public health or welfare. There are both primary and secondary ambient air quality standards. Primary standards are designed to protect public health, with a margin of safety. Secondary standards are designed to protect public welfare, in addition to health, and are therefore more stringent than primary standards. States may adopt more stringent standards that those required by the federal government. The State of California has established health-based ambient air quality standards which are more stringent than the federal standards.

Federal and state standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate (PM-10) and lead. California has also set standards for pollutants not covered by national standards (sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles). The state and federal primary standards for major pollutants are shown in Table 7-3.

Table 7-3

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards	
Ozone	1 Hour	9 pphm (1)	12 pphm (4)	Same as Primary
Carbon Monoxide (CO)	8 Hour	9.0 ppm (1)	9 ppm (3)	Same as Primary
	1 Hour	20 ppm (1)	35 ppm (3)	Same as Primary
Nitrogen Dioxide (NO_2)	Annual Average		100 (1) $\mu g/m^3$	Same as Primary
	1 Hour	0.25 ppm (1)		
Sulfer Dioxide (SO_2)	Annual Average		80 $\mu g/m^3$ (1)	
	24 Hour	0.05 ppm (2)	365 (3) $\mu g/m^3$	
	3 Hour			1300 (3) $\mu g/m$
	1 Hour	0.25 ppm (1)		
Suspended Particulat Matter (PM10)	Annual Average	30 ug/m^3 (1)	50 $\mu g/m^3$ (1)	
	24 Hour	50 $\mu g/m^3$ (1)	150 (3) $\mu g/m^3$	
Sulfates	24 Hour	.25 ug/m^3		
Lead	30 Day Ave	1.5 (2) $\mu g/m^3$		
	Cal Quarter		1.5 (3) $\mu g/m^3$	Same as Primary
Hydrogen Sulfide	1 Hour	0.03 ppm (2)		
Vinyl Chloride	24 Hour	0.010 ppm (2)		
Visability Reducing Particles	1 Observation	Prevailing visibility to less than 10 miles when the relative humidity is lessthan 70% (1)		

TABLE 7-4

OZONE EXCEEDANCES SUMMARY

OZONE EXCEEDANCES SUMMARY

	State Standard		Federal Standard					
Year	Days > .09	Hours > .09	Days > =.12	Hours > +.12	Days > =.13	Hours > +.13	Maximum Hourly Concentration	Station
1989	1	1	0	0	0	0	.10 ppm	Woodland
	4	8	1	2	0	0	.12 ppm	Vacaville
	2	2	0	0	0	0	.10 ppm	Broderick
	1	1	0	0	0	0	.10 ppm	Davis*
1990	3	8	0	0	0	0	.11 ppm	Woodland
	1	2	0	0	0	0	.11 ppm	Vacaville**
	9	18	2	6	1	2	.14 ppm	Broderick
	4	9	0	0	0	0	.11 ppm	Davis
1991	4	7	0	0	0	0	.10 ppm	Woodland***
	0	0	0	0	0	0	.07 ppm	Broderick****
	2	4	0	0	0	0	.10 ppm	Davis
1992	9	26	0	0	0	0	.11 ppm	Woodland
	9	20	1	1	0	0	.12 ppm	Davis
1993	2	7	0	0	0	0	.12 ppm	Woodland
	1	4	1	1	0	0	.13 ppm	Davis
1994*****	1	2	0	0	0	0	.10 ppm	Woodland

Revised 9/8/94

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*	Monitoring Aug-Dec only.
**	Monitoring Jan-July only.
***	Monitoring Jan-Aug only.
****	Monitoring Jan-Mar only.
*****	Davis data not yet available from ARB.

Table 7-5

YOLO SOLANO AIR QUALITY MANAGEMENT DISTRICT

PM-10 EXCEEDANCES SUMMARY

District Wide Summary			Station Summary		
Year	State Violations > 50 ug/m***	Federal Violations >150 ug/m***	Station	Highest Reading ug/m***	Number of State Violations***
1988	20	0	Vacaville*	80	4
			West Sac.	-	-
			Woodland	96	19
1989	11	0	Vacaville	109	6
			West Sac.	-	-
			Woodland	113	9
1990	12	0	Vacaville	96	6
			West Sac.**	147	8
			Woodland	80	7
1991	24	0	Vacaville	98	12
			West Sac.	136	19
			Woodland***	106	13
1992	23	0	Vacaville	70	4
			West Sac.	106	11
			Woodland	103	19
1993	11	0	Vacaville	53	1
			West Sac.	78	10
			Woodland	96	9

Revised 8/94

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* Monitoring initiated 10/6/88 at 650 Merchant Street

** Monitoring initiated on 9/2/90 at 132 15th Street

*** Monitoring suspended 9/4/91 at 117 Main Street and resumed 12/8/91 at 20 Sutter Street.

The air pollutants of most concern in the Yolo-Solano AQMD are ozone and PM-10. Tables 7-4 and Table 7-5 show ozone and PM-10 air quality data in the Yolo-Solano AQMD during the years 1988 through 1994. As shown in these two tables, the state standard for ozone (>.09 ppm) was exceeded a total of 20 days, and the federal ozone standard (>= .12ppm) was not exceeded at the Woodland monitoring station during this time period.

During this same time period, the state PM-10 standard (>50ug/m^3) was exceeded a total of 76 days while there were no federal PM-10 violations (>150ug/m^3) at the Woodland station.

CHARACTERISTICS OF POLLUTANTS

The primary air quality problems in Woodland are ozone and suspended particulates (PM-10). The following is a discussion of the nature of these pollutants, their major sources, and the health effects resulting from exposure to these pollutants.

Ozone

Ozone is produced by chemical reactions, involving nitrogen oxides (NOx) and reactive organic gases (ROG), that are triggered by sunlight. Nitrogen oxides are created during combustion of fuels at high temperatures while reactive organic gases are emitted during combustion of fuels and evaporation of organic solvents. Since ozone is not emitted directly to the atmosphere, it is considered a secondary pollutant. In the Sacramento Valley Air Basin, ozone is a seasonal problem, occurring roughly from May through October.

Ozone is a strong irritant that attacks the respiratory system, leading to the damage of lung tissue. Asthma, bronchitis, and other respiratory ailments as well as cardiovascular diseases are aggravated by exposure to ozone. A person exposed to high concentrations may become nauseated or dizzy, may develop headache or cough, or may experience a burning sensation in the chest. Research has shown that ozone also damages vegetation, resulting in significant agricultural crop damage.

Suspended Particulates (PM-10)

PM-10 is small suspended particulate matter, 10 microns in diameter or less, which can enter the lungs. The major component of PM-10 are dust particles, nitrates, and sulfates. PM-10 is directly emitted to the atmosphere as a by-product of fuel combustion, and wind erosion of soil and unpaved roads. Small particles are also created in the atmosphere during chemical reactions.

Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove much of these particles, but particles less than 10 microns in diameter are able to pass through the body's natural defenses and the mucous

membranes of the upper respiratory tract and enter into the lungs. The particles can damage the alveoli, tiny air sacs responsible for gas exchange in the lungs. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

Air Pollutant Sources

Woodland contains a multitude of air pollution sources. Automobile and truck exhausts, industrial combustion, combustion of natural gas in homes and businesses for space- and water- heating, and evaporation of paints and solvents are typical urban air pollutant air sources. Woodland is surrounded by agriculture lands which generate pollutants through equipment and vehicle exhausts, tilling, burning, unpaved road travel, and evaporation of pesticides.

The Yolo-Solano AQMD has permit authority over stationery sources of air pollutants. Major permitted sources in the Woodland area include Adams Schwab & Adams, Contadina, Fosroc, Leer West, Pacific International Rice Mill Inc., Spreckles, and the Woodland Biomass Power Ltd.

REGIONAL AIR QUALITY PLANNING

Federal Air Quality Programs

The 1970 Federal Clean Air Act established a joint state and federal program to control air pollution. As part of the 1977 amendments to the Clean Air Act, the Environmental Protection Agency (EPA) was directed to establish National Ambient Air Quality Standards (NAAQS) for six primary pollutants (ozone, carbon monoxide, nitrogen dioxide, particulate matter, sulfates, and sulfur dioxide. These amendments also required that each state identify areas within its borders that do not meet federal primary standards as "nonattainment areas". The 1977 amendments required all areas to submit plans to the EPA in 1979 and 1982 demonstrating attainment of the national health-based standards by no later than 1987.

The 1982 Sacramento area plan indicated that attainment by 1987 was not possible. The EPA took no action to disapprove the attainment demonstrations, but instead worked with the local agencies to develop improvements in their plans. Their decision not to disapprove the plan was challenged by environmental groups who sought a court order to require EPA to prepare replacement federal plans. In a subsequent settlement agreement, the EPA agreed to prepare a federal plan, called the Federal Implementation Plan, for ozone in the Sacramento area. In 1990, there were major amendments to the Clean Air Act which required the preparation of new nonattainment plans. The EPA argued that the agency no longer had an obligation to issue the Federal Implementation Plan under the 1979 amendments in light of the fact that new plans would be prepared with attainment deadlines to comply with the 1990 amendments. In December 1991, the courts ruled that the EPA

was still required to prepare the Federal Implementation Plan (FIP) for the Sacramento Metropolitan Area which includes the counties of Sacramento, Yolo, Solano (Northeast portion), Placer and El Dorado Counties (except the Tahoe Basin), and the southern portion of Sutter County adjacent to Sacramento County.

The FIP was finalized on the February 14, 1995, deadline. However, a U.S. District Court Judge ruled earlier that month that the effective date of the FIP would be postponed until 1997 to allow additional time for the EPA to work with the State to bring about full approval of the State Implementation Plan (SIP). The FIP was later rescinded to be replaced by the SIP. In a separate action, however, the Sacramento nonattainment area, including the Yolo-Solano AQMD, was "bumped up" from a "serious" to a "severe" nonattainment area for ozone.

This redesignation will allow the area an additional six years, from 1999 to 2005, to reach attainment, although "bumping up" will impose additional requirements on the Sacramento area. These additional requirements are as follows:

- The definition of a major stationary source of ozone precursors (ROG and/or NOx) would be lowered from 50 to 25 tons per year. This requirement will result in five additional stationary sources that will be subject to Title V permits in the District. The only one of these five sources in Woodland, Mobil Chemical has closed.

- The ozone precursor offset requirement for new and modified major stationary sources would be increased from the current 1.2 to 1 ratio to 1.3 to 1.

- The Sacramento Area would have to adopt an employer-based trip reduction rule that would include the requirements contained in the Federal Employee Commute Options Program. However, Congress adopted legislation in December 1995 making this program voluntary.

As mentioned above, the federal Clean Air Act Amendments of 1990 require that new nonattainment plans be prepared and submitted to the U.S. Environmental Protection Agency. In late 1994, the Yolo-Solano AQMD adopted its portion of the Sacramento Area Regional Attainment Plan which contains Federal, State, and District stationary and mobile source measures. This Plan is a portion of the State Implementation Plan (SIP) which was submitted to the EPA for their review. State and district measures in the SIP are intended to replace the FIP measures. The final SIP is expected to be approved by EPA sometime in 1996.

Under the federal standards, the Woodland area is included in the area that is considered nonattainment for ozone.

State Air Quality Programs

Prior to 1988 there was no program for the attainment of the state air quality standards. The California Clean Air Act, enacted in 1988, requires local air pollution control districts to prepare air quality attainment plans aimed at achieving healthful air. Generally, these plans must provide for district-wide emission reductions of five percent a year averaged over consecutive three-year periods. The California Clean Air Act of 1988 gave new authority to air districts to design, adopt, implement, and enforce comprehensive plans for attaining and maintaining the state air quality standards by the earliest practical date. Air districts were given new authority to establish controls on mobile source of pollution.

Under the California Clean Air Act, the Yolo-Solano AQMD is considered non-attainment for ozone and PM-10. An air quality attainment plan was adopted by the AQMD in 1994.

In 1992, the Yolo-Solano AQMD adopted an Air Quality Attainment Plan, as mentioned above. The Air Quality Attainment Plan represents the AQMD's commitment to implement the provisions of the California Clean Air Act. This Plan includes the following elements:

- **Air Quality and Emission Inventory**: Discussion of health effects associated with various degrees of air quality; the District's emission inventory data and air quality trends based on this data; ambient air quality monitoring; the transport of pollutants into and out of the District; and emission forecasts based on existing rules.

- **Public Education**: This section contains the District's program to change people's attitudes about air quality, thus preventing pollution through education.

- **Mobile Source Control Program**: This section addresses emissions from mobile sources, such as automobiles. It includes vehicles/fuels

management measures, transportation control measures, and indirect source control measures.

- **Stationary Source Control Program**: Provides both existing and new control technologies which reduce emissions from stationary and area wide sources of air pollution.

Since 1992, the Yolo-Solano AQMD has been working on the adoption of rules that implement the measures contained in the Air Quality Attainment Plan.

7.6 SOURCES

1. Wastewater Facilities Master Plan FEIR (Oct. 1985)
2. City of Woodland, prepared by Quad Consultants
3. Storm Drainage Master Plan (Dec. 1987)
4. City of Woodland, prepared by Quad Consultants
5. EIP Associates, Biological Resources Report, Yolo County, 1995.
6. Final EIR, Highway 113 re-alignment (Sept. 1985) C.H. #83091047
7. Habitat Conservation Program For Swainson's Hawk and Ferris' Birds-Beak In The City Of Woodland Planning Area (Dec. 1990) City of Woodland, prepare by The Planning Center.
8. Fred Meyer, California Fish and Game, 12/13/94
9. Yolo-Solano Air Pollution Control District Air Quality Attainment Plan. 1992.
10. United States Environmental Protection Agency. Federal Implementation Plan Fact Sheet. 1994.
11. Jim Antone, Yolo-Solano Air Quality Management District.
12. EIP Associates, Draft Habitat Conservation Plan, December 1995.

CHAPTER 8

HEALTH AND SAFETY

8.1 INTRODUCTION

Jurisdictions planning for future urban growth and development must take into consideration a wide range of public safety issues. Safety hazards may be naturally-induced, such as seismic and geologic, flood, and wildland fire hazards; some hazards may be the result of natural hazards which are exacerbated by human activity and alteration of the natural environment, such as dam failure, urban fire, and development in sensitive areas such as floodplains and areas subject to erosion and landsliding. Some hazards are manmade, including airport crash hazards, hazardous materials, and crime. Many of these hazards can be avoided through locational decisions made at the planning stages of development. The risk associated with some hazards may be lessened through the use of mitigation measures in the planning and land use regulation process.

This chapter inventories and assesses the major hazards confronting Woodland, including seismic and geologic hazards, flooding, wildland and urban fires, airport hazards, hazardous materials incidents, and public safety.

8.2 SEISMIC AND GEOLOGIC HAZARDS

The information in this section provides a preliminary indication of the degree of potential hazard or risk associated with various geologic or seismic zones. There are limits on the use of this information. The maps and text present generalized information, and therefore should be used as general guides to identifying the possible presence of seismic and geologic-related constraints; they should not be used as the sole basis for project approval or denial.

SEISMIC HAZARDS

Woodland had experienced moderate building damage due to earthquakes during the, 1890's. The causative fault and the precise location for these events are still uncertain.

Woodland has experienced ground shaking due to a number of earthquakes located on various Northern California faults since 1892.

To measure the characteristics of an earthquake, the Richter scale is used to measure the magnitude (or strength) of a quake, while the Mercalli Scale is used to measure earthquake intensity. Table 8-1 describes the effects of the 12 levels of the Mercalli Scale. The Mercalli Scale is used to measure the perceived intensity of a quake at a given location, based on types of damage that occur. The Modified Mercalli Scale is a function of the following factors:

- The magnitude and location of the epicenter of the quake;
- The geologic characteristics of an area;
- The groundwater characteristics of an area;
- The duration and character of the ground motion;
- The structural characteristics of a building

Table 8-1 describes the effects of the 12 levels of the Mercalli Scale and Table 8-2 compares the Richter and Mercalli scales.

FAULTS

There are no known faults within the radius of five miles of downtown Woodland. Helley and Herd (1977), however state that Geomorphic evidence for young faulting was found oust Southwest of the Clay of Woodland. A northwest-trending trench and linear valley within the Pliocene Tehama Formation extend southeast from Weggers (Watts Woodland airport) just south of Cache Creek. These fault features trend into Quaternary alluvium exhibiting strong 9011 moisture contrasts probably owing to the existence of a ground-water barrier. Juxtaposition of Holocene deposits along a linear contact in this area suggests young faulting. In a personal communication in 1978, Mr. Helley indicated that there is the possibility of a fault in the vicinity of Brown's Corner that is oriented in a northwest/southeast direction. His evidence is based on a study of false color infrared photography and some field mapping. Using the false color aerial photography, he has identified a strong photo lunation that appears to affect the boundaries between the various soil types disrupt drainage and maybe a water barrier. The cause of this lineation has not been determined. This and other lineations were seen by this principal investigator in an over-flight of the area on July 18, 1978. These lineations could be followed from the Dunnigan Hills southward to Cache Creek. South of Cache Creek, the principal lineation was ill-defined.

TABLE 8-1
MODIFIED MERCALLI SCALE OF EARTHQUAKE INTENSITY

Scale	Effects	Scale	Effects
I.	Earthquake shaking not felt	VII.	Many are frightened and run outdoors. People walk unsteadily. Pictures thrown off walls, books off shelves. Dishes or glasses broken. Weak chimneys break at roofline. Plaster, loose bricks, unbraced parapets fail Concrete irrigation ditches damaged.
II.	Shaking felt by those at rest.	VIII.	Difficult to stand. Shaking noticed by auto drivers. waves on ponds. Small slides and cave-ins along sand or gravel banks. Stucco and some masonry walls fall. Chimneys, factory stacks, towers, elevated tanks twist or fall twist or fail.
III.	Felt by most people indoors; some can estimate duration of shaking.	IX.	General fright. People thrown to the ground. Steering of autos affected. Branches broken from trees. General damage to foundations and frame structures. Reservoirs seriously damaged. Underground pipes broken.
IV.	Felt by most people indoors. Hanging objects swing, windows and doors rattle, wooden walls and frames creak.	X.	General panic. Conspicuous cracks in ground. Most masonry and frame structures destroyed along with their foundations. Some well-built wooden structures and bridges are destroyed. Serious damage to dams, dikes, embankments. Railroads bent slightly.
V.	Felt by everyone indoors; many estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle, and glasses clink. Doors close, open and swing.	XI.	General panic. Large landslides. Water thrown out of banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flatland. General destruction of buildings, Underground pipelines completely out of service. Railroads bent greatly.
VI.	Felt by everyone indoors and most people outdoors. Many now estimate not only the duration of the shaking, but also its direction and have no doubt as to its cause. Sleepers awaken. Liquids disturbed, some spilled, small unstable objects displaced. Weak plaster and weak materials crack.	XII.	General panic. Damage nearly total, the ultimate catastrophe. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Source: California Division of Mines and Geology, 1973

TABLE 8-2

APPROXIMATE RELATIONSHIPS BETWEEN EARTHQUAKE MAGNITUDE AND INTENSITY

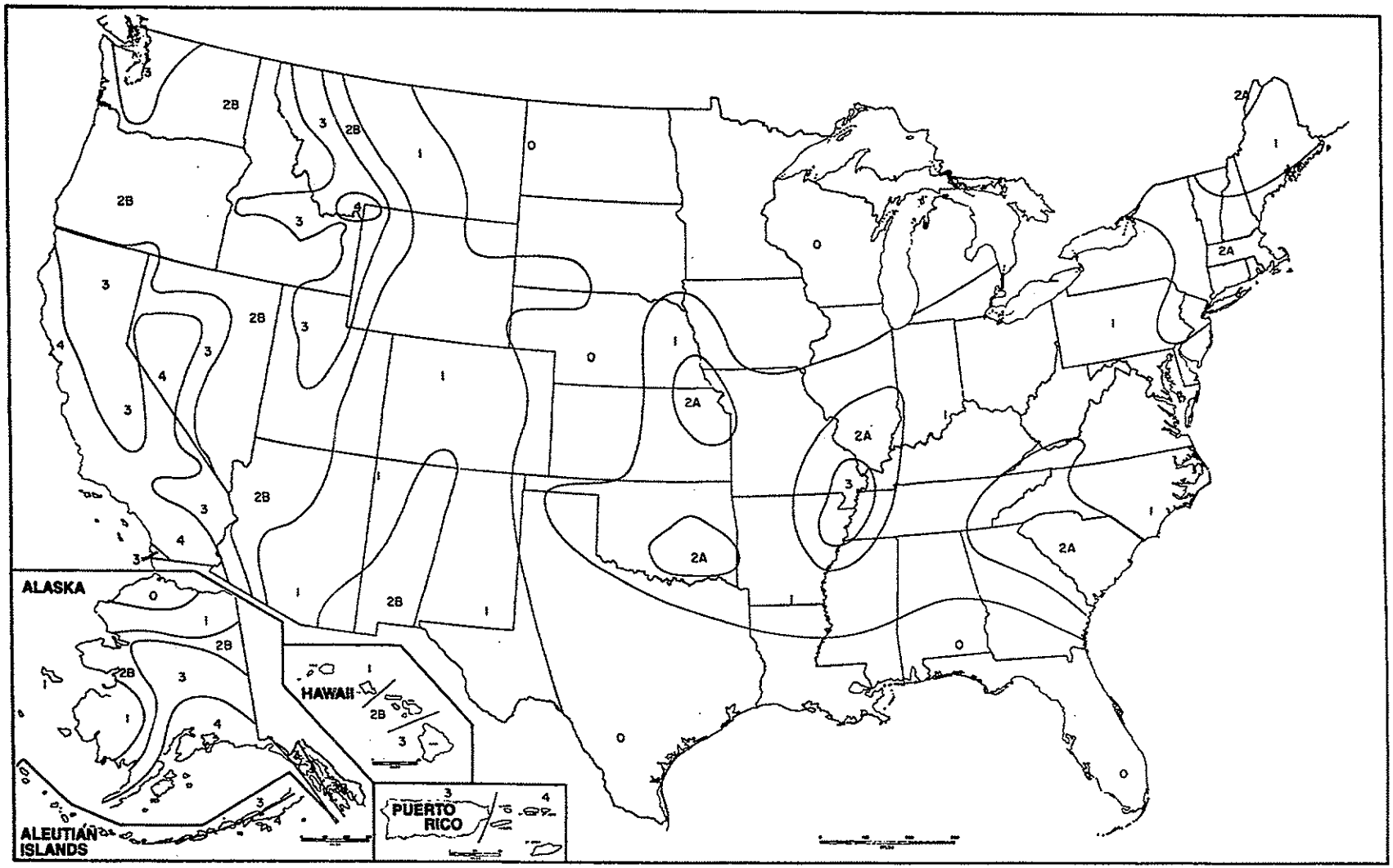
Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (kilometers)
2.0 - 2.9	I - II	0
3.0 - 3.9	II - III	15
4.0 - 4.9	IV - V	80
5.0 - 5.9	VI - VII	150
6.0 - 6.9	VII - VIII	220
7.0 - 7.9	IX - X	400
8.0 - 8.9	XI - XII	600

*Modified Mercalli Intensity Scale

Source: United States Geologic Survey, Earthquake Intensity Zonation and Quarternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

Another fault which has been identified by the California Division of Mines and Geology is the *Dunnigan Hills Fault* which is located approximately five miles northwest of Woodland. This fault has not yet been verified by field investigation but a projection of the trend of the fault will pass through Woodland. A credible earthquake of M=6.75 is possible on the Dunnigan Hills fault according to R. Greensfeld (1974) in his report on "Maximum Credible Rock Acceleration from Earthquakes in California." Further, there are two major areas of faults within Yolo County: the Midland Fault Zone and the area surrounding Capay Valley. The Midland Fault Zone is located approximately 20 miles southwest of Woodland between the town of Winters and the Coast Range in the southwestern portion of the County. Two concealed faults are located within the zone.

Included within the Capay Valley area, 25 miles west of Woodland, are two major faults that border the valley in the Capay Hills. The *Sweitzer Fault* is located just below the ridge line of the Capay Hills paralleling the valley. The *Eisner Fault* is located at the upper end of Capay Valley just below the Sweitzer Fault. Sweitzer is a thrust fault in nature. The remainder of the known faults are located on the western and northwestern border of Yolo County in the Blue Ridge and Rocky Ridge Hills. It is difficult, and perhaps impossible, to determine the actual effects these and active faults at greater distances might have on Woodland when an earthquake occurs. As shown in Figure 8-1, the Woodland area has



Seismic Zone Map of the United States

Figure 8-1

been placed in Zone 3 of the Seismic Risk Map of the United States for purposes of structure safety

The following Table 8-3 lists a number of northern California faults. If any one of these faults were the epicenter of a moderate to major earthquake, Woodland could be affected.

TABLE 8-3

NORTHERN CALIFORNIA FAULTS

Approximate Distance From Woodland Fault (miles)

Antioch	48 South	West Napa	38 Southwest
Bear Mountain	38 East	Sweitzer	19 Northwest
Calaveras	55 South	San Andreas	70 Southwest
Concord	47 Southwest		
Dunnigan Hills	7 Northwest	Melones	48 East
Green Valley	38 Southwest	Maacama	51 West
Hayward	58 Southwest		
Healdsberg-Rodgers Creek	50 Southwest		

The Antioch, Calaveras, Concord, Green Valley, Hayward, Healdsberg-Rodgers Creek fault systems are known to be active and it is estimated that maximum earthquakes on those faults could range from 6 to 7 Richter magnitude. The active San Andreas Fault, which could generate an earthquake of Richter magnitude 8.3, is located approximately 70 miles west of the site. The existence, location, and nature or activity of other faults in the site vicinity have not been proven. Faults that have been mapped near Woodland are shown on Figure 8-2.

GROUNDSHAKING

The most serious direct earthquake hazard is the damage or collapse of buildings and other structures caused by groundshaking which, in addition to property damage, can result in injury or death.

Groundshaking is the vibration which radiates from the epicenter of an earthquake. Damage to structures from groundshaking is caused by the vibration or shaking, and its potential impact on buildings and other urban development is determined by several factors:

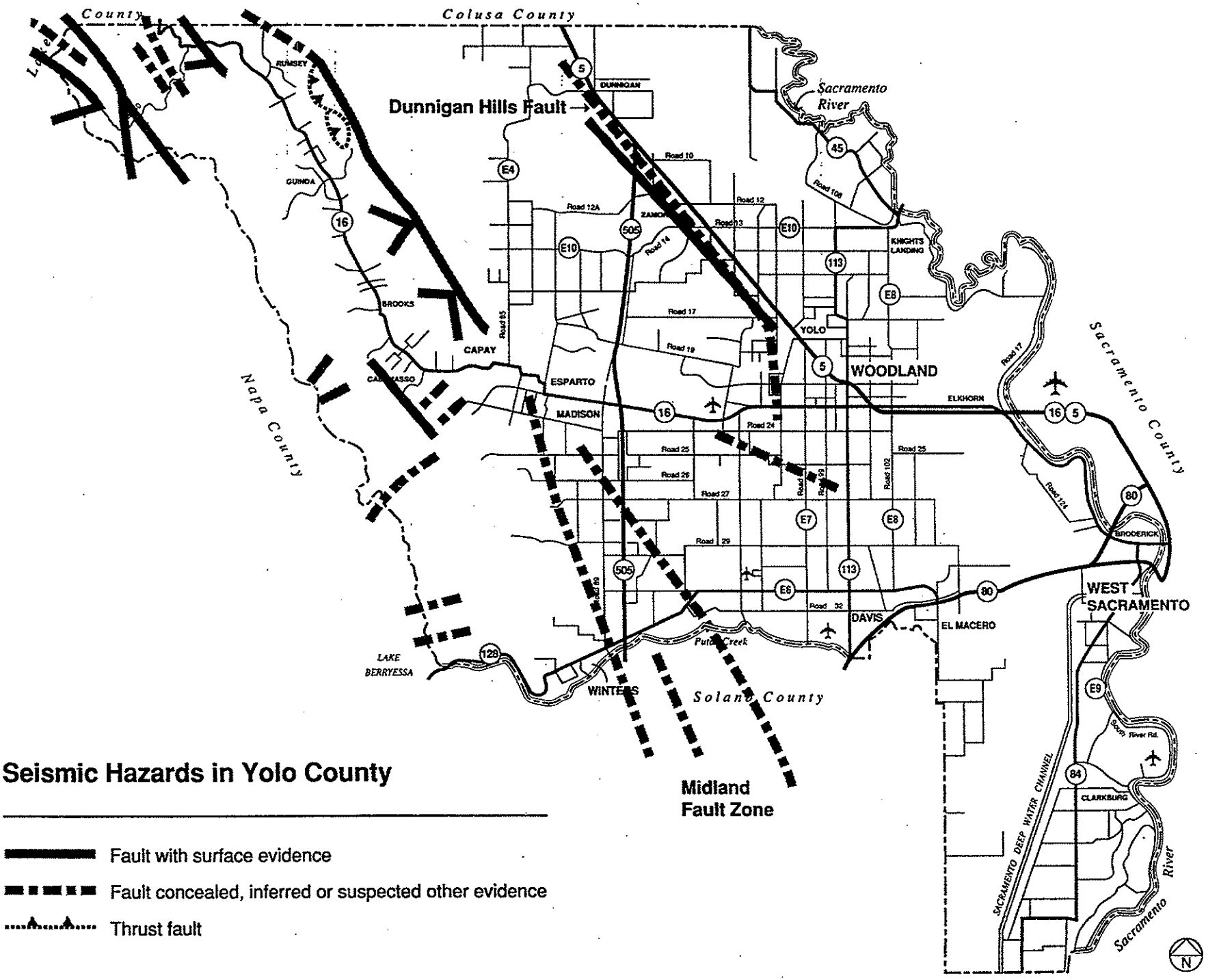
- The nature of the underlying materials, including rock and soil;
- The structural characteristics of a building;
- The quality of workmanship and materials used in its construction;
- The location of theca epicenter and the magnitude of the earthquake; and
- The duration and character of the ground motion.

Most of Woodland is located on alluvium deposits of varying depths, which can increase the potential for groundshaking damage. As earthquake waves pass from more dense rock to less dense alluvial or water-saturated materials, they tend to reduce in velocity, and increase in amplitude. Ground motion lasts longer on loose, water-saturated materials than on solid rock. As a result, structures located on these types of materials suffer greater damage than those located on solid rock. "Poor ground" can be a greater hazard for structures than close proximity to the fault or epicenter.

Groundshaking is the primary seismic concern for the City of Woodland. Woodland will experience the groundshaking effects of earthquakes, although the risk associated with this hazard in the Woodland area is low based on historical evidence of earthquake effects in Woodland. The California Division of Mines and Geology has produced a maximum expected earthquake intensity map which shows Woodland in the low severity zone. This zone could potentially experience groundshaking intensities of up to VI-VII in Mercalli intensity.

The state earthquake protection law *(California Health and Safety Code* 19100 *et seq.)* requires that buildings be designed to resist stresses produced by lateral forces causes by wind and earthquakes. Specific minimum requirements are spelled out in the *Uniform Building Code* which can be modified as necessary to meet local needs. The extent of groundshaking that buildings are designed to resist is based on the seismic zone in which they are located. Of the four seismic zones used nationwide, California includes the two zones of highest potential seismicity, Zones 3 and 4, with Zone 4 the most seismically active. Boundaries of the zones are determined by proximity to a fault considered capable of generating an earthquake of 6.0 to 7.0 magnitude or greater. The General Plan Study Area is located entirely within Zone 3.

Older buildings constructed before building codes were in effect, and even newer buildings constructed before earthquake resistance provisions were included to suffer damage in an earthquake. Most of Woodland's buildings are one or two stories high, and are of wood frame construction, which is considered the most structurally resistant to earthquake damage.



Seismic Hazards in Yolo County

Fault with surface evidence

Fault concealed, inferred or suspected other evidence

Thrust fault

Figure 8-2

Older masonry buildings without earthquake-resistant reinforcement are the most susceptible to the sort of structural failure which causes the greatest loss of lives. 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 ridged buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium may cushion low-ridged buildings, but accentuate the motion in tall buildings. The amplified motion resulting from softer alluvium soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include building projections which are not firmly anchored, such as parapets and cornices. These projections could collapse during periods of strong and/or sustained groundshaking.

Building codes are the primary tool governments possess to reduce seismic risk in structures. The City of Woodland has adopted the *Uniform Building Code;* all new buildings in the city must meet the seismic requirements of the 1991 edition of the *Uniform Building Code.* Critical facilities, such as hospitals and fire stations, should be sited, designed, and constructed to withstand severe groundshaking.

Older structures which do not conform to the *Uniform Building Code,* are dealt with according to the provisions of the City's *Dangerous Building Code,* which is a component of the *Uniform Building Code.* The *Dangerous Building Code* defines procedures for determining acceptable levels of risk in older structures. Hazardous buildings in the city are generally brought to the City's attention through filed complaints. Building owners are given a certain period of time within which to either demolish or rehabilitate the building.

Fire can also be a secondary earthquake hazard resulting from groundshaking effects. Most earthquake-induced fires start because of ruptured power lines, damage to wood, gas, or electrical stoves, and damage to other gas or electrical equipment. Firefighting ability can be hindered by buildings constructed of combustible materials, damage to a community's firefighting facilities, and rupture of water mains. This points out the need for greater emphasis on non-combustible material and on special construction techniques so that water mains will remain unbroken during large earthquakes.

GROUND FAILURE

In addition to structural damage caused by groundshaking, there are other ground effects caused by the shaking. These are known as ground failure effects and include liquefaction, settlement, lateral spreading, lurch cracking, and earthquake induced landslides.

Liquefaction is the loss of soil strength due to seismic forces acting on water-saturated granular soils. This loss of strength leads to a "quicksand" condition which causes many

types of ground failure. When the liquefied granular layer occurs at the surface, objects can either sink or float, depending on their density. The evaluation of potential for liquefaction is complex and must consider soil type, soil density, groundwater table, and the duration and intensity of shaking. Liquefaction is most likely to occur in deposits of weak saturated alluvium or similar deposits of artificial fill.

Liquefaction potential within Woodland exists in low-lying areas composed of unconsolidated, saturated, clay-free sands and silts. The exact degree of groundshaking required to induce liquefaction is fairly high. Since there is no historical evidence to suggest that high groundshaking intensities are common, the risk of liquefaction in the Woodland area is relatively low. Evaluation of liquefaction potential should be conducted on a site-by-site basis; soil reports are a requirement for new development under the Subdivision Map Act.

Settlement, or subsidence, is the compaction of soils and alluvium caused by groundshaking. It occurs irregularly and may be partly controlled by bedrock surfaces, and old lake, slough, swamp, and stream beds. The amount of compaction may range from a few inches to several feet. Irregular compaction is most widespread and extreme in major earthquakes. It may occur as much as 75 to 80 miles from the epicenter and may amount to several feet even at that distance. Compaction is most likely to occur in areas, such as Woodland, which are underlain by soft water-saturated low-density alluvial material. However, there are no significant subsidence problems in the Study Area.

Lurch cracking refers to fractures, cracks, and fissures produced by groundshaking, settling, compaction of soil, and sliding, and may occur many miles from the epicenter of an earthquake. These effects are characteristic of earthquakes large enough for significant ground motion to occur. The larger the earthquake magnitude, the more extensive the effects. Thus, a major earthquake may damage streets, curbs, sewer, gas, and water lines.

Lateral spreading is the horizontal movement or spreading of soil toward an open face such as a stream bank, the open side of fill embankments, or the sides of levees. Artificial fill areas which are improperly engineered or which have steep, unstable banks are most likely to be affected.

The potential for lurch cracking and lateral spreading is highest in areas where there is a high groundwater table, relatively soft and recent alluvium deposits, and where creek banks are relatively high. Fracture patterns from lurch cracking and lateral spreading may be controlled by the configuration of shallow bedrock structures, by highway surfacing, by the margins of fill, and engineering structures.

Earthquakes can also cause landsliding and slumping Woodland is mostly level, so landsliding and slumping should not be problems.

SEICHES

Seiches are earthquake-generated waves within enclosed or restricted bodies of water. Major, and even moderate earthquakes, miles away from Woodland can produce oscillations or waves in local bodies of water which could overtop and damage levees and cause water to inundate surrounding areas.

Since there are no lakes or reservoirs in or near Woodland, seiche hazards do not exist in the City.

8.3 FLOOD HAZARDS

100 YEAR FLOOD HAZARD

Figure 8-3 shows the location of the 1981 and 1988 FEMA Flood Insurance Rate Map (FIRM) regulatory flood plains in the Woodland area. The 100 year flood zone has a 1% (1/100) chance of occurance in any one year, while the 500 year flood zone has a 0.2% (1/500) chance of occurance in any one year. This map also shows areas with varying flood intensities during these different time spans.

The Flood Plain Overlay Zone is applied to areas identified by the official Flood Identification Map provided to the City by the Federal Insurance Administration in its "Flood Insurance Study" dated October 16, 1979, as amended. The map delineates those areas subject to flooding based upon evidence of past flood events and evaluation data pertinent to the hundred year flood or that which has a one (1) percent chance of occurrence in any one year. Based on an evaluation of this map, the City seeks to eliminate or reduce flood losses by regulating building construction and land use within the Flood Plain Hazard Areas identified on the map. Refer to the map and accompanying flood zone descriptions.

FLOOD ZONE DESCRIPTIONS

Zone Explanations

A Areas of 100-year flood; base flood elevations and flood hazard factors not determined (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.

AH Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.

A1-A3O Areas of 100-year flood; base flood elevations and flood hazard factors determined.

A-99 Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.

B Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas rotected by levees from the base flood.(Medium shading)

C Areas of minimal flooding. (No shading).

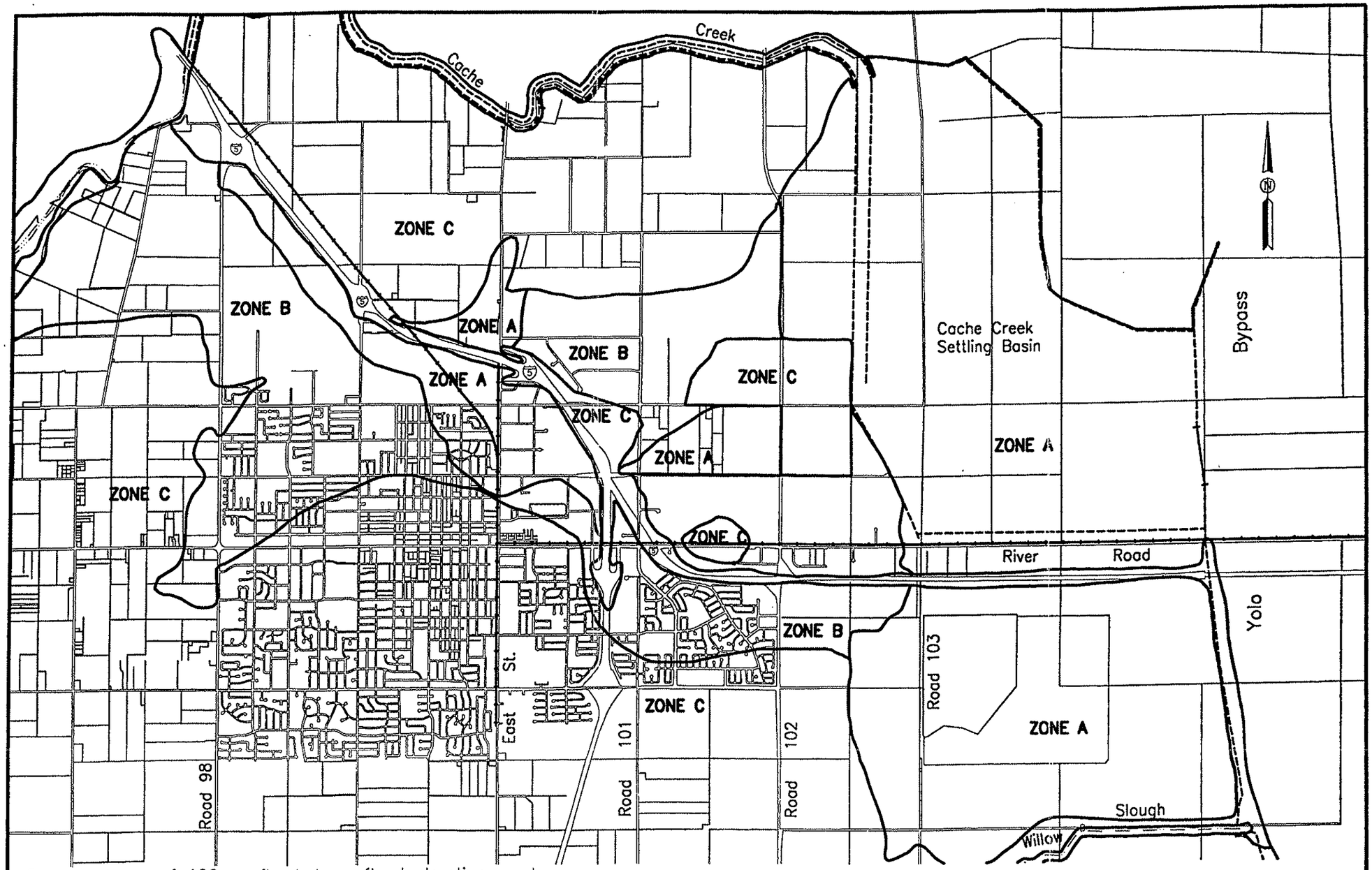
D Areas of undetermined, but possible, flood hazards.

A flood study of Cache Creek was conducted by the U. S. Army Corps of Engineers - Sacramento Division in June of 1994. This study, entitled: "Reconnaissance Report - Westside Tributaries to Yolo Bypass, California" indicated that the 50, 100 and 500 year flood events from Cache Creek would result in more extensive flooding of north and east Woodland than are predicted by the National Flood Insurance Program's Flood Insurance Rate Maps. The flooding would result from water overflowing creek banks and breaching the levees north and northwest of Woodland resulting in 1-3 ft. sheet flows and ponding. Figure 8-4 shows the Corps of Engineers 50, 100 and 500 year flood. The Corps of Engineers flood study was completed at the request of the Yolo County Board of Supervisors due to concerns over the adequacy of the existing levee system and maintenance of the creek's channel. The Reconnaissance phase of the Study has been completed. Some hydrology questions, however, are still being resolved. The feasibility phase of the study was not funded. The City of Woodland, County of Yolo and other agencies with jurisdiction are determining what levels of flood protection are appropriate and what programs/precautions are prudent given the extent of potential flooding and damage that could occur from a 100 year event. The Corps study will now require the City to take into account this increased potential for flooding when planning future urban growth areas and permit processing for any new development.

DAM FAILURE INUNDATION

A dam failure inundation hazard exists for Woodland and outlying areas due to the presence of the Indian Valley Dam and reservoir which is located on the North Fork of Cache Creek about 13 miles upstream from its confluence with the main stem of Cache Creek and approximately six (6) miles northeast of Clear Lake, in Lake County, California.

The dam was completed in 1976, with the major portion of the dam being constructed in 1973 and 1974. It is owned, operated and maintained by the Yolo County Flood Control



Zone A: Areas of 100-yr flood; base flood elevations and flood hazard factors not determined.
Zone B: Areas between limits of 100-yr & 500-yr flood; or certain areas subject to 100-yr flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

LEGEND

Zone C: Areas of minimal flooding.

Source: F.E.M.A. Flood Insurance Rate Maps, Dec.,1980, Oct.,1981, Mar.,1990

F.E.M.A.
Flood Insurance Rate Map

BORCALLI & ASSOCIATES, INC.

Figure 8-3

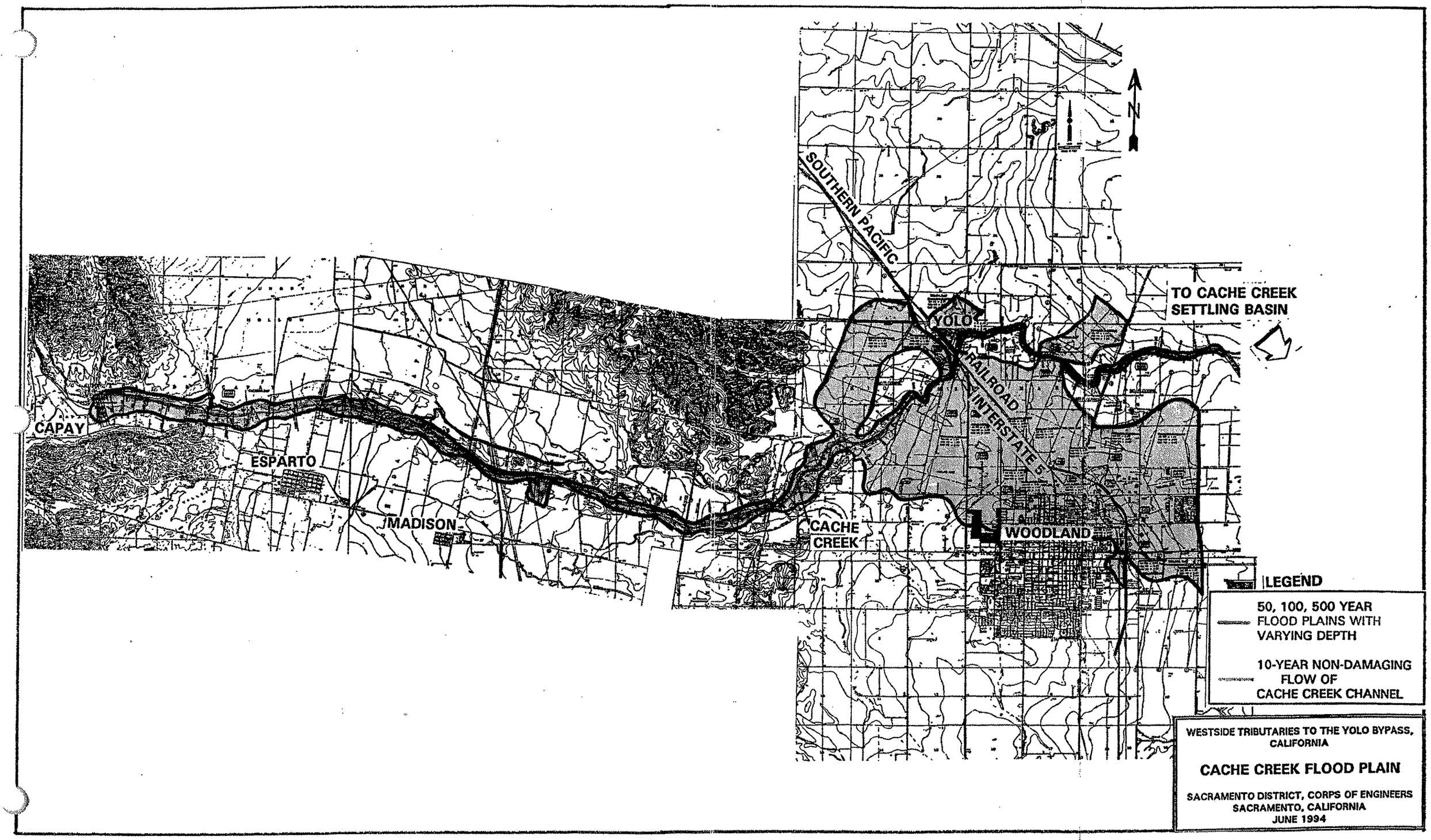

N
SOUTHERN PACIFIC
RAILROAD
INTERSTATE 5
YOLO
TO CACHE CREEK
SETTLING BASIN
CAPAY
ESPARTO
MADISON
CACHE
CREEK
WOODLAND
LEGEND
50, 100, 500 YEAR
FLOOD PLAINS WITH
VARYING DEPTH
10-YEAR NON-DAMAGING
FLOW OF
CACHE CREEK CHANNEL
WESTSIDE TRIBUTARIES TO THE YOLO BYPASS,
CALIFORNIA
CACHE CREEK FLOOD PLAIN
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
JUNE 1994

Figure 8-4

and Water Conservation District. The dam is a zoned earthfill structure with a maximum height of 207 feet above streambed and a crest length of 965 feet. The elevation of the top of the dam is 1,502 feet above mean sea level (MSL) . The capacity of the dam at top of spillway design is 359,000 acre feet while the conservation pool is 260,000 acre feet. The maximum spillway discharge capacity is 35,000 cubic feet per second.

The potential events that could lead to dam failure, or overtopping are: major flood inflows, earthquake, massive landslide or slippage, piping and erosion of the dam embankment. The January 1994 Emergency Action Plan (EAP) for the Indian Valley Dam prepared by the Yolo County Flood Control and Water Conservation District indicates that for Woodland the time from dam break to flooding would be 6-7 hours. The mitigation planned for this flooding is to evacuate north and west Woodland residents to the south. The inundation map (Figure 8-5) shows flooding of north and northwest Woodland and portions of east Woodland including most of the newly annexed southeast area. The flood depths are expected to range from 0-8 feet deep. This flooding would be much greater than a 500 year storm event. The Emergency Action Plan (EAP) for the Indian Valley Dam contains detailed procedures for emergency action to be taken by various Federal, State and Local agencies to respond to an emergency situation including the Woodland Police Department and the Yolo County Office of Emergency Services.

8.4 FIRE HAZARDS

Woodland encounters two types of fire hazards that threaten life and property: urban and rural fires. While urban fires may result in injuries and loss of property, rural fires may result in the loss of agricultural crops and natural vegetation, and the erosion of soil. Public protection of classifications are designated by the Insurance Services Office (ISO). The ISO bases its classifications on a number of factories, including fire department location, equipment, and staffing; water supply; and communication abilities. Ratings range from 1 to 10, with 1 being the best possible fire protection, and 10 being the worst. The City of Woodland maintains an ISO rating of 3, while the outlying areas maintain a rating of 9.

URBAN FIRES

Urban fires are primarily those associated with commercial, industrial and residential structures and the activities in and around them. most human fires are caused by human activity. Over the years, development standards have become more stringent in order to reduce the frequency and severity of such fires. Building codes have been improved to utilize the most up to date construction methods. In addition to the basic fire safety requirements (e.g., smoke detectors), the City of Woodland requires all new roof and

reroofs to be made of fire retardant materials. All residential units and other buildings over 5,000 square feet in size are required to be fire sprinklered.

Urban fire hazards in Woodland are greatest in areas containing older buildings which do not meeting current building codes. The City of Woodland has an active program to abate dangerous buildings through the Nuisance Abatement Ordinance. In the last two years, four buildings have been removed which were considered dangerous.

RURAL FIRE HAZARDS

The outbreak of rural fires in the General Plan area is a potential danger particular during the dry summer months and early fall months due to dry, humid and sometimes windy conditions. These fires may occur in fields and levee areas. The City of Woodland responds to these fires because of their Memorandum of Understanding with the Springlake Fire District which has the City providing all fire and emergency services within the Springlake District boundaries. The Springlake Fire District is much larger than both the city limit line and the urban limit line of the General Plan.

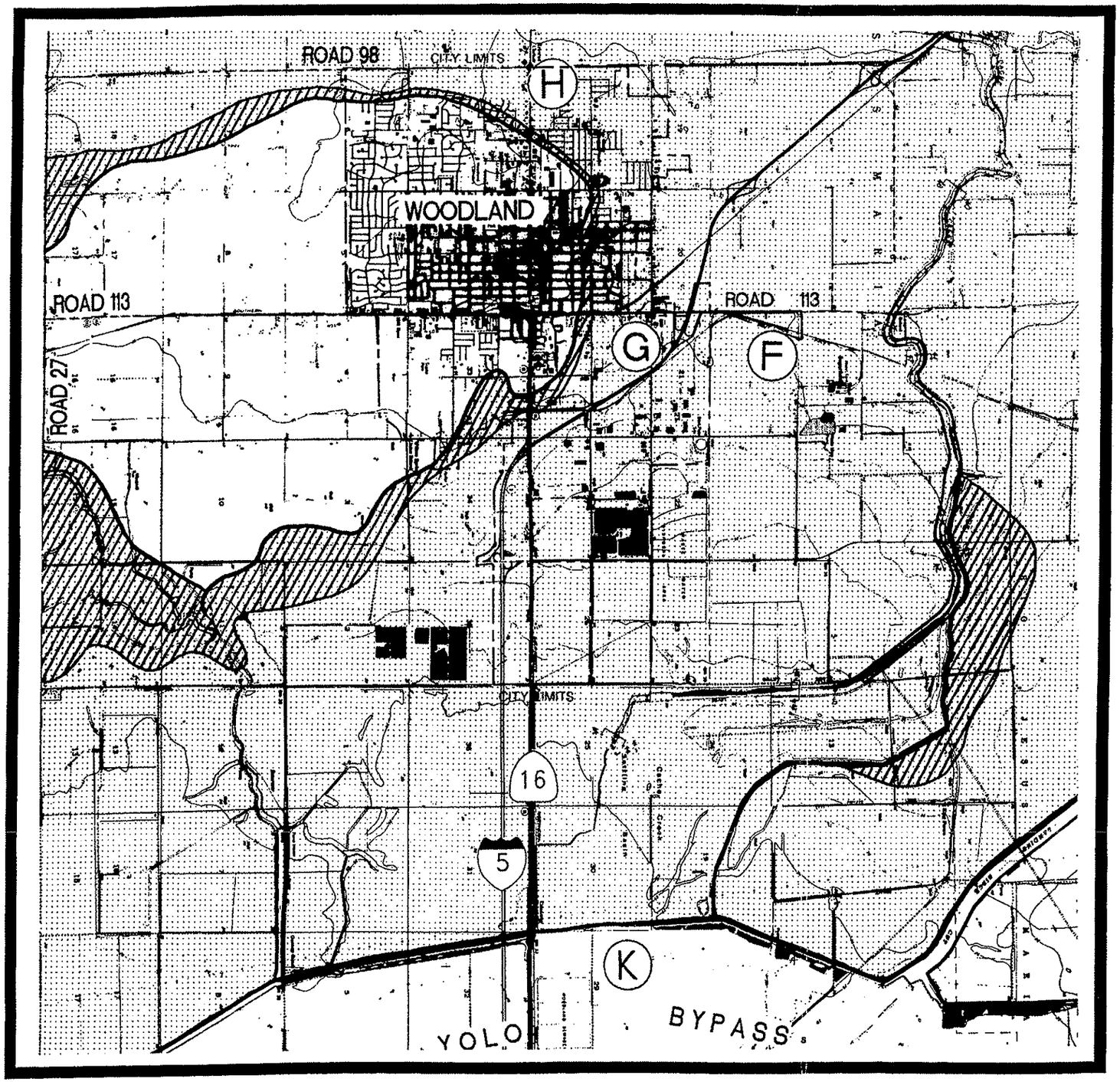
8.5 AIRCRAFT CRASH HAZARDS

AIRPORT-RELATED HAZARDS

Safety issues associated with airports are primarily concerned with hazards posed to flight and hazards posed to those on the ground. Flight hazards may be physical, such as tall structures that would obstruct airspace; visual, such as the glare caused by lights; or electronic, which could include any electronic uses that interfere with aircraft instruments or communication systems. With urban growth comes the need for increased airport operations, and this increased activity generates increased aircraft crash hazards. With proper land use planning, these risks can be reduced or mitigated, mainly through avoidance of incompatible land uses. This section describes potential safety hazards associated with the two small public use airports located in Yolo County near Woodland (Watts-Woodland and Yolo County) and Sacramento Metropolitan Airport, which is located in Sacramento County approximately 10 miles east of Woodland.

AIRPORT LAND USE PLANS

In 1982, local airport land use commissions (ALUCs) were mandated by California state law to prepare Comprehensive Land Use Plans (CLUPs) that would apply to public use airports and nearby areas (California Public Utilities Code Section 21670 et seq.). The



INUNDATION MAP

Indian Valley Dam Break Flood Inundation Study

LEGEND

SHALLOW FLOODING (LESS THAN 2 FEET)

APPROXIMATE LIMIT OF INUNDATION DUE TO HYPOTHETICAL DAM FAILURE

	Ⓕ ROAD 113 NORTH OF I-5	Ⓖ ROAD 113 SOUTH OF I-5
Maximum Depth	7.0 ft.	8.0 ft.
Maximum Flow	382,800 c.f.s.	57,800 c.f.s.
Time of Maximum Stage	10 hrs. 0 min.	9 hrs. 0 min.
Front of Wave Travel Tme	7 hrs. 30 min.	8 hrs. 0 min.
Maximum Elevation	58.8 ft. m.s.l.	63.0 ft. m.s.l.
Duration of Flooding	13 hrs. 0 min.	16 hrs. 0 min.

	Ⓗ WOODLAND	Ⓚ YOLO BYPASS
Maximum Depth	8.0 ft.	
Maximum Flow	57,800 c.f.s.	
Time of Maximum Stage	9 hrs. 0 min.	11 hrs. 0 min.
Front of Wave Travel Tme	8 hrs. 0 min.	10 hrs. 48 min.
Maximum Elevation	79.0 ft. m.s.l.	
Duration of Flooding	16 hrs. 0 min.	

NOTES

1. INUNDATION LIMITS ARE BASED ON A SUNNY DAY ANTECEDENT FLOW CONDITION FAILURE.
2. ELEVATIONS ARE BASED ON U.S.G.S. DATUM.
3. INUNDATION LIMITS, DEPTHS, FLOWS, FLOOD WAVE TRAVEL TIMES AND FLOOD DURATIONS ARE APPROXIMATE AND SHOULD BE USED ONLY AS A GUIDELINE FOR ESTABLISHING EVACUATION ZONES. ACTUAL AREAS INUNDATED WILL DEPEND ON ACTUAL FAILURE CONDITIONS.
4. THE RESULTS PRESENTED HEREIN DO NOT REFLECT IN ANYWAY ON THE STRUCTURAL INTEGRITY OF INDIAN VALLEY DAM AND ARE NOT TO SE CONSTRUED AS SUCH. THE ANALYSES PRESENTED ARE BASED ON THE HYPOTHESIS OF DAM FAILURE.
5. "FRONT OF WAVE TRAVEL TIME" IS DEFINED AS THE TIME THAT HAS ELAPSED FOLLOWING A FAILURE BEFORE THE STREAM CHANNEL IS FULL TO THE TOP OF ITS BANKS.
6. BASE MAP FROM U.S.G.S. 7.5 MINUTE QUADRANGLE.

Figure 8-5

purpose of these CLUPs is to maintain airspace for the safe operation of aircraft in the vicinity of the airport and to prevent exposure of people to substantial noise levels or safety hazards. In the Sacramento Region, including Yolo County, the Sacramento Area Council of Governments (SACOG) is the designated ALUC.

Acting in its capacity as the local airport land use commission, SACOG has completed CLUPs for the three airports whose operations could affect development in the general Woodland area: Watts-Woodland Field, Yolo County Airport, and Sacramento Metropolitan Airport. Each of the plans incorporates the complementary objectives of protecting the airports from encroachment by incompatible development and reducing the number of people exposed to airport-related hazards. The focus of these objectives is on ensuring that future development does not result in problems, rather than on remedying potential existing hazardous conditions.

As a means of delineating areas that might be exposed to aircraft hazards, the CLUPs define "airport safety restriction areas" where development is to be controlled so as to minimize the number of people exposed to aircraft crash hazards. The plans designate the following three safety areas:

Zone	Location/Restrictions
Clear Zone	Near the end of the runway; most restrictive
Approach-Departure Zone	Under the takeoff and landing slopes; less restrictive
Overflight Zone	Under the traffic pattern; least restrictive
Source: Sacramento Airport Land Use Commission, *Sacramento Metropolitan Airport Comprehensive Land Use Plan*, Amended January 1994.	

The following paragraphs generally describe each of the airports in the vicinity of Woodland, focusing on the CLUPs' designated airport safety zones and their relationship to the area covered by the Woodland General Plan.

Watts-Woodland Airport

Watts-Woodland Airport is located approximately five miles west of Woodland, adjacent to the intersection of State Highway 16 and Road 94B. The privately-owned airport is located on approximately 1,100 acres of land and is classified as a Basic Utility Stage II airport. It has one paved runway that is 3,770 feet long and 60 feet wide.

SACOG prepared a CLUP for Watts-Woodland Airport in December 1988 and updated it in March 1993. Figure 8-6 shows the safety zones for the airport, none of which extend into the area covered by the Woodland General Plan.

Yolo County Airport

Yolo County Airport, which is a publicly-owned basic utility airport, is located approximately 10 miles southwest of Woodland. It has one 6,000-foot by 100-foot north-south runway that is directly connected at each end by 75-foot wide taxiway. The airport has no navigational aids.

The Yolo County Airport Comprehensive Land Use Plan was completed in December 1981, then updated in December 1992. As Figure 8-7 shows, none of the airport safety zones for Yolo County Airport affect any land covered by the Woodland General Plan.

Sacramento Metropolitan Airport

Sacramento Metropolitan Airport (Metro), which lies just north of Interstate 5 approximately 10 miles east of Woodland, is the primary air carrier airport serving the Sacramento Valley. The 4,000-acre airport is operated by the Sacramento County of Airports. It has two parallel, north-south oriented runways that are 8,600 feet long and 150 feet wide. Metro is equipped with full instrumentation and has a Category II ILS capability, which allows instrument operations with visibilities as low as 1,200 feet RVR (runway visual range) and ceilings as low as 100 feet.

The *Sacramento Metropolitan Airport Comprehensive Land Use Plan* in October 1984 and has amended it four times since then, most recently in January 1994. Figure 8-8 shows the airport safety zones designated in the *Sac Metro CLUP*. As the figure illustrates, the only zone that extends into Yolo County is a small portion of the overflight zone that crosses the Sacramento River. It does not affect any land within the City of Woodland's General Plan Update Planning Area.

8.6 HAZARDOUS MATERIALS

Hazardous waste is defined as any waste material that is a potential threat to human health and environment, having the capacity to cause serious illness or death (*Health and Safety Code* §25117). In any urbanized environment, hazardous waste and its safe handling and disposal is an issue that must be addressed.

In 1989, according to the *Yolo County Hazardous Waste Management Plan* (HWMP), Yolo County generated approximately 8,440 tons of hazardous waste, all of which is transported

WATTS-WOODLAND AIRPORT SAFETY ZONES

LEGEND

(1) CLEAR ZONE

(2) APPROACH/DEPARTURE ZONE

(3) OVERFLIGHT ZONE

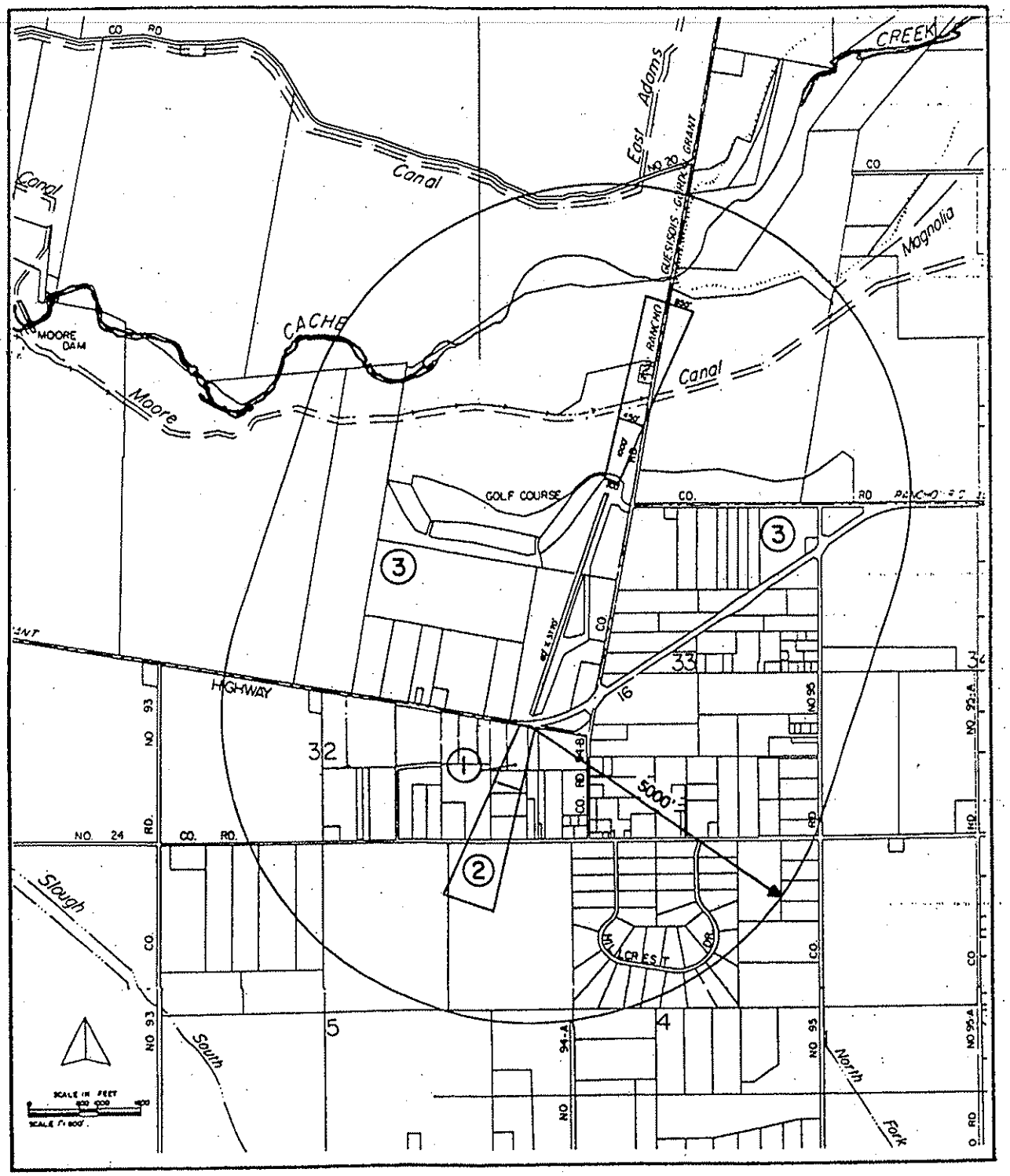


Figure 8-6

YOLO COUNTY AIRPORT SAFETY ZONES

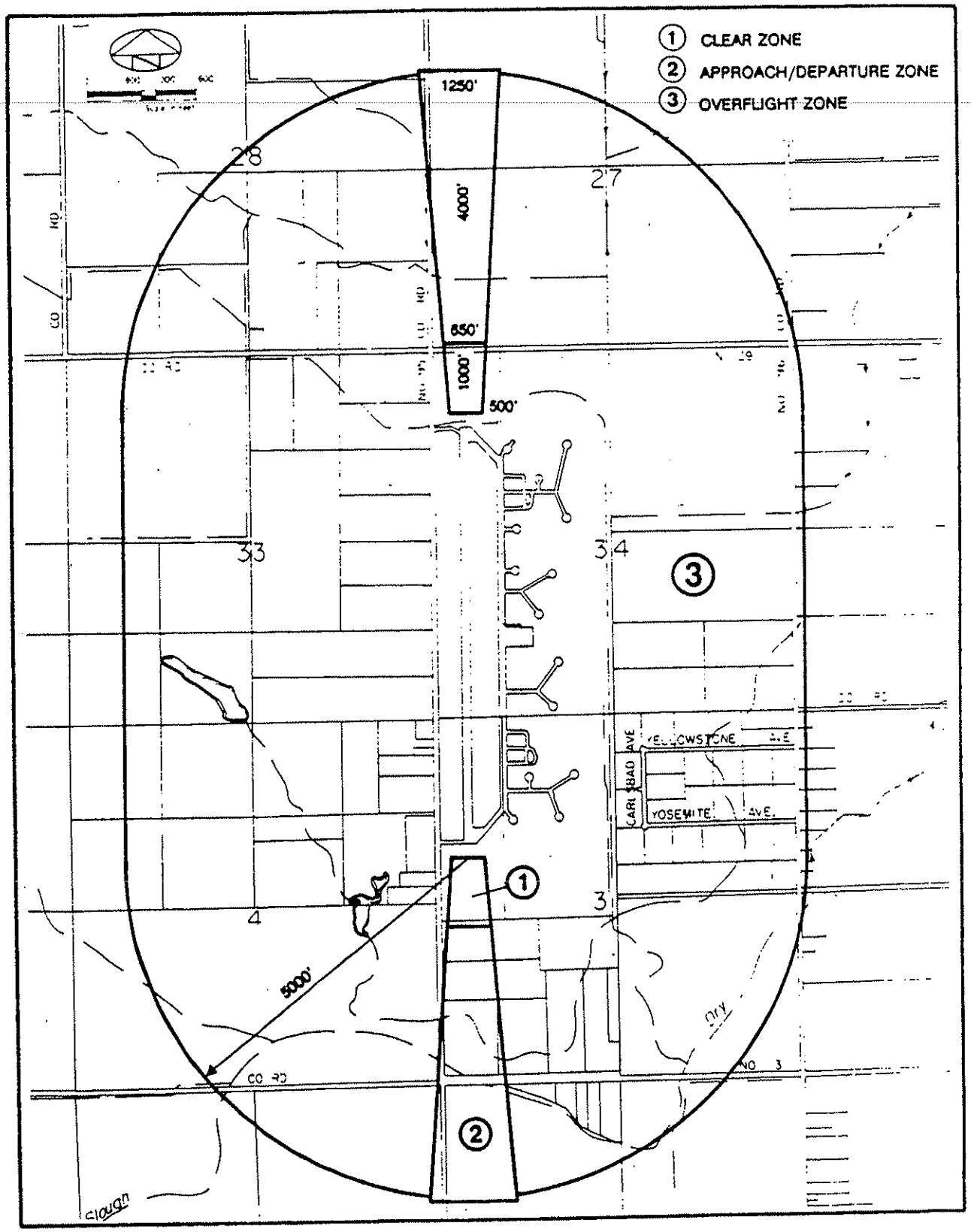


Figure 8-7

SACRAMENTO METROPOLITAN AIRPORT SAFETY ZONES

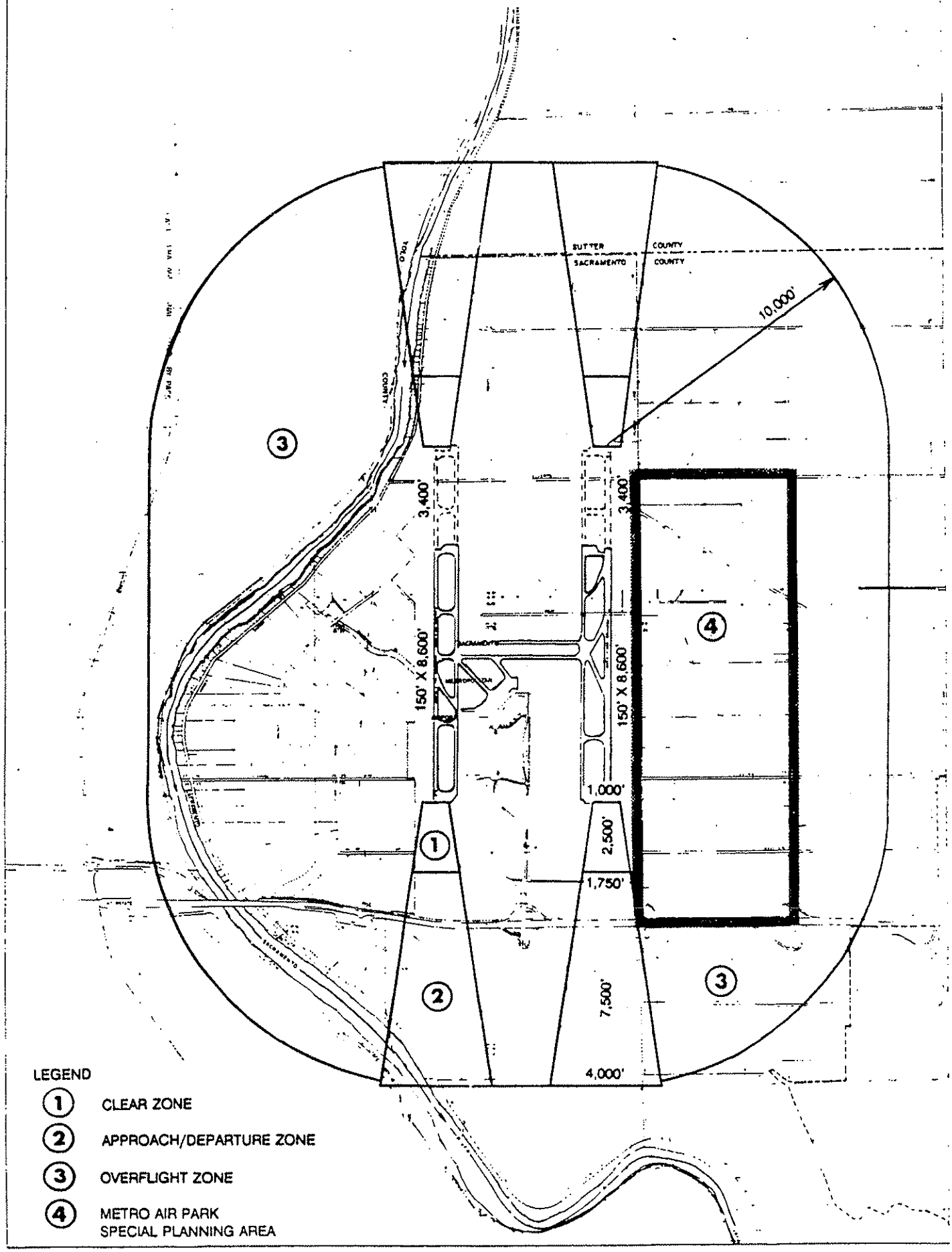


Figure 8-8

off site and out of the county for treatment and disposal. The sources of this waste are as follows:

1. Industrial hazardous wastes. According to the HWMP, approximately 4,660 tons of hazardous wastes are transported for treatment and disposal from major industrial generators, based on manifests supplied by the California Department of Health Services.

2. Wastes from small quantity generators. Small quantity generators are defined as those businesses generating less than 1,000 kilograms of hazardous wastes per month, accounting for approximately 3,300 tons of hazardous wastes per year in Yolo County, based on estimates from the HWMP.

3. Household hazardous wastes. Household hazardous wastes in Yolo County accounted for approximately 99.7 tons annually in 1990, less than one percent of Yolo County's hazardous waste stream. It is the fraction of the waste stream which is least managed however, and much or most household hazardous waste is disposed of in sewers or municipal landfills.

4. Woodland has waste from cleanup of contaminated sites. The HWMP estimates approximately 380 tons of site cleanup wastes based on 1986 manifest data. This included PCBs and PCB-contaminated materials, contaminated soil, and asbestos. Increasing attention his being directed towards cleanup of underground tanks and other contaminated sites.

5. Waste oil is the largest category of waste generated in the county, constituting 5,090 tons in 1990. The next largest categories include: solvents (660 tons); metal-containing liquids (490 tons); and organic wastes, including pesticides, PCBs, paint wastes, and organic sludges (360 tons). Miscellaneous inorganic wastes, including contaminated soils, asbestos, lead-acid batteries, and inorganic sludges represented another 1,840 tons.

HAZARDOUS WASTE MANAGEMENT PLAN

Counties are required by state law to prepare hazardous waste management plans. The Yolo County *Hazardous Waste Management Plan* (HWMP), May 1989, addresses the treatment, storage, and disposal of hazardous waste in Yolo County. The major goals of the plan are to provide for effective and efficient hazardous waste management, including waste reduction, treatment, transfer, storage, transport, and disposal and ensure protection of public health and the environment, and to maintain the county's economic viability. To accomplish this, the plan provides for the reduction of hazardous waste in the county through source reduction, recycling, and on-site treatment methods. Public education and community involvement are key features for obtaining this goal.

The Yolo County HWMP also determines suitable sites throughout the county for treatment, storage, and disposal facilities. Siting is to be based on a regional "fair-share" policy, whereby facilities are sited according to a region's contribution to the hazardous waste stream.

The HWMP also includes siting criteria to identify areas that might be potentially suitable for transfer, storage, or disposal facilities. Figure 8-9 indicates these areas in Yolo County. These areas were determined by screening for seismic hazard, potential for inundation due to dam or levee failure, seasonal wetlands, endangered species habitat, prime agricultural land, potential for groundwater contamination, zoned residential land, unstable soils, and ownership by federal agencies, military, or Native Americans.

8.7 EMERGENCY RESPONSE

Disasters can occur at any time and take many forms ranging from a major earthquake and flooding, to a hazardous material spill and fire, and may threaten both property and life. Potential disasters in Woodland include the following: leakage from bulk storage areas of petroleum and gaseous products, railroad derailments, freeway vehicular accidents, and a hazardous material spill within or near the city. In the event of such an emergency, evacuation routes have been determined. See Figure 8-10, Evacuation Routes.

The goal of the City of Woodland is to have a realistic assessment of the potential for a disaster and plans for recovery after a disaster has occurred. Due to the large number of public, quasi-public, and private agencies involved in emergency preparedness planning and their differing areas of responsibility, cooperation and coordination between entities is essential.

Communication is the critical element in emergency response capability. Cities, emergency and safety agencies, water districts, utilities, and other involved private agencies must be able to remain in contact in order to coordinate the provision of supplies and personnel. To this end, it is imperative that regular and effective on-going organizational meetings be held in order to assure the efficient and responsive provision of emergency services and supplies.

CRITICAL FACILITIES

Critical facilities are those facilities and parts of a community's infrastructure that must remain operational after an emergency event, such as an earthquake, flood, or fire, in order for a community to respond effectively. Examples of critical facilities include hospitals, fire stations, police stations, electrical power plants, and community service facilities.

*Areas of Yolo County potentially suitable for the siting of transfer, storage or treatment facilities, determined by screening for: Seismic hazard, potential for inundation due to dam or levee failure; seasonal wetlands; endangered species habitat; prime agricultural land; potential for ground water contamination; zoned residential land; unstable soils; and ownership by Federal agencies, military or Indians. Some areas eliminated may be deemed suitable if overriding public need, potential for correction by engineering means, or a favorable risk assessment can be demonstrated in the permit application.

Areas Potentially Suitable for Transfer, Storage or Treatment Facilities*

Areas potentially suitable for transfer, storage or treatment facilities

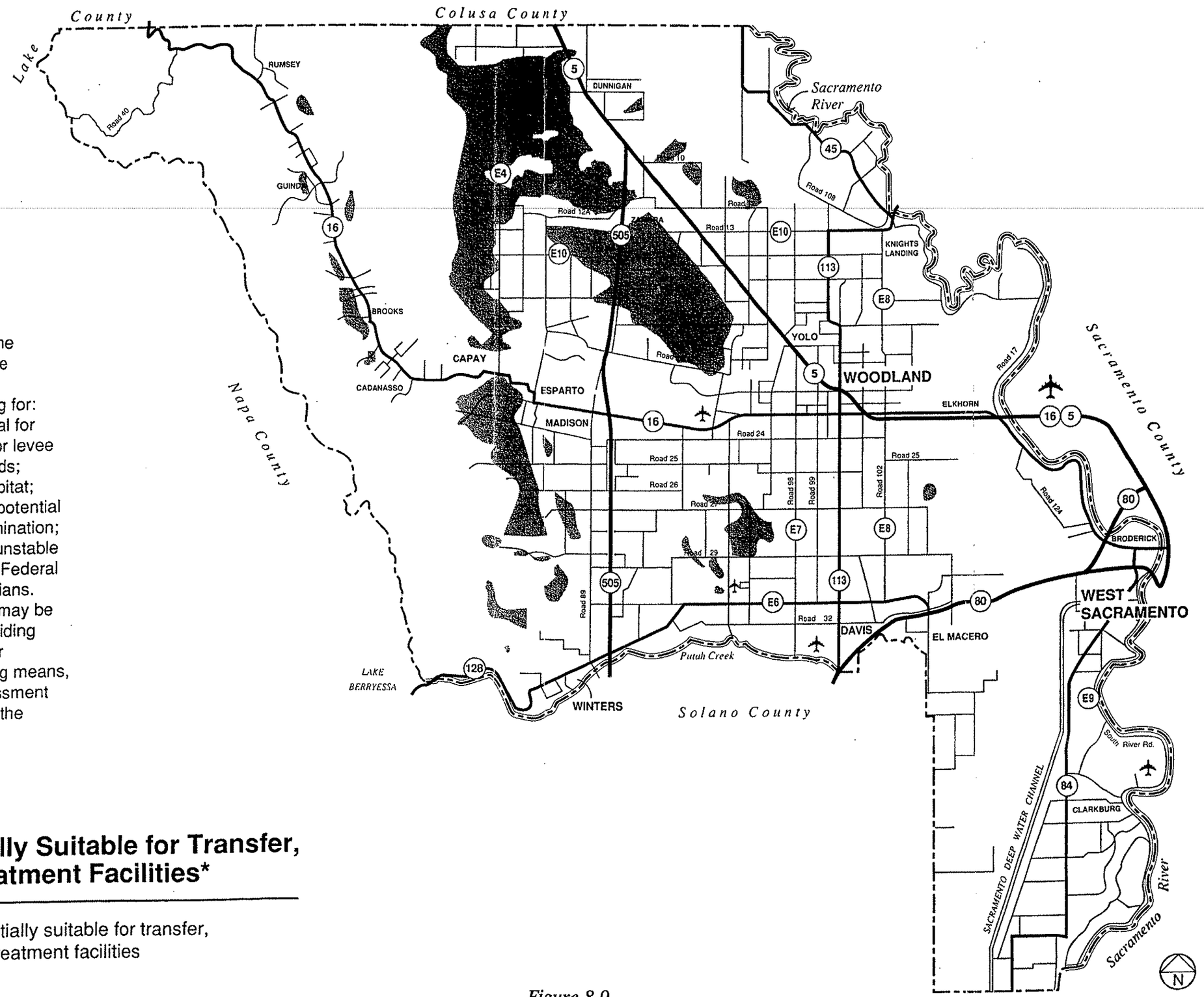
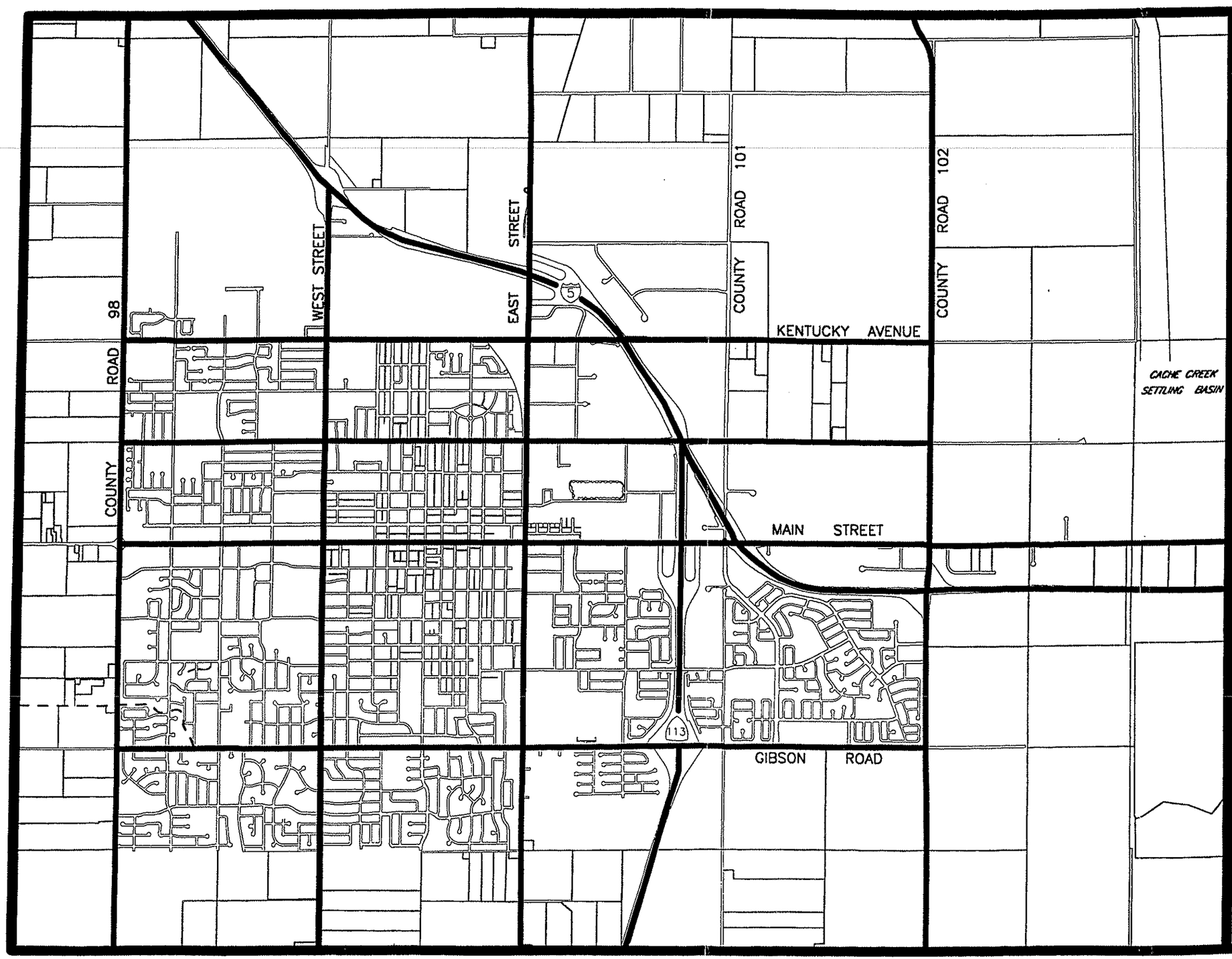


Figure 8-9



CITY OF WOODLAND

N

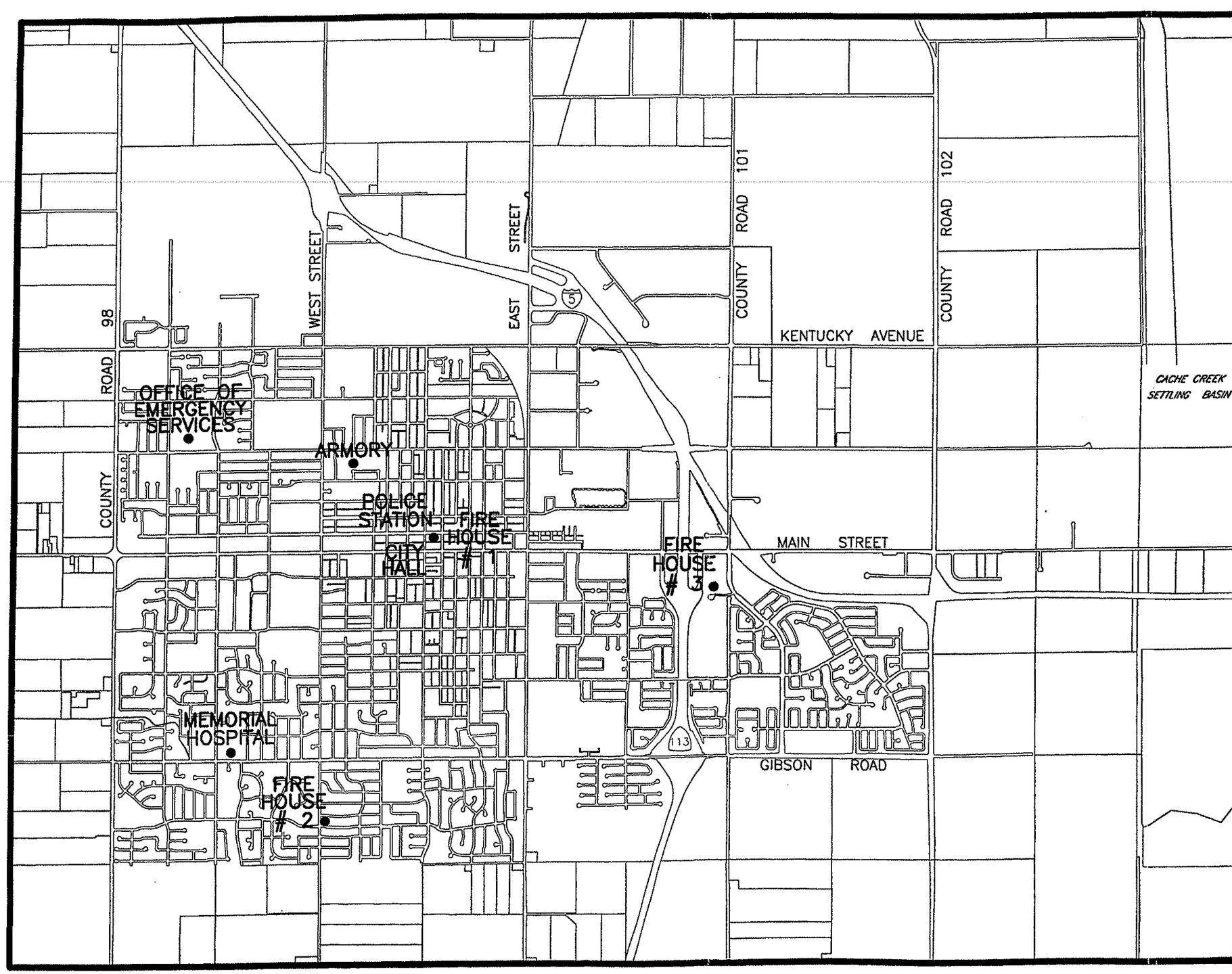
0 2
Scale in Miles

Base Map Prepared May 1995

EVACUATION ROUTES

Primary Routes

Figure 8-10



CITY OF WOODLAND

N

0 1/2
Scale in Miles

Base Map Prepared May 1995

CRITICAL FACILITIES

Figure 8-11

Figure 8-11 shows the location of critical facilities in Woodland. Ability to repair and/or restore such facilities is essential to recovery. Careful planning and rehabilitation of critical facilities is imperative to ensure the health, welfare, and safety of the public.

8.8 NOISE

EXISTING NOISE ENVIRONMENT

General

The State Office of Planning and Research Noise Element Guidelines require that major noise sources be identified and quantified by preparing generalized noise contours for current and projected conditions. Significant noise sources include traffic on major roadways and highways, railroad operations, airports, and representative industrial activities and fixed noise sources.

Noise modeling techniques and noise measurements were used to develop generalized L_{dn}[1] or L_{eq} noise contours for the major roadways, railroads and fixed noise sources in the City of Woodland area for existing conditions.

Noise modeling techniques use source-specific data including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Modeling methods have been developed for a number of environmental noise sources including roadways, railroad line operations, railroad yard operations and industrial plants. Such methods produce reliable results as long as data inputs and assumptions are valid. The modeling methods used in this report closely follow recommendations made by the State Office of Noise Control, and were supplemented where appropriate by field-measured noise level data to account for local conditions. The noise exposure contours are based upon annual average conditions. Because local topography, vegetation or intervening structures may significantly affect noise exposure at a particular location, the noise contours should not be considered site-specific.

A community noise survey was conducted to describe existing noise levels in noise-sensitive areas within the City of Woodland area so that noise level performance standards could be developed to maintain an acceptable noise environment. The community noise survey was conducted at many of the same sites which were previously monitored in 1987 for the current General Plan. Comparisons of background noise levels were made to provide an indication of changes in background noise levels in the City of Woodland.

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1 For an explanation of terms used in this report, see Appendix A.

Noise monitoring sites are shown on Figure 8-12.

Existing Regulatory Framework

The existing General Plan Noise Element is based upon recommendations by the California State Office of Noise Control as contained in the *Model Community Noise Control Ordinance*, and the *Guidelines for the Preparation and Content of Noise Elements of the General Plan*.

The Noise Element contains exterior noise level performance standards for locally-regulated noise sources. These noise sources are typically referred to as stationary noise sources or non-transportation related noise sources. Table 8-4 shows the existing performance standards.

TABLE 8-4

EXTERIOR NOISE LEVEL STANDARDS FOR LOCALLY-REGULATED NOISE SOURCES

Cumulative Number of minutes in any one-hour time period	Exterior Noise Level Standard, dBA	
	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
30	50	45
15	55	50
5	60	55
1	65	60
0	70	65

Discussions with the City of Woodland planning staff indicated that the performance standards contained within Table 8-4 were confusing and difficult to apply to projects.

The second set of criteria in the Noise Element is established for determining potential noise conflicts between various land uses, and transportation-related noise sources. These standards are based upon a 24-hour average sound level.

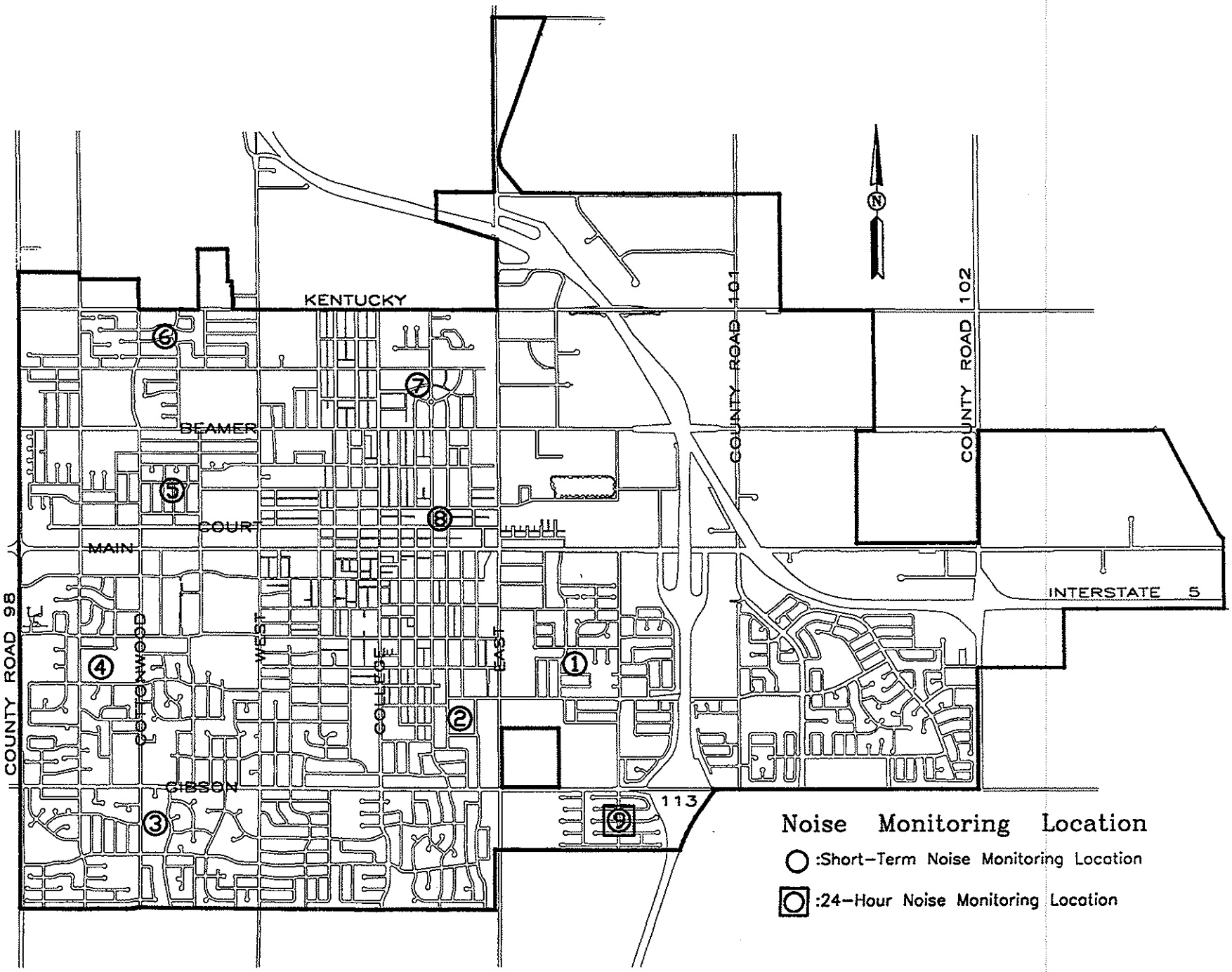

KENTUCKY
BEAMER
COURT
MAIN
COUNTY ROAD 98
COTTONWOOD
WEST
COLLEGE
EAST
GIBSON
113
COUNTY ROAD 101
COUNTY ROAD 102
INTERSTATE 5
N
Noise Monitoring Location
:Short-Term Noise Monitoring Location
:24-Hour Noise Monitoring Location

Figure 8-12

Roadways

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for all highways and major roadways in the City of Woodland General Plan study area. The FHWA Model is the analytical method presently favored for traffic noise prediction by most state and local agencies, including Caltrans. The current version of the model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour day and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Traffic data representing annual average traffic volumes for existing conditions were obtained from Caltrans and Fehr & Peers Associates traffic consultants. Day/night traffic distribution for Interstate 5 was based upon 24-hour noise measurement data, and day/night traffic distributions for other major roadways were based upon Caltrans and BBA data. Truck mix data were based upon Caltrans and BBA file data. Using these data and the FHWA methodology, traffic noise levels as defined by L_{dn} were calculated for existing traffic volumes. Distances from the centerlines of selected roadways to the 60 and 65 dB L_{dn} contours are summarized in Table 8-5. The locations of the 60 dB L_{dn} roadway noise contours are available to the public at the Woodland Community Development Office.

In some cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. Therefore the distances reported in Table 8-6 are estimates of noise exposure along roadways in the City of Woodland.

The effects of factors such as roadway curvature, grade, etc. can be determined from site-specific traffic noise measurements. The noise measurement results can be compared to the FHWA model results by entering the observed traffic volumes, speed and distance as inputs to the FHWA model. The differences between the measured and predicted noise levels can be used to adjust the FHWA model and more precisely determine the locations of the traffic noise contours.

TABLE 8-5

NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS

Segment	Description	Existing	
		60 dB	65 dB
Kentucky Avenue:			
1	Road 98 to North Ashley Avenue	69	32
2	North Ashley Avenue to North West Street	118	55
3	North West Street to North East Street	132	61
4	North East Street to I-5	85	39
5	I-5 to Road 101	66	31
6	Road 101 to Road 102	49	23
Beamer Street:			
7	Road 98 to Cottonwood Street	54	25
8	Cottonwood Street to North West Street	80	37
9	North West Street to North East Street	80	37
10	North East Street to I-5	72	33
11	I-5 to Road 101	62	29
12	Road 101 to 102	46	21
Court Street:			
13	Ashley Avenue to Cottonwood Street	56	26
14	Cottonwood Street to California Street	92	43
15	California Street to West Street	112	52
16	West Street to College Street	107	50
17	College Street to East Street	95	44
Main Street:			
18	Road 98 to West Street	118	55
19	West Street to East Street	122	57
20	East Street to Road 101	137	63
21	Road 101 to Road 102	54	25

Cross Street:			
22	Road 98 to Ashley Avenue	29	14
23	Ashley Avenue to West Street	63	29
24	West Street to East Street	56	26
Gibson Road:			
25	Road 98 to Ashley Avenue	56	26
26	Ashley Avenue to Cottonwood Street	73	34
27	Cottonwood Street to West Street	104	48
28	West Street to East Street	126	59
29	East Street to Road 101	130	61
30	Road 101 to Road 102	78	36
County Road 98:			
31	South of Gibson Road	74	34
32	Gibson Road to Main Street	93	43
33	Main Street to Kentucky Avenue	87	40
34	North of Kentucky Avenue	53	25
Ashley Avenue:			
35	Gibson Road to Main Street	59	27
36	Main Street to Beamer Street	52	24
37	Beamer Street to Kentucky Avenue	31	14
Cottonwood Street:			
38	South of Gibson Road	47	22
39	Gibson Road to Main Street	89	41
40	Main Street to Beamer Street	75	35
41	Beamer Street to Kentucky Avenue	54	25
West Street:			
42	South of Gibson Road	69	32
43	Gibson Road to Main Street	95	44
44	Main Street to Beamer Street	95	44
45	Beamer Street to Kentucky Avenue	78	36

College Street:			
46	South of Gibson Road	57	26
47	Gibson Road to Main Street	69	32
48	Main Street to Beamer Street	68	31
49	Beamer Street to Kentucky Avenue	50	23
Third Street:			
50	Gibson Road to Main Street	50	23
51	Main Street to Beamer Street	53	25
East Street:			
52	South of Gibson Road	52	24
53	Gibson Road to Main Street	121	56
54	Main Street to Beamer Street	126	59
55	Beamer Street to Kentucky Avenue	90	42
56	North of Kentucky Avenue	66	30
Matmor Road:			
57	Entire Length	67	31
County Road 101:			
58	South of Gibson Road	18	8
59	Gibson Road to Main Street	62	29
60	Main Street to Kentucky Avenue	57	26
61	North of Kentucky Avenue	41	19
County Road 102:			
62	South of Main Street	99	46
63	North of Main Street	90	42
Interstate 5:			
64	East of Road 102	1279	594
65	Road 102 to Main Street	1177	546
66	Main Street to Kentucky Avenue	898	417
67	North of Kentucky Avenue	928	431
State Route 113:			
68	Entire Length	247	115

Table 8-6 has been prepared to serve as a guide when applying the traffic noise exposure contour information presented in this section to areas with varying topography. The table is used by adding the correction factor to the noise level predicted at a given distance. It should be noted that the adjustment factors presented in this table are intended to provide conservative (worst-case) results, and that complex situations should be evaluated by an acoustical consultant where the potential for significant noise impact exists.

TABLE 8-6
TRAFFIC NOISE ADJUSTMENTS FOR VARIOUS TOPOGRAPHIC CONDITIONS

	Distance from Center of Roadway (Feet)		
Topographic Situation	<200	200 - 400	>400
Hillside overlooks roadway	-0-	+1 dB	+3 dB
Roadway Elevated (>15')	-5 dB	-2 dB	-0-
Roadway in cut/below embankment	-5 dB	-5 dB	-5 dB
Dense vegetation (100 feet or more)	-5 dB	-5 dB	-5 dB

Traffic noise contours were not developed for all roadway segments in the City of Woodland. However, Figure 8-13, prepared using the FHWA Model, may be used to estimate the distance to the 60 dB L_{dn} contour for projected volumes of arterial traffic. For arterial traffic, the predicted distance to the 60 dB L_{dn} contour is determined by the Average Daily Traffic Volume (ADT) and the posted speed limit. L_{dn} contours derived from Figure 8-14 are only indicators of potential noise conflicts, requiring more detailed analysis to determine traffic noise levels at any given location.

Railroads

Railroad activity in the City of Woodland General Plan Study Area generally occurs along the north/south mainline track, between Road 25A and Kentucky Street. The majority of train operations travel between 10 and 25 mph, and are due to switching engines operated by the California Northern Railroad. Approximately 2-3 trains per day originate in Woodland, and travel to Davis, while approximately 1 train per day originates in Woodland, and travels to the north. During "beet season" which is in July, approximately 2 trains per day travel through Woodland along the mainline track. Discussions with representatives from California Northern indicate that all operations generally occur between the hours of 7:00 am and 7:00 pm.

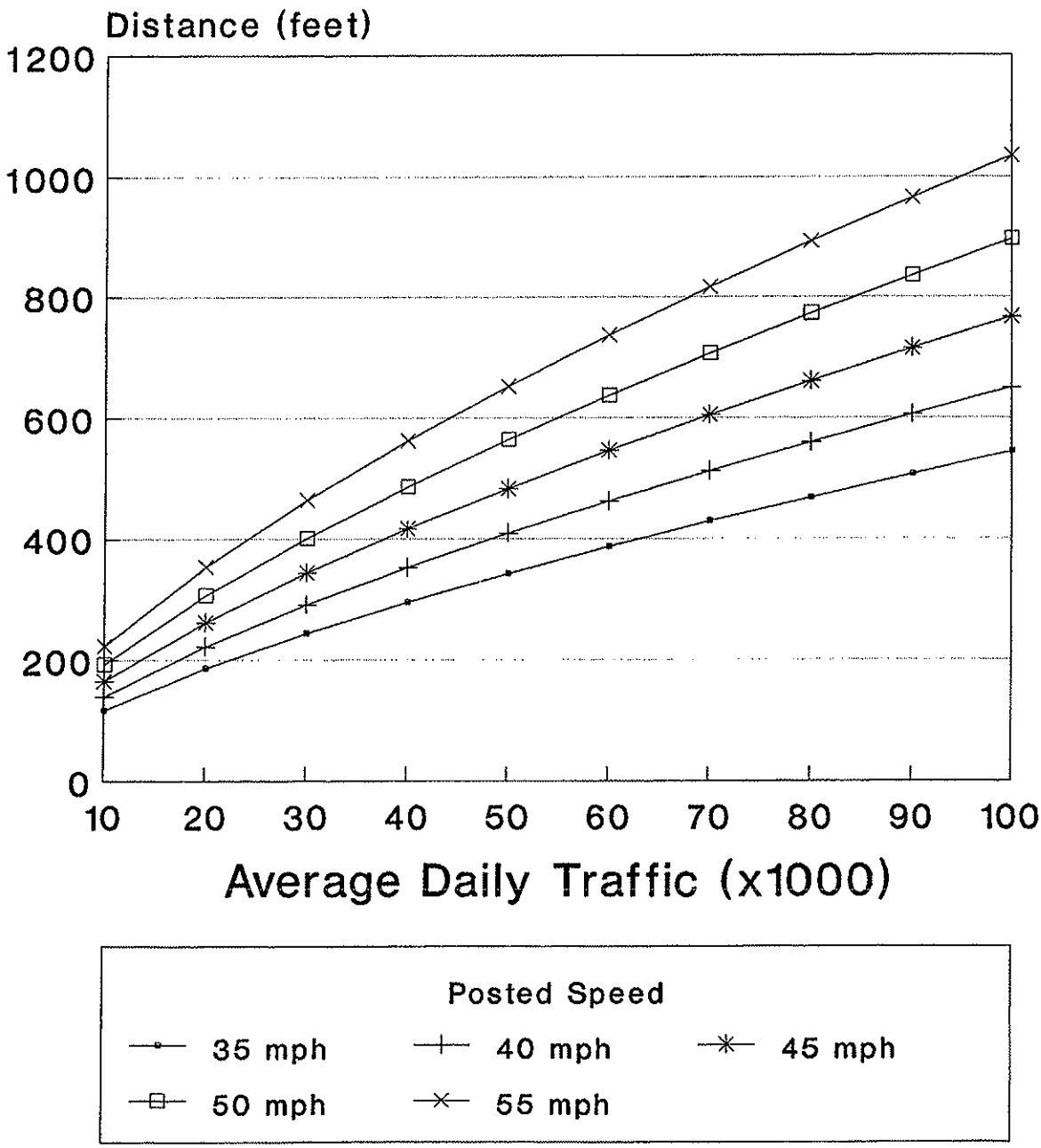
The mainline track which is now leased from the Southern Pacific Transportation Company (SPTCo) and is operated by California Northern Railroad has suspended through freight train travel. However, provisions exist to allow for through freight train travel in the future. Therefore, noise levels due to present railroad operations along the mainline may not accurately represent potential noise impacts. The existing Noise Element states that noise levels due to switching and through train traffic are approximately 71 dB L_{dn} at a distance of 100 feet from the track. This predicted noise level is expected to most accurately describe railroad operation noise levels during the peak periods of use. Based upon the noise levels described in the existing Noise Element, the distance to the 60 dB L_{dn} noise level contour is approximately 550 feet from the railroad track centerline.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which may be annoying to individuals who live in the nearby vicinity. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

From a land use planning perspective, fixed-source noise control issues focus upon two goals: to prevent the introduction of new noise-producing uses in noise-sensitive areas, and to prevent encroachment of noise sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures to ensure compliance with noise performance standards.

Distance to 60 dB Ldn Contour
Arterial Traffic



FHWA RD-77-108

Figure 8-13

Fixed noise sources which are typically of concern include but are not limited to the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers

The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

Numerous industrial facilities are dispersed throughout the General Plan study area. The following provides descriptions of existing fixed noise sources in the City of Woodland General Plan study area, and in some cases noise level data associated with their operations are included. The information is intended to be representative of the noise sources and noise levels associated with such uses.

Contadina Foods: 1376 Lemen Avenue

Contadina Foods operates a food processing and packaging plant. The facility operates 24-hours per day, from mid-June through September. Processing and limited operations occur during the remainder of the year. Noise producing activities at the plant include canners, conveyers, turbines and additional packaging equipment. Noise measurements of the Contadina plant operation were not performed due to production being completed prior to the noise survey. An acoustical analysis of the Contadina plant in full operation should be required prior

to the development of noise sensitive uses near the facility to ensure compliance with the Noise Element performance standards.

Adams Grain Dryer: 1020 East Street

Operations at the Adams Grain facility include drying, cleaning and storing of grain and feeds. Current work hours are 8:00 am to 5:00 pm, but shifts have been extended during peak harvest times. Noise sources at this facility include drying equipment, a roller mill, conveyers, and fans. Heavy truck traffic also contributes to the noise environment. BBA conducted noise level measurements of the facility on February 14, 1995. The measured noise level at a distance of approximately 100 feet from the property line was 67 dB L_{eq}. The distance to the 50 dB L_{eq} noise level contour is estimated to be approximately 700 feet from the facility property line.

Pacific International Rice Mill, Inc. (PIRMI): 845 Kentucky Avenue

Operations at the PIRMI plant include the drying, packaging and milling of rice. Typical hours of operation are 8:00 am to 4:00 pm, Monday through Friday. Plant operations increase to 24 hours per day with seasonal demands from mid-September through November. Noise sources at this facility include grain elevators, dryers and conveyers. Based upon noise level measurements conducted opposite of the main fan units, the distance to the worst case 50 dB L_{eq} contour is estimated to be 1,200 feet from the facility.

Woodland Biomass

The Woodland Biomass plant is located at the southeast corner of Kentucky Street and Road 101. Major noise sources associated with the operation of the Biomass plant are the boiler, fans, high pressure air/steam releases, and metal-on-metal contact of rotating machinery. BBA conducted a detailed analysis of noise levels associated with the Woodland Biomass plant in February 1990. Based upon the analysis, the distance to the 50 dB L_{eq} contour is approximately 1,250 feet from the facility.

Tire and Muffler Shops - At Various Locations:

Tire and muffler shops are typically identified as potential stationary noise sources. Major noise sources associated with muffler and tire stores include impact wrenches and hammers, compressors, and tire breakers. BBA conducted noise level measurements of each of these noise sources.

Impact wrenches and hammers produce sound levels of about 89 dB at a distance of 10 feet. The average duration for use of an impact wrench is approximately 15 seconds for each wheel. Pneumatic tire breakers produce significant noise levels

due to the release of air pressure through a number of small holes adjacent to the tire sidewall. Noise due to the tire breaker reaches a maximum level of about 105 dB at a distance of 10 feet. The high noise levels due to tire breakers last less than 1 second. Air supply compressors emit about 60 dB at a distance of 50 feet, and are operated intermittently during the work day.

It is not possible to determine a generalized location of an average hourly noise level contour for tire and muffler shops. Noise levels due to these operations vary based upon the locations of the equipment, shielding from building facades and frequency of use.

Airport Noise

The City of Woodland is considering the majority of expansion to the south. The area where expansion is expected to occur is described as the Urban Growth Boundary. The Urban Growth Boundary extends to the south adjacent to Road 25A. The Urban Growth Boundary extends to the east as far as Road 103. In addition, the Urban Reserve boundary extends approximately 1.5 miles east of Road 103, and generally south of I-5.

The City of Woodland has expressed concern regarding potential noise impacts associated with aircraft operations at Sacramento Metro Airport. Based upon the most recent noise contours contained within the *Final Report, Data Base Update, Sacramento Metro Airport, August, 1989*, the Urban Growth, and Urban Reserve areas are located outside of the 60 dB CNEL contours. Based upon that report, two departure tracks associated with runways 16R and 16L come within close proximity of the northeast corner of the Urban Reserve Boundary. Figure 8-14 shows the noise level contours prepared for the year 1995. Figure 8-15 shows the locations of the departure tracks.

Based upon the report, approximately 8.5% of airline departures follow these flight tracks, and no commuter/general aviation departures follow these flight tracks. Discussions with Jim Humphries of the Sacramento Metro Airport indicate that due to a recent increase in commercial flights to Portland and Seattle, the daily number of flights which use the flight tracks near the Urban Reserve Boundary have increased from 10 per day to approximately 24 per day.

Community Noise Survey

A community noise survey was conducted to document noise exposure in areas of the city containing noise sensitive land uses. For that purpose, noise sensitive land uses in the City of Woodland General Plan study area were considered to include residential areas, parks and schools. Noise monitoring sites were selected to be representative of typical residential conditions in the city.

Short-term noise monitoring was conducted at eight sites on February 7, 1995. Each site was monitored three different times during the day and night so that valid estimates of L_{dn} could be prepared. The noise monitoring sites are the same locations which were monitored in 1987 for the existing Noise Element. One continuous 24-hour noise monitoring site was established in the City of Woodland as part of the General Plan Update to record day-night statistical noise level trends. The continuous 24-hour site was monitored on February 7-8, 1995. The data collected included the L_{eq} and other statistical descriptors. Noise monitoring sites, measured noise levels, and estimated L_{dn} values at each site are summarized in Table 8-7.

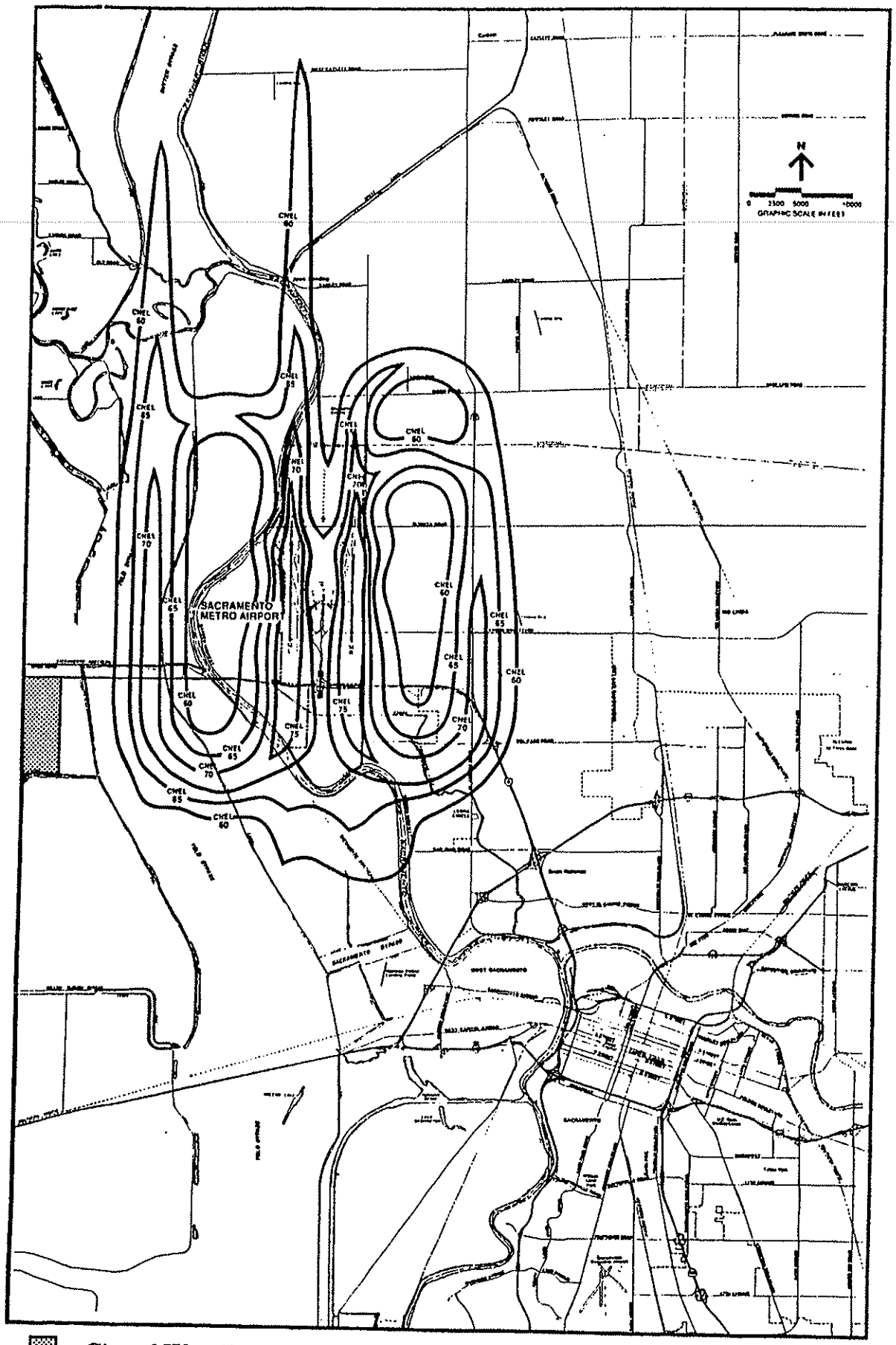
Community noise monitoring systems were calibrated with acoustical calibrators in the field prior to use. The systems comply with all pertinent requirements of the American National Standards Institute (ANSI) for Type I sound level meters.

The community noise survey results indicate that typical noise levels in noise sensitive areas of the City of Woodland General Plan study area are in the range of 53 dB to 56 dB L_{dn}. Traffic on local roadways and I-5, distant industrial activities and neighborhood activities are the controlling factors for background noise levels in the majority of the study area. In general, most areas of the City of Woodland which contain noise sensitive uses are moderately quiet to noisy, and are representative of an urban environment. The recent measured noise levels are similar to those which were measured in 1987 for the current General Plan Noise Element.

The L_{eq} values in Table 8-7 represent the average measured noise levels during the sample periods. The L_{eq} values were the basis of the estimated L_{dn} values. L_{max} values show the maximum noise levels observed during the samples.

The continuous monitoring data in Figure 8-16 show that ambient noise levels reach a minimum during the hours of 1-5 a.m., increasing during the daytime hours as a function of increased traffic and other human activities.

1995 NOISE EXPOSURE MAP



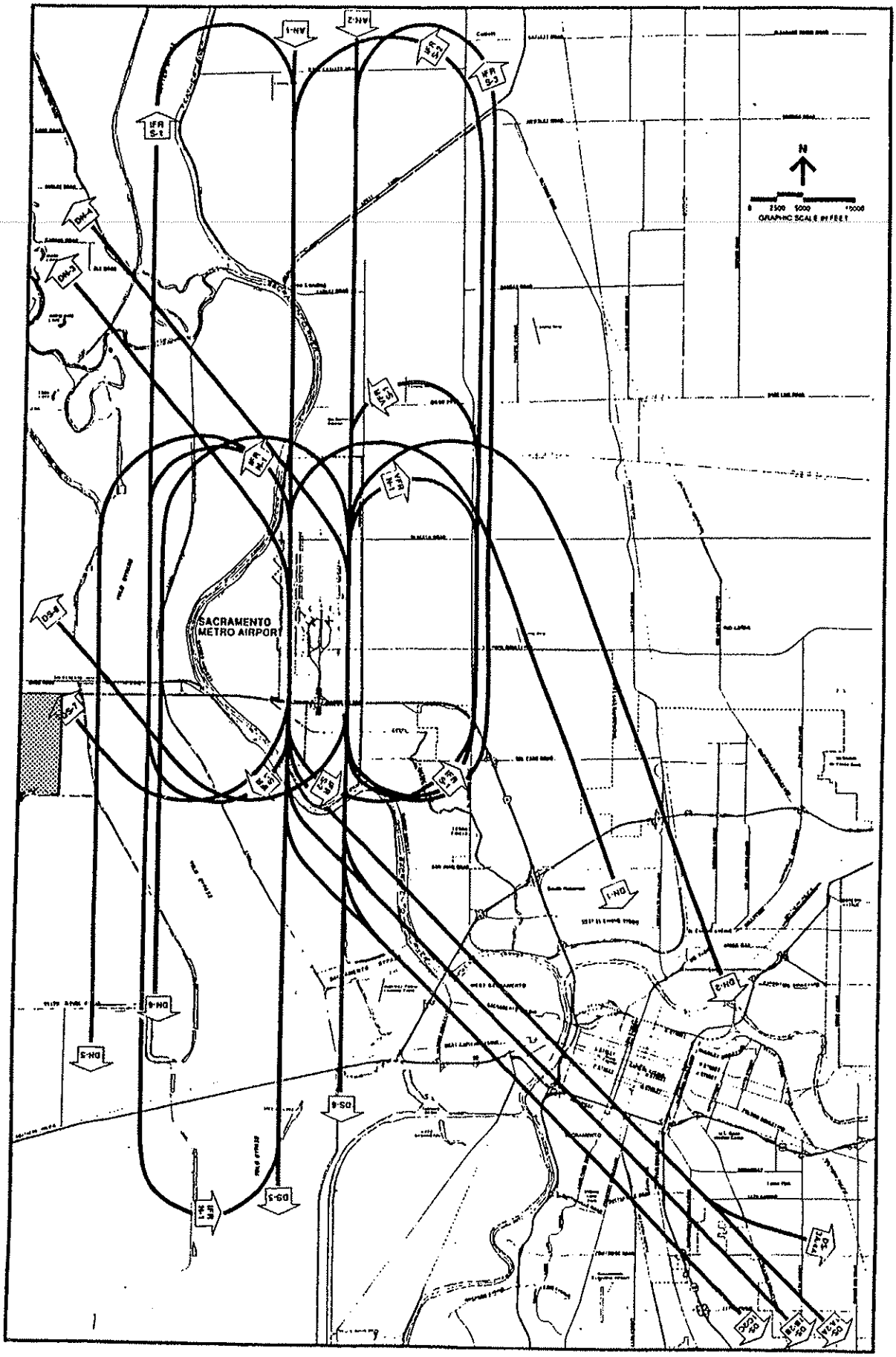
: City of Woodland Urban Reserve Boundary

Figure 8-14

Source: Data Base Update-Sacramento Metro Airport

Prepared by KPMG Peat Marwick, August 1989

ARRIVAL, DEPARTURE AND TRAINING FLIGHT TRACKS



: City of Woodland Urban Reserve Boundary

Source: Data Base Update-Sacramento Metro Airport
Prepared by KPMG Peat Marwick, August 1989

Figure 8-15

TABLE 8-7

Summary Of Measured Noise Levels And Estimated Day-Night Average Levels (L_{dn}) In Areas Containing Noise Sensitive Land Uses

Site	Location	Time Period	Sound Level, dB					
			L_{eq}		L_{max}		Est. L_{dn}	
			1995	1987	1995	1987	1995	1987
1	Hannah Campbell Park	Ld(1) Ld(2) Ln	49.0 51.5 45.5	56.2 53.4 45.3	64.8 64.0 62.5	N/A	53.1	55.1
2	Everman Park	Ld(1) Ld(2) Ln	54.6 54.5 45.5	54.5 49.4 44.7	65.5 66.0 65.5	N/A	54.9	53.5
3	Woodside Park	Ld(1) Ld(2) Ln	49.0 53.0 48.0	51.7 55.4 51.3	61.6 64.0 61.5	N/A	55.1	58.2
4	John Ferns Park	Ld(1) Ld(2) Ln	51.0 54.5 44.5	53.7 55.0 42.4	64.2 70.5 63.5	N/A	54.2	53.8
5	Sierra St. and Schuerle St.	Ld(1) Ld(2) Ln	53.8 54.5 47.5	53.5 58.0 46.2	70.6 70.5 66.0	N/A	55.7	56.3
6	Schuler Ranch @ Mariposa St.	Ld(1) Ld(2) Ln	49.1 50.5 47.5	50.4 60.1 42.3	65.7 56.5 57.5	N/A	54.3	56.2
7	Beamer Park	Ld(1) Ld(2) Ln	48.5 49.5 47.5	47.7 47.4 45.5	60.5 59.0 59.0	N/A	54.1	56.0
8	Court House	Ld(1) Ld(2) Ln	52.0 52.5 48.0	54.2 55.4 47.5	63.0 62.0 62.0	N/A	55.4	48.8
*9	1443 Hoover Court	Ld Ln	45.7 44.7				51.2	

* = Continuous Monitoring Site
Ld = Measured noise level during daytime hours (7:00 am - 10:00 pm)
Ln = Measured noise level during nighttime hours (10:00 pm - 7:00 am)

FUTURE TRAFFIC NOISE LEVELS

Future development under the General Plan would result in increased traffic noise levels. Table 8-8 shows the distances to the traffic noise contours for all highways and major roadways within the Planning Area. This table also shows the relative change in noise levels from existing levels. The potential exists for traffic noise levels at existing and future land uses to exceed acceptable noise exposure. Future noise-sensitive uses could be located inside the 60 dB Ldn roadway noise contours. Increased noise levels associated with traffic may encroach upon existing noise-sensitive land uses, or further increase noise levels already in excess of 60 dB Ldn.

TABLE 8-8

NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS

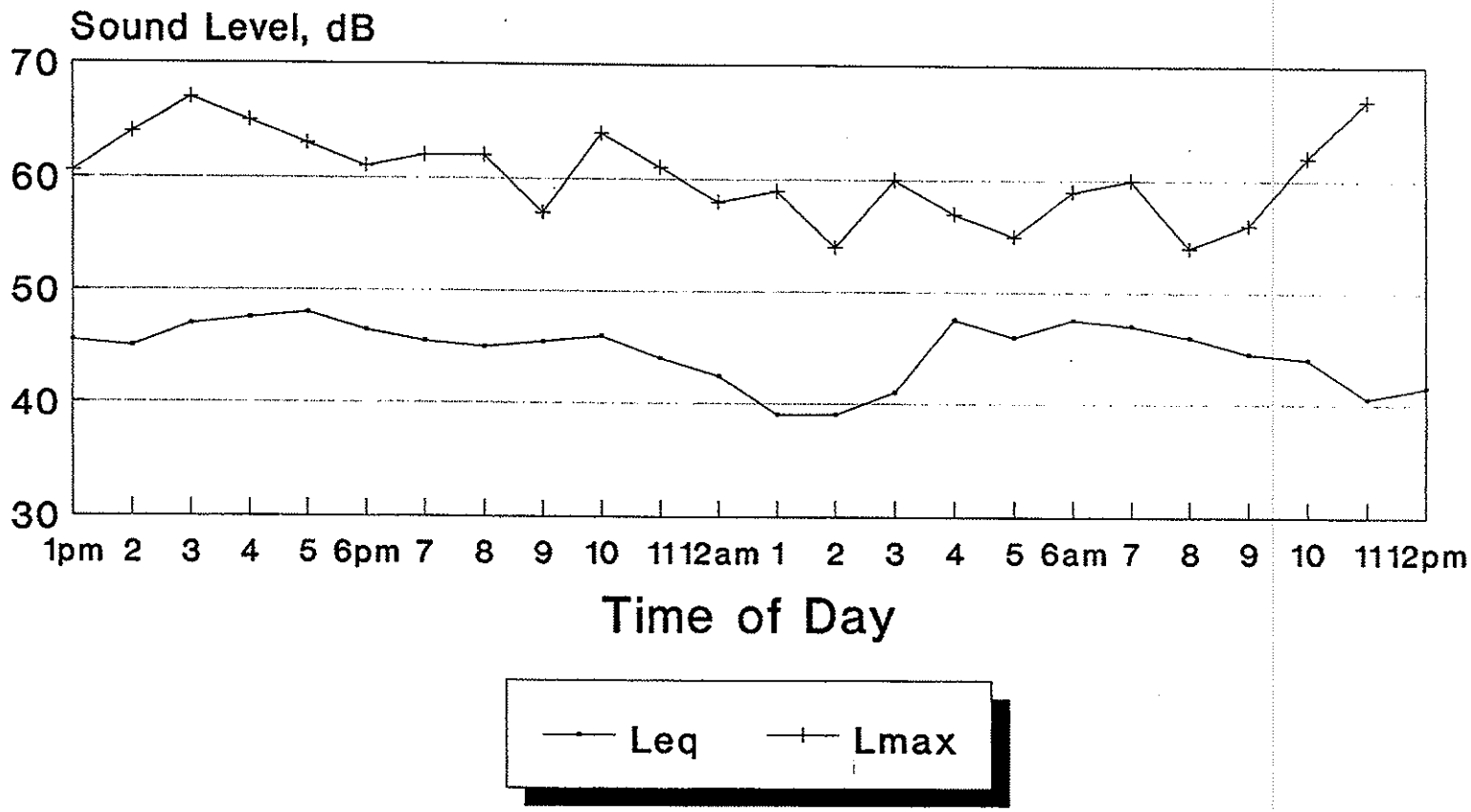
		Existing		Future		Difference dB
Seg.	**Description**	**60 dB**	**65 dB**	**60 dB**	**65 dB**	**at 100 feet**
Kentucky Avenue:						
1	Road 98 to North Ashley Avenue	69	32	70	33	+0.1
2	North Ashley Avenue to North West Street	118	55	129	60	+0.6
3	North West Street to North East Street	132	61	215	100	+3.2
4	North East Street to I-5	85	39	135	63	+3.1
5	I-5 to Road 101	66	31	135	63	+4.7
6	Road 101 to Road 102	49	23	98	45	+4.4
Beamer Street:						
7	Road 98 to Cottonwood Street	54	25	40	18	-0.2
8	Cottonwood Street to North West Street	80	37	84	39	+0.3
9	North West Street to North East Street	80	37	93	43	+1.0
10	North East Street to I-5	72	33	114	53	+2.9
11	I-5 to Road 101	62	29	121	56	+4.4
12	Road 101 to 102	46	21	87	40	+4.2
Court Street:						
13	Ashley Avenue to Cottonwood Street	56	26	69	32	+1.4
14	Cottonwood Street to California Street	92	43	80	37	-0.9
15	California Street to West Street	112	52	111	51	0
16	West Street to College Street	107	50	89	41	-1.2
17	College Street to East Street	95	44	90	42	-0.3
Main Street:						
18	Road 98 to West Street	118	55	104	48	-0.9
19	West Street to East Street	122	57	139	64	+0.8
20	East Street to Road 101	137	63	155	72	+0.8
21	Road 101 to Road 102	54	25	132	61	+5.8
Cross Street:						
22	Road 98 to Ashley Avenue	29	14	22	10	-1.7
23	Ashley Avenue to West Street	63	29	56	26	-0.8
24	West Street to East Street	56	26	77	36	+2.1

Gibson Road:						
25	Road 98 to Ashley Avenue	56	26	58	27	+0.3
26	Ashley Avenue to Cottonwood Street	73	34	69	32	-0.5
27	Cottonwood Street to West Street	104	48	117	54	+0.7
28	West Street to East Street	126	59	169	78	+1.9
29	East Street to Road 101	130	61	160	74	+1.4
30	Road 101 to Road 102	78	36	153	71	+4.5
Road 98:						
31	South of Gibson Road	74	34	91	42	+1.4
32	Gibson Road to Main Street	93	43	105	49	+0.7
33	Main Street to Kentucky Avenue	87	40	104	48	+1.2
34	North of Kentucky Avenue	53	25	68	32	+1.6
Ashley Avenue:						
35	Gibson Road to Main Street	59	27	16	8	-8.4
36	Main Street to Beamer Street	52	24	8	4	-12.4
37	Beamer Street to Kentucky Avenue	31	14	17	8	-3.8
Cottonwood Street:						
38	South of Gibson Road	47	22	36	17	-1.6
39	Gibson Road to Main Street	89	41	82	38	-0.5
40	Main Street to Beamer Street	75	35	66	31	-0.8
41	Beamer Street to Kentucky Avenue	54	25	51	24	-0.3
West Street::						
42	South of Gibson Road	69	32	65	30	-0.4
43	Gibson Road to Main Street	95	44	107	50	+0.7
44	Main Street to Beamer Street	95	44	89	41	-0.5
45	Beamer Street to Kentucky Avenue	78	36	93	43	+1.2
College Street:						
46	South of Gibson Road	57	26	59	27	+0.2
47	Gibson Road to Main Street	69	32	89	42	+1.7
48	Main Street to Beamer Street	68	31	78	36	+0.9
49	Beamer Street to Kentucky Avenue	50	23	66	31	+1.8
Third Street:						
50	Gibson Road to Main Street	50	23	63	29	+1.5
51	Main Street to Beamer Street	53	25	33	15	-3.2
East Street:						
52	South of Gibson Road	52	24	162	75	+7.4
53	Gibson Road to Main Street	121	56	144	67	+1.2
54	Main Street to Beamer Street	126	59	116	54	-0.5
55	Beamer Street to Kentucky Avenue	90	42	90	42	0
56	North of Kentucky Avenue	66	30	117	54	+3.7
Matmor Road:						
57	Entire Length	67	31	87	40	+1.7
Road 101:						
58	South of Gibson Road	18	8	141	66	+13.5
59	Gibson Road to Main Street	62	29	130	60	+4.9
60	Main Street to Kentucky Avenue	57	26	160	74	+6.8
61	North of Kentucky Avenue	41	19	53	24	+1.7
Road 102:						
62	South of Main Street	99	46	218	101	+5.2
63	North of Main Street	90	42	224	104	+5.9

I-5:						
64	East of Road 102	1279	594	2246	1043	+3.7
65	Road 102 to Main Street	1177	546	1752	813	+2.6
66	Main Street to Kentucky Avenue	898	417	1701	790	+4.2
67	North of Kentucky Avenue	928	431	1421	659	+2.8
SR 113:						
68	Entire Length	247	115	476	221	+4.3
North Side New Road:						
69	Road 98 to Road 99			54	25	--
South Side New Road:						
70	Road 102 to Road 101			92	43	--
71	Road 101 to East Street			124	57	--
72	East Street to West Street			--	--	--
73	West Street to Road 98			--	--	--
Source: Brown-Buntin Associates, September 1995.						

Measured Hourly Noise Levels

1443 Hoover Court
February 7-8, 1995



Ldn = 51.2 dB
Ld = 45.7 dB
Ln = 44.7 dB

Figure 8-16

8.12 SOURCES

1. Woodland General Plan and Data Base, 1988.

2. California Division of Mines and Geology Modified Mercalli Scale of Earthquake Intensity, 1973.

3. United States Geologic Survey, Earthquake Intensity Zonation and Quartermary Deposits, Miscellaneous Field Studies Map 9093, 1977.

4. Uniform Building Code, 1991.

5. FIRM Flood Insurance Rate Map for Woodland Area, 1981.

6. U. S. Army Corps of Engineers, Sacramento Division, "Reconnaissance Report - Westside Tributaries to Yolo Bypass, California, 1994."

7. Yolo County Flood Control and Water Conservation District Emergency Action Plan for Indian Valley Dam, 1994.

8. Sacramento Metropolitan Airport Comprehensive Land Use Plan, Amended January, 1994.

9. Yolo County Airport Comprehensive Land Use Plan, Amended 1992.

10. Yolo County Hazardous Waste Management Plan, 1989.

11. Woodland Fire Department, 1995.