

2030 Galt General Plan

Existing Conditions Report

Final



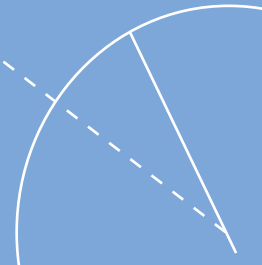
November 2005

With 2008 updates to the Traffic, Fire Protection, and Historic Resources sections

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on the General Plan Update: www.ci.galt.ca.us





City of Galt General Plan
EXISTING CONDITIONS REPORT

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1 | INTRODUCTION

This report contains an analysis of existing physical, social, and economic conditions within the city of Galt and its surrounding region. It provides background information for General Plan policies and the associated Environmental Impact Report. This report covers background information on the following topics:

- Economic Conditions
- Community Character
- Land Use and Demographics
- Circulation and Transportation
- Public Facilities and Services
- Housing
- Natural Resources
- Historic Resources
- Public Health and Safety

This report has been compiled by a multi-disciplinary consulting team headed by Mintier & Associates with assistance from RACESTUDIO, Environmental Science Associates, Applied Development Economics, Omni-Means, and the City of Galt staff.

1.1 REGIONAL SETTING AND COMMUNITY BACKGROUND

REGIONAL SETTING

Galt is located along State Highway 99 in Northern California's Central Valley, between the cities of Sacramento and Stockton, and near the Delta Recreation Area (Figure 1.1). From the city's nineteenth century agrarian roots to the diverse community of today, Galt residents have valued its friendly, small-town atmosphere. Its rich history is still evident in some of Galt's older buildings and the compact urban form of the city's downtown.

COMMUNITY BACKGROUND

The Galt area was originally inhabited by the Plains Miwok Indians, although no permanent settlements are believed to be located within today's city limits. Settlements for the Miwoks were located along the Cosumnes, Mokulumne, and Sacramento Rivers. Galt is located within the Spanish land grant *Rancho San Jon de los Moquelumnes*, and the area has been under cultivation since about the 1850s to 1860s. The entire Dry Creek Township was purchased by Dr. Obed Harvey in 1861, who is considered to be the founder of Galt.

The town was laid out by the Western Pacific Railroad Company in 1869 on a quarter section of land which was known as the Troy Place. The town was centered along a large rail yard and switching station located for its central position between

Sacramento and Stockton. The first buildings to be constructed (1869-70) in the city were hotels – the Galt House, the Harvey House, and the Railroad House. Later a school and general store were constructed, and in 1869 the city established its first post office. The town was eventually given the name Galt by Dr. John McFarland, a local businessman and farmer whose hometown was Galt, Canada.

Galt Market

The city is well-known in Northern California for its Galt Market, held every Tuesday and Wednesday. The market opened in the early 1950s and was little more than a traditional tailgate flea market and farmers' market. It has expanded over the years to become one of Northern California's largest outdoor retail and wholesale markets with room for 500 vendors in over 850 spaces. The market features retail and wholesale vendors on Tuesdays, and flea market and fresh produce vendors on Wednesday. It offers free admission and free parking, and attracts an estimated 750,000 visitors each year. The market's revenues account for nearly 11 percent¹ of the City's annual budget.

The market is owned and operated by the City of Galt through an agreement with Sacramento County and the State. The property was originally owned by the County and used as the site for the County Fairgrounds. The County transferred the land to the City in 1969 (AB 3773) with the condition that it could only be used for the market or parks and recreation purposes and revenues from the Market could only go towards parks and recreational purposes. These provisions still stand today, and if the market were to move from its current site, the property could only be used by the City for park or recreational uses. It is unknown whether the City would be able to retain ownership / operation under this special legislation if the Galt Market were to close. No other City is permitted to operate a flea market in California.

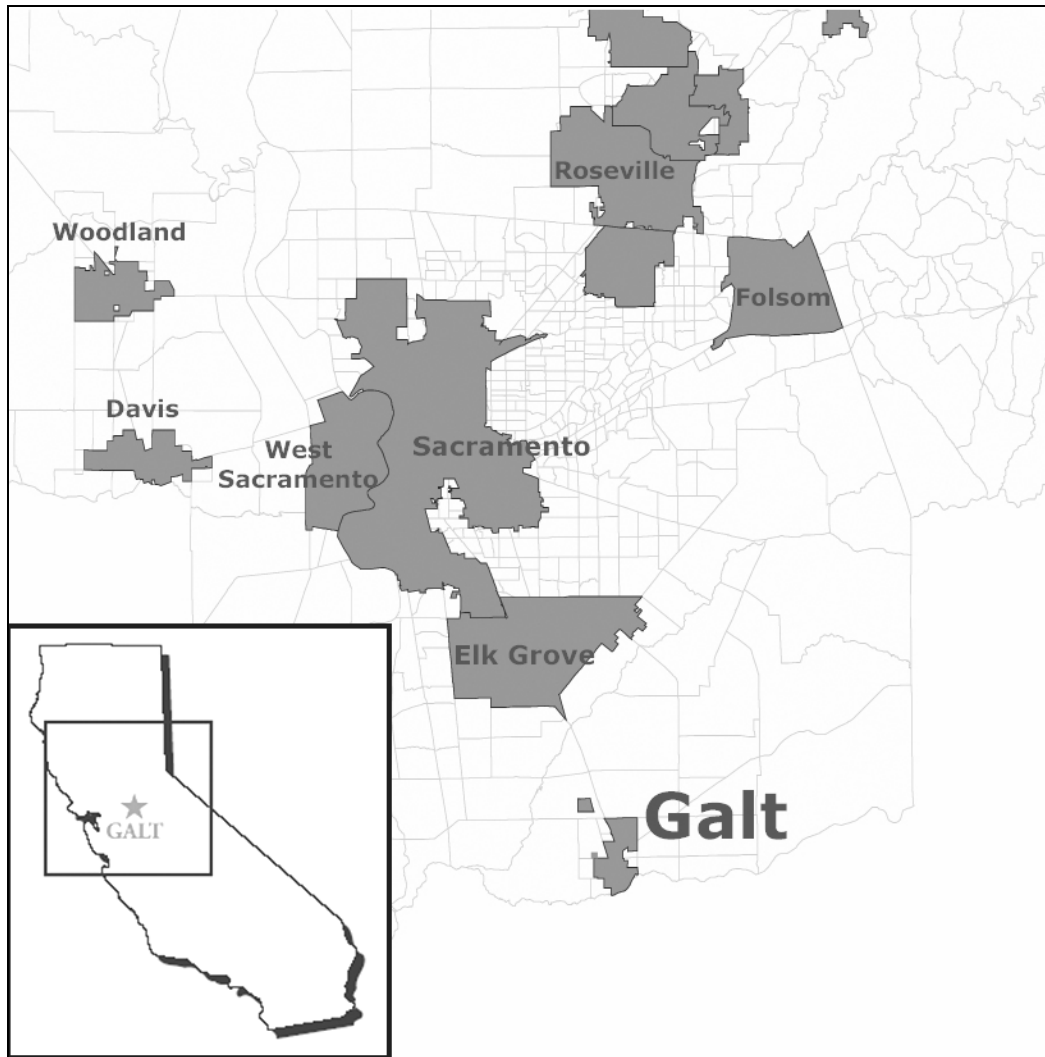
Historic Preservation District

Old Town Galt has always been the heart of the community, extending from 2nd Street in the west to Lincoln Way in the east, and A Street in the north to F Street in the south. The historic commercial core is centered at the intersection of C Street and 4th Street. In the early 1900s most commercial activities fronted on 4th Street facing the railroad property where a 90-foot flagpole marked the center of town activity.

Today, the center of Galt's commercial activity is located at the intersection of C Street and Lincoln Way, with the C Street corridor (between Lincoln Way and Highway 99) providing the majority of commercial space for the Downtown area.

¹ The estimated 2003-04 revenues for the Galt Market is \$3,100,000, and the estimated 2003-04 total budget for the City is \$27,082,575 (source: City of Galt Adopted Budget).

FIGURE 1.1
City of Galt and Vicinity



Sources: Sacramento Area Council of Governments, 2003; City of Galt, 2003; and Mintier & Associates, 2003.

1.2 CITY LIMITS, SPHERE OF INFLUENCE AND STUDY AREA BOUNDARY

The City of Galt has two political boundaries - the first is the more familiar city limits, and the second is the city’s sphere of influence. For the purposes of the General Plan Update, a third non-political boundary known as the Study Area Boundary has been established.

CITY LIMITS

The current (2004) City Limits represents all incorporated lands that are governed by the City of Galt (Figure 1.2). The City Limits roughly extend from Dry Creek on the south to Twin Cities Road on the north; and from McFarland Street/Sparrow Drive on the west to Marengo Road on the east. The City's Wastewater Treatment Facility is a detached incorporated island located north of Twin Cities Road and west of Highway 99. The incorporated city contains 3,760 acres of land, of which 2,211 acres (58 percent) are developed (Mintier & Associates, 2004).

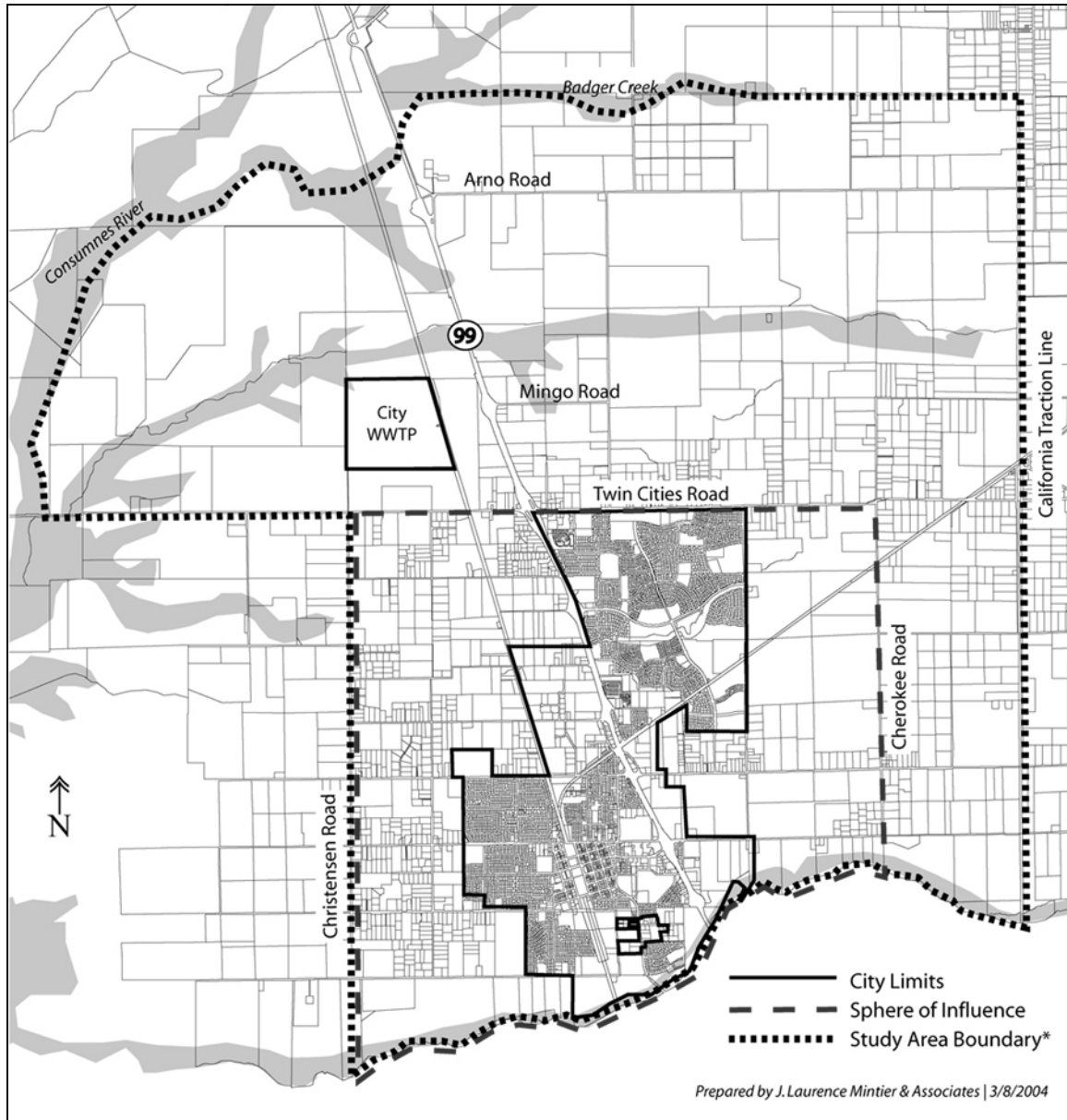
SPHERE OF INFLUENCE

Galt's Sphere of Influence boundary, adopted by the Sacramento County Local Agency Formation Commission (LAFCO) on June 7, 1995, is coterminous with the city limits on the north and south sides (see Figure 1.2), and borders Cherokee Road on the east and Christensen Road on the west. A Sphere of Influence is a plan for the probable physical boundaries and service area of a local governmental agency, as determined by LAFCO, and is periodically reviewed and updated. The Sphere of Influence currently (2004) encompasses 9,017 acres, of which 4,165 acres (46%) are developed (Mintier & Associates, 2004).

STUDY AREA

The Study Area defines the area within which information has been collected for the General Plan Update process. This boundary is larger than the city limits and sphere of influence. This boundary does not indicate any specific intent or plan on the part of the City to expand into the area. It is rather an area where the City has concerns regarding future developments and their associated impacts on Galt.

FIGURE 1.2
City Limits, Sphere of Influence and Study Area Boundary Map



* The Study Area represents areas where the City has concerns about the future and wishes to study as part of its General Plan Update process. Data has been collected for the Existing Conditions Report in this area to better understand Galt's planning context within the larger county area. The boundary does not represent any specific intent or plans on the part of the City to expand into these areas, and those decisions will not be made until later on in the General Plan Update process.

Source: City of Galt, 2003, and Mintier & Associates, 2004.

1.3 PERSONS CONSULTED

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1.4 BIBLIOGRAPHY

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2 | ECONOMIC CONDITIONS

2.1 INTRODUCTION

Economic health and security is a valuable aspect of any growing community. This chapter analyzes Galt's economic state, outlining areas of growth and recession. It is divided into four sections: population and housing trends, economic base analysis, retail market analysis, and economic base analysis methodology.

The first section of the chapter describes historical population and housing growth. In addition, this section provides estimates on population and housing growth in the future. The second section provides an analysis of the employment characteristics for the city and depicts which industries are exhibiting employment gains. The third section is an in-depth market analysis for the Galt area, showing retail sales leakages. The final section of the chapter defines the methodology used by the consultants (Applied Development Economics) to determine local and regional economic trends.

2.2 GALT POPULATION AND HOUSEHOLD TRENDS

According to the US Bureau of the Census, Galt had a population of 19,472 in 2000. The city added 10,697 people from 1990 to 2000. This is a 122 percent change, compared to the 19 percent increase in Sacramento County as a whole, as Table 2.1 below shows. This 110 percent increase is greater than the other Sacramento County cities of Elk Grove or Sacramento, and is also greater than Lodi in San Joaquin County.

In addition to a population growth rate of 122 percent, the number of housing units in Galt increased by 110 percent in that decade. This again was a much greater percentage than either Sacramento County as a whole or the cities of Elk Grove, Sacramento, or Lodi.

Because housing growth lagged slightly behind population growth, the number of persons per household increased slightly between 1990 and 2000 in Galt, from 3.0 to 3.1. Except for Elk Grove, the number of persons per household in Galt exceeded persons per household rates in comparison areas of Lodi, Sacramento and Sacramento County as a whole.

TABLE 2.1
Growth of Population and Housing in Galt, Elk Grove, Lodi,
Sacramento, and Sacramento County, 1990 – 2000

	1990	2000	Total Growth	Percent Change
Population				
Galt	8,775	19,472	10,697	122%
Elk Grove	N/A	59,984	N/A	N/A
Lodi	51,874	56,999	5,125	10%
Sacramento	366,500	407,081	40,581	11%
Sacramento County	1,031,500	1,223,499	191,999	19%
Housing				
Galt	2,964	6,211	3,247	110%
Elk Grove	N/A	18,894	N/A	N/A
Lodi	19,676	21,378	1,702	9%
Sacramento	151,012	163,957	12,945	9%
Sacramento County	410,471	474,814	64,343	16%
Persons Per Unit				
Galt	3.0	3.1	0.1	3%
Elk Grove	N/A	3.2	N/A	N/A
Lodi	2.6	2.7	0.1	4%
Sacramento	2.4	2.6	0.2	8%
Sacramento County	2.5	2.6	0.1	4%

Sources: Applied Development Economics, SACOG Population and Housing for Sacramento by Jurisdiction, Lodi from U.S. Census, 1990 and 2000.

It is clear that Galt will continue to expand in population. According to current estimates, the population in Galt in 2002 was 22,321—an increase of 14 percent since 2000. According to SACOG estimates for population growth in Sacramento County, Galt can expect to have a population of over 29,000 in 2015 and over 33,800 in 2025. Table 2.2 shows the projected population growth for Galt and Sacramento County. Population estimates for year 2002 in Table 2.2 is based on population estimates calculated by the US Bureau of the Census, while subsequent population figures for years 2005 through 2025 are official projections used by SACOG for the purposes of regional land-use planning and analysis. According to SACOG, Galt will grow by two percent annually between 2002 and 2025. However, local officials in Galt believe that, based on recent trends, Galt will grow by 3.4 percent annually between 2002 and 2025. Population projections based on the 3.4 percent annual growth are included in Table 2.2.

TABLE 2.2
Population Projections in Galt and Sacramento County

	2002	2005	2015	2020	2025	Annual Growth Rate 1990 – 2000	Annual Growth Rate 2002 – 2025
Galt (local)	22,321	24,391	32,779	38,000	44,150	8.3%	3.4%
Galt (SACOG)	22,321	23,450	29,210	31,620	33,790	8.3%	1.8%
Sacramento County	1,305,082	1,335,283	1,574,420	1,646,045	1,695,498	1.8%	1.1%

Sources: Applied Development Economics, SACOG 1990 and 2000, 2002 US Census Population Estimates for Counties and sub-areas, City of Galt, and SACOG Sacramento County Population Projections

Table 2.3 shows population and housing unit numbers as projected by local officials for Galt from 2000 through 2025. Housing units were calculated based on persons per housing rates calculated by SACOG for the city of Galt.

TABLE 2.3
Population and Housing Projections for Galt

	2000	2005	2010	2015	2020	2025
Population	19,472	24,391	28,276	32,779	38,000	44,052
Housing Units	6,196	8,130	9,425	11,303	13,103	15,190
Persons per Housing Unit	3.0	3.0	3.0	2.9	2.9	2.9

Source: Applied Development Economics, City of Galt and SACOG Sacramento County Projections.

2.3 GALT ECONOMIC BASE ANALYSIS

GALT EMPLOYMENT BASE

Located in southern Sacramento County, Galt has only recently begun to experience the employment growth demands of the Greater Sacramento region. Situated along Highway 99, Galt and surrounding communities are important transportation hubs for rail and trucking. According to SACOG, 2,960 people were employed in Galt in 2000—one percent of the Sacramento County workforce.¹ With an estimated population of 19,472, this translates into 6.2 residents per job.

TABLE 2.4
Ratio of Residents to Employment in Sacramento County (2000)

	Population	Employment	Ratio of Residents to Jobs
Galt	19,472	2,960	6.6
Sacramento	409,610	268,366	1.5
Elk Grove	72,685	20,585	3.5
Folsom	53,810	23,207	2.3
Citrus Heights	89,050	16,729	5.3

Source: Sacramento Area Council of Governments.

Galt has a higher ratio of residents-to-jobs than most Sacramento County cities (Table 2.4). This indicates not only a jobs-to-resident imbalance, but also that most Galt residents commute to work outside of the city. With one percent of the Sacramento County employment base, Galt has 1.5 percent of Sacramento County residents.

Employment in Galt is concentrated in non-manufacturing industries (services, warehousing, transportation, government, etc.) and retail. This concentration is much

¹ SACOG estimates 561,728 jobs in Sacramento County for the same period.

greater than Sacramento city or the county as a whole, but compares similarly to other Sacramento County cities. Table 2.5 shows the percentage of employment concentration amongst Sacramento County industries by jurisdiction.

TABLE 2.5
Percent Distribution of Employment by Sacramento County Jurisdictions

	Retail	Office	Medical	Education	Manufacturing	Other
Galt	27%	12%	7%	18%	5%	31%
Sacramento (City)	13%	41%	11%	5%	6%	23%
Elk Grove	31%	17%	4%	12%	6%	30%
Folsom	26%	10%	6%	5%	28%	26%
Citrus Heights	51%	10%	6%	6%	0%	27%
Sacramento County	18%	33%	9%	6%	7%	28%

Source: Sacramento Area Council of Governments, 1999 employment estimates.

Galt increased employment by 31 percent from 1990 to 1999, for a total of over 650 jobs. Education added the most jobs with 246 and had the largest percentage growth at 95 percent. Medical had the second largest percentage growth at 82 percent, adding 89 jobs. These sectors are highly dependent on the strong population growth in the city. Table 2.6 illustrates the estimated employment in Galt from 1990 to 1999.

TABLE 2.6
Galt Employment, 1990 – 1999

	1990	1995	1997	1999	Change
Retail	571	612	760	741	170
Office	305	307	329	346	41
Medical	109	109	161	198	89
Education	258	318	429	504	246
Manufacturing	142	112	197	148	6
Other	751	824	546	855	104
Total	2,136	2,282	2,422	2,792	656

Source: Sacramento Area Council of Governments, Sacramento County employment estimates by city.²

While population in Galt has seen a growth rate over the last decade of about eight percent, employment growth has been closer to three percent. This is expected to change. SACOG estimates that employment growth in Galt will be 3.5 percent from 1999 until 2025. Population growth is expected to be less, at 2.5 percent for the same period. Applying a rate of 3.5 percent, SACOG estimates current employment in Galt to be between 2,960 and 3,560.

² SACOG calculates employment holding capacities by an employment yield matrix with ten individual zoning categories. Each category is further divided into five different employment types (Retail, Office, Medical, Manufacturing and Other) and measured in employees per acre. Each land use type from a General Plan is coded to one of the zoning categories. The number of jobs expected in each employment category was calculated based on the total acreage of each type in each area. Consideration was given to topography if it placed limits on development. Retail = SIC 52-59, Office = SIC 40-49, 60-67, 91-97, Medical = SIC 80, Education = SIC 82, Manufacturing = SIC 20-39, Other = SIC 01-19, 50, 51, 68-79, 81, 83-90, 99. Estimates are current as of May 2001.

CURRENT GALT EMPLOYMENT

SACOG's estimate of the current total number of jobs is not broken down by industry. Using a commercial database,³ it is estimated that there are 3,308 jobs within the Galt zip code. Table 2.7 breaks down the current employment in the Galt area.

The largest employers in Galt are education and government administration/services. Together they employ 786 of the 3,308 employed in the Galt area. Retail trade is the next largest industry employer with 732 employees. Prominent manufacturers in the Galt area include Stone, Clay, Glass, and Concrete Products and Printing, Publishing and Allied Industries.

The Galt area has a well-diversified industry base. Table 2.8 shows the percentage of employment by major industry in Galt compared to Sacramento County.

Having defined employment growth and change in select industries over the past decade in Sacramento and San Joaquin Counties, the remainder of the economic base analysis focuses on those industries that would be potential targets for Galt expansion or attraction.

TABLE 2.7
Employment in the Galt Area, 2003⁴

Industry	No. Bus	% Total Businesses	Total Emps
Ag, Forestry, Mining	17	4.1%	126
Construction	37	9.0%	149
Manufacturing			
<i>Food and Kindred Products</i>	2	0.5%	31
<i>Apparel, Finished Products</i>	1	0.2%	1
<i>Lumber and Wood Products, Except Furniture</i>	2	0.5%	7
<i>Printing, Publishing and Allied Industries</i>	5	1.2%	58
<i>Chemicals and Allied Products</i>	1	0.2%	8
<i>Stone, Clay, Glass, and Concrete Products</i>	4	1.0%	300
<i>Primary Metal Industries</i>	1	0.2%	10
<i>Fabricated Metal Products</i>	3	0.7%	98
<i>Industrial and Commercial Machinery and Computer Equipment</i>	1	0.2%	1
<i>Electronic, Electrical Equipment and Components</i>	1	0.2%	2
<i>Miscellaneous Manufacturing Industries</i>	6	1.5%	13
Transportation and Communications	15	3.6%	98
Wholesale Trade	15	3.6%	37
Retail Trade	98	23.7%	732
Finance, Insurance and Real Estate Services	34	8.2%	132
<i>Hotels, Rooming Houses, Camps, and Other Lodging Places</i>	2	0.5%	27
<i>Personal Services</i>	31	7.5%	68
<i>Business Services</i>	32	7.7%	52
<i>Automotive Repair, Services and Parking</i>	17	4.1%	54
<i>Miscellaneous Repair Services</i>	7	1.7%	10
<i>Amusement and Recreation Services</i>	9	2.2%	99
<i>Health Services</i>	14	3.4%	185
Industry	No. Bus	% Total Businesses	Total Emps

³ Dunn & Bradstreet Marketing Solutions.

⁴ Italicized industries are subsets of larger aggregated categories.

TABLE 2.7
Employment in the Galt Area, 2003⁴

Legal Services	2	0.5%	4
Educational Services	12	2.9%	529
Other Services	37	9.0%	217
Government	8	1.9%	260
Total	413	100	3,308

Source: Dunn and Bradstreet Marketing Solutions, 2003. Data is for Galt Zip Code 95632.

TABLE 2.8
Galt vs. Sacramento County Employment Base, 2003

Industry	Galt	Sacramento County
Ag, Forestry, Mining	3.8%	1.1%
Construction	4.5%	18.0%
Nondurable Goods - Manufacturing	3.2%	2.5%
Durable Goods - Manufacturing	12.8%	3.1%
Transportation, Communications and Wholesale	4.1%	11.3%
Retail Trade	22.1%	12.6%
Finance, Insurance and Real Estate	4.0%	7.9%
Services	36.8%	31.1%
Government	7.9%	12.5%
Total	100.0%	100.0%

Source: Dunn and Bradstreet Marketing Solutions, 2003. Data is for Galt Zip Code 95632.

SACRAMENTO AND SAN JOAQUIN INDUSTRIES

Sacramento County is a more dominant economic entity than San Joaquin County. Seventy-one percent of the total employment in the two counties is in Sacramento County. Due to Galt's location, San Joaquin County will play an important role in its development. Because of this, San Joaquin County industry trends have been incorporated into this analysis.

TABLE 2.9
Sacramento and San Joaquin Employment Change 1991 – 2000

Industry	Sacramento and San Joaquin Employment 1991	Sacramento and San Joaquin Employment 2000	Change in Sacramento and San Joaquin Employment 1991 to 2000
Services	146,470	201,725	55,255
Construction	30,857	44,752	13,895
Retail Trade	113,600	127,064	13,464
TCPU	26,491	34,815	8,324
Manufacturing	51,305	59,565	8,260
Fire	44,438	49,571	5,133
Agriculture	22,879	26,037	3,158
Wholesale Trade	30,532	30,977	445
Total	466,572	574,506	107,934

Notes: Total employment does not include mining or unclassified establishments; TCPU–Transportation, communications, and public utilities; FIRE–Finance, insurance, and real estate; Agriculture includes agricultural crops, agricultural services, forestry, and fishing. Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

As shown in Table 2.9, services are the largest employer in Sacramento and San Joaquin Counties, and had the largest employment gain from 1991 to 2000. Retail trade is the second largest industry in Sacramento and San Joaquin Counties. Retail trade had the third largest gain in employment from 1991 to 2000. Manufacturing is the third largest employer in the region and had the fifth largest employment gain from 1991 to 2000.

INDUSTRY PERFORMANCE FOR SACRAMENTO AND SAN JOAQUIN COUNTIES

The previous section identified sectors and industries that comprise the economic base of the City of Galt and the Sacramento-San Joaquin region. This section places economic data in a comparative context, comparing Sacramento County-San Joaquin County region against the State of California, to identify growth industries and to determine whether growth industries are growing as fast as or in excess of similar industries in the state. This section also analyzes whether particular growing industries are concentrated more so in the Sacramento-San Joaquin region than in the state. In looking at relative growth rates and levels of concentration, the analysis begins to shed light on those industries in which the region maintains a comparative advantage, as well as gives insights into which industries are emerging and which are declining. Local officials can use the information in this section to identify possible target industries that they might want to pursue in conjunction with their partners in the private sector.

Table 2.10 shows the major industry categories and their performance in employment compared to California from 1991 to 2000. The table provides economic trends data in absolute and relative terms. The first two columns track absolute employment growth by sector for the two-county region and California as a whole. As shown in the table, the construction industry had the largest absolute percentage change in employment in Sacramento and San Joaquin Counties from 1991 to 2000. Over the same period, manufacturing grew by 16 percent in the region, whereas it declined by

four percent in the state.

Table 2.10 also tracks economic trends in relative terms. Column three (“relative growth”) shows that employment in agriculture in the two-county region declined by eight percent in relative terms. This is so because, while agriculture increased by 14 percent in absolute terms between 1991 and 2000, this rate of growth lagged behind statewide absolute growth of 21%. Thus, relative to the state, employment in agriculture declined.⁵ Another relative measure employed in Table 2.10 is “concentration.”⁶ Generally speaking, industries that exhibit concentration ratio greater than 1.25 are thought to be highly concentrated industries, so much so that they export their goods and services to places outside of the region. Based on the last column in the table, construction and finance-insurance and real estate (FIRE) are highly concentrated in the two-county region, with concentration ratios of 1.36 and 1.34 respectively. Table 2.10 also shows that the concentration of agriculture in the region declined from 1.23 in 1991 to 1.11 in 2000, meaning that, relative to the state, agriculture is still a prominent part of the regional economy although less so than in 1991.

⁵ Relative Growth = $(\text{[change in emp. by industry "x" by region]} / \text{[base year emp in industry "x" by region]}) / (\text{[change in emp. by industry "x" by state]} / \text{[base year emp. in industry "x" by state]})$. If “relative growth” is greater than “0”, then industry in region is growing faster than same industry in the state.

⁶ The concentration ratio for a specific industry is the ratio of the number of jobs in a specific industry in a specific place versus all jobs in the same place, versus the number of jobs in the same specific industry for a larger area (such as the State of California) versus all jobs in the larger area. A ratio of 1 means that an industry is distributed within the economy of an area in the same way that it is distributed in the comparison area’s economy. Likewise, a ratio greater than 1 means that an industry is more concentrated in a given area relative to the way the industry is concentrated in a comparison area. Ratios are also used as indicators of export and import activity. Differences in productivity at the level of establishments, regional labor needs, regional consumption patterns, and quality of products and services are factors that also influence whether an industry exports products and services. As a general rule of thumb, if the ratio is between 0.80 and 1.25, it cannot be said for certain that an area is a net exporter or importer.

TABLE 2.10
Industry Performance For Sacramento and San Joaquin Counties
1991 – 2000

Industry	----- ABSOLUTE GROWTH -----		----- RELATIVE ECONOMIC GROWTH -----		
	Percentage Change in Sacramento and San Joaquin Employment 1991 to 2000	Percentage Change in State Employment 1991 to 2000	Relative Growth 1991 - 2000	Concentration 1991	Concentration 2000
Agriculture	14%	21%	-8%	1.23	1.11
Construction	45%	33%	12%	1.30	1.36
FIRE	12%	-1%	12%	1.24	1.34
Manufacturing	16%	-4%	20%	0.59	0.68
Retail Trade	12%	13%	-1%	1.20	1.14
Services	38%	37%	1%	1.01	0.97
TCPU	31%	20%	11%	1.01	1.06
Wholesale Trade	1%	12%	-10%	0.95	0.83
TOTAL	23%	18%			

Notes: Agriculture includes agricultural crops, agricultural services, forestry, and fishing; FIRE–finance, insurance, and real estate; TCPU–transportation, communications, and public utilities. Total employment does not include unclassified establishments.

Sources: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

Locally concentrated industries include agriculture, construction, FIRE (finance, insurance, and real estate), and retail trade. Agriculture, while having an employment gain, declined in employment relative to the state and declined in its local concentration. FIRE became more locally concentrated and gained in employment. This is relative to the state, which saw a decline in FIRE employment. Retail trade had a slight decline in employment relative to the state.

Wholesale trade had a slight increase in employment, but lost concentration. Manufacturing had an increase in employment, bucking the statewide trend of job loss. This meant that manufacturing in Sacramento and San Joaquin Counties gained in the local concentration of manufacturing industries.

ECONOMIC BASE ANALYSIS OVERVIEW

The above information shows how the major industry divisions performed in Sacramento and San Joaquin Counties relative to the state. While some divisions saw only small employment gains, it does not mean that all industries within that category had such performance. To more accurately determine the region's performance since 1991, ADE ranked industries at a detailed level on the basis of two economic indicators – job growth between 1991 and 2000, and the employment concentration relative to the state. Once the indicators are calculated, the industries fall into one of four “quadrants.” These quadrants indicate the performance of a particular industry within the economy.

Business Attraction

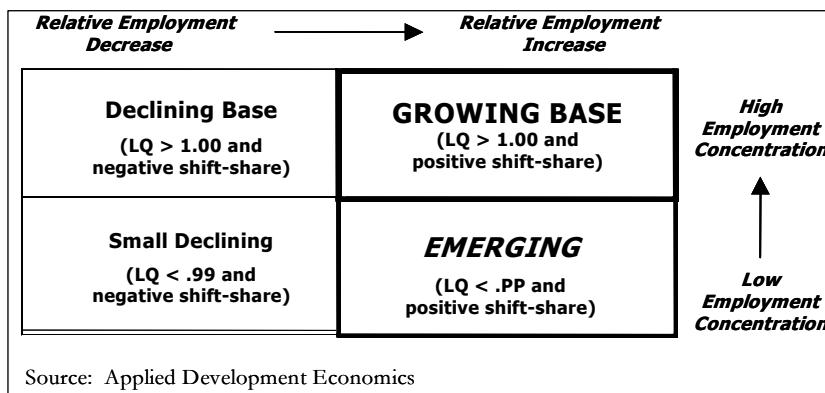
- **Growing Base** – High Concentration: Industries within this quadrant are considered growing economic sectors. They are economic base industries that have a high growth rate and a high local concentration. They constitute the strength of the economy, and represent opportunities for growth in other areas as supplier industries.
- **Emerging Base** – Low Concentration: This quadrant contains the emerging industries. These industries have shown accelerated growth, but still have room for further expansion.

Business Retention

- **Declining Base** – High Concentration: The declining economic base includes industry sectors that have a high local concentration but have a negative growth rate. These businesses have a concentration based on local comparative advantages, but the industry is weakening. They are strong industries that have shown some recent vulnerability, and could be considered business retention targets.
- **Small Declining** – Low Concentration: These industries do not have a notable regional presence and do not have growth prospects as strong as the industries in other quadrants. Industry sectors in this category would normally be considered targets only as part of a strategy to increase the local creation of products or services now being imported to strengthen a local industry cluster.

Figure 2.1 illustrates the parameters of the four quadrants. Within each quadrant is the possibility that an industry may be doing better, or worse, than the state. Identifying all industries will help Galt in making land use decisions—adjusting zoning for growing needs and vice-versa for declining industries in the region. This information is also important for business attraction and retention efforts.

FIGURE 2.1
Industry Performance Quadrants⁷



⁷ For a discussion of the location quotient “LQ” (i.e. concentration ratios) and shift-share (i.e. relative growth) see footnote 5 and 6

GALT ECONOMIC BASE ANALYSIS (Industrial and Commercial Users)

Table 2.11 graphically displays the base industries that are growing or declining, as well as the small emerging and small declining industries compared to the state at the three digit SIC level.⁸

⁸ The Standard Industrial Classification (SIC) system has served as the structure for the collection, aggregation, presentation, and analysis of the US economy for over 60 years. An industry consists of a group of establishments primarily engaged in producing or handling the same product or group of products or in rendering the same services.

TABLE 2.11
Concentrated, Growing, Emerging, and Declining
Sacramento and San Joaquin Base Industries
1991 – 2000

DECLINING BASE		GROWING BASE	
SIC	Industry	SIC	Industry
203	Preserved fruits and vegetables	202	Dairy products
204	Grain mill products	205	Bakery products
208	Beverages	206	Sugar and confectionery products
244	Wood containers	239	Misc. fabricated textile products
249	Misc. wood products	243	Millwork, plywood and structural members
263	Paperboard mills	245	Wood buildings and mobile homes
321	Flat glass	254	Partitions and fixtures
322	Glass and glassware, pressed or blown	259	Miscellaneous furniture and fixtures
344	Fabricated structural metal products	287	Agricultural chemicals
374	Railroad equipment	306	Fabricated rubber products, nec
503	Lumber and construction materials	325	Structural clay products
515	Farm-product raw materials	327	Concrete, gypsum, and plaster products
		361	Electric distribution equipment
		399	Miscellaneous manufactures
		421	Trucking and courier services, except air
		422	Public warehousing and storage
		494	Water supply
		501	Motor vehicles, parts, and supplies
		505	Metals and minerals, except petroleum
		507	Hardware, plumbing and heating equipment
		508	Machinery, equipment, and supplies
		511	Paper and paper products
		518	Beer, wine, and distilled beverages
SMALL DECLINING		EMERGING	
265	Paperboard containers and boxes	209	Misc. food and kindred products
267	Misc. converted paper products	242	Sawmills and planing mills
275	Commercial printing	251	Household furniture
281	Industrial inorganic chemicals	252	Office furniture
282	Plastics materials and synthetics	272	Periodicals
284	Soap, cleaners, and toilet goods	308	Miscellaneous plastics products, nec
323	Products of purchased glass	347	Metal services, nec
353	Construction and related machinery	349	Misc. fabricated metal products
365	Household audio and video equipment	354	Metalworking machinery
502	Furniture and home furnishings	355	Special industry machinery
506	Electrical goods	356	General industrial machinery
514	Groceries and related products	357	Computer and office equipment
516	Chemicals and allied products	359	Industrial machinery, nec
517	Petroleum and petroleum products	367	Electronic components and accessories
519	Misc. nondurable goods	369	Misc. electrical equipment and supplies
		371	Motor vehicles and equipment
		372	Aircraft and parts
		381	Search and navigation equipment
		382	Measuring and controlling devices
		384	Medical instruments and supplies
		394	Toys and sporting goods
		415	School buses
		451	Air transportation, scheduled
		473	Freight transportation arrangement
		491	Electric services
		495	Sanitary services
		504	Professional and commercial equipment
		509	Miscellaneous durable goods
		512	Drugs, proprietaries, and sundries
		513	Apparel, piece goods, and notions

Source: Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE

GROWING BASE

The largest concentrated base industry in Sacramento and San Joaquin Counties is Trucking and Courier Services (SIC 421). The majority of the workforce (over 10,000) for Trucking and Courier Services is located in San Joaquin County. It also had the

largest gain in employment from 1991 to 2000, adding over 2,700 jobs.

The next largest industry is within the wholesale trade division—Motor Vehicles, Parts, and Supplies (SIC 501), which employed over 3,300 in the region. Motor Vehicles, Parts, and Supplies had an employment gain of 20 percent from 1991 to 2000, adding over 500 jobs.

The largest concentrated manufacturing industry in Sacramento and San Joaquin Counties is Millwork for Plywood and Structural Members (SIC 243). With a 67 percent employment increase from 1991 to 2000, Millwork for Plywood and Structural Members employed over 3,300 in 2000. Other significant concentrated manufacturing industries include Sugar and Confectionery Products (SIC 206), Bakery Products (SIC 205), Miscellaneous Fabricated Textile Products (SIC 239), Concrete, Gypsum, and Plaster products (SIC 327), and Dairy Products (SIC 202).

Table 2.12 shows the performance of the concentrated base industries in Sacramento and San Joaquin Counties from 1991 to 2000.

TABLE 2.12
Sacramento and San Joaquin Counties Concentrated Base Industry Performance
1991 to 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Growth
		1991	2000	1991	2000			
202	Dairy products	974	1,058	1.48	1.44	84	9%	0.02
205	Bakery products	1,251	1,684	1.27	1.50	433	35%	0.26
206	Sugar and confectionery products	894	2,190	2.00	4.28	1,296	145%	1.35
239	Misc. fabricated textile products	385	1,588	0.38	1.29	1,203	312%	2.97
243	Millwork, plywood struct mbrs	1,995	3,325	2.07	2.60	1,330	67%	0.40
245	Wood buildings and mobile homes	385	529	1.88	2.09	144	37%	0.19
254	Partitions and fixtures	525	654	1.59	1.69	129	25%	0.12
259	Misc. furniture and fixtures	100	305	0.39	1.03	205	205%	1.95
287	Agricultural chemicals	263	375	1.74	2.71	112	43%	0.55
306	Fabricated rubber products, nec	296	349	0.85	1.13	53	18%	0.33
325	Structural clay products	50	310	0.45	2.73	260	520%	5.23
327	Concrete, gypsum, plaster product	974	1,295	1.18	1.30	321	33%	0.17
361	Electric distribution equipment	387	635	1.02	2.27	248	64%	0.93
399	Misc. manufactures	521	1,120	1.10	1.37	599	115%	0.50
421	Trucking courier services, exc air	7,610	10,349	1.25	1.55	2,739	36%	0.31
422	Public warehousing and storage	1,335	3,317	1.97	2.62	1,982	148%	0.70
494	Water supply	96	279	0.58	1.23	183	191%	1.58
501	Motor vehicles, parts, and supplies	2,809	3,361	1.33	1.29	552	20%	0.02
505	Metals minerals, exc. petroleum	563	724	0.95	1.09	161	29%	0.20
507	Hardware, plumbing htng equip	1,403	1,561	1.07	1.08	158	11%	0.05
508	Machinery, equipment, supplies	2,868	3,245	0.93	1.01	377	13%	0.13
511	Paper and paper products	1,156	1,107	1.02	1.03	-49	-4%	0.04
518	Beer, wine, and distilled beverages	1,074	1,176	1.48	1.49	102	9%	0.05

Note: NEC is "not elsewhere classified". Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

EMERGING BASE

The emerging base is industries that saw significant employment gains in Sacramento and San Joaquin Counties from 1991 to 2000, but did not have a competitive advantage to the rest of California. In other words, these industries had impressive employment gains, but were still not locally concentrated compared to the rest of the state.

The largest emerging base industry in Sacramento and San Joaquin Counties is Electronic Components and Accessories (SIC 367). Concentrated in Sacramento County, Electronic Components and Accessories employed over 6,300 people in 2000. Electronic Components and Accessories also had the largest increase in employment of any emerging base industry, adding 2,215 jobs from 1991 to 2000. Other large (over 1,000 employees) emerging manufacturing industries include Miscellaneous Plastics Products (SIC 308), Computer and Office Equipment (SIC 357), Motor Vehicles and Equipment (SIC 371), and Industrial Machinery Unclassified (SIC 359).

In addition to manufacturing, large emerging industries include wholesale trade of Professional and Commercial Equipment (SIC 504), Scheduled Air Transportation (SIC 451), and wholesale trade of Drugs, Proprietaries, and Sundries (SIC 512).

The emerging industry that saw the greatest overall percentage increase in employment was manufacturing of Search and Navigation Equipment (SIC 381). Overall, many of the emerging industries had impressive employment gains, with 12 having triple digit percentage increases. Table 2.13 illustrates the performance of Sacramento and San Joaquin Counties' emerging base from 1991 to 2000.

TABLE 2.13
Sacramento and San Joaquin Counties Emerging Base Industry Performance
1991 To 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Growth
		1991	2000	1991	2000			
209	Misc. food and kindred products	373	534	0.35	0.50	161	43%	0.46
242	Sawmills and planing mills	332	362	0.57	0.70	30	9%	0.24
251	Household furniture	479	953	0.41	0.63	474	99%	0.73
252	Office furniture	22	169	0.07	0.40	147	668%	6.32
272	Periodicals	222	377	0.43	0.55	155	70%	0.44
308	Misc. plastics products, nec	1,229	1,647	0.47	0.58	418	34%	0.30
347	Metal services, nec	310	445	0.36	0.44	135	44%	0.29
349	Misc. fabricated metal products	170	659	0.29	0.87	489	288%	2.64
354	Metalworking machinery	143	228	0.20	0.26	85	59%	0.41
355	Special industry machinery	131	278	0.27	0.30	147	112%	0.32
356	General industrial machinery	247	337	0.30	0.43	90	36%	0.44
357	Computer and office equipment	168	1,607	0.04	0.36	1,439	857%	8.54
359	Industrial machinery, nec	557	1,015	0.32	0.48	458	82%	0.68
367	Electronic components accessories	4,170	6,385	0.70	0.86	2,215	53%	0.34
369	Misc. electrical equipment supplies	83	438	0.10	0.78	355	428%	4.64
371	Motor vehicles and equipment	816	1,054	0.64	0.66	238	29%	0.09
372	Aircraft and parts	149	270	0.02	0.08	121	81%	1.33
381	Search and navigation equipment	26	417	0.01	0.19	391	1504%	15.53
382	Measuring and controlling devices	395	517	0.13	0.17	122	31%	0.29
384	Medical instruments and supplies	116	894	0.06	0.39	778	671%	6.53
394	Toys and sporting goods	31	271	0.06	0.37	240	774%	7.40
415	School buses	20	110	0.06	0.29	90	450%	4.40
451	Air transportation, scheduled	1,369	2,480	0.39	0.45	1,111	81%	0.32
473	Freight transportation arrangement	99	216	0.10	0.16	117	118%	0.82
491	Electric services	54	626	0.06	0.84	572	1059%	10.78
495	Sanitary services	471	850	0.49	0.83	379	80%	0.79
504	Professional commercial equipment	3,013	3,763	0.69	0.68	750	25%	0.03
509	Misc. durable goods	1,055	1,552	0.54	0.64	497	47%	0.30
512	Drugs, proprietaries, and sundries	494	1,178	0.58	0.97	684	138%	1.03
513	Apparel, piece goods, and notions	218	299	0.17	0.17	81	37%	0.06

Note: Nec is "not elsewhere classified".

Source: Employment data from Covered Employment and Wages (ES202) 1991 – 2000, calculations by ADE.

DECLINING BASE INDUSTRIES

The declining base industries are defined as those industries that are losing their competitive edge compared to the State. Many declining base industries demonstrate job growth and, therefore, may continue to be important players in the local economy. On the other hand, any economic development efforts related to declining base industries would be focused on regaining a competitive edge as opposed to attraction or growth.

The industry with one of the largest declines in Sacramento and San Joaquin Counties from 1991 to 2000 was manufacturing of Preserved Fruits and Vegetables (SIC 203). Declining over 36 percent, Preserved Fruits and Vegetables lost over 2,300 jobs. Another industry with a notable decline in employment was the wholesale trade of Raw Farm Materials (SIC 515). It is likely that both of these industries declined as the result of a major employer closing.

Other industries with employment losses of more than 200 include the manufacturing industries of Flat Glass (SIC 321), Beverages (SIC 208), Glass and Glassware (SIC 322), and Wood Products (SIC 249); and the wholesale trade of Gas (SIC 492).

A few examples of industry employment gain, but losses of competitiveness include manufacturing of Wood Containers (SIC 244) and Railroad Equipment (SIC 374). Table 2.14 shows the declining base industry performance in Sacramento and San Joaquin Counties from 1991 to 2000.

TABLE 2.14
Sacramento and San Joaquin Counties Declining Base Industry Performance
1991 To 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
203	Preserved fruits veg	6,563	4,197	2.81	2.16	-2,366	-36%	-0.16
204	Grain mill products	1,322	1,228	3.39	2.92	-94	-7%	-0.11
208	Beverages	2,138	1,863	1.70	1.08	-275	-13%	-0.44
244	Wood containers	302	380	1.64	1.48	78	26%	-0.08
249	Misc wood products	1,025	783	2.89	2.32	-242	-24%	-0.15
263	Paperboard mills	299	293	5.23	4.56	-6	-2%	-0.10
321	Flat glass	638	354	7.29	3.57	-284	-45%	-0.53
322	Glassware	625	355	2.01	1.53	-270	-43%	-0.14
344	Fabricated metals	2,270	2,699	1.43	1.37	429	19%	0.00
374	Railroad equipment	38	172	11.32	5.29	134	353%	-4.77
413	us transportation	354	347	5.56	3.26	-7	-2%	-0.62
492	Gas prod & distrib	667	451	1.31	1.10	-216	-32%	-0.10
503	Construction matls	2,392	2,386	2.21	1.82	-6	0%	-0.17
515	Farm-product matls	2,394	140	10.03	1.21	-2,254	-94%	-0.41

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

A few base industries that were not locally concentrated had a large decline in employment relative to the State. The largest of these was Soap, Cleaners, and Toilet Goods (SIC 284), which lost 544 employees. Other industries with significant declines include Commercial Printing (SIC 275), manufacturing of Construction and Related Machinery (SIC 353) and Miscellaneous Converted Paper Products (SIC 267). Table 2.15 shows the performance of declining industries from 1991 to 2000 in Sacramento and San Joaquin Counties.

TABLE 2.15
Sacramento and San Joaquin Counties Declining (Not Concentrated)
Industry Performance
1991 to 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
265	Paperboard containers and boxes	798	763	0.97	0.91	-35	-4%	-0.02
267	Misc. converted paper products	470	262	0.69	0.37	-208	-44%	-0.44
275	Commercial printing	2,526	2,103	0.90	0.80	-423	-17%	-0.07
281	Industrial inorganic chemicals	263	104	0.73	0.45	-159	-60%	-0.22
282	Plastics materials and synthetics	182	125	1.15	0.52	-57	-31%	-0.77
284	Soap, cleaners, and toilet goods	829	285	1.39	0.44	-544	-66%	-0.69
323	Products of purchased glass	205	129	0.92	0.48	-76	-37%	-0.54
353	Construction and related machinery	508	271	1.46	0.82	-237	-47%	-0.38
365	Household audio and video equipment	179	146	0.25	0.19	-33	-18%	-0.25
478	Miscellaneous transportation services	250	141	2.40	0.69	-109	-44%	-1.32
502	Furniture and home furnishings	797	634	0.87	0.50	-163	-20%	-0.55
506	Electrical goods	1,654	1,860	0.49	0.47	206	12%	0.00
514	Groceries and related products	4,865	4,564	1.02	0.86	-301	-6%	-0.12
516	Chemicals and allied products	233	223	0.39	0.31	-10	-4%	-0.23
517	Petroleum and petroleum products	484	477	1.01	0.95	-7	-1%	-0.02
519	Misc. nondurable goods	3,061	2,729	0.97	0.80	-332	-11%	-0.15

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

OFFICE AND SERVICE COMMERCIAL INDUSTRIES

Most base industries are export-related businesses that supply or create a product that is exported outside the local market area, creating local wealth. But some base industries are services that are provided within the local market that bring in outside dollars. The most obvious example is the tourist trade. Because of potential land-use implications and the strong growth in the service sector in the Sacramento region, an analysis of service-providing industries is included here. Looking at the service providing industry's performance from 1991 to 2000, Table 2.16 graphically displays where the industries fall within the quadrants.

TABLE 2.16
Concentrated, Growing And Declining Sacramento and San Joaquin Counties
Service Providing Industries, 1991 – 2000

DECLINING BASE		GROWING BASE	
SIC	Industry	SIC	Industry
60	Depository institutions	61	Non-depository institutions
72	Personal services	63	Insurance carriers
81	Legal services	64	Insurance agents, brokers service
		65	Real estate
		67	Holding and other investment offices
		75	Auto repair, services, and parking
		76	Miscellaneous repair services
		80	Health services
		83	Social services
		86	Membership organizations
SMALL DECLINING		EMERGING	
70	Hotels and other lodging places	62	Security and commodity brokers
78	Motion pictures	73	Business services
84	Museums, botanical, zoological gardens	79	Amusement and recreation services
87	Engineering and management services	82	Educational services
88	Private households	89	Services, not elsewhere classified

Source: Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE

GROWING SERVICE INDUSTRIES

Health Services (SIC 80) is the largest growing service industry in Sacramento and San Joaquin Counties. Health Services employed over 51,000 in 2000 with most of the jobs concentrated in Hospitals (SIC 806). Health Services was followed by Social Services (SIC 83) in size of employment, employing over 16,000. The majority of jobs in Social Services were concentrated in Individual and Family Services (SIC 832) with over 4,900 employed.

The third largest service industry is also the most locally concentrated. Insurance Carriers (SIC 64) employed over 13,000 in Sacramento and San Joaquin Counties in 2000, 10 percent of all state employment. Also, where the state lost employment in the Insurance Carrier industry, Sacramento and San Joaquin Counties gained employment. Within the Insurance Carrier industry, Medical Service and Health Insurance providers (SIC 632) employed the most people.

The majority of service industry growth between Sacramento and San Joaquin Counties is related to growing populations and the demand for services that new population exert. Table 2.17 is the performance of the larger service industries from 1991 to 2000 in Sacramento and San Joaquin Counties with smaller industry concentrations where applicable.

TABLE 2.17
Sacramento and San Joaquin Counties Concentrated Service Providing Industry
Performance
(Including Concentrated Sub-Industries), 1991 To 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
61	Non-depository institutions	2,604	5,784	1.17	1.50	3,180	122%	0.56
614	<i>Personal credit institutions</i>	669	2,928	1.14	4.08	2,259	338%	3.21
63	Insurance carriers	11,327	13,442	1.76	2.17	2,115	19%	0.26
632	<i>Medical service and health insurance</i>	3,170	7,000	2.70	4.53	3,830	121%	0.95
64	Insurance agents, brokers, and service	5,248	5,836	1.41	1.53	588	11%	0.13
65	Real estate	9,054	9,115	1.05	1.01	61	1%	0.01
655	<i>Subdividers and developers</i>	1,814	1,499	1.67	1.91	-315	-17%	0.13
67	Holding and other investment offices	1,703	3,755	1.30	2.08	2,052	120%	0.89
75	Auto repair, services, and parking	6,034	8,851	1.06	1.16	2,817	47%	0.18
753	<i>Automotive repair shops</i>	3,668	4,853	1.20	1.29	1,185	32%	0.15
76	Miscellaneous repair services	2,148	2,251	1.03	1.19	103	5%	0.18
80	Health services	44,662	51,445	1.28	1.23	6,783	15%	0.00
806	<i>Hospitals</i>	17,292	18,884	1.26	1.27	1,592	9%	0.05
83	Social services	11,047	16,825	1.35	1.31	5,778	52%	0.02
832	<i>Individual and family services</i>	3,061	4,922	1.40	1.39	1,861	61%	0.06
86	Membership organizations	5,209	5,936	1.24	1.23	727	14%	0.04

Note: Italicized industries are subsets of larger aggregated categories

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

EMERGING SERVICE INDUSTRIES

Business Services (SIC 73) is the largest emerging service industry in Sacramento and San Joaquin Counties. Adding over 29,000 employees from 1991 to 2000, Business Services more than doubled its employment. While the extent to which this industry is concentrated in the region increased between 1991 and 2000 from .92 to .94, overall it remains less prominent in the region than it is statewide. Within Business Services, Services to Buildings (SIC 734) was the largest employer.

Amusement and Recreation Services (SIC 79), Educational Services (SIC 82) and Security and Commodity Brokers (SIC 62) were the other emerging industries in Sacramento and San Joaquin Counties. Table 2.18 shows the performance of the emerging service industries from 1991 to 2000 with any standout sub industries.

TABLE 2.18
Sacramento and San Joaquin Counties Emerging Service Industry Performance
(Including Concentrated Sub-Industries), 1991 to 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
62	Security and commodity brokers	823	1,583	0.46	0.46	760	92%	0.08
73	Business services	28,340	57,743	0.92	0.94	29,403	104%	0.13
734	<i>Services to buildings</i>	2,971	4,339	0.84	0.88	1,368	46%	0.13
79	Amusement and recreation services	5,956	8,487	0.85	0.83	2,531	42%	0.03
799	<i>Misc. amusement, recreation services</i>	3,682	6,104	0.80	0.80	2,422	66%	0.07
82	Educational services	5,571	8,345	0.84	0.97	2,774	50%	0.25

Note: Italicized industries are subsets of larger aggregated categories.

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

DECLINING CONCENTRATED SERVICE INDUSTRIES

A few concentrated service industries lost some of their competitive edge from 1991 to 2000. Depository Institutions (SIC 60) had the largest decrease in employment. Other employment declines occurred in Personal Services (SIC 72) and Legal Services (SIC 81). Table 2.19 is the performance for concentrated service industries that had relative growth slower than the state.

TABLE 2.19
Sacramento and San Joaquin Counties Declining Service Industry Performance
1991 to 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
60	Depository institutions	13,679	10,056	1.17	1.12	-3,623	-26%	0.00
72	Personal services	6,449	6,295	1.24	1.11	-154	-2%	-0.07
81	Legal services	6,321	5,833	1.10	1.04	-488	-8%	-0.01

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

DECLINING, NOT CONCENTRATED, SERVICES INDUSTRIES

Only one industry that was not concentrated lost employment from 1991 to 2000 in Sacramento and San Joaquin Counties. Hotels and Other Lodging Places (SIC 70)

declined by 286 jobs. All other non-concentrated large industries in Sacramento and San Joaquin Counties gained employment, though not as fast as the state. Table 2.20 is the performance for the non-concentrated service industries from 1991 to 2000.

TABLE 2.20
Sacramento and San Joaquin Counties Declining (Not Concentrated) Service Industry Performance 1991 To 2000

SIC	Industry	Sacramento and San Joaquin Employment		Concentration		Employment Change 1991 to 2000	% Change in Employment 1991 to 2000	Relative Performance
		1991	2000	1991	2000			
70	Hotels and other lodging places	4,868	4,582	0.60	0.50	-286	-6%	-0.13
78	Motion pictures	1,681	2,247	0.31	0.25	566	34%	-0.23
84	Museums, botanical, zoological gardens	150	197	0.50	0.37	47	31%	-0.37
87	Engineering and management services	13,857	16,369	0.81	0.76	2,512	18%	-0.03

Source: Employment data from Covered Employment and Wages (ES202) 1991 - 2000, calculations by ADE.

GALT EMPLOYMENT GROWTH

According to the California Employment Development Department (EDD), Sacramento County will continue to experience employment growth from now until at least 2006, as the Sacramento region's economy continues to expand and diversify. Galt is expected to be part of this growth with SACOG projecting employment of over 6,880 jobs by 2025. Applying this same rate of growth (three percent) to the Galt area⁹, over 9,800 jobs will be present in 2025.

The majority of job growth in Sacramento and San Joaquin Counties, as shown here, has occurred in services. This is expected to continue with EDD projecting over 49,000 new service industry jobs in Sacramento County by 2006. Retail is also expected to expand a great deal as is the finance, insurance, and real estate industries. Government is expected to hold steady or decline. Manufacturing in Sacramento County is expected to continue a trend of diversification and grow by over 7,700 jobs by 2006.

Assuming the distribution of jobs by industry remains constant in the Galt area, Table 2.21 shows the projected employment for 2006.

⁹ Zip code 95632

TABLE 2.21
Galt Area Employment, 2005 Estimate

Industry	Projected 2005 Employment
Ag, Forestry, Mining	351
Construction	290
Manufacturing	899
Transportation, Communications and Wholesale	375
Retail Trade	850
Finance, Insurance and Real Estate	125
Services	1,535
Government	410
TOTAL	4,711

Source: ADE, Inc, based on EDD Sacramento County employment projection data and Dun and Bradstreet Marketing Solutions for Galt zip code 95632.

ADE estimates that there will be just over 4,700 jobs in the Galt area¹⁰ by 2005. If the percentage of jobs by industry remains constant, the Galt area can expect the bulk of employment to be in services. But while this may hold true for the Galt area, the City of Galt may have a different employment distribution. It is important for Galt to know what is expected so that it can plan accordingly. By selecting target industries, Galt can engage stakeholders and perform outreach to help develop its economic base.

Using SACOG employment projections and current estimates, ADE has estimated employment growth in Galt. Table 2.22 shows estimated growth in Galt from current estimates to 2025.

TABLE 2.22
**Projected Employment Growth in City of Galt
 2000 – 2025**

Industry	2000	2005	2010	2015	2020	2025
Ag, Forestry, Mining	171	199	227	237	248	260
Construction	245	285	324	339	355	372
Manufacturing	148	169	183	182	182	181
Transportation, Communications and Wholesale	264	308	350	366	384	401
Retail Trade	688	824	1,009	1,136	1,279	1,439
Finance, Insurance and Real Estate	106	124	140	147	153	160
Services	1,048	1,315	1,805	2,280	2,878	3,635
Government	290	337	382	400	417	436
TOTAL	2,960	3,560	4,421	5,087	5,896	6,884

Source: Calculations by ADE based on projected employment totals by SACOG at an overall 3% annual growth rate.

The above tables assume a growth rate similar to what occurred from 1990 to 1999 in Galt. For example, from 1990 education and medical services (part of the services

¹⁰ Zip code 95632

industry group) grew from 17 percent of total employment to 25 percent of total employment in 1999. The estimate above estimates that services currently accounts for 35 percent of employment, increasing to over 50 percent of employment in Galt by 2025. Table 2.23 is the projected change in employment distribution in Galt from 2003 through 2025.

TABLE 2.23
Projected Employment Distribution in Galt from 2003 – 2025

Industry	2003	2005	2010	2020	2025
Ag, Forestry, Mining	6%	6%	5%	4%	4%
Construction	8%	8%	7%	6%	5%
Manufacturing	5%	5%	4%	3%	3%
Transportation, Communications and Wholesale	9%	9%	8%	7%	6%
Retail Trade	23%	23%	23%	22%	21%
Finance, Insurance and Real Estate	4%	3%	3%	3%	2%
Services	35%	37%	41%	49%	53%
Government	10%	9%	9%	7%	6%
	100%	100%	100%	100%	100%

Source: Calculations by ADE based on employment growth rates from SACOG employment estimates from 1990 to 1999.

TARGET INDUSTRIES

While all industries are expected to gain in employment in Galt, retail and services are expected to add the most employees. Looking at the performance of industries in Sacramento and San Joaquin Counties allows Galt to see which are most likely to locate in the city.

Service Providing Industries (Finance, Insurance, Real Estate and Services)

Within Sacramento and San Joaquin Counties personal credit institutions had the largest positive change in employment from 1991 through 2000. With steady population growth it can be expected that Galt will increase the demand for these businesses along with other financial services such as security and commodity brokers. Also, insurance brokers are expected to continue to expand employment.

Health services have seen growth in Galt over the last decade and can be expected to continue to expand. Also in need of office space and business park type facilities are business services that have been growing faster in Sacramento and San Joaquin Counties than the state. Educational services will also continue to expand. To summarize, service-providing industries that Galt can expect to grow are:

- Credit Unions/Banks
- Security and Commodity Brokers
- Insurance Agents
- Health Services
- Business Services (including, service to buildings, temporary employment agencies)
- Educational Services

Base Industry (Manufacturing, Wholesale Trade)

The Galt area has a large concentration of manufacturers and transportation related facilities. This is part of the industries that begin on Power Inn Road in Sacramento

and extend throughout South Sacramento County along Highway 99. But the City of Galt proper has fewer manufacturers than the unincorporated area surrounding the city. As shown above, Galt is expected to increase little in manufacturing. But even so, Galt can effectively change this if it chooses or play an integral role in attracting business that may be on the outskirts of the city or within its sphere of influence. Base industries to promote for attraction or likely to grow locally include:

Nondurable Goods

- Sugar and confectionery products
- Miscellaneous fabricated textile products

Durable Goods

- Miscellaneous fabricated metal products
- Miscellaneous furniture and fixtures
- Structural clay products
- Miscellaneous electrical equipment and supplies
- Office furniture
- Search and navigation equipment
- Medical instruments and supplies

Transportation and Wholesale Trade

- Distribution of Drugs, proprietaries, and sundries

2.4 RETAIL MARKET ANALYSIS

INTRODUCTION

This section of the report quantifies spending on the part of households in Galt and in the regional market trade area, which includes Galt, and census tracts and census block groups immediately surrounding Galt. This section tracks spending on a variety of retail goods, and compares this spending potential against actual sales of retail goods by Galt retailers. In so doing, this report identifies what is known as “retail sales leakage,” which occurs when household spending for particular retail store types and goods exceed actual sales for the same retail goods. Local officials can use information on retail sales leakage to attract new retailers into the City, or to encourage existing retailers to do more to fulfill the unmet needs of local residents.

Given the distances households are willing to travel to shop, this section examines household demand, actual sales, and potential sales leakages in a broader regional geographic context. The market trade area in this report includes and extends beyond the boundaries of the City of Galt, and is calculated based on a variety of factors. These factors include distance, regional, and super-regional shopping malls in the region and, for households living outside of Galt, the relative convenience in driving to Galt versus the other regional and super-regional malls.

RETAIL SALES LEAKAGE ANALYSIS: CITY OF GALT AND REGIONAL MARKET TRADE AREA

Market Area

Figure 2.2 is a map of the region surrounding the City of Galt. Located in Southern Sacramento County, where the county borders San Joaquin County, its neighbor to

south, Galt has experienced the growth pressures recently experienced by other communities in the Greater Sacramento region. Figure 2.3 identifies the regional market trade area, which consists of Galt and census tracts and blocks group immediately surrounding Galt.

FIGURE 2.2
City of Galt and
Surrounding
Region

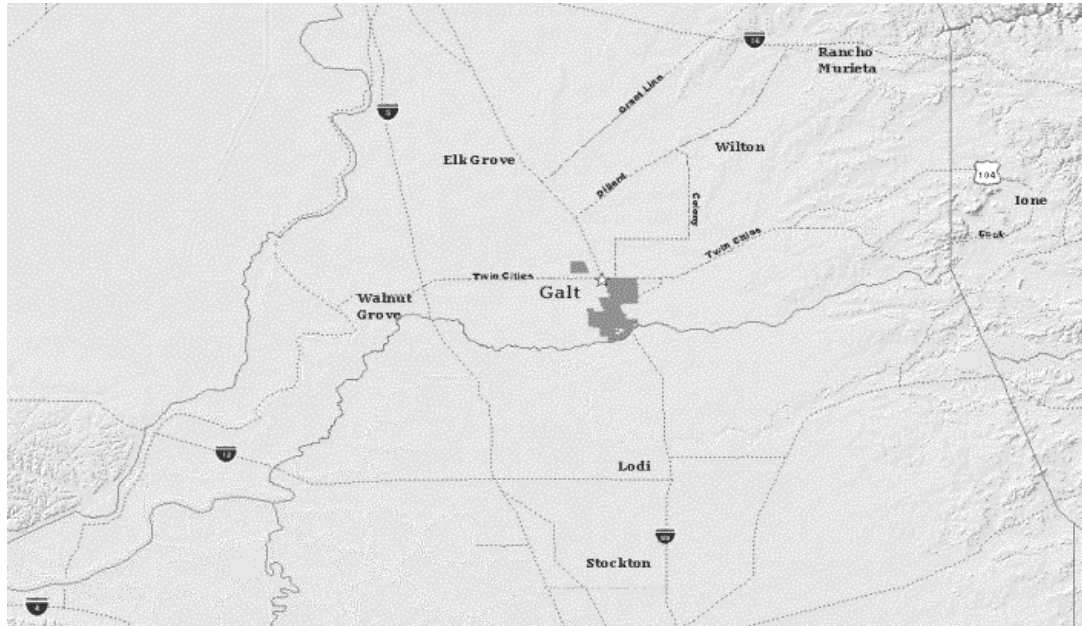
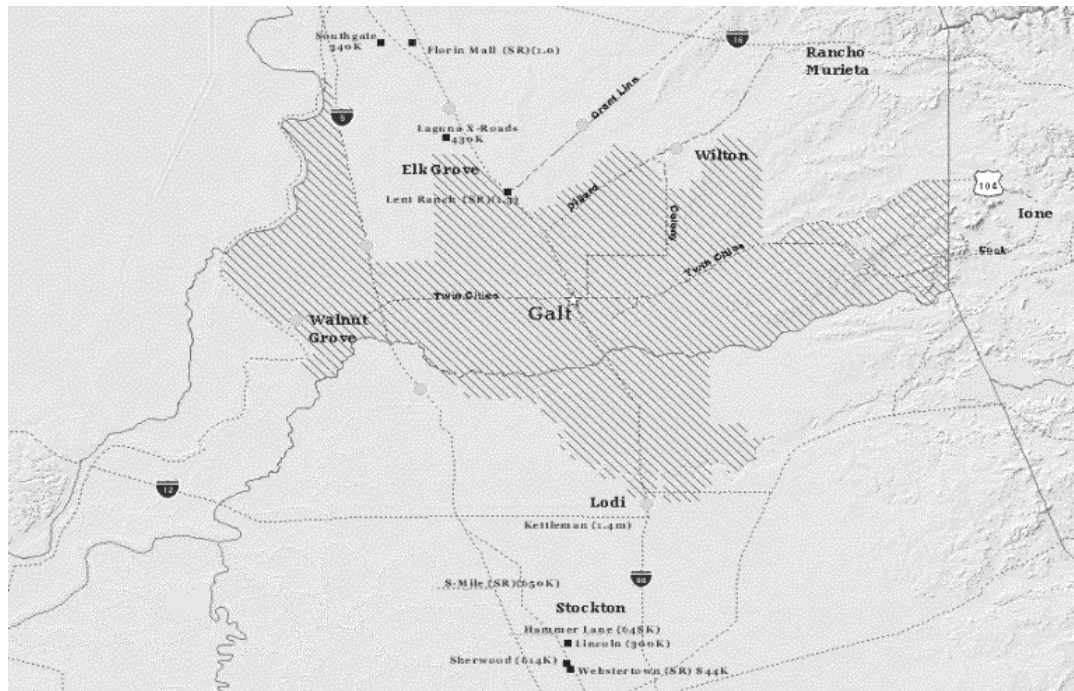


FIGURE 2.3
Regional Market
Trade Area and
Competition



Methodology

When examining retail demand and sales trends, the analysis typically includes data for specific types of stores within broad categories—such as household demand for and retail sales by auto supply stores, which are within the automotive group category. The City of Galt provided the consultant with sales data by specific store types. Due to confidentiality requirements of the data in a relatively small city such as Galt, for the purposes of this analysis, the consultant aggregated data to preclude the release of information on specific establishments and for store types with no more than three establishments.

In devising the regional trade area market, we first identified the geographic extent from which households from the region could potentially come to shop in Galt. In devising the extent of the market area, we relied on analysis of the Urban Land Institute (ULI), which determined that regional malls attract shoppers from distances of up to 12 miles. Thus, in preparing the regional market area, the regional market trade area stretched 12 miles in all directions from the center of Galt. Then we identified the census tracts and block groups that comprise the market area. We also identified existing regional and super-regional malls that could attract households within the regional market trade area. Table 2.24 identifies the regional and super-regional shopping malls in the surrounding region.

TABLE 2.24
Regional Competition: Regional, Super-Regional and Major Commercial Corridors

	NAME	CITY	TYPE	SQ. FT.
1	Marketplace At Birdcage	Citrus Heights	Regional shopping mall	314,000
2	Sunrise Mall	Citrus Heights	Super-regional shopping mall	1,100,000
3	Laguna Crossroads Center	Elk Grove	Regional shopping mall	430,000
4	Lent Ranch Marketplace (proposed)	Elk Grove	Super-regional shopping mall	1,300,000
5	Rancho Cordova Town Center	Rancho Crdva	Regional shopping mall	313,000
6	Arden Fair Mall	Sacramento	Super-regional shopping mall	1,113,000
7	Country Club Center	Sacramento	Regional shopping mall	370,000
8	Country Club Plaza	Sacramento	Regional shopping mall	545,000
9	Florin Mall	Sacramento	Super-regional shopping mall	1,000,000
10	Natomas Marketplace	Sacramento	Regional shopping mall	500,000
11	Southgate Plaza	Sacramento	Regional shopping mall	340,000
12	Westfield Shopping Downtown Plaza	Sacramento	Regional shopping mall	340,000
13	Kettleman commercial corridor	Lodi	Commercial corridor	1,400,000
14	Eight Mile Road Shopping Mall	Stockton	Regional shopping mall	650,000
15	Hammer Lane shopping corridor	Stockton	Commercial corridor	648,000
16	Sherwood Regional Mall	Stockton	Regional shopping mall	614,000
17	Lincoln Regional Shopping Mall	Stockton	Regional shopping mall	360,000
18	Webster Town Regional Shopping Ctr	Stockton	Regional shopping mall	844,000

Source: Applied Development Economics.

Finally, we applied a mathematical algorithm to determine the probability that a household in some census tract or block group outside of Galt would shop in Galt versus the other regional and super-regional shopping centers, given distance to and total square footage of each regional and super-regional shopping center. With the

probability figure, we could then estimate the amount of households from the regional market trade area who would shop in Galt.

Household Demand in Galt and Regional Market Trade Area

Table 2.25 distributes potential household spending by retail groups. In aggregate, the 6,456 households¹¹ in Galt spent up to \$113.9 million in a variety of retail store types and categories in the year 2003. As demonstrated in the table, households in the regional market trade area annually spend an estimated \$189.7 million at a variety of retail store types.

TABLE 2.25
Retail Spending By Retail Categories

	City of Galt Trade Area HH Demand	Regional Market Trade Area HH Demand
General merchandise stores	\$23,537,627	\$39,247,167
Apparel stores	\$6,836,976	\$11,403,990
Discount stores	\$6,621,981	\$11,060,306
Department stores	\$4,515,857	\$7,556,438
Other (warehouse clubs)	\$5,562,813	\$9,226,433
Food stores	\$23,659,559	\$38,955,200
Grocery stores	\$19,544,635	\$32,191,344
Convenience stores	\$876,038	\$1,439,061
Drugs and proprietary	\$3,238,886	\$5,324,795
Eating and drinking places	\$9,249,358	\$15,353,888
Home furnishings and appliances	\$6,990,317	\$11,849,186
Building material and farm implements	\$4,068,050	\$6,858,367
Auto dealers and auto supplies	\$26,783,386	\$44,766,923
Service stations	\$9,753,180	\$16,062,574
Other retail stores (include specialty)	\$9,885,373	\$16,573,609
	\$113,926,850	\$189,666,914

Source: Applied Development Economics.

It should be noted that not all of this spending will occur in Galt. For example, regional market trade area households annually spend approximately \$18.5 million in discount (\$11.0 million) and department stores (\$7.5 million). Households in the local market will spend \$11.1 million in discount and department stores. These types of stores include Sears, Wal-Mart, and Target. Because no such establishments currently operate in Galt, this spending goes to other communities that have discount and department stores, most likely Lodi, Elk Grove or perhaps even Stockton. This distinction between spending and where it occurs will be discussed further in the section pertaining to retail leakage.

¹¹ SACOG, 2003.

Among households in the local and regional market trade areas, the two largest retail categories are food stores and the automotive group. Together, these categories account for 41 percent of the total retail spending among regional market area residents.¹² Among the individual store types within these broad categories, new car dealerships and grocery stores each account for a large share, with grocery spending representing \$32.2 million of the \$34.6 million in the larger food store category.

Retail Sales Leakage Analysis: City of Galt Trade Area

As Table 2.26 shows, households in Galt annually spend an estimated \$113.9 million at a variety of retail store types. In contrast, retailers in Galt sell an estimated \$107.6 million in goods. Overall, retailers in the city experience approximately \$6.3 million in retail sales leakages (i.e. the difference between aggregate actual sales and aggregate household demand).

TABLE 2.26
Retail Sales Leakage Analysis: City of Galt Trade Area, 2003

	Galt Market Trade Area Household Demand, '03	Taxable Sales	Actual Sales	Sales Leakage	Sales Surplus
General merchandise stores	\$23,537,627	\$918,800	\$963,624	\$22,574,002	
<i>apparel stores</i>	\$6,836,976	Confidential	Confidential		
<i>discount stores</i>	\$6,621,981	Confidential	Confidential		
<i>department stores</i>	\$4,515,857				
<i>other (warehouse clubs)</i>	\$5,562,813				
Food stores-drugs and proprietary	\$23,659,559	\$17,460,500	\$54,868,878		\$31,209,320
<i>grocery stores</i>	\$19,544,635	Confidential	Confidential		
<i>convenience stores</i>	\$876,038	Confidential	Confidential		
<i>drugs and proprietary</i>	\$3,238,886	Confidential	Confidential		
Eating and drinking places	\$9,249,358	\$12,444,500	\$13,827,222		\$4,577,865
Home furnishings and appliances	\$6,990,317	\$554,900	\$554,900	\$6,435,417	
Bldg. Matr. And farm implements	\$4,068,050	\$3,426,000	\$3,426,000	\$642,050	
Auto dealers and auto supplies	\$26,783,386	\$10,028,600	\$10,028,600	\$16,754,786	
Service stations	\$9,753,180	\$19,415,900	\$21,012,879		\$11,259,699
Other retail stores (incl. specialty)	\$9,885,373	\$2,911,300	\$2,911,300	\$6,974,073	
	\$113,926,850	\$67,160,500	\$107,593,404	\$6,333,446	

Table 2.26 also shows that the city experiences sales leakages in broad retail categories as well. For example, households in the Galt trade area will spend up to \$23.5 million per year at general merchandise–apparel stores but, by comparison, Galt-based retail stores within this broad category generated \$963,624 in actual

¹² 41% = (\$34.1 million + \$44.7 million) / \$189.7 million

sales. As a result, retailers in the general merchandise-apparel store category experienced \$22.5 million in sales leakages.

In other words, households who live in Galt are spending an estimated \$22.5 million at general merchandise-apparel stores outside of Galt. This report cannot reveal the precise amount leakages experienced by specific store types (such as discount stores) within the broad general merchandise-apparel store category for reasons of confidentiality.

General Merchandise Stores

As Table 2.26 shows, Galt market trade area households will have spent an estimated \$6.6 million at discount stores in the year 2003, which is not enough to support a large-size discount store. On average, large-size discount stores such as Wal-Mart generate \$29.5 million in sales. However, a big-box store such as Wal-Mart sells a variety of merchandise offered by store types within the broad category of general merchandise-apparel store. In other words, should a Wal-Mart locate in Galt, this store will earn its \$29.5 million in sales by capturing some, if not all, of the \$22.5 million in general merchandise-apparel store spending that, for now, is being spent in places other than Galt. Thus, given the amount of leakages in the general merchandise-apparel category, households in Galt cannot support a discount store such as Wal-Mart, although households in Galt and in the census tracts and blocks groups immediately surrounding Galt can support this discount store, as demonstrated in the regional market trade area retail sales leakage analysis. It should be noted that discount stores such as Wal-Mart typically draw shoppers from beyond the city in which they are located.

Food and Drug Stores

As Table 2.26 shows, Galt market trade area households will have spent an estimated \$23.7 million in the year 2003 at food and drug stores, including convenience stores. By comparison, existing food and drug stores generate approximately \$54.9 million in actual sales. In other words, in addition to meeting the needs of Galt households, who spend roughly \$23.7 million on groceries and drug store items, these stores are also serving households who live outside of Galt. Food and drug stores succeed in pulling into Galt approximately \$31.2 million in spending from households who live outside of Galt, most likely in the census tracts and block areas immediately surrounding the city.

Home Furnishings and Appliances

The city of Galt can support one quality home furnishing store and one small electronic store. As Table 2.26 shows, there is approximately \$6.4 million in leakage in home furnishing-appliance category. National home furnishing stores such as Pier 1 Imports, Cost Plus, Linen N' Things, Bed Bath 'N Beyond, and Williams Sonoma sell, on average, \$4.7 million of goods per store. It is important to note that, generally speaking, these stores tend to locate in newer shopping centers, including "big box" centers along highways, and they tend not to locate on a stand-alone basis. A small electronics store such as Radio Shack generates approximately \$1 million in sales annually. Radio Shacks can be found in community and regional malls, as well as in downtown and neighborhood shopping districts.

Building Materials Stores

At \$642,000, there is not enough leakage to support additional building materials stores. National building materials stores such as Home Depot or Lowes locate in

places where they can earn approximately \$35 million. In addition, there is not enough leakage to attract small hardware stores, which locate in places where they can generate at least \$1 million and \$8 million respectively in sales.

Auto Dealers and Auto Supplies

Within the broad category of “auto dealers and auto supplies,” there is enough leakage to support auto parts and supply stores, although not enough leakage to support a new car dealership. As Table 2.26 shows, there is \$16 million in leakage in the auto dealers and auto supplies category. On average, a new car dealership in California seeks to generate \$50 million in sales annually, meaning that there is not enough leakage to accommodate new car dealers. However, since new auto dealers tend to attract customers from areas beyond the city and regional market trade area, decision-makers might still want to consider the possibility of luring a new auto dealer, especially since the city is conveniently located along the highway. There is enough leakage to accommodate auto supply and parts stores which generate less than \$3 million in revenues annually.

Retail Sales Leakage Analysis: Regional Market Trade Area

As Table 2.27 shows, households in the regional market area annually spend an estimated \$189.7 million at a variety of retail store types. In contrast, retailers in Galt sell an estimated \$107.6 million in goods. Overall, retailers in the city experience approximately \$82.1 million in retail sales leakages (i.e. the difference between aggregate actual sales and aggregate household demand).

Table 2.27 also shows that the city experiences sales leakages in specific retail store types as well. For example, households in the regional trade area will spend up to \$39.2 million per year at general merchandise–apparel stores but, by comparison, Galt-based retail stores within this broad category earned \$963,624 in actual sales. As a result, retailers in the general merchandise-apparel store category experienced \$38.3 million in sales leakages. In other words, households who live in Galt and in the census tracts and block groups immediately surrounding Galt are spending an estimated \$38.3 million at general merchandise-apparel stores outside of Galt.

TABLE 2.27
Retail Sales Leakage Analysis: Regional Market Trade Area, 2003

	Regional Market Trade Area Household Demand, '03	Taxable Sales	Actual Sales	Sales Leakage	Sales Surplus
General merchandise stores	\$39,247,167	\$918,800	\$963,624	\$38,283,543	
<i>apparel stores</i>	\$11,403,990	Confidential	Confidential		
<i>discount stores</i>	\$11,060,306	Confidential	Confidential		
<i>department stores</i>	\$7,556,438				
<i>other (warehouse clubs)</i>	\$9,226,433				
Food stores-drugs and proprietary	\$38,955,200	\$17,460,500	\$54,868,878		\$15,913,678
<i>grocery stores</i>	\$32,191,344	Confidential	Confidential		
<i>convenience stores</i>	\$1,439,061	Confidential	Confidential		
<i>drugs and proprietary</i>	\$5,324,795	Confidential	Confidential		
Eating and drinking places	\$15,353,888	\$12,444,500	\$13,827,222	\$1,526,665	
Home furnishings and appliances	\$11,849,186	\$554,900	\$554,900	\$11,294,286	
Bldg. Matrl. And farm implements	\$6,858,367	\$3,426,000	\$3,426,000	\$3,432,367	
Auto dealers and auto supplies	\$44,766,923	\$10,028,600	\$10,028,600	\$34,738,323	
Service stations	\$16,062,574	\$19,415,900	\$21,012,879		\$4,950,305
Other retail stores (incl. specialty)	\$16,573,609	\$2,911,300	\$2,911,300	\$13,662,309	
	\$189,666,914	\$67,160,500	\$107,593,404	\$82,073,510	

General Merchandise Stores

At first glance, it would appear that households in Galt and census areas immediately surrounding the city do not spend enough to support a large-size discount store. As Table 2.27 shows, regional market trade area households will have spent an estimated \$11.0 million in the year 2003, which is not enough to support a large-size discount store. On average, large-size discount stores such as Wal-Mart generate \$29.5 million in sales. However, a big-box store such as Wal-Mart sells a variety of merchandise offered by store types within the broad category of general merchandise-apparel store. In other words, should a Wal-Mart locate in Galt, this store will earn its \$29.5 million in sales by capturing some, if not all, of the \$38.3 million in general merchandise-apparel store spending that, for now, is being spent in places other than Galt. Thus, given the amount of leakages in the general merchandise-apparel category, households in the regional market trade area can support a discount store such as Wal-Mart.

Food and Drug Stores

As Table 2.27 shows, the regional market trade area experiences a leakage in the food and drug category to the tune of \$1.5 million. This is not enough leakage to attract a grocery store or a drug store, which locate in places where they can generate, on average, \$20 million and \$8 million respectively.

Home Furnishings and Appliances

The city of Galt can support between two and four quality home furnishing and appliance stores. As Table 2.27 shows, there is approximately \$11.3 million in leakage in home furnishing-appliance category. National home furnishing stores sell, on average, \$4.7 million of goods per store. A small electronics store generates approximately \$1 million in sales annually. Thus, at \$11.3 million, there is enough leakage to accommodate two quality home furnishing stores and one small electronics store, which altogether will generate roughly \$10.4 million in sales annually.

Building Materials Stores

At \$3.4 million, there is still not enough leakage to support additional building materials stores, particularly national building materials stores such as Home Depot or Lowe's. There is enough leakage to support small hardware stores, which, on average, generates at least \$1 million in sales.

Auto Dealers and Auto Supplies

Within the broad category of “auto dealers and auto supplies,” there is enough leakage to support auto parts stores, although there is still not enough leakage to support a new car dealership. As Table 2.27 shows, there is \$34 million in leakage in the auto dealers and auto supplies category. On average, a new car dealership in California seeks to generate \$50 million in sales annually, meaning that there is not enough leakage to accommodate new car dealers. However, since new auto dealers tend to attract customers from areas beyond the city and regional market trade area, decision-makers might still want to consider the possibility of luring a new auto dealer, especially since the city is conveniently located along the highway. Aside from new auto dealership, there is enough leakage to accommodate other kinds of auto-related stores, such as auto supplies stores like Kragen, Pep Boys or Autozone, all of which generate less than \$3 million in revenues annually.

City of Galt and Regional Market Trade Area: Year 2025

According to local projections, the city of Galt is projected to grow to 44,000 people by the year 2025. In so doing, aggregate household retail spending will increase to \$225.8 million (year 2003 dollars). Moreover, the region surrounding Galt is projected to grow by 1.3 percent annually (or by 30 percent) between 2003 and 2025, according to SACOG. Thus, households in the regional market area will spend an estimated \$345.1 million on retail goods by the year 2025. This figure does not include estimated spending by households in the proposed Del Webb Active Adult Community project, which, if included, increases overall spending in the year 2025 to \$412.4 million. Table 2.28 provides a retail sales leakage analysis based on the projected population growth for the local market area. Table 2.29 provides a leakage analysis based on population projections for the regional market trade area, and this table includes households in the proposed Del Webb project. Both tables assume that the number of stores in 2025 by store category will remain the same as in the year 2003.

TABLE 2.28
Retail Sales Leakage Analysis: City of Galt Trade Area, 2025

	City of Galt Market Trade Area Household Demand, '25	Taxable Sales	Actual Sales	Sales Leakage	Sales Surplus
General merchandise stores	\$46,398,260	\$918,800	\$963,624	\$45,434,636	
<i>apparel stores</i>	\$13,477,306	Confidential	Confidential		
<i>discount stores</i>	\$13,053,499	Confidential	Confidential		
<i>department stores</i>	\$8,901,828				
<i>other (warehouse clubs)</i>	\$10,965,628				
Food stores-drugs and proprietary	\$46,638,618	\$17,460,500	\$54,868,878		\$8,230,260
<i>grocery stores</i>	\$38,527,125	Confidential	Confidential		
<i>convenience stores</i>	\$1,726,878	Confidential	Confidential		
<i>drugs and proprietary</i>	\$6,384,615	Confidential	Confidential		
Eating and drinking places	\$18,232,684	\$12,444,500	\$13,827,222	\$4,405,462	
Home furnishings and appliances	\$13,779,577	\$554,900	\$554,900	\$13,224,677	
Bldg. Matrl. And farm implements	\$8,019,095	\$3,426,000	\$3,426,000	\$4,593,095	
Auto dealers and auto supplies	\$52,796,424	\$10,028,600	\$10,028,600	\$42,767,824	
Service stations	\$19,225,838	\$19,415,900	\$21,012,879		\$1,787,041
Other retail stores (incl. specialty)	\$20,732,087	\$2,911,300	\$2,911,300	\$17,820,787	
	\$225,822,582	\$67,160,500	\$107,593,404	\$118,229,178	

TABLE 2.29
Retail Sales Leakage Analysis: Regional Market Trade Area, 2025

	Regional Market Trade Area Household Demand, '25	Taxable Sales	Actual Sales	Sales Leakage	Sales Surplus
General merchandise stores	\$85,247,288	\$918,800	\$963,624	\$84,283,663	
<i>apparel stores</i>	\$24,468,387	Confidential	Confidential		
<i>discount stores</i>	\$24,148,798	Confidential	Confidential		
<i>department stores</i>	\$16,486,408				
<i>other (warehouse clubs)</i>	\$20,143,695				
Food stores-drugs and proprietary	\$84,126,482	\$17,460,500	\$54,868,878	\$29,257,604	
<i>grocery stores</i>	\$68,909,669	Confidential	Confidential		
<i>convenience stores</i>	\$3,076,098	Confidential	Confidential		
<i>drugs and proprietary</i>	\$12,140,715	Confidential	Confidential		
Eating and drinking places	\$33,422,098	\$12,444,500	\$13,827,222	\$19,594,876	
Home furnishings and appliances	\$25,238,912	\$554,900	\$554,900	\$24,684,012	
Bldg. Matrl. And farm implements	\$15,222,865	\$3,426,000	\$3,426,000	\$11,796,865	
Auto dealers and auto supplies	\$98,587,110	\$10,028,600	\$10,028,600	\$88,558,510	
Service stations	\$35,000,991	\$19,415,900	\$21,012,879	\$13,988,113	
Other retail stores (incl. specialty)	\$35,603,594	\$2,911,300	\$2,911,300	\$32,692,294	
	\$412,449,340	\$67,160,500	\$107,593,404	\$304,855,936	

General Merchandise Stores

Tables 2.28 and 2.29 above show that households in the local and regional markets will spend \$13.0 million and \$24.1 million at discount stores in the year 2025. On average, large-size discount stores such as Wal-Mart generate \$29.5 million in sales. However, a big-box store such as Wal-Mart sells a variety of merchandise offered by store types within the broad category of general merchandise-apparel store. In other words, should a Wal-Mart locate in Galt, this store will earn its \$29.5 million in sales by capturing some, if not all, of the \$45.4 million (Table 2.28) to \$84.3 million (Table 2.29) in general merchandise-apparel store spending that, in 2025, would be leaking out to places other than Galt, should no discount store such as Wal-Mart locate in Galt between 2003 and 2025.

As it is, a large-size national discount store has already expressed strong interest in a site in Galt that is ideally located along Highway 99, with favorable views of and easy access to and from this much traveled highway. Given the strategic location of Highway 99, a Galt-based large-size discount store such as Wal-Mart would be in a good position to compete for the \$45.4 million-\$84.3 million in leakages.

Food and Drug Stores

Even though Galt's population is projected to grow to 44,000 by the year 2025, there will not be any leakages at that time in the food and drugs category, as Table 2.28 shows. As Table 2.29 shows, the regional market trade area experiences leakages in the food and drug category to the tune of \$29.3 million. This is enough leakage to attract a grocery store, particularly a Savemart or an Albertsons, which, on average, generates \$15 million annually. It should be noted that most national chain supermarkets generate approximately \$20 million in annual sales.

Home Furnishings and Appliances

Assuming that there will be the same number of home furnishing and household appliance stores (six stores) in Galt in 2025 as in the year 2003, households in the city and from the surrounding region will be able to support additional home furnishing and appliance stores in the year 2025. In the year 2025, households in the local and regional market trade areas will spend \$13.8 million (Table 2.28) to \$25.2 million (Table 2.29) on home furnishings and appliances. Of this spending, the vast majority will leak out to places other than Galt, or \$13.0 million and \$24.7 million. Thus, households in the local and regional market will be able to support three to four quality home furnishing stores and, at most, one small-sized household electronics-appliance store, if store sale averages of major national chain stores are used when calculating number of supportable stores.

Building Materials Stores

At \$4.5 million (Table 2.28) and \$11.8 million (Table 2.29), there will not be enough leakage to support additional building materials stores, particularly national building materials stores such as Home Depot or Lowes. These stores generate up to \$43.8 million in annual sales. There is enough leakage to support small hardware stores such as Ace or Orchard, which, on average, generates \$1 million and \$8 million in annual sales.

Auto Dealers and Auto Supplies

Within the broad category of "auto dealers and auto supplies," there is enough

leakage in 2025 to support a new car dealership and some auto supply stores. As Table 2.28 shows, in the local market area, there will be \$42 million in leakage in the auto dealers and auto supplies category. For the regional market area, there will be \$88.6 million in leakages in the auto category. On average, a new car dealership in California seeks to generate \$50 million in sales annually, meaning that there is enough leakage to accommodate new car dealers, with additional leakage to justify an auto supply store such as Krage, Pep Boys or Autozone, all of which generate less than \$3 million in revenues annually.

2.5 ECONOMIC BASE ANALYSIS METHODOLOGY

To identify growing and declining industries the *local concentration* (location quotient) of industry sectors, and the *employment growth* of those industry sectors are compared to the state. These calculations show how the local industry sectors are strong or weak and how they are changing compared to the state industry structure. The calculations can help to identify local industry clusters to recruit and retain. The number of employees in each industry sector is a good indicator of the activity of the industry as a whole. ADE calculated the local concentration and employment growth of industry sectors in Sacramento and San Joaquin Counties using the employment by two- and three-digit SIC (standard industrial classification) codes for 1991 and 2000.¹³

The local concentration helps to define the *economic base* of the area. A local concentration greater than 1.00 indicates that the region may export that industry sector's product or service; if less than 1.00, then the region imports that industry sector's product or service.

Calculating the local concentration is not an exact science. Because of differences in productivity of firms, regional labor needs and consumption patterns, and quality and nature of the products produced, the local concentration may not show the actual export employment of the local industry. Generally, if the local concentration is between 1.25 and 0.80, it cannot be said for certain that the area is a net exporter or importer. By definition, local concentrations more than 1.00 indicate that the region is exporting; in reality the region may be a net exporter or importer.

The *relative growth* (called differential shift, or the local portion of the shift-share) of industry sectors compares the changes of the local economy to those of the state economy. As industries become more important in the state—employing more people—those same industries may or may not be adding jobs in Sacramento and San Joaquin Counties. The local growth potential of industry sectors is shown better by the differential shift than by whether the local employment is growing in absolute terms. The differential shift can help show where comparative advantage is increasing. This calculation adds nuance to the categories.

¹³ Employment figures with this detail are available only from state unemployment insurance files, which do not include farm employees, government employees, nonprofit businesses, and the self employed, some domestic service in private homes, children under 18 employed by a parent, persons employed by a son, daughter, or spouse, others. Individuals who hold more than one job may be counted more than once.



3 | COMMUNITY CHARACTER

3.1 INTRODUCTION

The memory of cultural and historical events and community pride are reflected in Galt's pattern of new investment and reinvestment. Every generation has contributed to the image of the community as will future Galtonians. This section provides an examination of the traditions that have created a strong sense of place and community identity within Galt. This chapter provides a qualitative summary of Galt's design character and evolution.

3.2 COMMUNITY IMAGE AND SETTING

PHYSICAL MEMORY AND PLACE: Social, Economic and Physical Centers

Galt's physical transformation reflects generations of investment. It has layers of memories and places that served the community's growth and maturation. Traditional downtown Galt evolved around the railroad and was augmented by the Lincoln Highway. Schools became the focus for community life. Neighborhoods became dependent on automobile access to the freeway. Businesses gravitated towards the movement of goods and people for visibility and increasing their ability to capture a slice of the regional market. Throughout these changes, Galt has demonstrated the ability to remember the past and plan for the future. The image of this philosophy can be seen in Galt's traditional and contemporary investment.

FIGURE 3.1
4th Street Galt



Source: RACESTUDIO, 2003.
Galt's 4th Street was the traditional point of arrival by rail.

FIGURE 3.2
Historic Home in Galt



Source: RACESTUDIO, 2003

The current (1989) General Plan identifies over 50 historic structures and features. Each of these contributes to the character and sense of place in the historic core area. In addition to the structures in the Old Town Historic District, there are farmhouses and agricultural structures that are located within the General Plan study area. These structures provide a link to Galt's agrarian past and can provide an architectural reference and cultural connection for new investment. Many agricultural communities are striving to find ways to integrate these features into their future.

The General Plan also identifies agricultural and natural resources that have provided Galt's scenic rural setting. Dry Creek and Deadman Gulch are two of several natural water features in the General Plan study area. Framed by these creeks and others flowing to the Delta, Galt has an enviable position of being in the midst of riparian habitat and vegetation. These natural places have also been an important part of defining Galt's setting and geographic influence. In addition, Galt is surrounded by a rural landscape.

TRADITIONS: City-Centered Development

Galt's pride comes from a strong sense of belonging to a small and friendly community. The vision of Galt's founding families, leaders, businesses, and citizens has shaped both the physical and social patterns in the community. Traditional Galt had a compact and integrated core where residential, civic, and economic functions took place. In Post War Galt, these activities spread out as in many communities. Contemporary residential and commercial investment to the northeast is geographically and socially separated from Old Town.

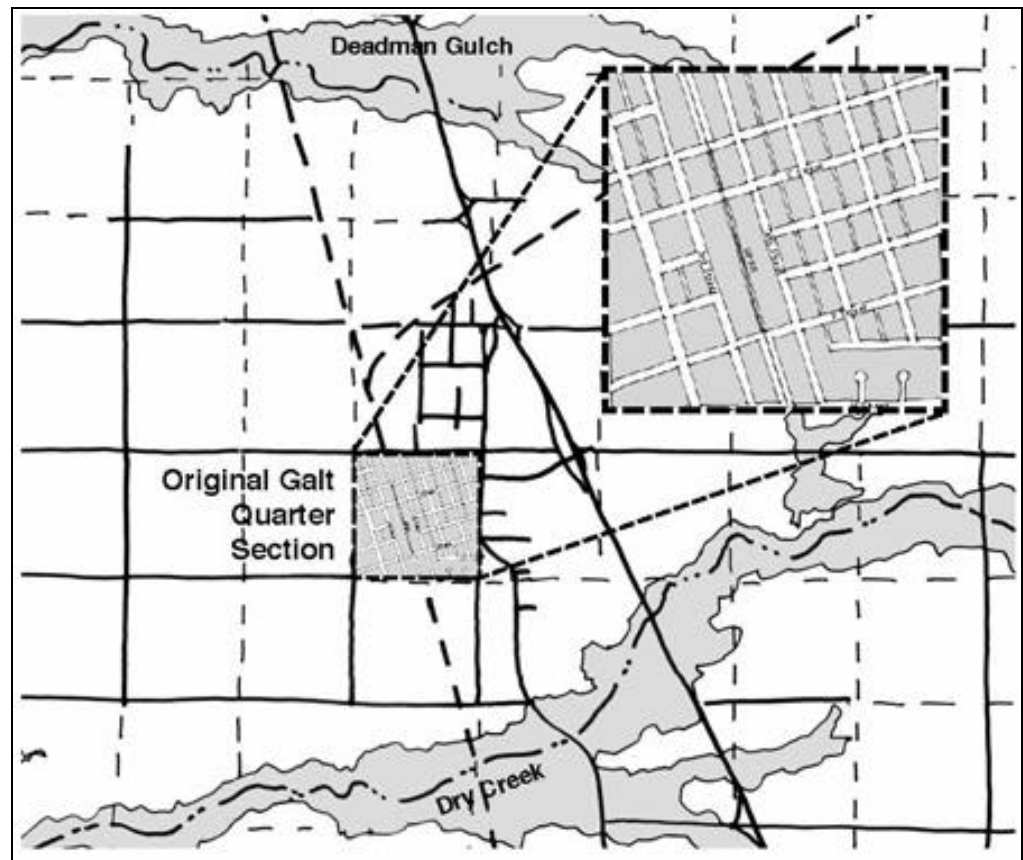
TRENDS: Subdivisions

Recent development trends have been towards curvilinear subdivisions in the northeast. This is different from the traditional pattern of concentric and connected neighborhoods noticed in the downtown area. This land use pattern tends to result in subdivisions where public facilities are isolated from one another.

3.3 GALT'S EVOLUTION

Galt's invention as a railroad and farming community was possible due to its central regional location. This position was reconfirmed with the development of the Lincoln Highway and later as a bedroom community for the growing regional centers of Sacramento and San Joaquin Counties. This section summarizes how Galt has evolved from a railroad town to a bedroom community.

FIGURE 3.3
Galt Township Sections Context



RAILROAD AND FARMING TOWN: Historical Evolution

The Liberty cemetery is all that remains of the settlement of Liberty founded in 1852 on the high ground south of Dry Creek. The settlement provided a port serving barge traffic on the creek serving the gold fields. The settlement can be found on railroad maps from the 1860's. The railroad, in fact, is what changed the future of Liberty.

In 1869, Obed Harvey convinced the Western Pacific Railroad (WPRR) to build tracks through his land, now the location of Galt. The land was surveyed and laid out as the town's grid of streets and lots. In addition, Galt had a regional rail route to the town of Lone in Amador County that curved back to Stockton and connected to the Central Pacific Railroad. The regional and short-haul railroad lines are now owned by the Union Pacific Railroad.

A farmer and businessman named John McFarland named Galt after a town in Canada and built the first brick buildings. As investment drew people to Galt's railroad access, Liberty slowly died. Many of the wood frame buildings were relocated to Galt. The small gridded blocks aligned with the railroad tracks and freight yards. Front Street's (4th Street) businesses supported locals and visitors as well as being the venue for the annual Fourth of July Parade. By the 1880s, the downtown had a variety of food, finance, hardware, and specialty goods and services.

Agriculture thrived with easy access to well water. Grain and ranching were important activities that were later augmented with dairy cattle, feed crops, and orchards. Local manufacturing businesses were connected to Galt's role as an agricultural center. Examples of large local employers were Sego Milk Products and Utah Condensed Milk Company.

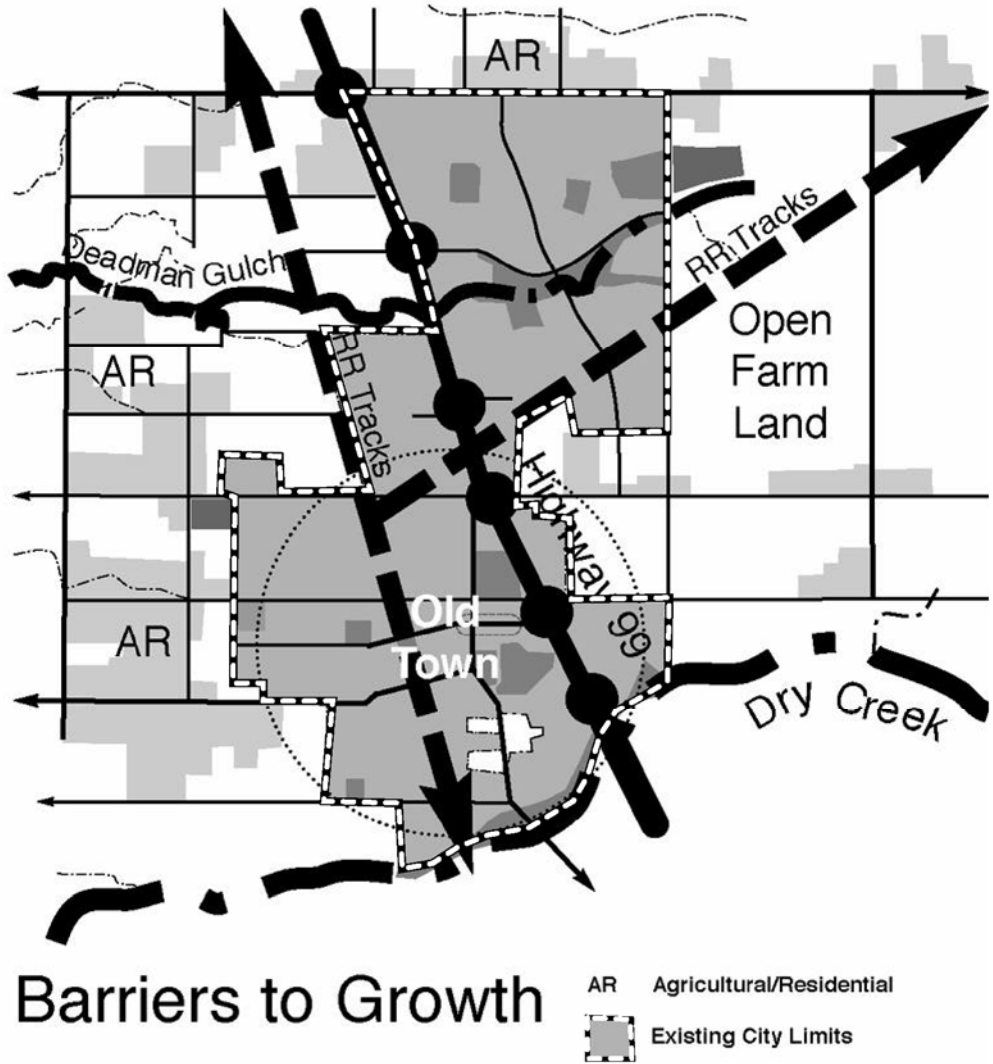
Galt's successful local stock show and fair later turned into the Sacramento County Fair. In 1969 the fairgrounds were given to the community and became the Galt Market. The legal agreements with the State dedicated revenue from the market to flow to Galt's recreational facilities as long as it was used for a public use.

TOWNSHIP PATTERNS: Original Town Plan

Galt is resting in a context of one-mile grid squares of rural roads created by California's Township and Section system. This orthogonal system of roads organizes agricultural fields and property lines. Crisscrossing the mile grid are creeks, railroad lines, and Highway 99. Galt has grown within the grid and these built and natural barriers.

Galt's original town pattern consisted of blocks that aligned with the railroad and fit neatly into one of the quarter sections. Later development took place at the edges of this compact and definable community of 160 acres. This second generation was informally opportunistic, taking advantage of open land and city services around the quarter section "square".

FIGURE 3.4
Barriers to Growth



Source: RACESTUDIO, 2003.

STATE ROUTE 99: Part of First National Highway

In 1912 Galt had the longest iron bridge in California. Crossing Dry Creek, it was part of the Lincoln Highway. The Lincoln Highway (now Lincoln Way) was part of the first national road from 1913 to 1926. The road brought the first generation of auto-oriented retail to the east end of the town. In 1928, State Route 99 was formed connecting the Central Valley. Galt’s historic highway routes have evidence of early auto-oriented commercial uses such as roadside produce stands, diners, motels and service stations. State Route 99 did more than create opportunities for local businesses, it connected Galt to the growing cities of the region.

BEDROOM TOWN: Post War Suburbs

Since Galt was incorporated in 1946, the town has increasingly become part of the regional economy. By 1980, 62 percent of Galt's employees were commuting outside the city with 22.7 percent going towards Sacramento and 35.1 percent going to San Joaquin County. The trend continues with increasing interest in residential development. Balancing residential development with local employment opportunities continues to be a challenging objective.

GROWTH BARRIERS: Railroads and Highway

Galt has grown into two cities. One is located around the traditional downtown. The other has grown to the northeast. This asymmetrical pattern reflects the path of least resistance for subdivision development. The community has Agricultural Residential (AR) uses, Highway 99, the railroad tracks, and creeks that separate and channel development.

3.4 PATTERNS AND URBAN FORM

Galt's location on Dry Creek and at the intersection of regional and short-haul railroads reflected the desire to be an accessible commercial service and agricultural business center. Railroads, roads, and wetlands have shaped the community. Future urban patterns will reflect these traditional form-giving features while responding to new regional access requirements. This section summarizes the role wetlands, working landscapes, Agricultural Residential (AR) subdivisions, railroads, and roads have played in shaping Galt.

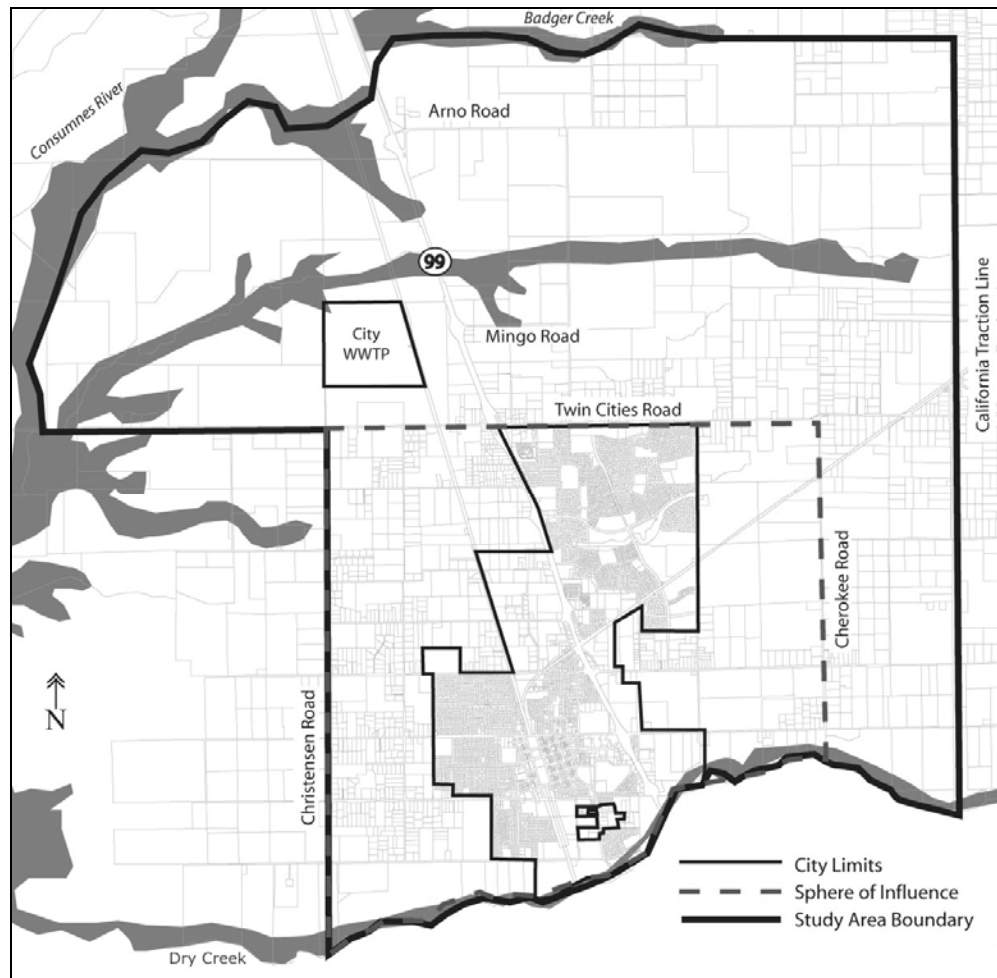
WETLANDS: Part of the Delta

Galt has significant flood plain areas along Dry Creek to the south and Deadman Gulch to the north. At the northern boundary of the General Plan study area is the Consumnes River Preserve. These wetlands are natural barriers and shapers of growth patterns. Dry Creek is the county line and has flood plains and vegetation that defines the southern edge of Galt. To the west are Hen Creek wetlands and the San Jon De Los Moquelumnes. Deadman Gulch is a significant east-west wetlands and recreational feature within the City. Riparian woodlands can be found along portions of the creeks. In addition, the existing (1989) General Plan identifies vernal pools in the northern portions of the study area near Arno Road east of Highway 99.

WORKING LANDSCAPES: Rural Setting

Galt's role as a sub-regional agricultural center came from strong farming tradition and rail access. Galt's dairy, grain, and orchard crops have resulted in an open scenic landscape of working fields and farms. The agricultural and natural landscapes between Galt and neighboring communities provides a rural travel experience along Highway 99 and other county roads. Land Preservation Act areas to the west of Galt's Sphere of Influence are subject to Williamson Act contracts.

FIGURE 3.5
Galt Wetlands Context



Source: Mintier & Associates, 2003.

SACRAMENTO COUNTY'S AGRICULTURAL RESIDENTIAL POLICIES AND ZONING: Ranchettes

Galt's rural setting has been eroding in recent years, as the area has become a desirable "ranchette" location. Sacramento County has approved scores of Agricultural Residential (AR) subdivisions around Galt. These subdivisions do not appear rural, but as low-density suburban developments effectively altering the scenic landscape with low-amenity and low-density suburban housing. This development also hems in the town making it difficult to pursue a rational and healthy pattern of more land-efficient annexation. This is a particularly difficult problem on the west and north sides of Galt.

RAILROADS: Barriers

Union Pacific has two lines running through Galt both of which were assumed from the Southern Pacific Railroad. The main north-south line was the original Western Pacific Railroad and the northeast line part of the sub-regional system supporting the foothills. The main line separates traditional Galt west of Highway 99. The sub-

regional line bisects the southern portions of the 1990's and 2000's subdivisions in northeast Galt. Besides the physical separation, these also impact the community with noise.

FIGURE 3.6
Union Pacific Locomotives in Galt



Source: RACESTUDIO, 2003.

FIGURE 3.7
Dry Creek Gateway and Boundary



Source: RACESTUDIO, 2003.

3.5 CIVIC FRAMEWORK

Galt is a “main street” and railroad town that has been evolving into a contemporary suburb. This section examines Galt’s existing framework of streets and places, neighborhoods, and travel experiences to better understand how new investment can result in a better-planned and designed community.

FIGURE 3.8
Downtown Galt



Source: RACESTUDIO, 2003.

GALT'S CIVIC FRAMEWORK

Galt's constellations of urban and natural environments are experienced by residents and visitors and provide the quality of life that Galtonians cherish. Streets, civic parks, public buildings, and landmarks contribute to the community's urban form.

Galt's Signature Streets

Galt's signature streets include important historic travel routes that have played an important economic, transportation, and social function. C Street has been Galt's "main street" and gateway from Highway 99. 4th Street was the train arrival street. Lincoln Way was the historic Lincoln Highway. New Hope Road and Twin Cities have connected Galt to adjacent communities. Each has played an important role in the community's history.

FIGURE 3.9
Former Sego Milk Water Tower



Source: RACESTUDIO, 2003.

Community Parks

Railroad Park facing 4th Street between B and C Streets was the central square and arrival place for Galt. The park is located across the street from where the Galt railroad depot was once located (Galt Historical Society, 2004). Stores, a hotel, churches, industry, and homes abutted this important space. As Galt's economy shifted towards the Lincoln Highway, and later Highway 99, the park lost some of its importance. The Lincoln Highway became the new civic focus with City Hall being moved to a storefront near C Street. The County Fair Grounds and Galt High School were also built along Lincoln Way.

The Galt Market converted the Fair Grounds into a financial and commercial asset for Galt. The Market, as long as it is used for public purposes, provides funding for Galt's recreational programs and facilities. It is also a regional destination and an important part of Galt's identity.

Galt's creeks and wetlands are part of the community's open space and recreational system. The 1989 General Plan included plans for creating a creek-side park (Dry Creek Parkway) connected to Meadowview Park along Kost Road. A portion of this park was developed as part of the Creekside Subdivision east of Lincoln Way. In addition, Deadman Gulch, Emerald Vista, and Canyon Creek parks are part of this open space system. Connecting the local creek open space system to the Consumnes River as part of a regional trail system was also an existing General Plan policy.

Galt has made an effort to include parks with schools. Greer Basin Park and McCaffery Middle School is an example of a joint use park. The northeastern subdivisions of the 1990s and 2000s were planned to include schools and open spaces as central features. Located at the intersection of Walnut Avenue and Carillion Boulevard is Galt Community Park. This park is connected to the Deadman Gulch wetlands.

Located in the southeast portion of the community is Dry Creek Golf Course. The clubhouse is accessed off Crystal Way, a frontage road off Highway 99 in Galt. The course is located primarily in San Joaquin County.

Community Buildings

Galt has clustered community facilities on the former Fair Grounds site. City Hall, Chabolla Community Center, and Galt Library are located here. The post office was moved out of downtown to North Lincoln Way. The Municipal Services Center (Engineering, Building and Planning Departments) is located in the Galt Industrial Park.

Public safety buildings are located in other parts of the community. The police building is located in the industrial park on Industrial Drive. Fire stations are located on 5th Street in Old Town and on Walnut Avenue in northeastern Galt.

Located on Twin Cities Road near Midway Avenue is the Richard A. McGee Correctional Training Facility. This facility is used by the State as a training center for the Department of Corrections.

FIGURE 3.9
Galt Library



Source: RACESTUDIO, 2003

Landmarks

Galt's landmarks take on a variety of forms, but act as important references for wayfinding and making a cultural connection to the past.

One of the most famous is the downtown Galt water tower located south of C Street between 5th and 6th Streets. In addition, there is a water tower standing on F Street that once served the former Sego Milk Products facilities that burned down in 1992. In other locations, smaller residential water towers still stand in backyards.

Historic churches in the downtown area are both architectural and cultural landmarks. Found in visible locations, these revival buildings are taller and uniquely designed structures.

FIGURE 3.10
St. Luke's Episcopal Church



Source: RACESTUDIO, 2003.

CENTRAL PLACES

Galt has changed from a community with *one* central place to a community of *many* central places. As Galt has changed from a main street community to a suburban bedroom community, it has added places that provide social and economic focus.

Old Town Galt

The traditional point of arrival, economic and social focus was Front Street (now 4th Street). The downtown still functions as the spiritual center of the town, even if the economic forces have moved contemporary retailing to Highway 99. It is Galt's original central place. Old Town is the most pedestrian friendly part of the community. The early residential and commercial streets are connected and walkable.

Lincoln Way

In 1913, the Lincoln Highway (now Lincoln Way) connected to Old Town's eastern edge along C Street. Storefront buildings, gas stations, and city hall were located here. It functioned as Galt's "number one corner" until the 1950s when the city began to reorient itself towards Highway 99 along C Street.

FIGURE 3.11
Old Town Galt



Source: RACESTUDIO, 2003.

Schools as Centers of Community

Galt takes great pride in schools. Schools are located throughout the town acting as recreational and social centers in neighborhoods. There are four elementary schools, two middle schools and a high school. A continuation high school is adjacent to Galt High School. A conscious effort has been made to integrate schools into the community as it grows, making them central to everyday life.

Two new school sites have been purchased outside Galt's city limits. A new high school site is located along Marengo Road in northeastern Galt. The second site is located on Galt's west side along Orr Road.

The Galt Market

In 1946 when the City was incorporated, many of the early residents around Galt were farmers. Local farmers began meeting in a field east of the community to sell their produce. Cattlemen began bringing animals to sell, and farmers, ranchers, and families would come to see what was for sale. This once a week gathering was the beginning of the Market.

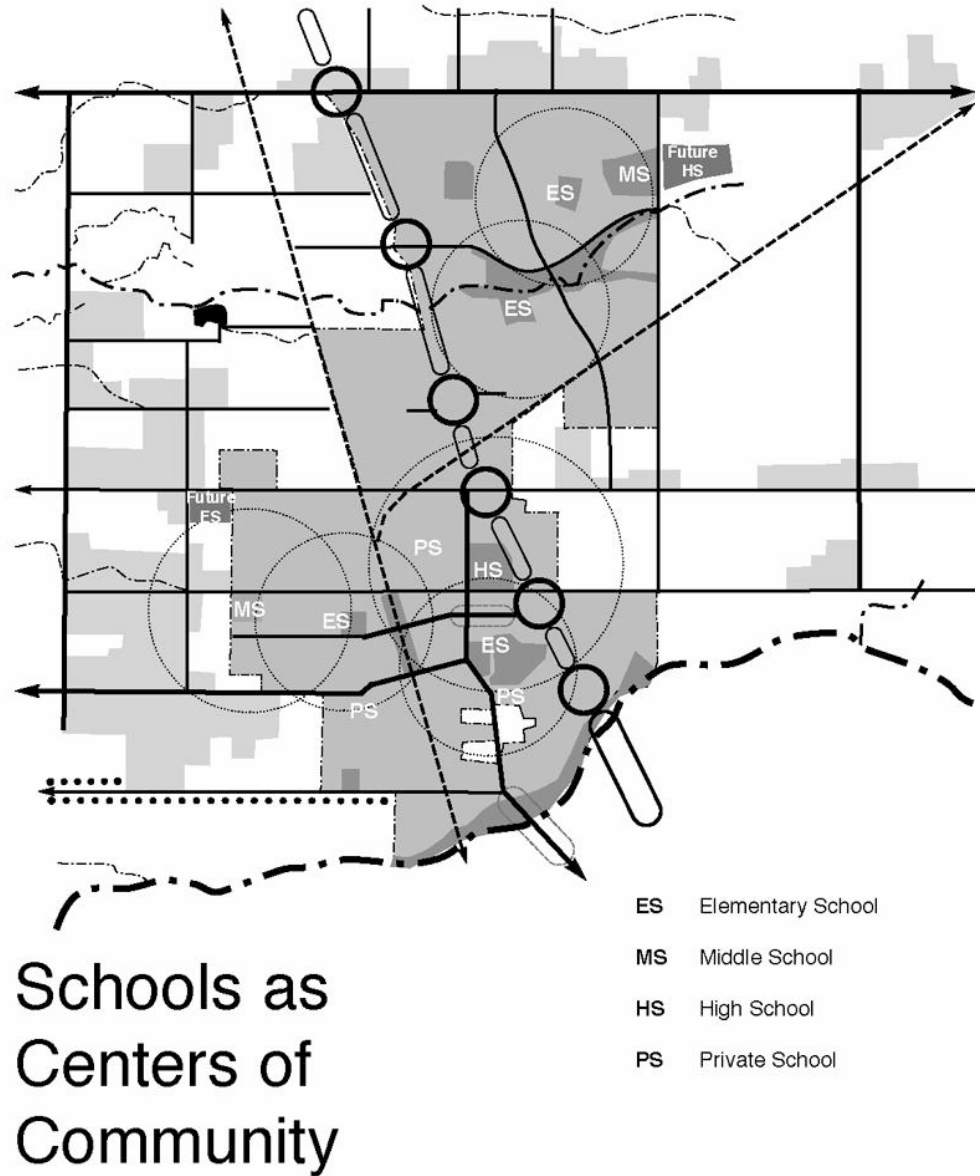
The market, on Caroline and Chabolla avenues and Meladee Lane, was the site of the Sacramento County Fair, which was held in Galt from 1937 until 1959.

Galt's county fairgrounds took up 48 acres, which was most of the area south of C Street between Highway 99 and Lincoln Way.

The Sacramento County Fair eventually found a new home at Cal Expo in Sacramento, and the property was deeded to the City of Galt by the State of California in 1971. The weekly sale, which by then had adopted the name "Galt Flea Market" continued on and grew into an open-air market of considerable size.

Today the Galt Market offers a variety of merchandise and produce. There are over 500 vendors in 880 spaces on Tuesdays and Wednesdays. Upwards of 750,000 visitors attend the Market each year. Revenue from the market must be used for parks and recreational purposes. Because of special legislation, if the market were to close the land could only be used for recreational purposes by the City. It is also unlikely that a similar market could be created anywhere else in the city.

FIGURE 3.12
Schools as Centers of Community



Source: RACESTUDIO, 2003.

NEIGHBORHOODS

Galt, like most communities, has definable neighborhoods. There is the traditional downtown neighborhood, Post War neighborhoods, contemporary subdivisions, and low-density rural neighborhoods.

Traditional Neighborhoods

Galt's original blocks form the core of the traditional commercial and residential patterns in the town. Old Town was a neighborhood with all the everyday necessities within walking distance. There was the park, stores, the school, post office, industry, church and train station, all within walking distance.

Post War Neighborhoods

After World War II, new development started around the edges of the traditional downtown, primarily to the north. These subdivisions took advantage of easy access to Lincoln Highway, Highway 99, and downtown's commercial services. The blocks were subdivided in a less regular pattern with small lots and "starter housing".

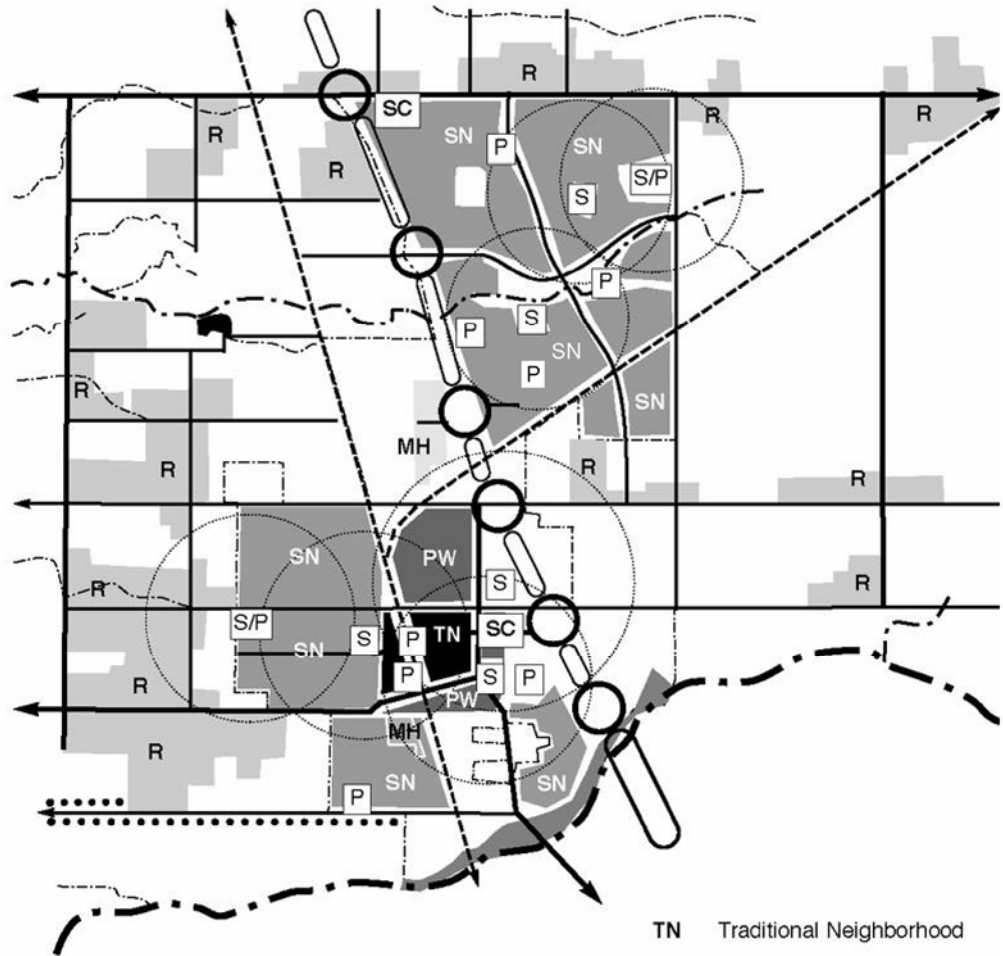
Suburban Neighborhoods

Most of the housing developed in Galt has been in contemporary suburban neighborhoods and subdivisions. West of downtown was developed in the 1980's and 90's. They have cul-de-sac streets but fit in to the orthogonal county road system. The new subdivisions in the northeast have been developing in a curvilinear street and block pattern that bends with Deadman Gulch open space. Walnut Avenue and Carillion Boulevard are the two arterials that cross in the center of the subdivisions. The master planned subdivisions include school and park sites and anticipate expansion to the east and south.

Rural Neighborhoods

Due to the County's policies allowing Agricultural Residential (AR) uses to be developed contiguous to Galt, there are large-lot "ranchettes" developed along the City Limits. These AR areas lack the types of amenities (schools, parks, and shopping) and social focus of Galt's neighborhoods. However, in some portions of the City's Sphere of Influence they cluster creating very-low density "neighborhoods".

FIGURE 3.13
Galt's Neighborhoods



Galt's Neighborhoods

- TN Traditional Neighborhood
- PW Post War Neighborhood
- SN Suburban Neighborhoods
- R Rural Subdivisions
- MH Mobile Homes

- S Existing Public Schools
- P Existing Parks
- SC Existing Shopping Centers

Source: RACESTUDIO, 2003.

TRAVEL EXPERIENCE

Traveling through Galt one experiences the quaintness of visiting a small historic town, serenity of a working landscape, the drama of crossing a river bridge, as well as auto oriented strip-mall development.

Scenic Galt

Scenic Galt can be experienced along country roads that enter the town and cross through its historic center. Lincoln Way and New Hope Road both provide this type of experience. They come from the rural areas, have distinctive entries, and pass through Downtown. Other scenic drives include Christensen Road, Marengo Road, Twin Cities Road, and portions of east-west roads that have not been completely converted to AR subdivisions.

Entry and Arrival

The Highway 99 corridor provides an uneven entry experience for Galt. The approach from the south is dramatic and lush as the highway crosses Dry Creek. From the north, the frontage road, older commercial development, billboards, and lack of landscaping provide a less flattering entry. The C Street entry to Central Galt lacks streetscaping and continuity of a planned commercial district.

Highway 99 is to be widened from four to six lanes and potential removal of frontage roads will change the appearance of Galt's regional identity and visibility. As part of the Highway 99 interchange improvements, C Street and other ramps will be re-engineered. These projects will offer a chance to improve the roadway design, landscaping, and wayfinding for Central Galt's regional entry.

Community Edges

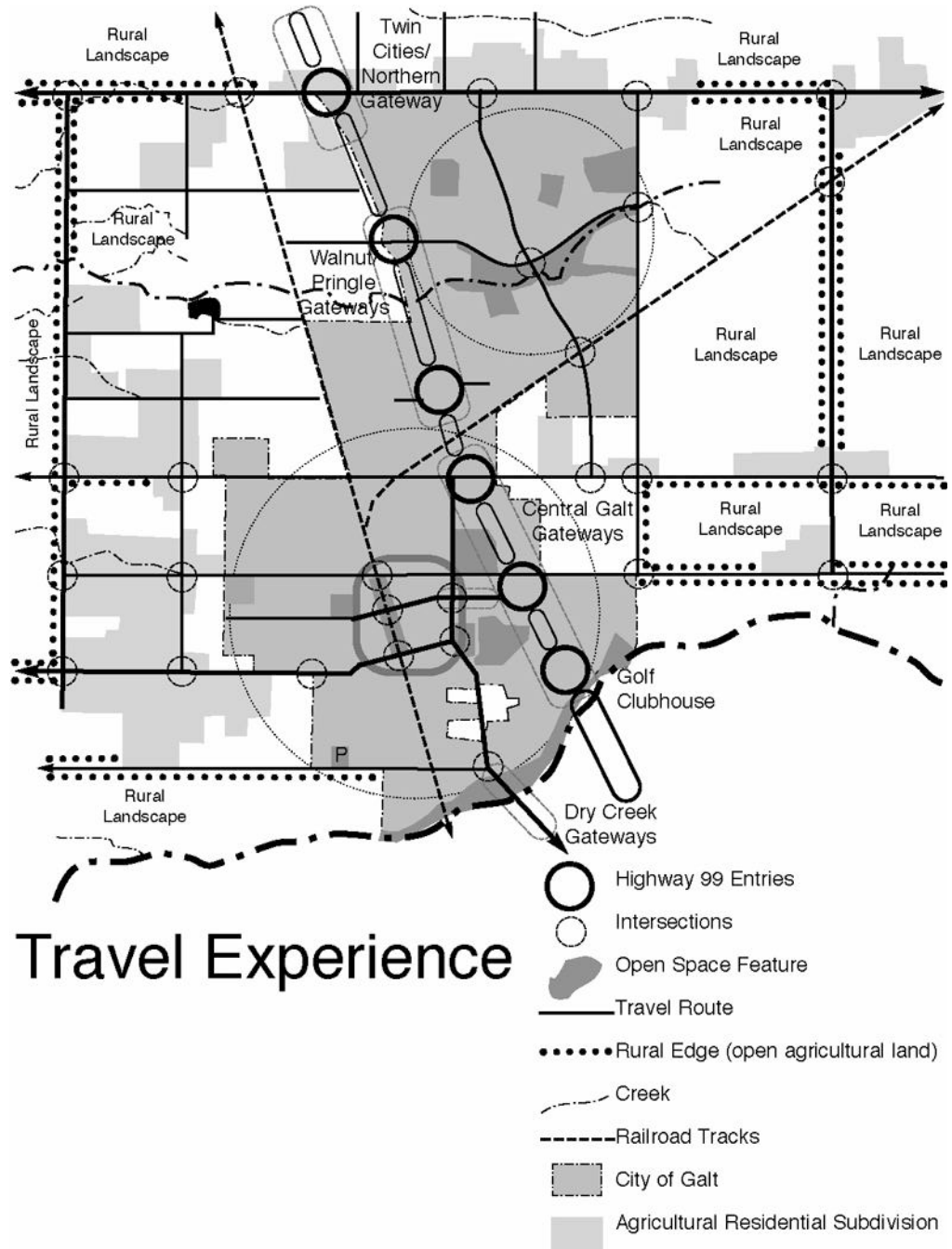
Galt's edges are unevenly defined. They are very clear along Dry Creek on the south, poorly defined on the west and northeast due to AR subdivisions, and open for definition on the northwest and east. Maintaining Galt's working landscape at the edges of the city will be a challenge. Much of it has transitioned into AR.

FIGURE 3.14
Agricultural Tree Buffer



Source: RACESTUDIO, 2003.

FIGURE 3.16
Travel Experience



Source: RACESTUDIO, 2003.

FIGURE 3.17
Highway 99 Frontage Road (North Lincoln Way)



Source: RACESTUDIO, 2003

FIGURE 3.18
Street Strip Commercial Gateway



Source: RACESTUDIO, 2003

Above: The photographs show the Highway 99 and C Street entry experience. The Highway 99 improvement project provides an opportunity to reinvent the image of central Galt commercial district.

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4 | LAND USE AND DEMOGRAPHICS

4.1 INTRODUCTION

Land use is the primary focus of the General Plan, and the information in this chapter is vital to understanding how changes in land use can affect growth within the city. Described in this chapter are the existing land use and demographic characteristics for Galt and its neighboring region. Information has been compiled from the 1989 General Plan, 1998 Zoning Ordinance, the 1987 Northeast Area Specific Plan, and various other local and regional policy and implementation documents. City Staff and the consultants have also performed research on existing conditions within the planning area. This chapter has been divided into six sections: population and demographics data, general plan policies, existing land uses, zoning ordinance and map, and other City, County and regional policies and projects.

4.2 POPULATION AND DEMOGRAPHICS

Population projections are essential to the planning process and form the basis for most planning decisions. Community planning is dependent upon the ability of local officials to anticipate population growth. A good way to estimate future growth is to first look at historical growth patterns. Galt experienced significant growth from 1990-2000 with an increase of 9,650 new residents, accounting for a 110 percent change in population, as illustrated in Table 4.1. This was the largest increase the city has seen in the last three decades, and nearly as much as the 1970s and 1980s combined.

**TABLE 4.1
Historic Population Growth by Decade (1970-2000)**

Year	Population	Additional Persons	Percent Change
2000	18,425	9,650	110%
1990	8,775	3,261	59.1%
1980	5,514	2,314	72.3%
1970	3,200	-	-

Source: California Department of Finance, 2003; Sacramento Area Council of Governments, 2002; and Mintier & Associates, 2004.

Table 4.1 is more specific and looks at growth rates for the city from 1995 to 2007. During this time period the city of Galt grew by 8,669 residents, or nearly 49 percent. The largest increase was in 2001 when 1,525 new residents came to Galt.

TABLE 4.2
Historic Population Growth by Year (1995-2007)

Year	Population	Additional Persons	Percent Change
2007	23,469	452	2.0%
2006	23,017	238	1.1%
2005	22,779	620	2.8%
2004	22,159	159	0.7%
2003	22,000	700	3.4%
2002	21,300	1,300	6.5%
2001	20,000	1,525	8.3%
2000	18,425	1,215	7.0%
1999	17,260	868	5.3%
1998	16,392	467	2.9%
1997	15,925	502	3.3%
1996	15,423	623	4.2%
1995	14,800	-	-

Source: California Department of Finance, 2007; Sacramento Area Council of Governments, 2002; and Mintier & Associates, 2004.

Two agencies are responsible for preparing population growth forecasts for Galt. They are the Sacramento Area Council of Government (SACOG) and the California Department of Finance (DOF). SACOG prepares population projections for El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties, and DOF does the same for all of California. Both agencies base their assumptions off of historical US Census information and then assume growth rates relative to historic trends.

According to SACOG's projections, shown in Table 4.3, Galt will grow to 33,790 residents by the end of the General Plan timeframe (2025), a growth of 15,365 residents from the year 2000 (83 percent change). This is a higher annual compounded growth rate than Sacramento County or California. The local projection of 3.4 percent (based on City Council decision) is higher than SACOG (2.46 percent) and results in 44,150 people in 2025.

TABLE 4.3
Population Projections for Galt, Sacramento County, and California

Year	[1]	[2]	Sacramento	
	Galt (local)	Galt (SACOG)	County	California
2025	44,150	33,790	1,810,056	47,792,241
2020	38,000	31,620	1,707,600	45,821,900
2015	32,779	29,210	1,591,100	42,711,200
2010	28,276	26,490	1,486,500	40,262,400
2005	24,391	23,450	1,368,500	37,473,500
2002	22,321	19,343	1,280,044	35,389,601
2000	18,425	18,425	1,242,000	34,480,300
<i>Population Change (2000 – 2025)</i>	25,627	15,365	568,056	13,311,941
<i>Simple Average (2000 – 2025)</i>	5.56%	3.34%	1.83%	1.54%
<i>Annual Compounded Growth Rate (2000 – 2025)</i>	3.40%	2.46%	1.52%	1.31%

[1] Based on City Council decision to use higher annual growth rate than SACOG.

[2] SACOG estimated growth, 2004.

Sources: California Department of Finance, 2001; Sacramento Area Council of Governments (SACOG), 2001; Mintier & Associates, 2005.

Another important factor to consider with population data is the average household size. This information is important in determining the quantity of housing units that are necessary for future residents. SACOG's 2001 projections show the average household size for Galt in 2000 is 3.04, and is projected to shrink to 2.96 by the year 2025 (see Table 4.4).

TABLE 4.4
2000-2025 Population Per Household Projections*

Year	Galt	Sacramento County
2025	2.96	2.55
2020	2.97	2.55
2015	2.99	2.55
2010	3.01	2.54
2005	3.02	2.54
2000	3.04	2.53

*These projections are based on July 1 of each year.

Source: Sacramento Area Council of Governments Projections, 2001.

Associated with the population per household projections are housing unit projections. They represent the total number of units that exist (6,196) using 2000 as the base year and the number of units that will need to be built. SACOG estimates that by the year 2025 Galt will need to build an additional 5,470 housing units, bringing the total housing stock to 11,666 units (Table 4.5).

TABLE 4.5
2000-2025 Housing Unit Projections*

Year	Galt	Sacramento County
2025	11,666	662,004
2020	10,861	641,512
2015	9,958	612,752
2010	8,984	567,740
2005	7,950	518,430
2000	6,196	473,211

*These projections are a total of all housing units and are based on July 1 of each year.

Source: Sacramento Area Council of Governments Projections, 2001.

Employment is also an important indicator used in the planning process. Employment plays a major factor in the number of people that will move and stay in an area. For Galt, there is also a large employment draw to the Sacramento and Stockton areas. As for the city itself, in 2000 there were an estimated 2,960 persons employed within the city. SACOG predicts that this number will more than double to 6,884 by 2025 (Table 4.6).

TABLE 4.6
20-Year Employment Projections*

Year	Galt	Sacramento County
2025	6,884	814,220
2020	6,134	792,494
2015	5,366	753,641
2010	4,421	694,531
2005	3,560	633,584
2000	2,960	561,728

*These projections are based on July 1 of each year.

Source: Sacramento Area Council of Governments Projections, 2001.

4.3 EXISTING GENERAL PLAN POLICIES

The City of Galt's first General Plan was adopted in 1961, and was updated by five subsequent plans in 1968, 1975, 1978, 1984 and 1989.

GENERAL PLAN ELEMENTS

The following nine elements (chapters) were included in the 1989 Galt General Plan:

- Conservation, Open Space, and Scenic Highways Element
- Safety and Seismic Element
- Noise Element
- Historic Element
- Economic Element
- Housing Element
- Land Use Element
- Circulation & Transit Element
- Public Facilities & Services Element

CONSERVATION, OPEN SPACE, AND SCENIC HIGHWAYS ELEMENT

Galt's Conservation, Open Space, and Scenic Highways Element addresses visual, biological, agricultural, mineral, water resources, and air quality concerns. The element's goal is to protect existing visual attributes in both the urban core and rural surroundings, to enhance existing aesthetics whenever possible, and provide for attractive new development.

SAFETY AND SEISMIC ELEMENT

The Safety and Seismic Element defines various local and regional hazards to persons and property. A large portion of the information gathered in this element was derived from the Seismic Safety and General Safety Elements of the 1974 Sacramento County General Plan. The hazardous waste portion was based on the Sacramento County Hazardous Waste Management Plan of 1988. The goal of this element is to protect lives and property from avoidable and unacceptable risks and damages due to seismic and geologic activity, fire, flooding, hazardous materials and waste, and other hazards.

NOISE ELEMENT

The City of Galt's Noise Element was designed to identify existing noise concerns within the community and future potential noise effects that may occur through the implementation of the General Plan. The element also provides data and estimates on noise levels generated by roads, rail, freeway traffic, and industry. There is also a compatibility matrix that defines acceptable noise levels relative to various land uses. This element has the goal of protecting residents from harmful effects due to exposure to excessive noise, and to protect the City's economic base by preventing the encroachment of incompatible land uses within areas affected by noise producing activities.

HISTORIC ELEMENT

Galt's Historic Element was established with the goal of identifying and preserving the rich heritage of the community. The element identifies structures and features of historical importance, and presents financial options for restoring them to their original condition. This element also calls for the creation of a specific Downtown Historical District study, in order to adequately list historic sites. The goal of this element is to protect the City's cultural development and history.

ECONOMIC ELEMENT

At one time Galt was the main place for trade in the surrounding farming region. Because of the development of nearby neighbors and the ease of vehicular mobility, much of the retail past of Galt has been lost. The Economic Element identifies and protects Galt's trade area, types of commercial/retail uses, and economic development potential.

HOUSING ELEMENT

The Housing Element contains seven sections and was adopted in 2002. Section one is a general introduction to the need, structure and goals for the housing element. Section two is an evaluation of the city's 1991 housing element. Section three outlines the city's goals, policies, and program actions through this new plan. Section four discusses city and county housing programs. Section five reviews quantified objectives for the maintenance, preservation, improvement, and

development of housing. Section six outlines the element's public participation programs and activities. Section seven reviews Housing Element consistency with the existing (1989) General Plan.

LAND USE ELEMENT

The Land Use Element includes current land use and zoning designations for the city. This element provides data on the location and amount of various land uses, as well as providing a history of land use planning in Galt. The element addresses existing land uses, urban form, fiscal concerns & public facility provisions, growth management, jobs-housing balance, annexation policy, community image, and opportunities for special land uses. The element also contains a matrix defining land use policies and implementation programs.

The overarching goals of this element are to provide for land uses which will develop and broaden the employment and fiscal base of the City. This is done by the creation of adequate retail, industrial, and service opportunities, and the creation of a range of housing types. Also important is the protection of the City's sensitive environmental and cultural characteristics, paying special attention to safeguarding the general health, safety and welfare of the residents. Table 4.7 shows the 2004 net acreages for land use categories within Galt.

TABLE 4.7
Acreages by General Plan Designation (2004)

Land Use Designation	Acreage*	Percent of Total
Low Density Residential	1,498	48%
Medium Density Residential	219	7%
High Density Residential	150	5%
Commercial	276	9%
Office/Professional	11	0.4%
Public/Quasi-Public	564	18%
Industrial/Light Manufacturing	314	10%
Open Space	68	2%
Total	3,100	100%

* These totals only include parcels, not roads or other infrastructure.

Sources: City of Galt, 2004; and Mintier & Associates, 2004.

CIRCULATION & TRANSIT ELEMENT

The Circulation & Transit Element describes major thoroughfares, transportation routes, terminals, and facilities. It defines existing issues and opportunities, and presents viable options to address the cities circulation needs. The goal of this element is to provide a transportation system which will support planned land uses and efficiently transport goods and all segments of the community while protecting the quality of existing neighborhoods and the City's environment.

PUBLIC FACILITIES ELEMENT

Galt's Public Facilities Element address development issues related to water supply, sewage disposal, storm drainage, police protection, fire protection, schools, solid waste, and public/semi-public buildings. It presents findings on the adequacy of existing infrastructure systems and fiscal implementation measures for refurbishing or expanding systems. The goal of this element is to maintain an adequate and affordable system of public services and facilities which met the needs of existing and

future development. Associated with this is the goal to ensure that new development must pay its fair share of expansion of existing public facilities and for new public facilities needed to serve it.

4.4 EXISTING LAND USE

The following paragraphs are based on the City's 2004 land use database and provide a breakdown of existing uses within incorporated Galt. In 2004 there were a total of 3,760 acres of land within the city limits. Table 4.8 shows a breakdown of land uses within the city by acreage and percentage.

TABLE 4.8
Galt Existing Land Uses (2004)

Classification	Acreage	Percent Total
Low Density Residential	944	25%
Medium Density Residential	201	5%
High Density Residential	101	2%
Light Industrial	218	5%
Commercial	108	2%
Office Professional	5	<1%
Open Space	16	<1%
Public/Quasi Public	536	14%
Roads/Infrastructure	720	19%
Vacant	911	24%
<i>Total</i>	<i>3,760</i>	<i>100%</i>

Sources: City of Galt, 2004; Sacramento Area Council of Governments, 2003; and Mintier & Associates, 2005.

Low Density Residential

Low density residential land is defined as having a maximum of 6 dwelling units per acre. Approximately 944 acres of land within the city limits are developed as low density residential uses. This accounts for approximately 25 percent of developed citywide land. There are an additional 564 acres (15 percent) of land that is zoned for low density residential but not yet developed.

Medium Density Residential

Medium density residential land is defined as having a maximum of 8 dwelling units per acre. Approximately 201 acres of land within the city limits are developed as medium density residential uses. This accounts for approximately 5 percent of developed citywide land. There are an additional 18 acres (<1 percent) of land that is zoned for medium density residential but not yet developed.

High Density Residential

High density residential land is defined as having between 8-18 dwelling units per acre, with a preferred minimum density of 14 dwelling units per acre. Approximately 101 acres of land within the city limits are developed as high density residential uses. This accounts for approximately 2 percent of developed citywide land. There are an additional 38 acres (1 percent) of land that is zoned for high density residential but not yet developed.

Light Industrial

Light industrial lands are mainly located in the northwest and southeast portions of the city. There are approximately 218 acres of land developed as light industrial uses, accounting for 5 percent of the city. There are an additional 96 acres (2 percent) that are zoned for light industry but not yet developed.

Commercial

Galt has a large array of commercial development, from neighborhood convenient stores to large highway oriented shopping centers. Developed commercial land uses account for 108 acres (2 percent) of the city. There is an additional 162 acres (4 percent) of land zoned for commercial uses that are not yet developed.

Office Professional

Office professional uses are characterized as office, business and research development parks. Developed office professional uses account for 5 acres (<1 percent) of the city. There is an additional 6 acres (<1 percent) of land zoned for office professional that are not yet developed.

Open Space

The city of Galt contains approximately 68 acres (2 percent) that are dedicated to open space. This includes creeks, trails and open space corridors.

Public/Quasi-Public

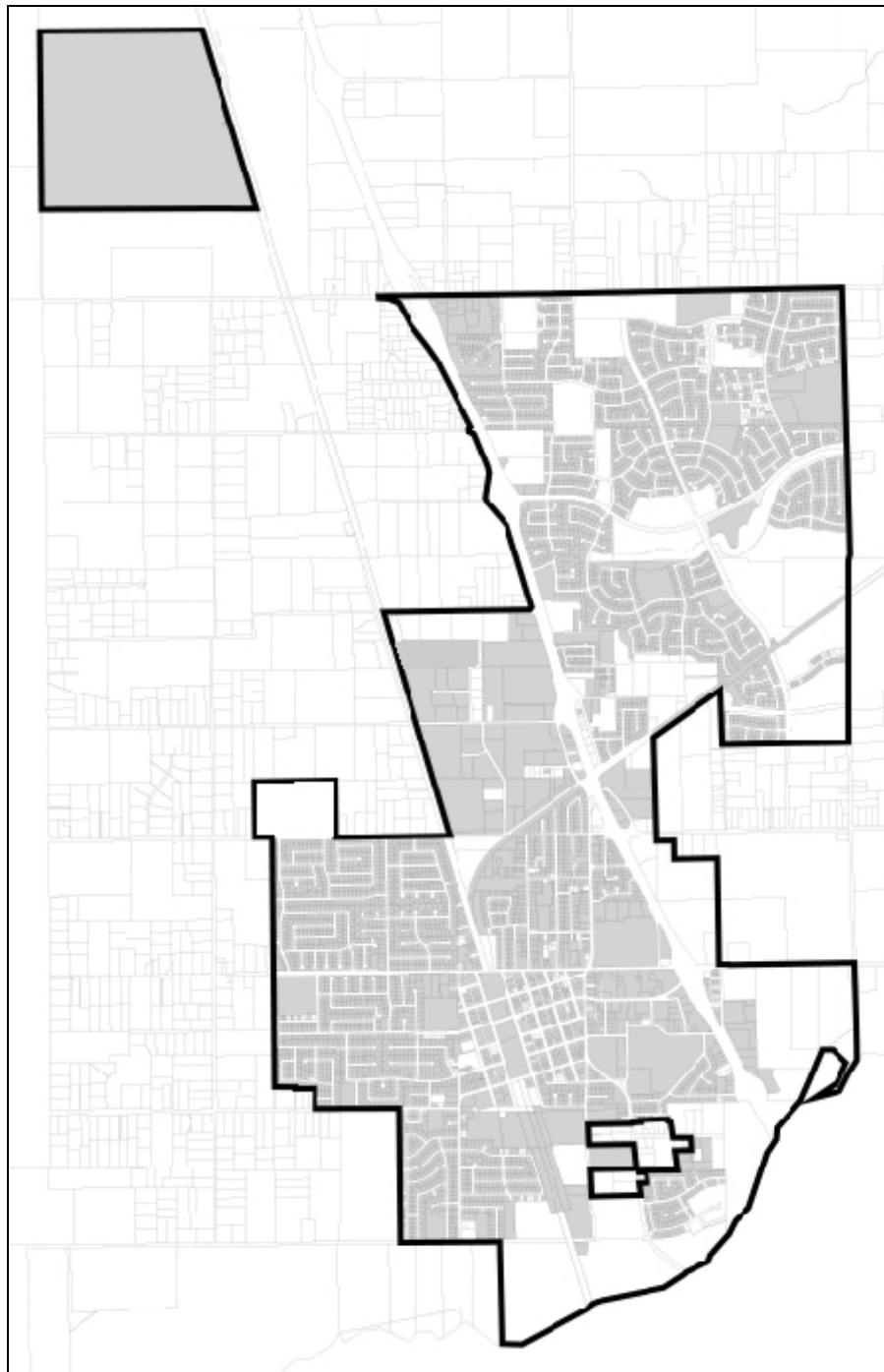
Public/Quasi-Public lands includes the community center, parks, institutional facilities such as schools, police and fire stations, and the waste water treatment plant. Developed public/quasi-public lands account for 536 acres (14 percent) of the total land in Galt. The waste water treatment plant alone is approximately 297 acres (7 percent).

There is an additional 27 acres (<1 percent) either zoned public/quasi-public or currently under ownership by the City and not yet developed. This acreage does not include newly purchased public/quasi-public properties that are outside of the 2004 city limits (such as the new high school site and park sites).

Roads and Infrastructure

Roads and infrastructure make up a significant portion of Galt's total land. There are 720 acres (19 percent) of land that are currently developed as roads or infrastructure (i.e., well sites, lift stations, etc.).

FIGURE 4.1
Developed Parcels within Galt



Source: City of Galt, 2003; and Mintier & Associates, 2004.

4.5 CITY ZONING ORDINANCE AND MAP

Galt's Zoning Ordinance and Map was adopted in 1998 and is the principal tool for implementing the city's General Plan (see Figure 4.2).

TABLE 4.9
City of Galt Zoning Classifications (1998)

Classification	Acres	Percent Total
Special Purpose		
OS: Open Space	163.24	4.5%
PQ: Public/Quasi-Public	608.70	16.8%
Residential		
RA: Residential Agriculture	0.0	0.0%
R1A: Low-Density Single-Family	507.48	14.0 %
R1B: Intermediate-Density Single-Family	296.12	8.2%
R1C: Maximum-Density Single-Family	969.92	26.8%
R2: Medium-Density Residential	263.61	7.3%
R3: Multiple-Family	150.69	4.2%
Commercial		
C: Commercial	59.39	1.6%
HBD: Historic Business District	111.21	3.1%
HC: Highway Commercial	174.80	4.8%
NC: Neighborhood Commercial	6.09	0.2%
OP: Office-Professional	11.11	0.3%
Manufacturing		
M: Industrial	6.84	0.2%
LM: Light Manufacturing	289.18	8.0%
Total	3618.38*	100.0%

* Major roadways and rail lines were left out of these totals.

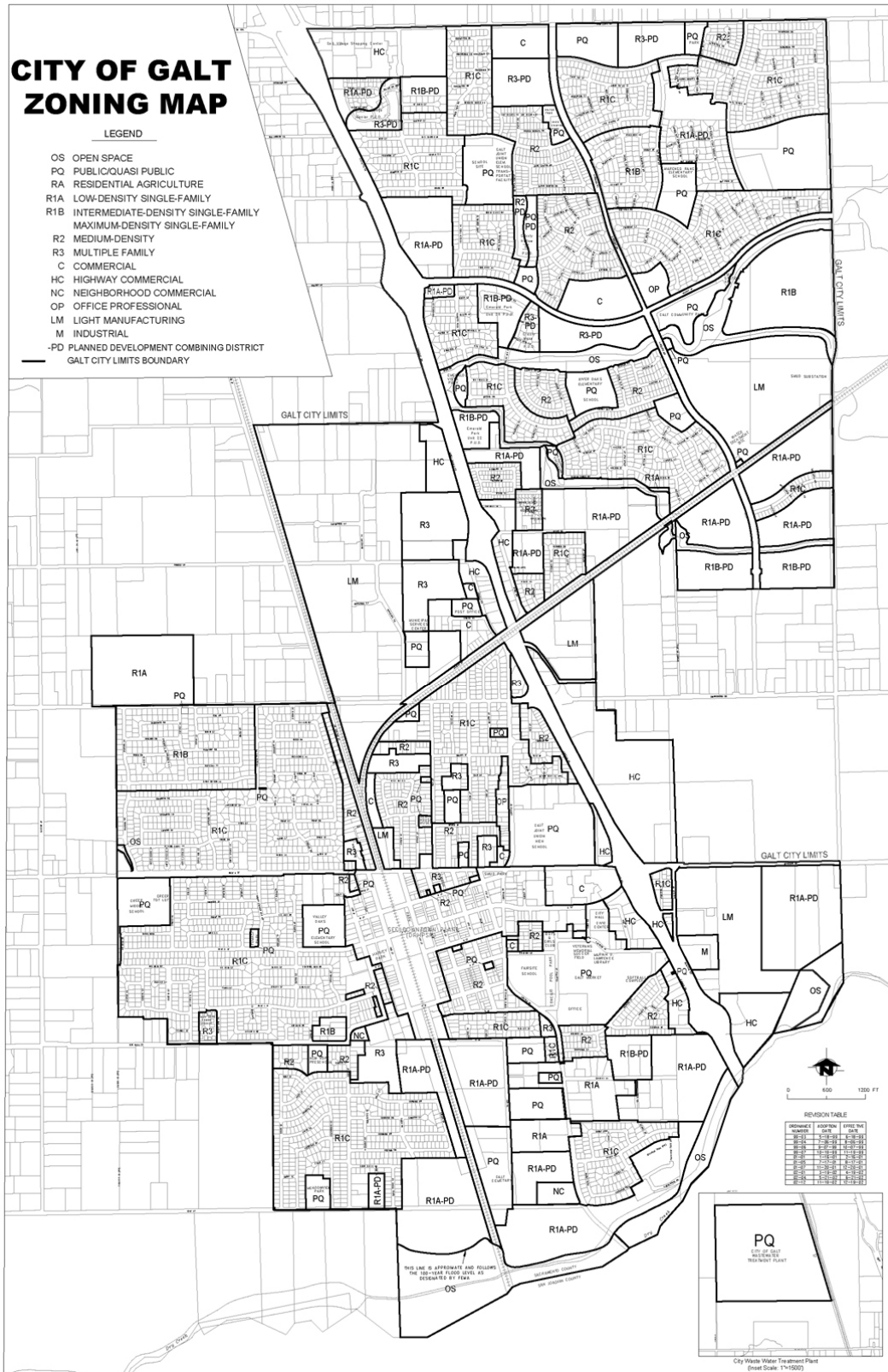
Sources: City of Galt, 2004; and Mintier & Associates, 2004.

The City also has two combining zoning districts: Planned Unit Development, and Specific Plan. These districts are an overlay to existing zoning and accommodate special needs and characteristics of the community.

Planned Unit Development (PD) has the intent of encouraging a creative and efficient approach to the use of land while maximizing choice in the type of development available. It also encourages the efficient allocation and maintenance of open space and provides for the redistribution of overall density where such rearrangement is desirable. Lastly, it provides the means for greater creativity and flexibility in design than is provided under the strict application of the other zoning district regulations, while preserving the public interest, health safety, welfare, and property values. At a minimum, the PD overlay requires architectural review approval from the City prior to development entitlement.

A Specific Plan is a tool for the systematic implementation of the general plan. It effectively establishes a link between implementing policies of the general plan and the individual development proposals in a defined area. A specific plan may be as general as setting forth broad policy concepts, or as detailed as providing direction to every facet of development from the type, location and intensity of uses to the design and capacity of infrastructure; from the resources used to finance public improvements to the design guidelines of a subdivision (OPR, 2003).

FIGURE 4.2
Galt 2004 Zoning Map



Source: City of Galt, 2004; Mintier & Associates, 2004.

4.6 CITY SPECIFIC PLANS

Specific plans are used to implement the general plan within a defined portion of the planning area. They specify in detail land uses, public and private facilities needed to support land uses, phasing of development, standards for conservation, development, and use of natural resources, and a program of implementation measures, including financing measures (California Planning Roundtable, 2001). This section summarizes two major specific plans that have been approved in Galt.

CITY OF GALT NORTHEAST AREA SPECIFIC PLAN (1987)

The *Northeast Area Specific Plan* site is located east of Highway 99 between the highway and Marengo Road, Twin Cities Road and the Lone Spur railroad tracks including a 100 area portion south of the tracks. The planning area consisted of 1,247+/- acres that were annexed to the City for residential, commercial, and public facility development. The site was a flat, largely undeveloped farmland bisected by Deadman Gulch and its tributaries.

The plan took into account the policies of the City's General Plan, and established site specific policies for the planning area. A Specific Plan Land Use Map was created and became an amendment to the City's existing General Plan Land Use Map and Comprehensive Zoning Plan Map and was intended to implement goals and policies within the General Plan. Basic City zoning standards generally apply within the plan area with the addition of design standards specific to the plan area concerns. Associated with the Specific Plan is an Environmental Impact Report (EIR) that is used by the City Council and Planning Commission to determine whether or not a project as proposed will create significant environmental impacts.

CITY OF GALT DOWNTOWN REVITALIZATION AND HISTORIC PRESERVATION SPECIFIC PLAN (1995)

The *Downtown Revitalization and Historic Preservation Specific Plan* was designed to help the City accomplish two major goals:

- Economic revitalization of the City's Downtown, especially the historic core area; and
- Preservation of the Downtown's historic character.

These goals reflect the policies and direction established for the Central Business District during the City's General Plan process in the late 1980's. This plan is used as a tool for the implementation of the goals and policies of the General Plan.

The project area for this plan encompasses the historic Downtown core, whose commercial activities were traditionally located along Fourth Street facing the railroad tracks and along a portion of C Street immediately to the east. Other commercial areas include Lincoln Way and C Street east to Civic Drive. Residential areas are included west of Third Street and both north and south of C Street, behind the commercial frontages.

4.7 OTHER CITY, COUNTY, AND REGIONAL POLICIES AND PROJECTS

Because the General Plan is prepared in the context of existing city and surrounding jurisdictions' policies, a thorough analysis of other plans and policies in the vicinity is necessary. This section summarizes local and regional planning and policy documents, and non-profit projects that affect Galt.

CITY OF GALT REDEVELOPMENT PLAN (1983)

The City's *Redevelopment Plan* (1983) identifies blighted areas within the city that are prone for redevelopment. The primary objective of the plan is to revitalize the downtown business and historic structures district, develop vacant parcels in the Galt Industrial Park, and encourage and assist the rehabilitation of the City's existing affordable housing stock. Approximately 180 conventional residential units existed in the Project Area at the time of the *Redevelopment Plan's* adoption (1983). The Project Area contained approximately 817 acres (residential and non-residential uses) broken into four distinct subareas:

- The downtown central business district and civic center area.
- Low density areas west of the downtown core.
- Low density areas south of the downtown core.
- Mobile home parks and vacant land designated for industrial use in the northwestern part of the city.

REDEVELOPMENT IMPLEMENTATION PLAN (2000)

The *Redevelopment Implementation Plan* (2000) provides a description of proposed goals that are designed to reduce existing blighted conditions in the project area and set forth activities, programs, and public improvement projects for a five year period (the plan is re-evaluated every 5 years thereafter). The plan also provides a summary of housing needs for low and moderate income housing, including descriptions of housing, current housing needs, housing programs aimed at meeting those needs, and five and ten year housing production plans.

CITY OF GALT PARK MASTER PLAN (1992)

The City of Galt's *Park Master Plan* was adopted in 1992 and serves as both a policy and implementation document. The purpose of this plan is to protect and enhance recreational activities within the Galt community. The plan has sections related to recreational needs and standards assessment, a summary of key findings, a prioritization of projects, a description of cost and funding sources, and concept designs for future neighborhood parks.

CITY OF GALT BICYCLE TRANSPORTATION PLAN (2002)

The City's *Bicycle Transportation Plan* was adopted in 2002 in an effort to improve safety for school children riding to school, encourage commuters to ride rather than drive to work, and encourage people to exercise and enjoy their community on two wheels. The City recognizes that bicycle transportation can be an important, low-cost strategy to reduce reliance on the single passenger automobile and can contribute to a reduction in air and noise pollution and traffic congestion.

The Galt Bicycle Transportation Plan was developed to implement the Galt General Plan Circulation Element. The purpose of the document was to collect in a single place all of the policies and technical information related to bicycles and bikeways, and to define a system of bike routes and support facilities that will be necessary to meet the needs of Galt through the buildout of the current (1989) General Plan. The Galt Bicycle Transportation Plan includes all of the required elements necessary to qualify for Proposition 116 funds, State Bicycle Lane Account, and other federal and state funding sources.

GALT SPHERE OF INFLUENCE STUDY (1995)

The *Sphere of Influence Study* was adopted by the Local Agency Formation Commission (LAFCO) in June of 1995, and is an analysis of potential growth options within the study area. The purpose of this study was to evaluate and recommend an amended sphere of influence for the city. The main focus of this report was to evaluate different growth options for the city relative to public services (e.g. water, sewer, and fire protection) and environmental constraints.

SACRAMENTO AREA COUNCIL OF GOVERNMENTS (SACOG) PLANS AND POLICIES

The Sacramento Area Council of Governments (SACOG) is an association of Sacramento Valley governments formed from six counties - El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba - and 22 member cities. SACOG's primary charge is to provide regional transportation planning and funding, as well as a forum for the study and resolution of regional issues. In this role, SACOG prepares the region's long-range transportation plan; prepares the Housing Needs Allocation for its member jurisdictions; keeps a region-wide database for its own and local agency use; helps counties and cities use federal transportation funds; assists in planning for transit, bicycle networks, clean air and airport land uses; and is undertaking a new program to link transportation and land development more closely.

SACOG is currently in the process of formulating a regional growth alternatives plan known as the Blueprint project. This project is a comprehensive regional process integrating land use and transportation, air quality and other regional concerns. It is an in-depth modeling and research process, conducted by SACOG in cooperation with all jurisdictions in the region that will look at how future growth is likely to occur.

SACRAMENTO COUNTY GENERAL PLAN (1993)

Sacramento County has jurisdiction for all lands that are not incorporated into cities. The Planning Area Boundary for Galt includes many parcels that are within the county's jurisdiction. As a result, their land use patterns and policies will greatly affect the new general plan. The most notable policy is that related to large lot residential parcels to the north and west of Galt (see Sacramento County Agricultural-Residential Study). The County is currently (2004) in the process of updating their General Plan.

SACRAMENTO COUNTY AGRICULTURAL-RESIDENTIAL STUDY (2002)

Agricultural-Residential (Ag-Res) is a term used to describe large lot residential property that can be used for small agricultural operations such as horse corrals or personal vineyards. Sacramento County's *Agricultural-Residential Study* began around 1974 to address the need to establish a permanent large lot residential land use category where people could also include incidental agriculture. The study covered Agricultural-Residential developments Countywide and focused on issues

such as, but not limited to, proper lot size if public water and sewer are available. In 1991, the first draft of the county's Land Use Element contained language which would have reserved Ag-Res zoned land for urban uses in the Urban Services Boundary (USB) and limit the expansion of Ag-Res land located outside the USB. Strong opposition to expanding the Ag-Res lands outside the USB led the board to establish the Ag-Res steering committee. Policies to address Ag-Res land uses inside the USB were adopted along with the General Plan Update in 1993.

The study focuses on the area outside the Urban Services Boundary, primarily the rural communities of Wilton, Alta Mesa, Clay Station, Herald, unincorporated portions of Galt and areas nearby Rancho Murieta. The policies in this study would require an amendment to the County's general plan.

NATURE CONSERVANCY'S COSUMNES RIVER PRESERVE (2003)

The 80 mile long Cosumnes River is the last remaining undammed river on the western slope of the Sierra Nevada. The Nature Conservancy purchased 85 acres of valley oak groves in 1984 and established the *Cosumnes River Preserve*. The preserve has since grown to approximately 40,000 acres. The Conservancy has created more than 1,500 acres of new wetlands, participated in reforestation projects, removed levees along the river in order to restore natural flooding processes, and worked with local farmers in developing sustainable agricultural practices.

The Nature Conservancy has focused its activities and investments within the lower floodplain of the Cosumnes River, in Sacramento and San Joaquin counties. Figure 4.3 shows lands that are within the Cosumnes River Preserve. Some of these lands are also within the planning area boundaries for the general plan update. As a result, these protected parcels will be a constraint to development of the northwestern portion of the planning area. They will also provide a buffer between portions of Galt and southern expansion of the Elk Grove area.

FIGURE 4.3
Consumnes River Preserve



Sources: The Nature Conservancy, 2004; Mintier & Associates, 2004.

4.8 PERSONS CONSULTED

- Curt Campion, Planning Director, City of Galt
- Sandra Kiriou, Principal Planner, City of Galt
- Eric Veerkamp, Senior Planner, City of Galt
- Mike McKeever, Principal Program Expert – Blueprint Project, Sacramento Area Council of Governments
- Joe Concannon, Senior Planner/GIS Analyst, Sacramento Area Council of Governments
- Ryan Kirkham, GIS Analyst, Sacramento Area Council of Governments.

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5 | CIRCULATION AND TRANSPORTATION

5.1 INTRODUCTION

This chapter provides a description of the City's existing transportation system. It includes transportation and land use information that is necessary for understanding existing travel and land development conditions. A complete listing of all background transportation documents and information sources is found in the Bibliography.

5.2 LAND DEVELOPMENT PATTERNS

The City of Galt is predominantly a “bedroom community,” with the majority of workers commuting outside the city to work in the metropolitan areas of Sacramento to the north and Stockton to the south. In the past ten (10) years, the City has grown in population from about 13,000 people to over 22,000 people currently. Much of this growth has occurred in both the Northeast and West portions of the City. With the adoption of the Northeast Area Specific Plan in the late 1980's, residential development in this area has been particularly active. With the proximity of both Sacramento and Stockton as metropolitan employment hubs, little growth in employment has occurred within the City. Many commercial, business/professional and industrial lands remain vacant or underutilized within the City. Therefore, the land development pattern remains skewed to residential development and being a “bedroom community”. The Galt Market remains a major regional shopping attraction each week on Tuesday and Wednesday, making Tuesday/Wednesday traffic conditions in the city significantly worse than all other days. Locally, other community and neighborhood shopping opportunities are provided along with other amenities of balanced residential communities, including schools and parks.

The City of Galt's first General Plan was adopted in 1961, and was followed by five subsequent plan updates in 1968, 1975, 1978, 1984 and 1989. Since 1984, many annexations to the city have occurred allowing primarily new residential development to the west of downtown and northeast of State Route 99 (SR 99). Shown in Figure 5.1 is the current City Limits and Sphere of Influence boundary. Future growth is likely to occur north to Twin Cities Road (SR 104), and along Simmerhorn Road and Boessow Road.

About two-thirds of the city is comprised of low- to medium-density residential development, generally concentrated in the southwestern and northeastern quadrants of the city. Retail Commercial and Highway Commercial opportunities are located mainly in downtown Galt, and along the SR 99 corridor. Light manufacturing uses are primarily located in the northwestern quadrant of the city, between SR 99 and the Union Pacific Railroad tracks.

5.3 EXISTING TRANSPORTATION SYSTEM

The City of Galt is located in southern Sacramento County, just north of Dry Creek and borders San Joaquin County. As stated, the city is located between two

metropolitan areas and is at the crossroads of two highways, SR 99 and SR 104. Additionally, Union Pacific Railroad has both a main track and spur line traversing through the city. Also, both local and regional public transit is available within the city as provided by Community Transportation Agency (CTA). The city also provides for non-motorized transportation and includes systems for both bicyclists and pedestrians alike. No airports, however, are immediately nearby. Regional and international air travel is available from Sacramento International Airport, and more localized air travel can be accessed at Sacramento Executive Airport and Franklin Airport in Sacramento County and Lodi Airport in San Joaquin County.

The following describes in more detail the available existing transportation systems serving the city of Galt.

5.4 EXISTING ROADWAY SYSTEM (*updated June 2008*)

The City of Galt, in combination with its land development patterns, is largely formed by its system of local and regional roadways. State Route 99 is the major State highway, which bisects the middle of the city, providing important regional access. State Route 104, traverses the current northern boundary, also providing regional accessibility. The balance of the city street system is largely a combination of roadways that connect the City with surrounding county lands and provide for inter-city travel.

State Route 99

State Route 99 (SR 99) facilitates regional and inter-regional north-south travel within and through the city. SR 99 serves as a primary automobile commuter route, as well as a designated truck route. According to the 2002 Caltrans data, SR 99 carries an Average Daily Traffic (ADT) volume of approximately 58,000 vehicles at the C Street interchange. Trucks comprise approximately 18 percent of the SR 99 ADT through Galt. SR 99 through the City is currently four (4) lanes and according to a Caltrans Project Study Report is in need of widening to six (6) lanes initially, and ultimately to eight (8) lanes to accommodate projected growth in travel within this important north-south regional corridor.

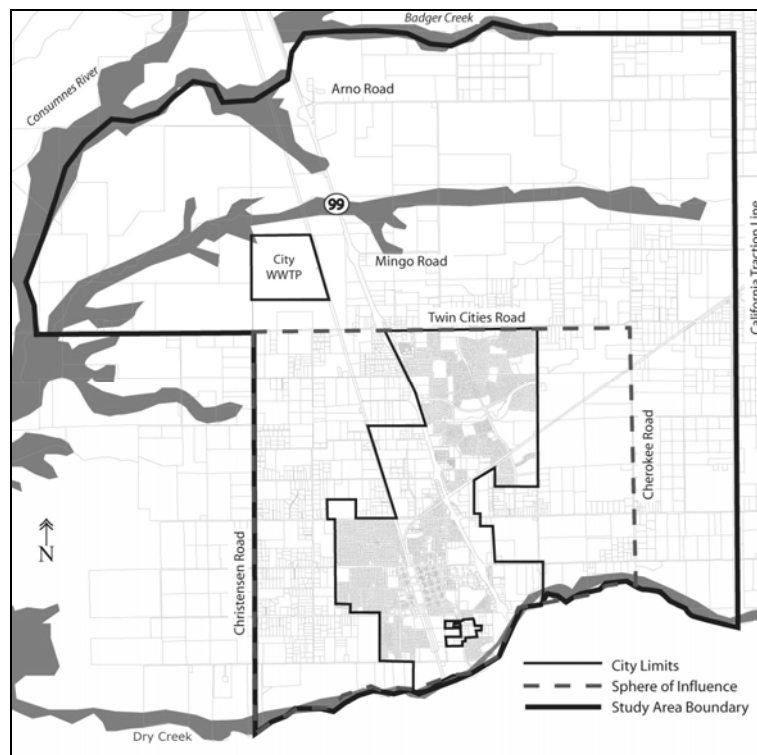
Twin Cities Road (State Route 104)

Twin Cities Road (State Route 104) provides east-west regional access within and through Galt and Sacramento County. Twin Cities Road provides important connection between Galt and Interstate 5 to the west and into Amador County, including Herald, Lone and Jackson, to the east. Just east of SR 99 to Marengo Road, Twin Cities Road, as Galt's major arterial, serves the large and growing residential and shopping areas in the northeast quadrant of the City and carries ADT of approximately 12,790 vehicles (Caltrans, 2002). Twin Cities Road is designated as an "expressway/thoroughfare" and as a "transit route" by the City's existing General Plan Circulation Element. Twin Cities Road between SR 99 and SR 124 is proposed as a scenic highway by the existing Sacramento County's General Plan.

Major Arterials

According to the General Plan, Kost Road, New Hope Road, Harvey Road/A Street/Boessow Road, Orr Road/Elm Road/Simmerhorn Road, and Walnut Avenue constitute "arterial streets" in the east-west direction. Marengo Road, Carillion Boulevard, Lincoln Way, and Christensen Road corridors represent north-south "arterial streets."

FIGURE 5.1
City of Galt City Limits, Sphere of Influence, and Study Area Boundaries



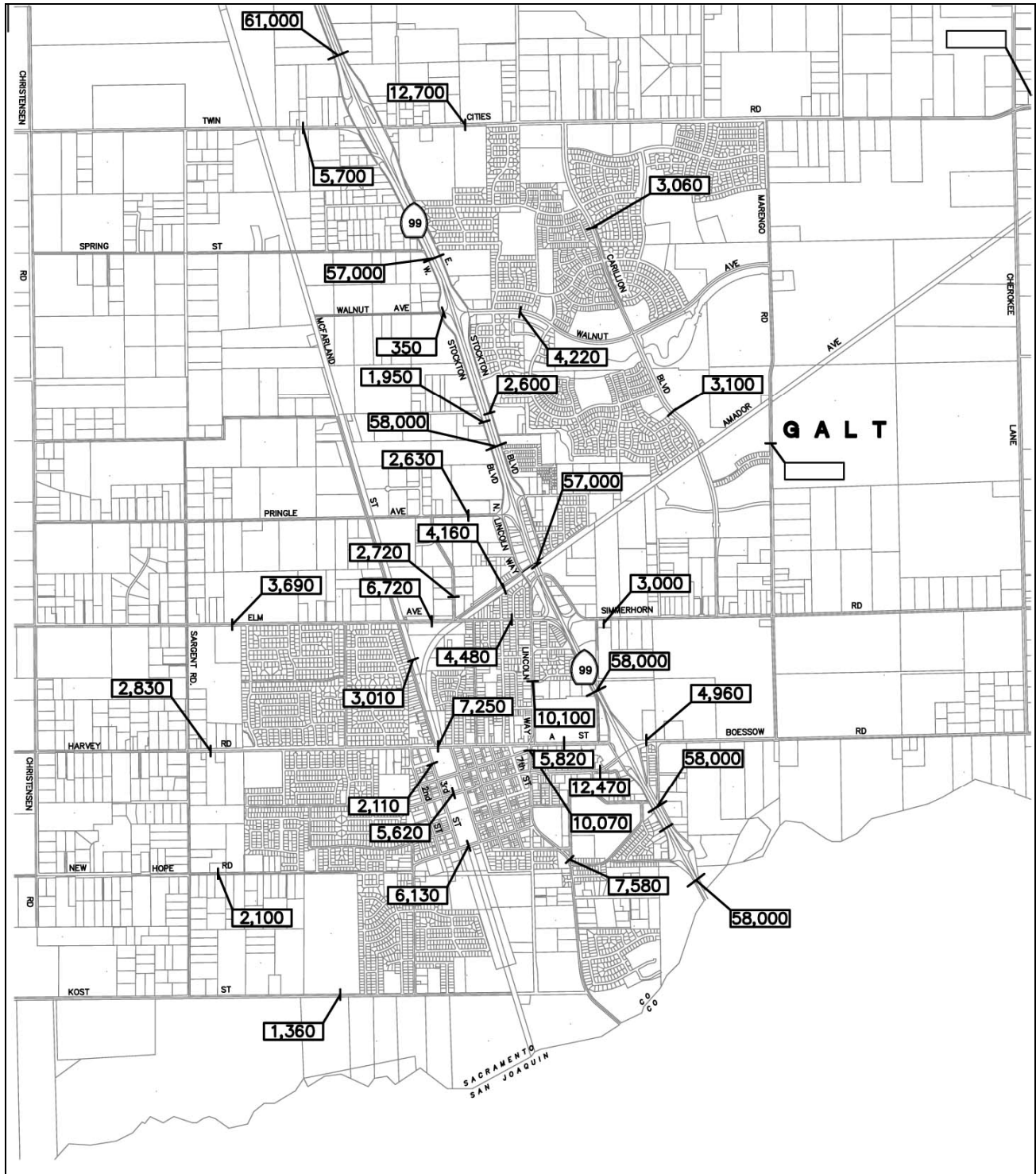
Source: Mintier & Associates, 2004.

EXISTING TRAFFIC COUNTS

Existing daily and peak hour traffic counts were obtained in November, 2003, at key locations within the city's study area. These daily and peak hour traffic counts were all taken on either a Tuesday or Wednesday when the Galt Market was open. Using these days for traffic counts, allows analysis of existing traffic conditions during the busiest travel periods during an average week. Figure 5.2 shows the existing (2003) daily traffic volumes at roadway segment locations throughout the City (note: unless otherwise stated, all references to existing data means data collected in 2003). Figure 5.3 illustrates the existing (2003) AM and PM peak hour intersection turning movement traffic volumes at all study intersections. Figure 5.4 indicates the existing intersection lane geometrics and controls at the study intersections.

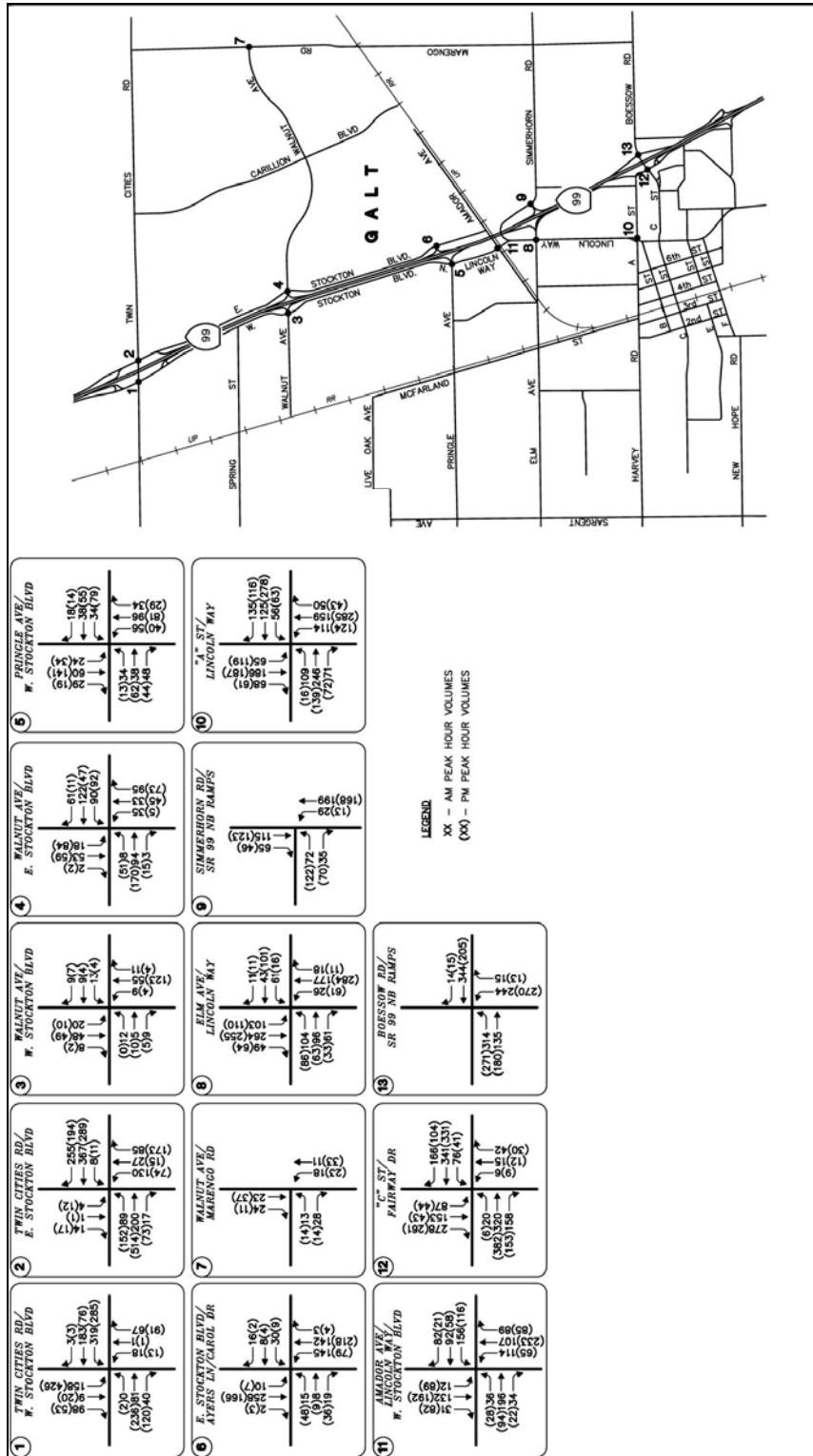
In addition, as part of this study of background transportation conditions, a comparison of the latest (2003) traffic counts with the Citywide Circulation Study counts (2000-01) has been completed to identify recent traffic growth trends and to quantify incremental traffic impacts over the last three years.

FIGURE 5.2
Existing (2002-2003) Roadway Traffic Volumes



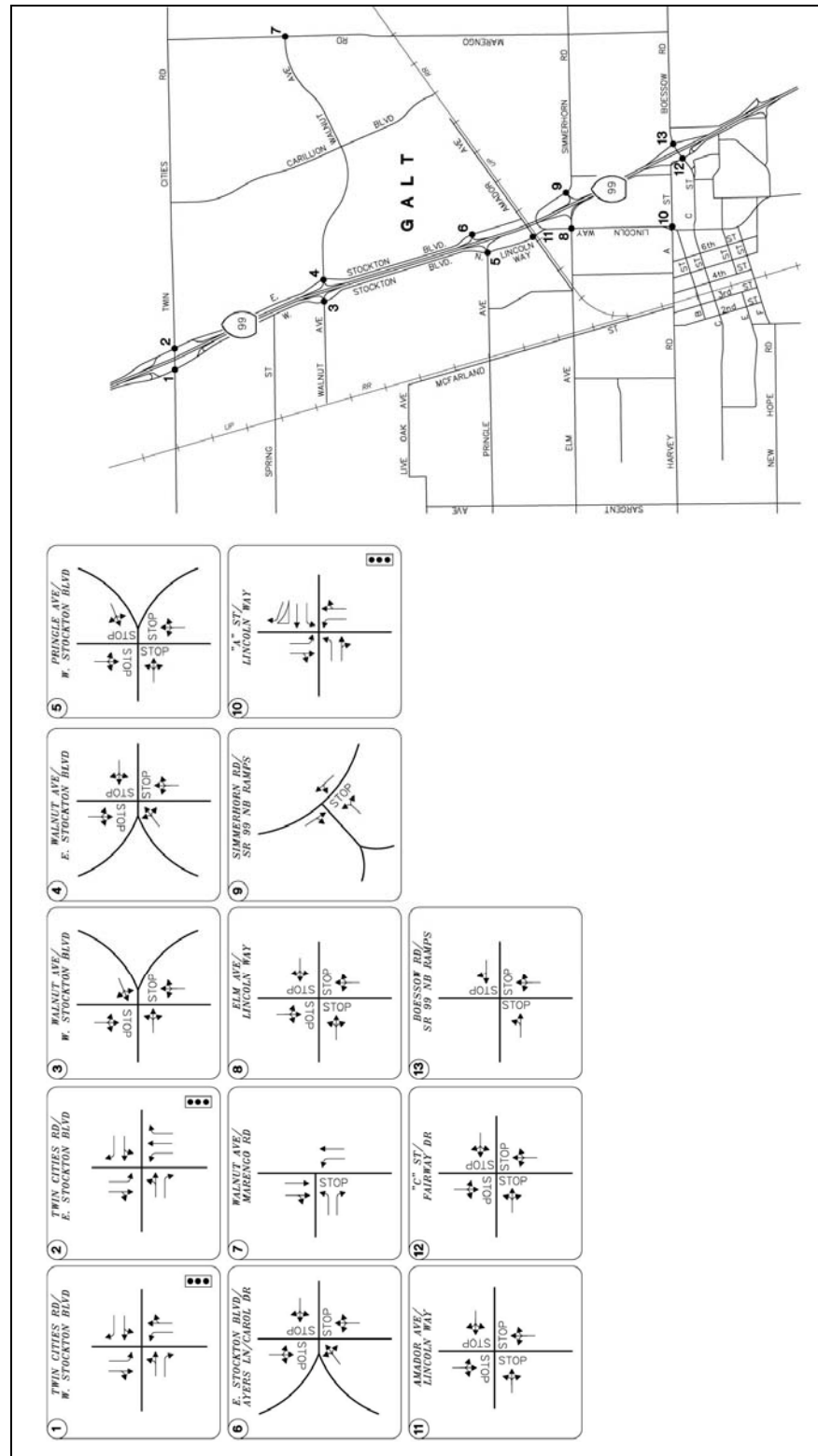
Source: Omni-Means, 2003.

FIGURE 5.3
Existing (2002 – 2003) Intersection Traffic Volumes



Source: Omni-Means, 2003.

FIGURE 5.4
Existing Intersection Land Geometrics and Control



Source: Omni-Means, 2003.

LEVEL-OF-SERVICE POLICY AND METHODOLOGY

Existing conditions traffic operations have been quantified through the determination of “Level of Service” (LOS). Level of Service is a qualitative measure of traffic operating conditions, whereby a letter value “A” through “F” is assigned to an intersection or roadway segment representing progressively worsening traffic conditions (e.g., LOS A represents free-flowing traffic conditions while LOS F represents gridlock).

The existing City of Galt policy for acceptable Level of Service traffic conditions is LOS C throughout the City, except for locations within one-quarter mile of interchanges along State Route 99, where the current policy is LOS D.

Methodologies documented in the *Highway Capacity Manual, (HCM) Transportation Research Board, Fourth Edition, 2000*, are used. Specifically, the analysis of signalized intersections is completed using the *2000 HCM Operations* methodologies, and the analysis of un-signalized intersections (both two-way-stop-controlled and all-way-stop-controlled) is completed using the *2000 HCM Un-signalized* methodologies. LOS definitions for different types of intersection controls are outlined in Table 5.1. Roadway segment LOS were estimated using average daily traffic (ADT) based on LOS thresholds. Table 5.2 shows the ADT-based roadway segment and LOS thresholds used in this study.

To determine whether “significance” should be associated with unsignalized intersection LOS, a supplemental traffic signal warrant analysis has also been performed. This study has employed the signal warrant criteria presented in the *Caltrans’ Traffic Manual* for intersections falling within the State right-of-way, including freeway ramp intersections. Specifically, this study has used the Peak-Hour-Volume Warrant 11 (Urban Areas). For all other study intersections, the *Manual on Uniform Traffic Control Devices (MUTCD)* based signal warrant criteria have been used.

TABLE 5.1
Level-of-Service (LOS) Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Delay/Vehicle (seconds)		
				Signalized	Unsignalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0	>10 and ≤ 15.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20 and ≤ 35.0	>15 and ≤ 25.0	>15 and ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0	>25 and ≤ 35.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0	>35 and ≤ 50.0	>35 and ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over-saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0	> 50.0

Source: Highway Capacity Manual, Transportation Research Board, Fourth Edition, 2000.

TABLE 5.2
Level-of-Service (LOS) Thresholds for Roadway Segments

	LOS A	LOS B	LOS C	LOS D	LOS E
All Facilities (Volume-to-Capacity Ratio (V/C))	<0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0
Roadway Segment Type	Total Daily Vehicles in Both Directions (ADT)				
	LOS A	LOS B	LOS C	LOS D	LOS E
6-Lane Freeway	<72,000	<84,000	<96,000	<108,000	<120,000
4-Lane Freeway	<48,000	<56,000	<64,000	<72,000	<80,000
6-Lane Expressway	<36,000	<42,000	<48,000	<54,000	<60,000
4-Lane Expressway	<24,000	<28,000	<32,000	<36,000	<40,000
6-Lane Major Arterial	<29,000	<33,500	<38,500	<43,000	<48,000
4-Lane Major Arterial	<19,000	<22,500	<25,500	<29,000	<32,000
4-Lane Minor Arterial	<17,000	<19,500	<22,500	<25,000	<28,000
2-Lane Minor Arterial	<8,500	<10,000	<11,000	<12,500	<14,000
4-Lane Collector	<14,500	<17,000	<19,000	<21,500	<24,000
2-Lane Collector	<7,000	<8,500	<9,500	<11,000	<12,000

Notes:

ADT = Average Daily Traffic, LOS = Level of Service

1. Based on "Highway Capacity Manual", Transportation Research Board, 2000 peak hour capacities. Daily capacities in the study area are assumed as ten times the peak hour capacity.

2. All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each Level of Service listed above may vary depending on a variety of factors including (but not limited to) roadway curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, travel lane widths, signal timing characteristics, on-street parking, volume of cross traffic and pedestrians, etc.

Source: Based on "Highway Capacity Manual", Transportation Research Board, 2000.

EXISTING TRAFFIC OPERATIONS

Intersections

Existing peak-hour intersection traffic operations were quantified applying existing traffic volumes (Figure 5.3) and existing intersection lane geometrics and control (Figure 5.4). Table 5.3 shows the existing peak hour intersection levels of service, as well as illustrates 2000 operations for comparison purposes.

TABLE 5.3
Existing (2003) and 2000 Intersection Levels of Service

No	Intersection	Year 2000						Existing (2003)							
		Control Type	AM Peak Hour			PM Peak Hour			Control Type	AM Peak Hour			PM Peak Hour		
			Avg Delay	L O S	Warrant Met?	Avg Delay	L O S	Warrant Met?		Avg Delay	L O S	Warrant Met?	Avg Delay	L O S	Warrant Met?
1	Twin Cities Rd./ W. Stockton Blvd.	TWSC	34.2	D	No	95.6	F	No	Signal	22.6	C	-	41.7	D	-
2	Twin Cities Rd./ E. Stockton Blvd.	AWSC	11.3	B	No	13.1	B	No	Signal	21.3	C	-	28.6	C	-
3	Walnut Ave./W. Stockton Blvd.	TWSC	9.8	A	No	9.6	A	No	TWSC	9.9	A	No	10.0	A	No
4	Walnut Ave./ E. Stockton Blvd.	AWSC	8.1	A	No	8.2	A	No	AWSC	10.3	B	No	10.4	B	No
5	Pringle Ave./W. Stockton Blvd.	AWSC	8.5	A	No	16.9	C	No	AWSC	9.0	A	No	9.6	A	No
6	E. Stockton Blvd./ Ayers Ln./Carol Dr.	AWSC	9.2	A	No	14.3	B	No	AWSC	10.6	B	No	10.4	B	No
7	Walnut Ave./ Marengo Rd.	TWSC	9.1	A	No	8.9	A	No	TWSC	8.7	A	No	8.9	A	No
8	Elm Ave./Lincoln Way	AWSC	19.1	C	No	17.1	C	No	AWSC	19.9	C	No	21.6	C	No
9	Simmerhorn Rd./ SR 99 NB Ramps	TWSC	11.2	B	No	11.1	B	No	TWSC	11.8	B	No	12.2	B	No
10	A Street/Lincoln Way	Signal	24.7	C	-	33.3	C	-	Signal	27.8	C	-	26.7	C	-
11	Amador Ave./ Lincoln Way	AWSC	11.4	B	No	13.3	B	No	AWSC	17.4	C	No	18.4	C	No
12	C Street/ Fairway Dr.	AWSC	189.1	F	Yes	39.8	E	Yes	AWSC	149.6	F	Yes	65.0	F	Yes
13	Boessow Rd./ SR 99 NB Ramps	AWSC	14.8	B	Yes	15.6	C	No	AWSC	22.6	C	Yes	20.6	C	No

Notes: TWSC = Two-Way-Stop Control; AWSC = All-Way-Stop Control.
 Average Delay = Average Intersection Delay for Signalized and AWSC Intersections.
 Average Delay = Worst-Case Intersection Movement Delay for TWSC Intersections.
 LOS = Average Intersection Level-of-Service for Signalized and AWSC Intersections.
 LOS = Worst-Case Movement's Level-of-Service for TWSC Intersections.
 Warrant = Caltrans or MUTCD Peak-Hour Volume Warrant-11 (Urban Areas).

As shown in Table 5.3, all study intersections except the Twin Cities Boulevard/West Stockton Boulevard intersection and C Street/Fairway Drive intersection are currently operating at AM and PM peak hour LOS “C” or better conditions. The Twin Cities Boulevard/West Stockton Boulevard intersection has been upgraded from an unsignalized intersection in year 2000 to a signalized intersection, and is currently operating at AM peak hour LOS “C” and PM peak hour LOS “D” conditions. LOS “D” is acceptable at this intersection as it is a City facility lying within one-quarter mile of the SR 99 freeway interchange. The unsignalized intersection at C Street/Fairway Drive is currently operating at LOS “F” conditions under both AM and PM peak hour periods. This intersection meets the Caltrans Peak Hour Volume Warrant-11 (Urban Areas), in the AM and PM peak hour periods. Also, the Boessow Road/SR 99 NB Ramp intersection meets the Caltrans Peak Hour Volume Warrant-11 (Urban Areas) in the AM peak hour period, although it is operating at acceptable levels of service both in the AM and PM peak hour periods.

Based on the operations indicated in Table 5.3, it appears that the C Street/Fairway Drive intersection would need traffic signalization. Given that the Boessow Road/SR 99 NB Ramp intersection also currently meets the peak hour signal warrant, traffic standards indicate that both the SR 99 NB and SB off ramp intersections with C Street and Boessow Road be installed with coordinated signals. However, before these intersections are signalized, the design and overall capacity of the interchange requires further study. Caltrans and the City are currently preparing a Project Study Report (PSR) to identify long-term improvements to this interchange.

Roadway Segments

Existing roadway segment LOS were estimated based on thresholds described in Table 5.2. The existing conditions ADT-based LOS for study segments within the General Plan’s Sphere of Influence boundary are presented in Table 5.4. Also included in Table 5.4 are 2000 roadway operations for comparison purposes. As shown in Table 5.4, all roadway segments (including freeway segments within the City’s Sphere of Influence) are currently operating at ADT-based LOS “C” or better conditions.

TABLE 5.4
Existing (2003) and 2000 Roadway Segment Levels of Service

Roadway Segment	Capacity Configuration	2000		Existing (2003)	
		ADT	L O S	ADT	L O S
SR 99 (b/w County line and Fairway Dr)	Four-lane divided freeway	48,500	C	58,000	C
SR 99 (b/w Fairway Dr and C Street)	Four-lane divided freeway	50,000	C	58,000	C
SR 99 (b/w C Street and Elm Ave.)	Four-lane divided freeway	50,000	C	58,000	C
SR 99 (b/w Elm Ave. and Pringle Ave.)	Four-lane divided freeway	49,000	C	57,000	C
SR 99 (b/w Pringle Ave. and Walnut Ave.)	Four-lane divided freeway	50,000	C	58,000	C
SR 99 (b/w Walnut Ave. and Twin Cities Rd.)	Four-lane divided freeway	50,000	C	57,000	C
SR 99 (north of Twin Cities Rd.)	Four-lane divided freeway	52,000	C	61,000	C
Lincoln Way (b/w F Street and Southern City Limits)	Two-lane arterial	6,490	A	7,580	A
Lincoln Way (just south of A Street)	Two-lane arterial	10,480	B	10,070	B
Lincoln Way (b/w A Street and Elm Avenue)	Two-lane arterial	10,480	B	10,100	B
New Hope Road (just west of Western City Limits)	Two-lane arterial	2,350	A	2,100	A
F Street (just east of 3 rd Street)	Two-lane arterial	5,190	A	6,130	A
C Street (just east of 3 rd Street)	Two-lane arterial	5,340	A	5,620	A
C Street (just east of Civic Drive)	Two-lane arterial	10,250	B	12,470	C
Boessow Road (just east of SR 99 NB Ramps)	Two-lane arterial	4,760	A	4,960	A
Fairway Drive (just south of SR 99 SB On-Ramp)	Two-lane arterial	2,950	A	1,870	A
Harvey Road (b/w western City Limits and McFarland St)	Two-lane arterial	1,510	A	2,830	A
A Street (just east of McFarland Street)	Two-lane arterial	6,770	A	7,250	A
A Street (just east of Lincoln Way)	Two-lane arterial	4,720	A	5,820	A
Orr Road (b/w western City Limits and McFarland Street)	Two-lane arterial	2,050	A	3,690	A
Elm Avenue (just east of McFarland Street)	Two-lane arterial	5,500	A	6,720	A
Elm Avenue (just west of Lincoln Way)	Two-lane arterial	4,550	A	4,480	A
Simmerhorn Road (just east of SR 99 NB Ramps)	Two-lane arterial	3,340	A	3,000	A
Walnut Avenue (just west of West Stockton Blvd.)	Two-lane arterial	380	A	350	A
Walnut Avenue (just east of East Stockton Blvd.)	Two-lane arterial	1,650	A	4,220	A
Carillion Boulevard (just south of Walnut Avenue)	Two-lane arterial	1,920	A	3,100	A
Carillion Boulevard (b/w Walnut Ave and SR 104)	Two-lane arterial	2,180	A	3,060	A
SR 104-Twin Cities Rd (just east of East Stockton Blvd)	Two-lane arterial	8,000	A	12,700	C
SR 104-Twin Cities Rd (just west of West Stockton Blvd)	Two-lane arterial	5,230	A	5,700	A
Marengo Road (just south of Walnut Avenue)	Two-lane arterial	1,200	A	1,350	A
3 rd Street (just south of A Street/Harvey Road)	Two-lane arterial	1,710	A	2,110	A
McFarland Street (b/w Elm Avenue and A Street)	Two-lane arterial	1,950	A	3,010	A
East Stockton Blvd (b/w Walnut Ave and Carol Drive)	Two-lane arterial	3,800	A	2,600	A
West Stockton Blvd (b/w Walnut Ave and Pringle Ave)	Two-lane arterial	2,200	A	1,950	A
Kost Road (just west of western City Limits)	Two-lane arterial	1,440	A	1,360	A
Industrial Drive (just north of Elm Avenue)	Two-lane arterial	1,750	A	2,720	A
Amador Avenue (b/w Lincoln Way and Elm Avenue)	Two-lane arterial	3,900	A	4,160	A
Pringle Avenue (b/w Industrial Dr. and SR 99 SB Ramp)	Two-lane arterial	2,240	A	2,630	A

Legend: b/w - between

5.5 PUBLIC TRANSPORTATION AND MASS TRANSIT

The City and County jointly plan, manage, and fund local transit service and is guided by the regular update of their Short Range Transit Plan. The current contract transit operator, Community Transportation Agency, Inc. (CTA), in the City of Galt operates South County Transit (SCT) Link. The SCT Link maintains 18 vehicles with seating capacity between 18 and 21 persons per vehicle, depending on the number of wheelchair positions. SCT provides fixed route SR 99 and Delta area service, as well as door-to-door Dial-A-Ride service in Galt. SCT hours of operation are listed in Table 5.5.

Table 5.5
SCT Hours of Operation

Service	Days of Operation	Hours of Operation
Highway 99 Service	Monday to Friday	5:30 AM to 7:25 PM
Delta Service	Monday to Friday	7:AM to 6:25 PM
Galt Dial-A-Ride Service	Monday to Friday	6:30 AM to 6:00 PM
	Saturday	8:00 AM to 5:00 PM
Southeast Sacramento County Dial-A-Ride Service	Monday to Friday	5:00 AM to 7:00 PM
Dial-A-Ride Senior Service	Monday, Thursday, Friday	8:00 AM to 3:00 PM

State Route 99 service connects Galt with Lodi and Elk Grove. Since 1997, State Route 99 service has been expanded to provide service to Florin Center and connect to Sacramento's Regional Transit. Delta Service is provided with direct service from the Delta communities of Walnut Grove and Isleton to Galt, with bus stops at Walnut Grove post office, Isleton City Hall, and Galt City Hall. For those Delta riders living in Courtland, Hood, Ryde, and Franklin who live too far from designated bus stops, door-to-door pickup is available with a 24-hour notice. Dial-A-Ride service within Galt requires one-hour advance reservation. The Southeast Sacramento County Dial-A-Ride service also requires reservations made 24 hours in advance. On Thursdays, a special Dial-A-Ride service takes Delta residents to downtown Sacramento, with stops at K Street Mall, Sutter General Hospital, and Sacramento Medical Center. The Dial-A-Ride Senior Service is a door-to-door service to Sacramento and Elk Grove, started on July 18, 2003. This service takes seniors and disabled persons not able to ride the fixed route into the Sacramento area. The Dial-A-Ride Senior Service is provided to Methodist Hospital, Laguna Shopping Area, Kaiser South Sacramento Hospital, and UC Davis Medical Center. Reservations are required.

5.6 RAILROADS

The Union Pacific Railroad (UPRR) tracks run north/south through the middle of the city. Freight trains passing through Galt are getting excessively long, traveling at speeds between 30 and 60 mph. The trains do not run on a uniform schedule, but instead pass through Galt during randomly distributed times both day and night. Recently (2001-2002), UPRR added a second track from approximately Elm Avenue north beyond Twin Cities Road, to allow slower freight trains to switch to the side track so that faster passenger trains could pass.

The number of freight trains has significantly increased in recent years. The north/south tracks experience approximately 27 trains per day on an irregular schedule (Bromley, 2005), and tend to disrupt east/west cross-town City traffic. With no current railroad grade separation within the City, the delay and inconvenience created by trains passing through pales to the issue and problem created for cross-

town emergency response. The UPRR lone track extension is less of a problem as it used on a minimal basis, generally once a day.

5.7 AVIATION

The closest public airport to Galt is Franklin Field, approximately seven miles west from the Twin Cities/SR 99 interchange. Franklin Field currently is not open after dark and does not have hangars. Lodi Airport, a private airport, is located five miles to the south with full service to general aviation. Scheduled commercial airlines use Sacramento International Airport (45 miles to the northwest) and San Joaquin Metro (30 miles to the south). A proposal has been submitted to Sacramento County to permit the current private Mustang Airport (10565 Arno Road) to expand and convert to a public facility.

5.8 BIKE AND PEDESTRIAN PATHS

The City adopted “The Galt Bicycle Transportation Plan (BTP)” in May 2002, to establish a safe, interconnected bicycle and pedestrian system throughout Galt. The city of Galt currently has about 9,180 lineal feet of Class I bikeway (bike paths), 10,750 lineal feet of Class II bikeway (bike lanes), and no Class III bikeway (bike routes) (see Figure 5.6). Class I bikeways exist along a portion of Dry Creek and a portion of Deadman Gulch. Full construction of these bikeways has not been completed.

Class II bike lanes exist on both sides on Lincoln Way, beginning at the southern city limits and extending north to “E” Street and then again between “A” Street and Pringle Avenue. Class II bike lanes also exist on both sides of “A” Street, “C” Street, “F” Street, 6th Street, Amador Avenue and Industrial Drive. Also, in the Northeast area of the City, bike lanes exist on Carillion Boulevard, Walnut Avenue and East Stockton Boulevard.

The City currently has not officially designated Class III bike routes, although the 2,500-foot segment of “A” Street between approximately Emerald Oak Drive and the Greer Middle School is serving as an informal Class III bike route. New bikeway routes are proposed along the roadway segments listed in Table 5.5.

5.9 MAJOR TRANSPORTATION ISSUES

As the City looks to update their current Circulation Element and plan for the future transportation needs of a growing community, the following major transportation issues will need to be addressed and resolved.

- Currently, the city lacks a “backbone” hierarchy of arterials, collectors, and local streets to provide a cohesive circulation system. In particular, the city lacks an arterial that provides good cross-town connectivity across SR 99. As a result, city residents tend to use the freeway for localized travel.
- The Central Galt/SR 99 Interchange is a non-standard “tight”-diamond” interchange design that congests regularly, but particularly on Galt Market days. Improvement to this interchange is imperative to support future growth of the community.

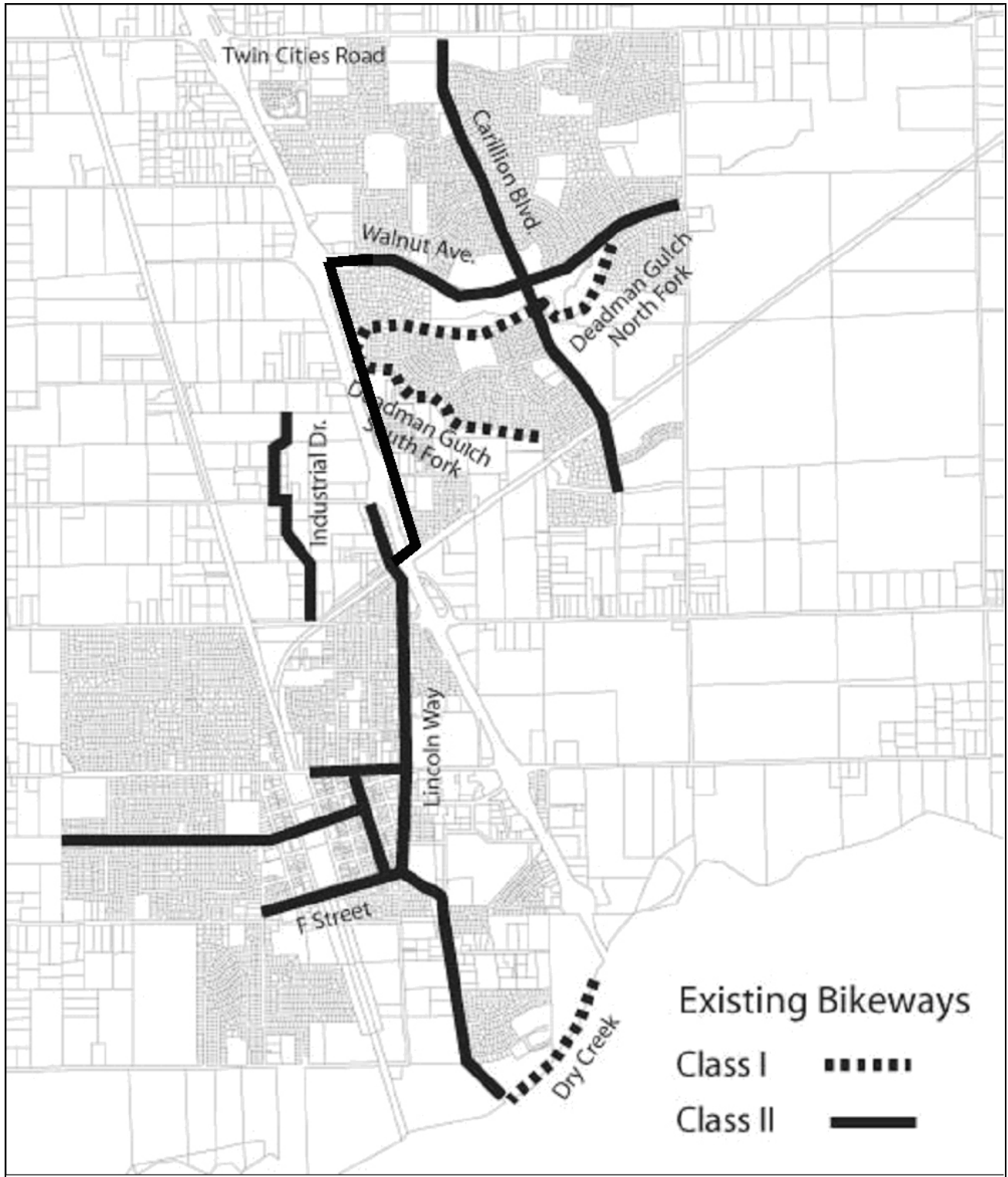
- The Twin Cities Road/SR 99 Interchange is also very important not only to the city, but also to the region providing both local and foothill regional travel.
- To provide capacity for the ever-increasing commuter and other travel on SR 99, Caltrans has plans for the future widening of SR 99 to six lanes. When such widening occurs the existing “hook-ramps” at Twin Cities Road, Walnut Avenue, Pringle Road, Ayers Road, Elm Street, Simmerhorn Road, Fairway Drive, and Crystal Way may either have to be removed or redesigned to accommodate the future widening.
- The City of Galt is also experiencing a significant increase in the number of freight and commuter trains. The increased daily train traffic and the length of trains (from 10 to 140 cars) causes more traffic problems. Also, lack of separated grade crossings at railroad tracks adds to the circulation problems already facing the City.

TABLE 5.5
Proposed Bike Routes

Roadway Segment	Beginning Point	Ending Point	Total Length (feet)
Twin Cities Road	Midway Road	Marengo Road	13,415
Sargent/Midway Road	Twin Cities Road	Kost Road	16,115
Marengo Road	Twin Cities Road	Boessow Road	13,360
Carillion Boulevard	Twin Cities Road	Highway 99	9,420
Frontage Road	Twin Cities Road	Pringle Avenue	9,035
North Lincoln/Lincoln Way	Frontage Road	County Boundary	11,430
Mc Farland Street/4 th Street/RR	Twin Cities Road	City Limit	11,430
Walnut Avenue	Cherokee Lane	Marengo Road	6,785
Vintage Oak Avenue	Walnut Avenue	Carillion Boulevard	4,875
Live Oak Avenue	North Lincoln Way	North Lincoln Way (end of Pavement)	1,584
Orr/Elm Avenue	Sargent Avenue	North Lincoln Way	6,935
Sparrow Avenue	Orr Avenue	West A Street	2,600
Emerald Drive	Orr Avenue	West C Street	3,700
Oak Avenue	Orr Avenue	West A Street	2,575
Simmerhorn Road	Marengo Road	Highway 99 bridge crossing	5,250
A Street	Sargent Road	Lincoln Way	9,015
C Street/Boessow Road	City Limit	Marengo Road	7,600
New Hope/F Street	Sargent Road	Lincoln Way	7,150
Kost Road	Sargent Road	Lincoln Way	8,220
Stockton Boulevard	Walnut Avenue	Twin Cities Road	10,400

Source: Omni-Means, 2003.

FIGURE 5.5
Existing Bikeways



Source: Omni-Means, 2003.

5.10 PERSONS CONSULTED

John Bromley, Director of Public Affairs, Union Pacific. Written communication.
February 2, 2005.

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6 | PUBLIC FACILITIES AND SERVICES

6.1 INTRODUCTION

This chapter provides an assessment of current public facilities in order to determine what effects future planning policies will have on Galt's infrastructure. This includes capacities of existing public facilities and services such as water supply, waste water systems, storm drainage, solid waste, gas and electric systems, communication systems, law enforcement, fire protection, schools, parks and libraries.

6.2 WATER SUPPLY (*updated June 2008*)

The City of Galt Public Works Department operates the city's water system which provides water throughout the community. The city's source of water is entirely from ground water. The quality of the ground water is excellent with the City only needing to treat for iron and manganese for taste and odor. In addition, the water is disinfected by adding low levels of chlorine. The water system is depicted in Figure 6.1.

The city has 10 well sites of which eight wells are currently active. The wells have capacities ranging from 1,000 to 1,550 gallons per minute (gpm) with a total capacity of approximately 8,900 gpm. The depth to ground water is approximately 80 feet to 100 feet with the wells drawing water from depths ranging from 350 feet to 900 feet.

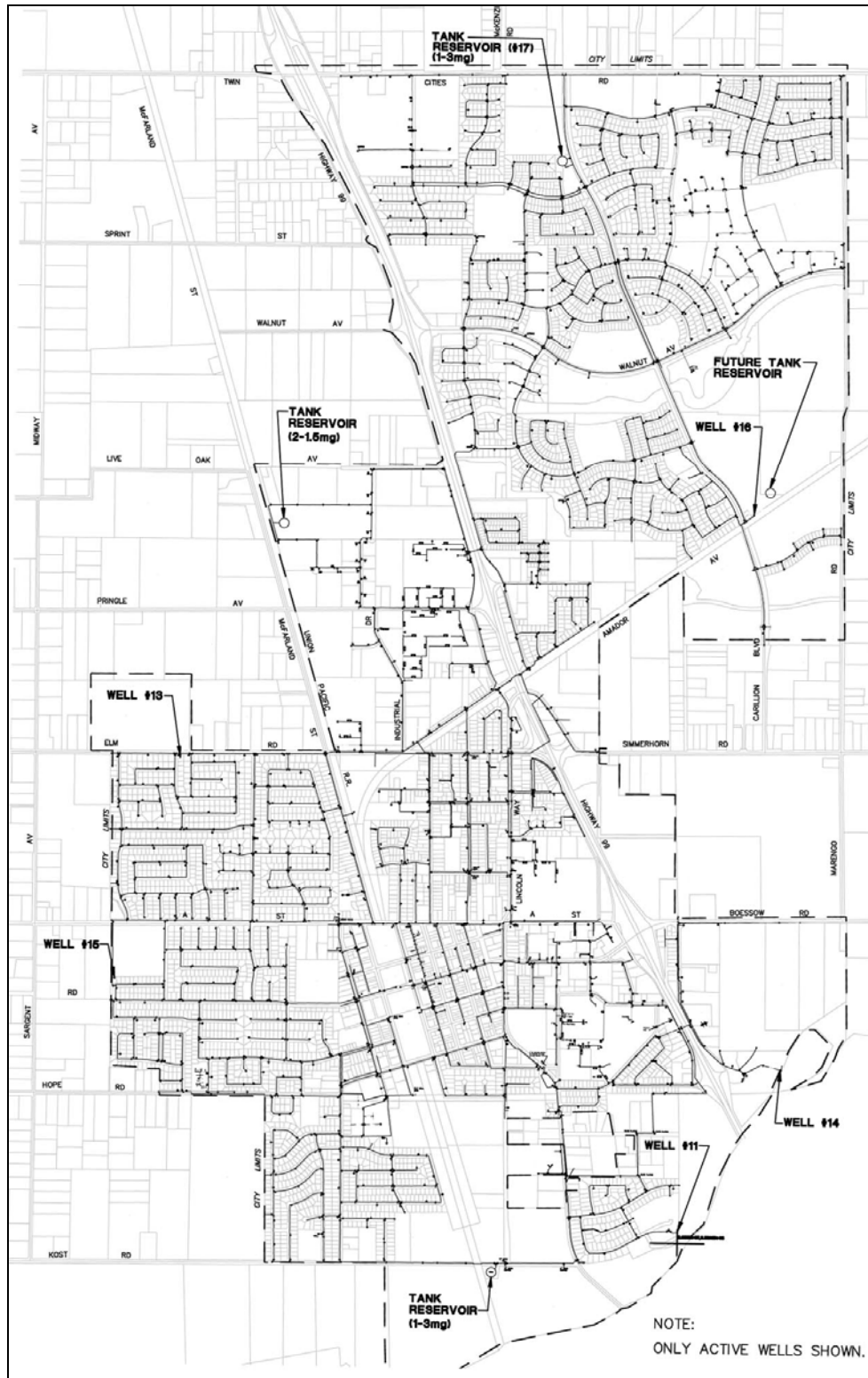
The water system includes storage tanks at three locations. Two of the locations each have a three-million gallon storage tank and one location has two one and a half-million gallon storage tanks. The total existing storage capability is nine-million gallons. A fourth storage tank location is presently planned near Well 16 on the east side of the city.

There are presently 7,300 water service accounts in the city (includes single-family residential, multi-family residential, commercial, and industrial accounts). In calendar year 2006, the total water consumption was 1.847 million gallons pumped from eight wells. The 2006 average annual daily consumption was 4.6 million gallons per day (MGD). This equates to approximately 725 gallons per day per account.

The average daily consumption varies from month-to-month and is dependent on the weather. Based on 2007 production figures, the average daily consumption ranges from a low of 2.3 MGD in January to a high of 7.9 MGD in July. This equates to approximately 350 gallons per account per day in the winter months to 1,200 gallons per account per day in the summer months.

The water distribution system consists of pipelines ranging in size from 4-inches to 12-inches in diameter. The water transmission system consists of pipelines ranging in size from 16-inches to 24-inches in diameter.

FIGURE 6.1
Existing Water System



Source: Omni-Means, 2003.

For the most part, the City water system is unmetered. Commercial and industrial users are fully metered; some multi-family users are metered; all single-family users are un-metered.

The operation and maintenance of the water system is funded by a monthly utility fee. A development impact fee is assessed to new development to fund the development of new wells and the transmission system. New development is required to construct the distribution system associated with their projects.

For a discussion on the specific State legal requirements that the City must meet relative to water supply and distribution, please see *Regulations that Address Hydrologic Resources* in Chapter 8: Natural Resources, under section 8.2.

6.3 WASTEWATER SYSTEMS

The City of Galt Public Works Department operates the city's sanitary sewer collection and treatment system. The collection system consists of collection lines and trunk lines ranging in size from 4-inches to 24-inches in diameter. Due to the relatively flat topography of the city, the sewage must be lifted by sanitary sewer lift stations. There are a total of 12 sanitary lift stations in the city. Ultimately, the sewage is lifted and placed in a two-mile long 14-inch to 16-inch force main where it is transported to the City's Wastewater Treatment Plant (WWTP) located north of the city. This major force main runs along the west side of the Union Pacific Railroad track. Presently (2008), there is no level of redundancy in this force main. If the force main fails for any reason, it will have an impact on the ability to convey sewage to the WWTP and could cause sewage backups in the community. The sanitary sewer collection system is depicted in Figure 6.2.

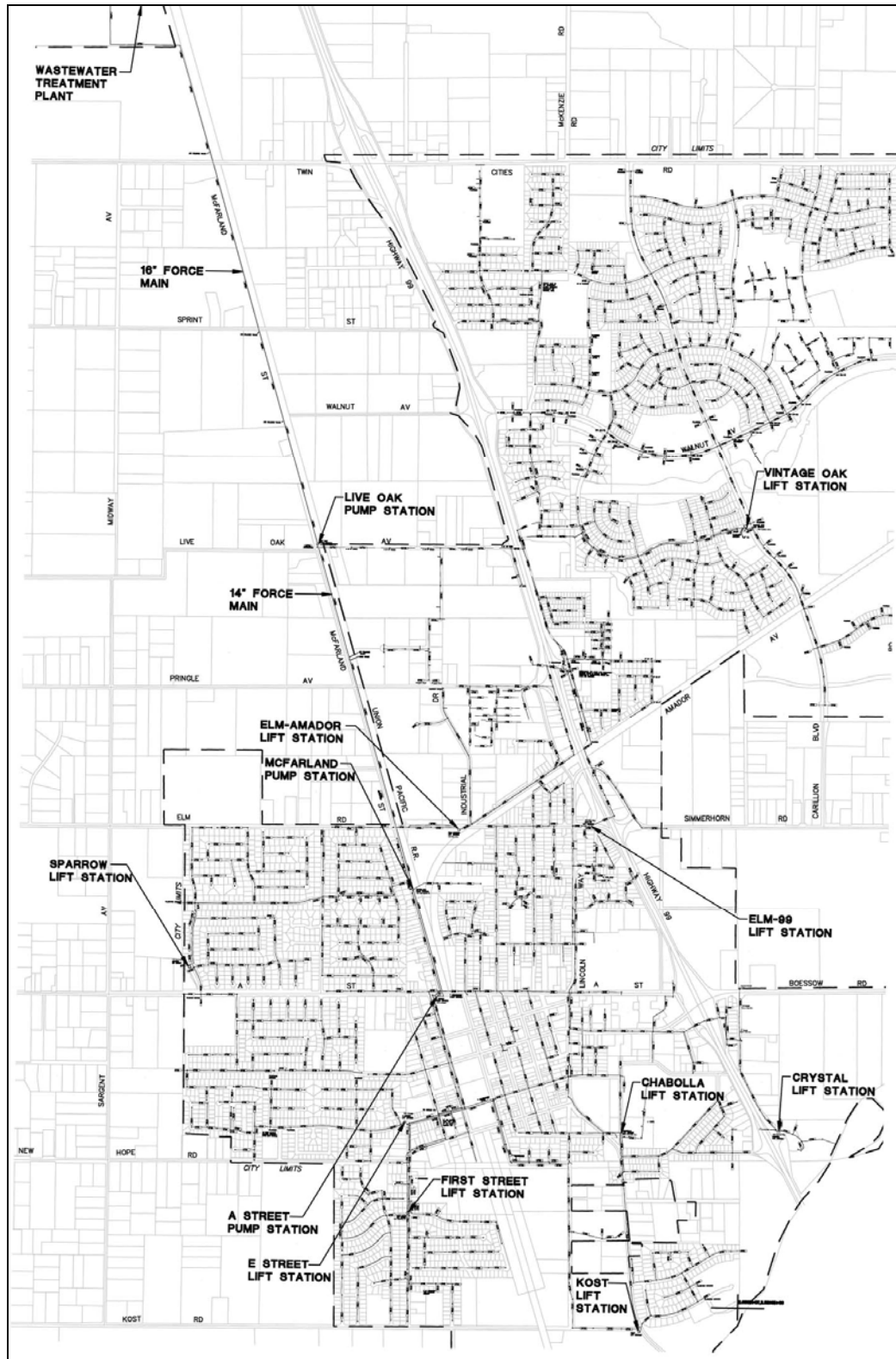
The WWTP is located north of the community, north of Twin Cities Road and west of the Union Pacific Railroad tracks (see Figure 1.2). The WWTP operates under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board (RWQCB), Central Valley Region. The plant is rated at three million gallons per day (MGD). The plant is currently operating at approximately two MGD and provides secondary treatment.

During the winter months (November 1 through April 30), the WWTP is allowed to discharge effluent to Laguna Creek which is a tributary of the Cosumnes River. During the summer months (May 1 through October 31), the effluent must be reclaimed for the irrigation of fodder crops. Due to the amount of land that is available for irrigation, the City is limited to a maximum discharge of 2.6 MGD during the summer months.

The City of Galt owns approximately 150 acres of land surrounding the WWTP. In March 2003, the City leased an additional 180 acres adjacent to the WWTP for reclamation purposes. This brings the total land available for the application of effluent during the summer months to 330 acres.

The City currently (2008) services approximately 6,056 sanitary sewer accounts. The city has a very limited discharge from industrial-type users. Therefore, the majority of the sewage is domestic in nature, coming from residential and commercial users. The average discharge is approximately 330 gallons per day per account.

FIGURE 6.2
Existing Sanitary Sewer Collection System



Source: Omni-Means, 2003.

As noted above, the WWTP has a design capacity of three MGD. The plant is designed and laid out in a manner that would allow it to expand to treat six MGD. However, there is still not enough land to accommodate applied effluent.

The operation and maintenance of the sanitary sewer collection system and the WWTP is funded by a monthly utility fee. A development impact fee is assessed to new development to fund the construction of the trunk line system and the WWTP. New development is required to construct the sanitary sewer collection system associated with their projects.

TERTIARY FILTRATION

The City's current (2008) National Pollutant Discharge Elimination System (NPDES) permit requires the WWTP to be upgraded to tertiary treatment in order to protect the beneficial uses of Laguna Creek, remove viruses and parasites, and to achieve turbidity and suspended solids limits. Several filtration technologies are available on the market that can meet the regulatory limits. In order to select the filtration technology that best suits our specific needs, the City completed pilot testing of three different types of tertiary filters; including cost evaluations and system operation and maintenance recommendations. The three filtration technologies that were pilot tested were cloth media filters, membrane filters, and sand filters.

ULTRAVIOLET DISINFECTION

The Galt WWTP currently (2008) uses chlorine to disinfect the wastewater prior to discharge to Laguna Creek or land application. Because chlorine can produce harmful byproducts, the new NPDES permit contains limits for these constituents and compliance with these limits will require converting to UV disinfection and decommissioning the existing systems.

6.4 STORM DRAINAGE

The City of Galt Public Works Department operates the city's storm drain collection and disposal system. The storm drain system consists of curbs and gutters which collect storm water and direct it into catch basins where it enters an underground system of pipes. The underground piping system then conveys the storm runoff to one of three drainage channels: Dry Creek, Hen Creek, or Deadman's Gulch. The city's storm drainage system is depicted in Figure 6.3.

Dry Creek is a natural channel which forms the southern boundary of the city and the boundary between Sacramento County and San Joaquin County to the south. Dry Creek, flowing in a westerly direction, flows into the Mokelumne River which then flows to the Delta area.

Deadman's Gulch flows in a westerly direction generally through the center of the northeast portion of the town. East of SR 99, Deadman's Gulch has been designed and reconstructed to serve as a storm water detention facility in addition to a storm water conveyance facility. This occurs as a result of the culvert structure under SR 99 which meters the flow into Deadman's Gulch west of the highway. This allows the storm water flows from the development occurring east of the highway to better match the channel capacity west of the highway.

The city has one other detention basin which serves as a joint use facility/city park. It is located on the west side of town adjacent to the Greer Middle School. After being detained in the detention basin, the storm flows are pumped to Hen Creek for

ultimate disposal. The lift station at Greer Detention Basin is one of only two lift stations in the city of Galt.

The storm drainage system is comprised of pipelines ranging in size from 8-inches to 84-inches in diameter. The larger pipe sizes serve as the outfall structures conveying the storm runoff from the southwest portion of the community to Dry Creek.

Galt has a Phase 1 National Pollutant Discharge Elimination System (NPDES) storm water permit. The City joined with Sacramento County and other cities in the county to obtain the permit during the first round of permitting in the early 1990s.

The City funds the operation and maintenance of the storm drainage system through a storm drainage monthly utility rate. For the most part, the monthly utility rate is insufficient to fully fund the operation and maintenance of the system and is augmented with gas tax funding. A storm drainage impact fee is assessed new development to fund the construction of the major components of the storm drainage system. New development is required to construct the storm drainage system associated with their projects.

6.5 SOLID WASTE

California Waste Recovery Systems (CWRS), based in Lodi, currently provides residential and commercial solid waste collection within the city via a franchise agreement. CWRS provides 60 gallon trash and recycling carts, 90 gallon yard waste carts, and 1-to-40 cubic yard containers for commercial uses. The City offers curbside recyclable and green-waste collection, an annual clean-up day, and household hazardous waste collection event for residents.

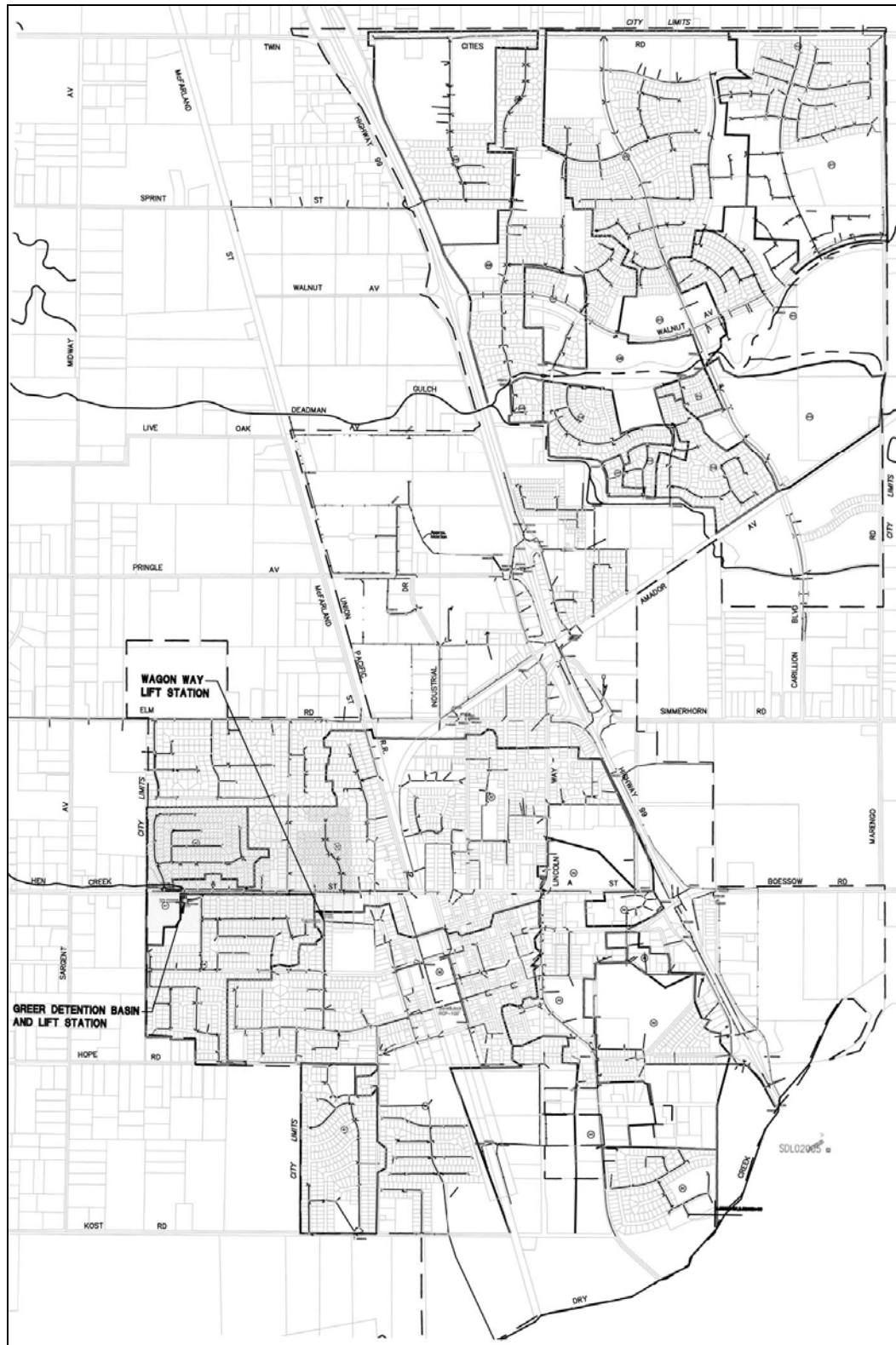
For the year 2003 the city produced 20,406 tons of solid waste, of which 6,276 tons were recyclable materials (31%). The city was able to recycle 43.28% of all residential waste collected and 16.14% of all commercial waste. Table 6.1 shows a breakdown of those materials.

TABLE 6.1
City of Galt Commercial and Residential Solid Waste Diversion Report, 2003

Service Type	Trash	Paper	Glass	Metal	Plastic	Wood Yard Waste	Concrete Dirt	Total	Diversion Tons	Diversion Percentage
Commercial	7,894.93	457.06	65.37	116.86	97.07	283.46	661.87	9,414.18	1,519.25	16.14%
Residential	6,234.15	1,244.30	65.37	52.08	97.07	3,298.83	661.87	10,991.80	4,757.65	43.28%
<i>Totals</i>	<i>14,129.08</i>	<i>1,701.36</i>	<i>65.37</i>	<i>168.94</i>	<i>97.07</i>	<i>3,582.29</i>	<i>661.87</i>	<i>20,405.98</i>	<i>6,276.90</i>	<i>30.76%</i>

Source: California Waste Recovery Systems, 2004.

FIGURE 6.3
Existing Storm Drainage System



Source: Omni-Means, 2003.

State law requires that each municipality diverts (i.e. recycles) at least 50 percent of their solid waste. The City has applied for a new 2001 base year survey to identify any potential sources of diversion that have not been incorporated into the CWRS survey. An audit has been completed and the City is in the process of going before the California Integrated Waste Management Board. The City anticipates to be approved by the board at having 57 percent diversion, thus complying with State mandates.

LANDFILLS

There are no landfills located within the city of Galt. Waste from the city is disposed of in the following locations:

- Arvin Sanitary Landfill (Kern County)
- Foothill Sanitary Landfill (San Joaquin County)
- Forward, Inc. (San Joaquin County)
- L-D Landfill Co. (Sacramento County / City of Citrus Heights Regional Agency)
- North County Landfill (San Joaquin County)
- Sacramento County Landfill (Kiefer, Sacramento County / City of Citrus Heights Regional Agency)

CERTIFIED USED OIL CENTERS

Galt has one certified used oil collection center located at the AutoZone store at 1018 C Street.

6.6 GAS AND ELECTRIC

Gas service for the County of Sacramento and the City of Galt is provided by Pacific Gas & Electric Company (PG&E). Electric service for the County of Sacramento and the City of Galt is provided by the Sacramento Municipal Utilities District (SMUD).

6.7 COMMUNICATION SYSTEMS

Telephone service is provided by SBC/Pac Bell. Cable television is provided by Comcast, and DSL internet services are provided by AT&T Broadband.

6.8 LAW ENFORCEMENT

HISTORY AND FACILITIES

Galt organized its own Police Department when the City incorporated in 1946. The location of law enforcement offices has moved over the years, one of the oldest being the Lee Township Justice Court Office on 5th Street near B Street across from the Fire Station. In July 1978 a new City Hall (380 Civic Drive) was completed and all City offices, including the Police Department, were moved to that location.

On May 1, 2003, the new police facility opened at 455 Industrial Drive. This new facility now houses all police operations for the city and includes a 22,000 square foot main building (see Figure 6.4) and a 3,000 square foot service building.

FIGURE 6.4
Galt Police Facility at 455 Industrial Drive



Source: Mintier & Associates, 2003

FUNDING SOURCES

Funding for the Police Department comes primarily from the City’s General Fund. A portion of its operational expenses dealing with traffic safety is funded by the Traffic Safety Fund. The Recreation Fund pays for the portion of the expenses dealing with the Galt Market. The department also receives periodic grants and entitlements from the State and Federal governments.

STAFFING AND SERVICE LEVELS

Galt currently (2004) does not have an adopted set of standards for levels of police services. In 1988, the Police Department provided a service level of 1.82 officers per 1,000 residents. Over the years that ratio has decreased and present levels are 1 officer per 1,000 residents. Police staff recommends that the current level of service should not decrease. The Police Department estimates that they will require an additional 17 officers by the year 2020 (assuming a population of 37,000). Table 6.2 shows the 2004 police staffing positions and levels for the city:

TABLE 6.2
2004 Galt Police Staffing Positions and Levels

Chief of Police	1
Administrative Assistant	1
Lieutenant	2
Sergeant	4
Police Officer	13
Detectives	3
School Resource Officer	1
Dispatcher/COS	7
Records/Dispatch Supervisor	1
Records Clerk	1
Part-Time Police Officer	1
Volunteers	30

Source: Galt Police Department, 2004

SPECIAL ASSIGNMENTS AND COMMUNITY SERVICES

The Galt Police Department is involved in various special assignments and community service programs. Table 6.3 shows the number of officers assigned or trained in special programs.

TABLE 6.3
Number of Officers Assigned to
Special Assignments and Community Services

Number	Position
7	Special Weapons and Tactics Team (SWAT)
3	Traffic (including one part-time)
2	Community Services Officers (one in patrol, one in detectives)
5	Crime Scene Team
2	K-9 Units
2	Field Training Officers
2	Special Team Enforcement Program (STEP)
3	Bike Patrol (part-time)

Source: Galt Police Department, 2003

FACILITIES, EQUIPMENT NEEDS, AND PLANNED IMPROVEMENTS

With the creation of the new police facility at 455 Industrial Drive, the current and foreseeable needs of the department are met. There are no planned facility improvements at this time for the department.

POLICE ISSUES THAT CAN BE ADDRESSED IN THE GENERAL PLAN UPDATE

Traffic circulation issues will continue to impact the city and surrounding areas. Structures and equipment built to discourage vandalism should be considered and employed whenever practical.

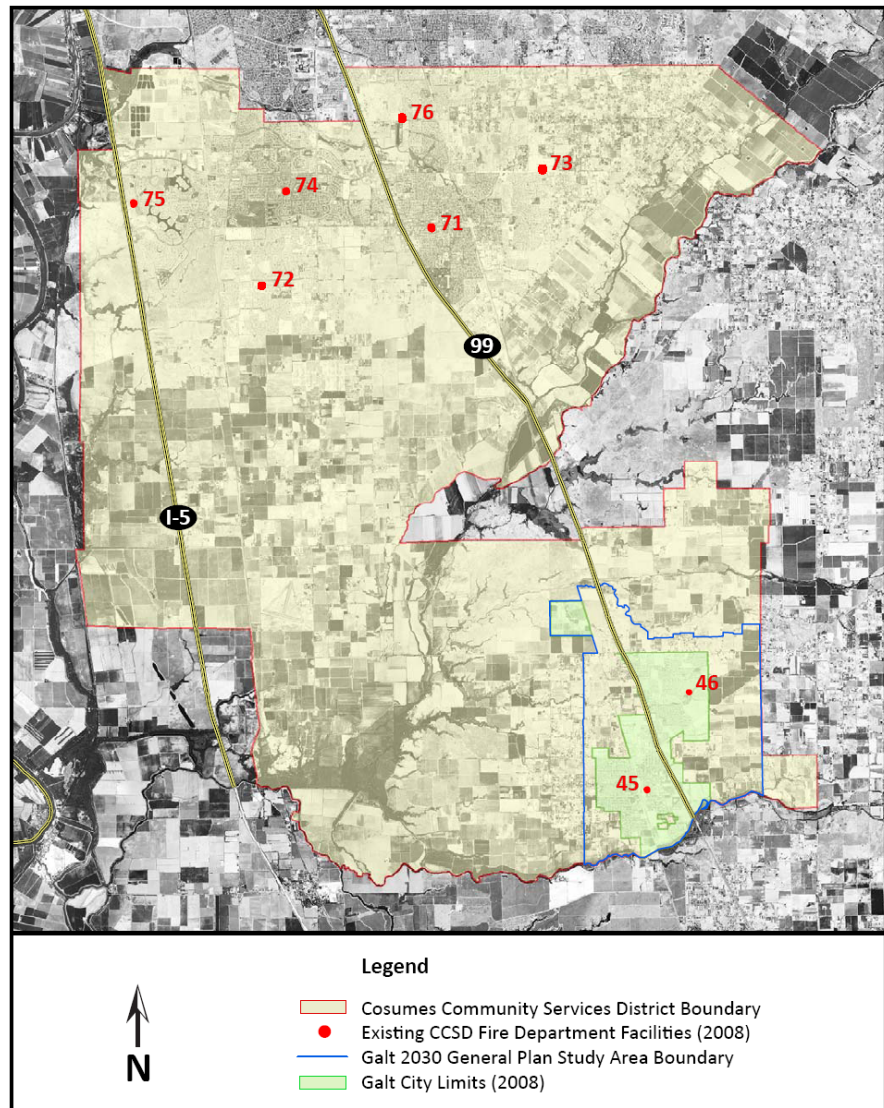
6.9 FIRE PROTECTION (*updated June 2008*)

DISTRICT STRUCTURE AND STAFF

The Cosumnes Community Services District (CCSD) Fire Department was formed in November 2006 when the Elk Grove Community Services District Fire Department reorganized with the Galt Fire Protection District. The District provides fire and life safety services to the Elk Grove and Galt, and parks and recreation services to Elk Grove. The District extends into some outlying areas of Sacramento County bordering Elk Grove and Galt. All of the territory previously served by the Galt Fire Protection District is now served by CCSD.

The District serves a population of approximately 180,000 people in a 157-square mile district (Figure 6.5). In addition, ambulance transport services are provided to the communities of Wilton, Herald, Courtland, and Walnut Grove, which creates an emergency medical services delivery area of 360 square miles.

FIGURE 6.5
CCSD District Boundaries and Existing Facilities



Source: Cosumnes Community Services District, 2008.

FACILITIES

CCSD operates eight fire stations serving the cities of Elk Grove and Galt, as well as areas of unincorporated Sacramento County. Most non-emergency Fire Department business is conducted on weekdays from the CCSD Fire Department Administration Building. CCSD has two fire stations in Galt, one at 229 5th Street (Station #45) and one 1050 Walnut Avenue (Station #46).

FIGURE 6.6
Station #45 and Station #46



Source: Galt Fire Protection District, 2003

DEPARTMENTAL STAFFING

CCSD's current staffing includes 186 full-time personnel. This includes staffing for management, administration, operations, fire prevention, public education, training, emergency medical service (EMS), special operations, fleet maintenance, geographical information systems, and logistics. The District has eight fire stations with nine suppression companies and six medic ambulance companies. Administrative services such as human resources, payroll, finance, and accounting are jointly provided to both the Parks & Recreation and Fire Departments by the Administrative Services Department of CCSD.

CCSD utilizes a staffing model comparable to other Sacramento region fire service agencies. This model requires three-person staffing on all engine companies, four-person staffing on all truck or rescue companies, and two-person staffing for all medic ambulances. The Department also deploys a paramedic on all front-line apparatus, creating an all Advanced Life Safety staffing model.

CURRENT (2007) SERVICE RATIOS

CCSD is currently (2007) adequately staffed for the city of Galt and the surrounding area, with the exception that there is no truck company stationed in the Galt city limits. When a truck company is needed for an incident in Galt it comes from Elk Grove to respond, creating a response time gap for incidents requiring a truck. Current staffing level is a major improvement compared to the Galt Fire Protection District prior to the reorganization. The CCSD provides services within its district boundaries of 157 square miles, including the city of Galt (5.6 square miles). The CCSD also provides an ambulance response zone of some 360 square miles, including the city of Galt and the surrounding area. Current staffing provides immediate Advanced Life Support (ALS) service and requires off-duty personnel for additional response capability.

RESPONSE AND PROTECTION

The District operates eight stations and comprehensive fire prevention, public education, fire investigation programs with a yearly budget of approximately \$41.7 million. The District responded to 13,134 calls for service during 2007, including 1,851 calls from the city of Galt.

COMMUNITY SERVICES

The District provides fire suppression, EMS, technical rescue, and hazardous materials services, as well as comprehensive fire prevention and public education programs to the Galt area. Fire prevention services include public and private construction plan reviews and inspections, issuance of permits, and fire investigation.

Future services that will be required to serve the expected growth and the expanded total population in the district will include a full-scale Hazardous Materials Team, a Heavy Rescue team, and other specialized emergency response units. The District operates within a Mutual Aid system that allows for dropped boundaries with other regional emergency service agencies. It is an integrated system that ensures that the closest available emergency unit, regardless of department, responds to a given incident. The District also brings units from other agencies to large scale emergencies that cannot be mitigated by an individual department due to factors that range from drawdown of resources (all department units responding to a single emergency, leaving the rest of the community vulnerable) to the specialized nature of an incident.

PLANNED IMPROVEMENTS

The District recently adopted a five-year (2008-2013) Capital Improvement Plan which includes the consideration of future fire station locations in the city of Galt, as well as CCSD facilities serving the entire district. Each new station is proposed to house two fire apparatus and one medic ambulance vehicle. Additional projects include a new fleet maintenance facility, a training/education building, and a logistics center. *(Note: The City has not received or commented on the District's CIP)*

The District also has a Fire Station Concentration Policy that states, "The Fire Department constructs and staffs fire stations such that their distribution and location allow compliance with the Department's Response Time Policy." The department's Response Time Policy is as follows:

"It is the goal of emergency response units from the Fire Department to arrive on-scene in urban areas of the CSD within six minutes of initial dispatch, 90 percent of the time. In rural areas of the CSD the Department shall arrive on-scene within seven minutes of initial dispatch, 90 percent of the time."

The Concentration Policy and Response Time Policy combined are designed to allow the fire department to position resources such that they are capable of responding to emergencies in a timely manner before significant fire spread, in the case of fire, or brain damage, in the case of medical emergencies, occurs.

6.10 HOSPITALS

There are no hospitals located within the city of Galt. Table 6.4 shows the hospitals closest to the city and the types of services they provide.

TABLE 6.4
Hospitals near Galt and the Services they Offer

Hospital	Services Provided
Kaiser Permanente Medical Center - South Sacramento 6600 Bruceville Road Sacramento (14.2 miles from Galt)	Services offered include: adult medicine, allergy, breastfeeding support center, business office, cardiology, care coordination, chemical dependency services, dermatology, ear, nose, and throat, EKG, EEG, endocrinology, eye care, head and neck surgery, HIV/AIDS program, hospice service, injections, labor and delivery, laboratory, neurology, nuclear medicine, nutrition, obstetrics/gynecology, oncology, orthopedics, pediatrics, pharmacies, physical medicine and rehabilitation, physical therapy, plastic surgery, podiatry, poison control, psychiatry, radiology, respiratory care, rheumatology, social services, surgery, hearing, urology women's preventive health clinic.
Lodi Memorial Hospital 975 South Fairmont Ave Lodi (11.7 miles from Galt)	Lodi Memorial Hospital is a 173-bed, non-profit, independent, acute-care hospital. Its mission is to provide quality medical care, education, and support services to the community. Two hospital campuses and eight satellite clinics are used to provide a variety of inpatient, outpatient, urgent, emergency, and primary care services.
Methodist Hospital 7500 Hospital Way Sacramento (13.6 miles from Galt)	Services offered at the hospital include: Cardiac intensive care, cardiac stress testing (EKG), cardiac echocardiograms, diagnostic imaging, endoscopy, emergency, gastroenterology, general surgery, intensive care, lithotripsy, nephrology, neonatal intensive care unit, neuroscience, nuclear medicine, obstetrics/gynecology, occupational therapy, oncology, ophthalmology, orthopedics, outpatient surgery, pediatrics, perinatology, physical therapy, podiatry, pregnancy and parenting education, pulmonary medicine, speech therapy, sports medicine, sub-acute care and rehabilitation, and urology.
St. Josephs Medical Center 1800 North California St. Stockton (21.5 miles from Galt)	The largest regional medical center in the county with 291 beds and over 400 physicians. Services include general medical and surgical services, 24-hour emergency services, perinatal and pediatric care, neonatal intensive care, women's services, nurse call center, clinical laboratory, Healthcare Clinical Laboratories, Radiology Department/Diagnostic Imaging, Critical Care Services, Sister Mary Pia Regional Cancer Center, Heart Center, Outpatient Surgery Services, Physical, Speech and Occupational Therapy, Pulmonary and Cardiac Rehabilitation, Hyperbaric Oxygen Therapy, Distinct Part Skilled Nursing Unit, Sports Medicine, Respiratory Services, Immediate Care Center Occupational Medicine Center, Home Health Agency, Community Home Care.

Sources: Kaiser Permanente, 2003; Lodi Memorial Hospital, 2003; Online Highways, 2003; and St. Joseph's Medical Center, 2003.

6.11 PUBLIC SCHOOLS

The city of Galt has two public school districts: Galt Joint Union Elementary School District and Galt Joint Union High School District. Figure 6.8 shows the location of all public schools in Galt.

GALT JOINT UNION ELEMENTARY SCHOOL DISTRICT

The Galt Joint Union Elementary School District encompasses the City of Galt and surrounding areas in Sacramento and San Joaquin Counties (Figure 6.5). This district currently serves 4,257 K-8 students in regular education as per October 2002 CBEDs. Most of these students reside in the city of Galt. The District currently (2003) operates six schools:

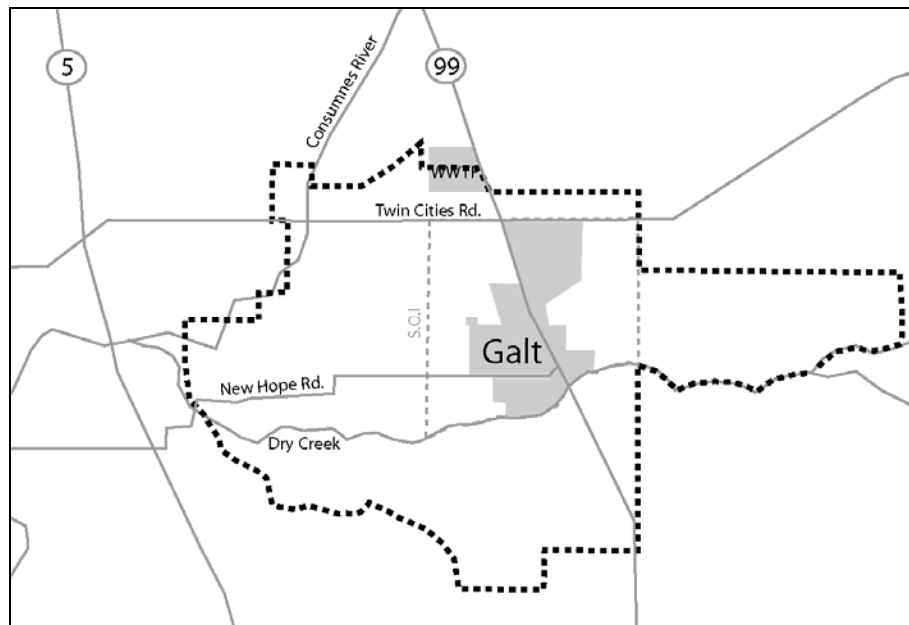
TABLE 6.5
Galt Elementary/Middle Schools Enrollments (2003) and Capacity

School	Enrollment (2003)	Capacity*
Fairsite Elementary	744	350
River Oaks Elementary	671	375
Valley Oaks Elementary	916	500
Marengo Elementary	988	375
Vernon E. Greer Middle School	938	270
Robert L. McCaffrey Middle School	(just constructed)	918
Total	4,257	2,788

* Capacity is equal to the counted number of total teaching stations times 25 students per station for grades K-5 and 27 students per station for grades 6-12.

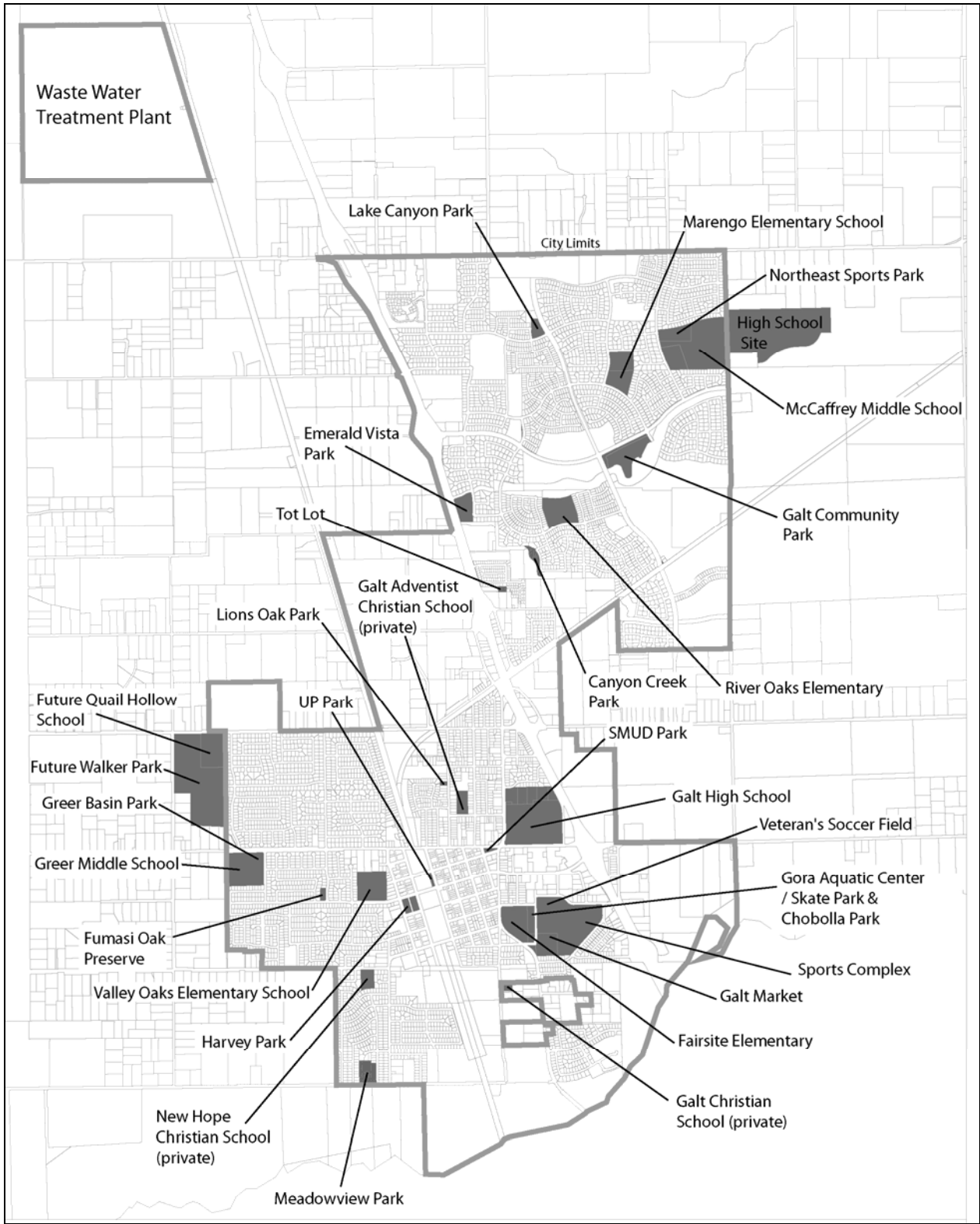
Source: Shilts Consultants, Inc., 2003; Ed-Data, 2003.

FIGURE 6.7
Galt Joint Union Elementary School District Map



Sources: Galt Joint Union Elementary School District, 2004; Mintier & Associates, 2004.

Figure 6.8
Location of Public Schools, Private Schools, and Parks & Recreation Facilities



Source: Mintier & Associates, 2004.

Galt Elementary has experienced an average enrollment growth of approximately four percent per year over the last five years. Most of this increase was generated by new residential construction.

GALT JOINT UNION HIGH SCHOOL DISTRICT

The Galt Joint Union High School District encompasses all of Galt Elementary School District plus three other feeder elementary districts, Oak View Elementary, New Hope Elementary, and Arcohe Elementary School District¹ (Figure 6.9). The Galt Joint Union High School boundaries include the City of Galt, unincorporated communities of Thornton, Herald, Clay and Twin Cities, and rural areas in Sacramento and San Joaquin County. The district currently (2003) serves 1,879 regular and special education students, 19 independent study students, and 94 continuing education students (Table 6.6). The District operates two schools:

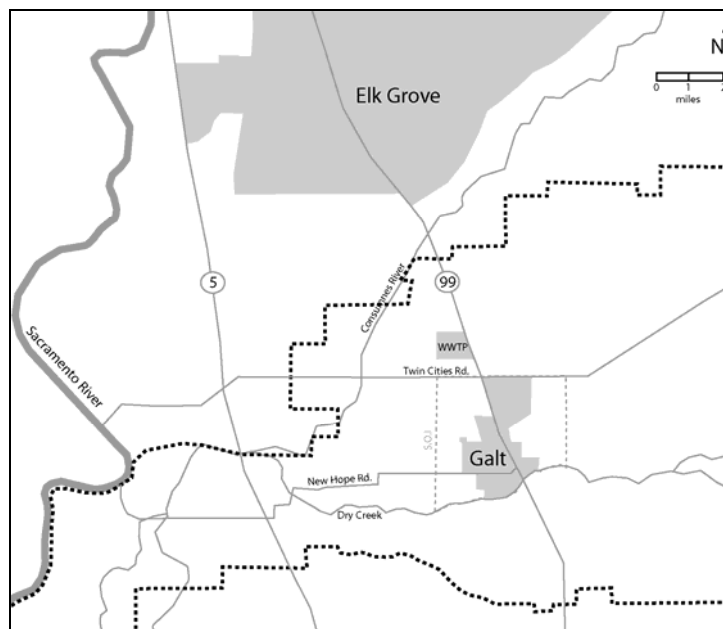
**TABLE 6.6
Galt High Schools**

School	Enrollment (2003)	Capacity*
Galt High School	1,785	810
Estrellita High School	153	-

*Capacity is equal to the counted number of total teaching station times 27 students per station for grades 9-12.

Source: Shilts Consultants, Inc., 2003.

**FIGURE 6.9
Galt Joint Union High School District Map**



* The official boundaries for the High School District extend beyond the maps area.

Sources: Galt Joint Union High School District, 2004; Mintier & Associates, 2004.

¹ The feeder districts were not factored into the 2003 Needs Analysis prepared by Shilts Consultants, Inc.

Galt Joint Union High School District experienced an annual enrollment increase of approximately four percent over the last five years. This growth was mainly due to the new residential construction within the city of Galt. There is a proposal for a new high school to be built adjacent to the city's eastern border.

ENROLLMENTS

Enrollments for both districts have grown at an average annual rate of approximately four percent over the last six years. Table 6.7 summarizes historical growth rates for the districts.

TABLE 6.7
Historical Enrollment (K-12)

Year	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
K thru 5	2,388	2,470	2,608	2,706	2,733	2,827
6 thru 8	1,127	1,192	1,229	1,298	1,356	1,430
9 thru 12	1,613	1,711	1,698	1,773	1,879	1,953
Total Regular Education	5,128	5,373	5,535	5,777	5,968	6,210
Continuing Education	93	108	106	101	94	111
Independent Study	13	16	13	16	19	10
Total	5,234	5,481	5,641	5,878	6,062	6,321

Source: Shilts Consultants, 2003

SCHOOL CAPACITIES

Existing school capacity is determined by a teaching station methodology (pursuant to SB 50) whereas each permanent teaching station is counted and loaded at a rate of 25 students per classroom for grades K through 6, and 27 students per classroom for grades 7 through 12. Pursuant to the Education Code Section 17071.30(b), the maximum number of portable classrooms included within the capacity calculation shall not exceed 25 percent of the number of permanent classrooms.

Galt Joint Union Elementary School District's enrollment exceeds capacity by 1,312 students and the Galt Joint Union High School District's enrollment exceeds capacity by 1,113 students (Table 6.8).

TABLE 6.8
School Capacity vs. Enrollment

	SB50 Capacity	Oct-02 Enrollment	Over Capacity
Elementary Schools	1,574	2,733	1,159
Middle Schools	1,203	1,356	153
High Schools	860	1,973	1,113
Total K-12	3,637	6,062	2,425

Source: Shilts Consultants, 2003

ENROLLMENTS FROM NEW HOUSING DEVELOPMENT

Major consideration for the General Plan Update process is anticipating how future development will increase the number of students within the two districts. A 2003 study by Shilts Consultants, Inc. concluded that new school facilities will need to be built for enrollments generated by new residential development. If 1,250 new housing units are constructed as projected, the Galt Joint Union Elementary School District enrollments will increase by approximately 785 students and the Galt Joint Union High School District enrollments will increase by approximately 245 (total enrollment increase of 1,030).

PROPOSED FACILITIES

Both the Elementary and High School Districts have a number of upcoming building projects geared to help alleviate current and projected needs.

- *Quail Hollow Elementary*: Proposed for the west side of town (see Figure 6.8). The land has been purchased by the School District, but no improvements have been made to the site.
- *McCaffrey Middle School Phase I*: completed construction in July 2003, creating an additional 34 teaching stations.
- *McCaffrey Middle School Phase II*: currently underway and will create an additional 12 portable teaching stations. There is also a proposal to create a fifth elementary school (Lake Canyon Elementary School) for K through 5 students.
- *New High School*: proposed near the intersection of Walnut Avenue and Marengo Road. The 52-acre site was purchased in August of 2001 by the School District and construction of this school is contingent upon the passing of a local general bond.

6.12 PRIVATE SCHOOLS

There are currently three private schools within Galt (see Figure 6.8). The first, Galt Adventist Christian School located at 619 Myrtle Avenue, is a private elementary school serving grades 1 through 8. The second, Galt Christian School located at 801 Church Street, also serves students from grades kindergarten through 11. The third is New Hope Christian School, located at 200 New Hope Road, serves pre-kindergarten and kindergarten students. Figure 6.8 shows the location of all private schools in Galt. Table 6.9 shows a breakdown of grades for these schools.

TABLE 6.9
Galt Private School Enrollments (2004)

	Galt Adventist Christian School	Galt Christian School	New Hope Christian School
Pre-Kindergarten	-	-	85
Kindergarten	-	16	20
1 st	4	17	-
2 nd	2	19	-
3 rd	3	18	-
4 th	4	16	-
5 th	1	12	-
6 th	2	8	-
7 th	1	8	-
8 th	3	12	-
9 th	-	1	-
10 th	-	1	-
11 th	-	1	-
12 th	-	-	-

Sources: National Center for Education Statistics, 2004; Mintier & Associates, 2004.

6.13 PARKS

The Parks & Recreation Department provides a variety of leisure activities for Galt citizens that include youth and adult sports. In addition, the Department is responsible for the maintenance and scheduling of parks, pools, and all city facilities, recreational programs, park information, and facility rental. Table 6.10 shows a listing of Parks & Recreation facilities, their location, and the types of amenities they offer. Figure 6.8 shows the location of all Parks & Recreation Facilities within Galt.

Table 6.10
Galt Parks & Recreation Department Facilities

Facility	Location	Amenities
Meadowview Park	Located at Meadowview Drive and Kost Road	<ul style="list-style-type: none"> Restrooms Shaded Picnic Area with Barbecues Baseball Diamonds with Bleachers 2 Playgrounds
Harvey Park	Located at 2nd Street and C Street	<ul style="list-style-type: none"> Unisex Restroom Shaded Picnic Area with Barbecue Lighted Baseball Diamond with Bleachers
S.P. Park	Located at 4th Street and C Street	N/A
Gora Aquatic Center & Chabolla Park	Located at 630 Chabolla Avenue	<ul style="list-style-type: none"> Restrooms 8-Lane Competition Pool Recreation Pool with Water Slides Picnic Area with Barbecue (outside aquatic facility) Volleyball Court
Sports Complex	Located at 1022 Caroline Avenue	<ul style="list-style-type: none"> Restrooms Shaded Picnic Area and Barbecues Play Structures 3 Lighted Softball Fields with Concession Stand
Veteran's Soccer Field	Located at 900 Caroline Avenue	<ul style="list-style-type: none"> Lighted Soccer Field Bleachers Restroom - Unisex
Lion's Oak Park	Located at Oak Avenue	<ul style="list-style-type: none"> Play Structure Picnic Area and Barbecue
SMUD Park	Located at Lincoln and A Street	N/A
Emerald Vista Park	Located at Winn and Emerald Vista Drives	<ul style="list-style-type: none"> Restrooms Scenic Bike Path Picnic Area Play Structures
Greer Basin	Located at A Street & Fumasi Dr.	<ul style="list-style-type: none"> Restrooms Shaded Picnic Area and Barbecue 4 Baseball Diamonds Play Structure
Canyon Creek Park	Located at Canyon Creek Way	<ul style="list-style-type: none"> Restrooms Shaded Picnic Area and Barbecue Play Structures Lighted Basketball Court Bike Path
Lake Canyon Park	Located at Lake Canyon Avenue	<ul style="list-style-type: none"> Play Structures Shaded Picnic Area and Barbecue Horse Shoe Pit Lighted Basketball Court
Greenwood Tot Lot	Located at Lyonia Drive	<ul style="list-style-type: none"> Play Structures
Fumasi Oak Preserve	Located at Emerald Oak & West C Street	<ul style="list-style-type: none"> Pathway Benches
Galt Community Park	Located at Walnut & Carillion	<ul style="list-style-type: none"> Play Structures Shaded Picnic Area and Barbecue

-
- 2 Lighted Volleyball Courts
 - 5 Lighted Tennis Courts
 - Lighted Horse Shoe Pits
 - Baseball/Soccer Field
 - Lighted Basketball Court
 - Batting Cages
 - Scenic bike / pedestrian paths
-

Source: City of Galt Parks & Recreation Department, 2004.

6.14 LIBRARY

The Galt Library was established in 1908 and is the second-oldest library in Sacramento County. It is a City owned building, operated by the Sacramento County Library System, and is currently located at 1000 Caroline Avenue, near City Hall. The library's service area is in the southern part of Sacramento County and includes portions of northern San Joaquin County. Communities served include Galt, Wilton, Herald, Acampo, and Lockeford. Approximately 18,000 people reside within the geographical service area.

The library is dedicated to serving the needs of children and students, and offers year-round programs as well as weekly preschool story time. The library provides customized "homework collections," Internet access, and word processors for school reports. The library also has an extensive collection of materials in Spanish to serve Galt's Hispanic community.

The library is a repository for Galt Historical Society materials as well as City of Galt information and documents. Community support of the library has been impressive, and in just six years the library has purchased almost \$20,000 in new books, furniture, and equipment.

6.15 PERSONS CONSULTED

- Curt Campion, Planning Director and Assistant City Manager, City of Galt
- Douglas Matthews, Police Chief, Galt Police Department
- Jim Bauler, Assistant Superintendent, Galt Joint Union Elementary School District
- Timothy J Mrozinski, Transition Coordinator, Galt Fire Protection District
- Galt City Managers office

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7 | HOUSING

7.1 INTRODUCTION

California State law requires that general plan housing elements be updated every five years and approved by the State Department of Housing and Community Development (HCD). The City of Galt is currently (2008) in the process of updating its Housing Element on a separate track from the remainder of the General Plan Update. Following adoption by the City and certification by HCD, the 2008 Housing Element will be inserted as Chapter 7 of the 2008 Galt General Plan. For more information on the Housing Element Update, please visit the City's website at: www.ci.galt.ca.us.



8 | NATURAL RESOURCES

8.1 INTRODUCTION

The city's location within a predominately agricultural area of Sacramento County and its proximity to the Cosumnes River allows for a juxtaposition of developed portions of the city to interact with a variety of unique open space environments. This chapter identifies the key natural resources of the study area and is divided into the following discussions.

- Hydrology
- Biological Resources
- Soils and Agricultural Resources
- Greenhouse Gas Inventory

8.2 HYDROLOGY

Although groundwater is the major source of water, the city's water resources also include a number of streams, creeks, and canals. This section provides an overview of the regulations that affect the city's water resources and generally describes the quality of these surface and groundwater resources. Additional information related to water supply is described in Chapter 6 "Public Facilities and Services." Flooding concerns for the study area are more fully described in Chapter 10 "Public Health and Safety."

METHODS AND DATA SOURCES

A variety of data related to the city's water resources was reviewed in preparing this section. Primary sources of data include information from the U.S. Environmental Protection Agency (EPA), and the United States Geological Survey (USGS).

ENVIRONMENTAL SETTING

The city's study area is characterized by a Mediterranean-type climate with wet, cold winters, and warm, dry summers. Most of the rainfall occurs between November and April with an average annual rainfall of 17.5 inches. Flooding concerns are an important issue for the study area and are more fully described in Chapter 10 "Public Health and Safety."

Surface Water Resources

The General Plan study area is divided into three watersheds including the Dry Creek, Hen Creek, and Deadman Gulch watersheds. Watercourses within these watersheds drain to the Cosumnes River watershed, which flows into the larger San Joaquin River Basin. The San Joaquin River Basin covers 15,880 square miles, with its major river systems consisting of the San Joaquin River and its larger tributaries:

the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. The Basin drains surface waters from below the American and Sacramento River watersheds to the Delta and subsequently to the San Francisco Bay. Within this basin, both groundwater and surface water (rivers, streams, canals, and reservoirs) are significant water sources for both urban and agricultural users.

The Sacramento/San Joaquin Delta (Delta), through which one-half of the State's surface runoff water passes each hydrologic year, is formed at the confluence of the San Joaquin and the Sacramento Rivers. The Delta covers 738,000 acres interlaced with hundreds of miles of waterways. Although a majority of the land comprising the Delta is below sea level, a large network of levees (over 1,000 miles) provides protection against flooding. The land and waterways of the Delta support communities, agriculture, a variety of recreational activities and tourism, in addition to providing essential fish and wildlife habitat. The Delta received its first official boundary in 1959 with the passage of the Delta Protection Act (Section 12220 of the Water Code).

The primary surface water features that traverse through the study area include Badger Creek, Willow Creek, Laguna Creek, Skunk Creek, Deadman Gulch, and Dry Creek, with an additional number of canals and irrigation facilities traversing the area (see Figure 8.1). A majority of these smaller surface water features are naturally occurring features that have been modified by impoundments or diversion channels. Channel modification is a result of the largely agricultural nature of the area. For areas outside the Delta, importation and extensive distribution of surface water has allowed agricultural interests to take advantage of the long-growing season and temperate climate.

As shown in Figure 8.1, the Cosumnes River is located near the western boundary of the study area. Additionally, information regarding the Cosumnes River, one of the largest surface water features in the study area, is provided below.

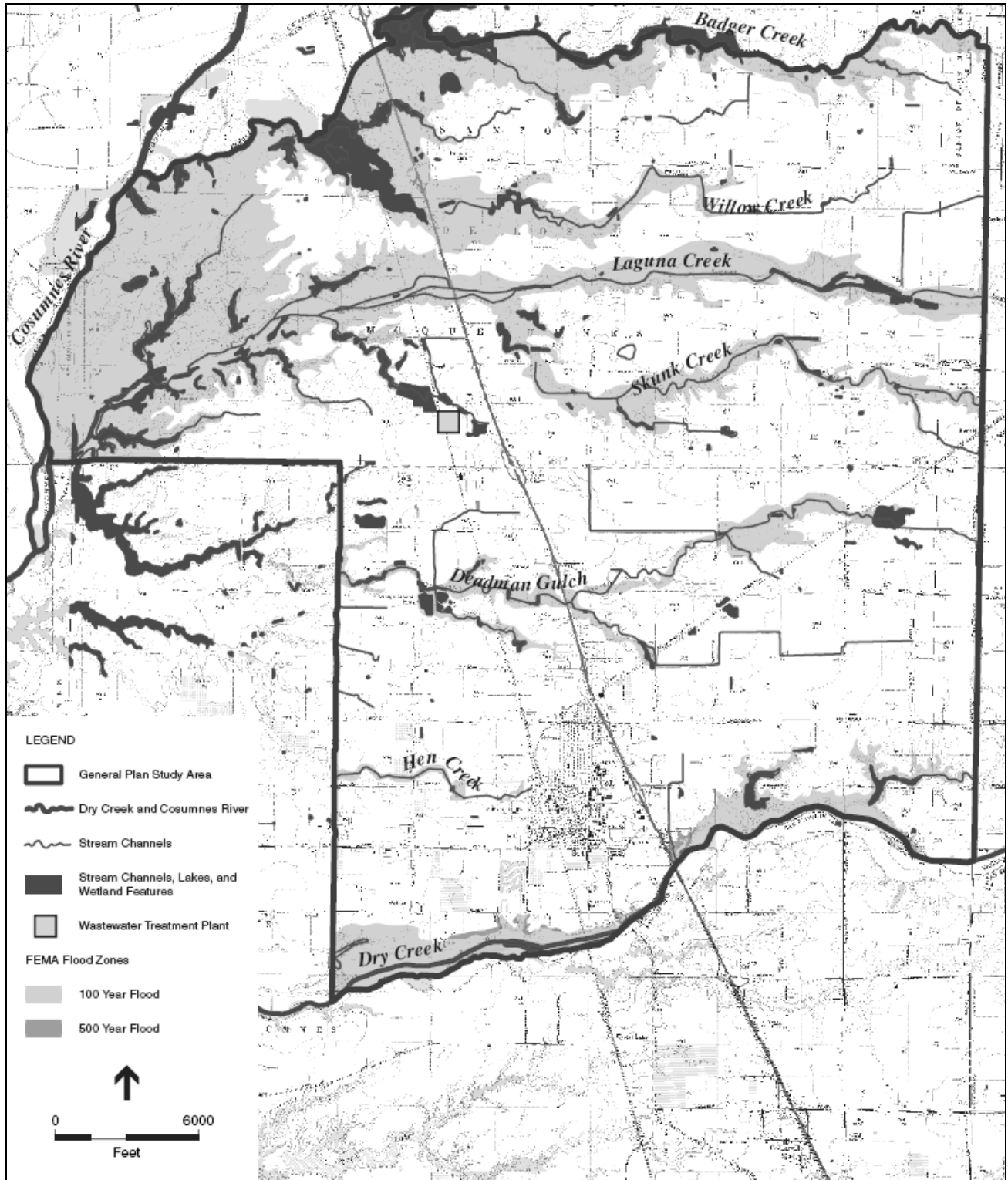
Cosumnes River

The entire Cosumnes River watershed encompasses a 616,600 acre area that is rich with a variety of open space resources and is often divided into three zones including an upper, middle, and lower watershed. Beginning in the Sierra Nevada mountain range, the upper watershed supports approximately 172,000 acres of conifer forest (28% of the total watershed), with most of the land located in the El Dorado National Forest. The middle watershed is located in the Sierra Nevada foothills and extends from State Highway 49 to the Highway 16 Bridge. Oak woodlands and chaparral habitats comprise a majority of the middle watershed, which accounts for an estimated 20% of the entire watershed. The lower or remaining portion of the watershed extends from the Highway 16 Bridge to the river's confluence with the Mokelumne River (Jones & Stokes, 2003).

The lower watershed includes a portion of the study area to the west (see Figure 8.1). Overall, the lower portion of the watershed includes over 50,000 acres of cropland and almost 16,000 acres of orchards and vineyards. The lower watershed also includes the 37,000+ acre Cosumnes River Preserve which is managed by a partnership of several organizations and serves as a key waterfowl wintering area.

A majority of the water flow in the Cosumnes River and its tributaries results from winter rain. Snow accumulation and melt provide only a minor contribution to annual runoff since the area of snow cover is generally less than 16% of the watershed. Low or no flows in the river typically occur in the late summer.

FIGURE 8.1
Hydrological Features in the Study Area



Sources: USFWS NWI Data, 1994; FEMA Floodplain Data, 1993; USGS 7.5' Quads; Teale Hydro Data; and Environmental Science Associates, 2003.

Surface Water Quality

The General Plan study area contains a variety of land uses. Impacts to water quality often result from runoff during wet weather events, indirect discharge associated with industrial and commercial activities, leaking sewer infrastructure, and illicit dumping. While none of the study area's industrial facilities are known to directly discharge waste water into local water courses, treated sewage generated in the City limits is eventually discharged to Laguna Creek during the winter months pursuant to the City's NPDES permit. Additional pollutant sources within the study area may include past waste disposal practices, agricultural chemicals, urban and industrial stormwater runoff, and chemicals and fertilizers applied to landscaping. Typical contaminants include sediment, hydrocarbons and metals, pesticides, nutrients, bacteria, and trash.

The SWRCB, in compliance with the Clean Water Act, Section 303(d), has prepared a list of impaired water bodies in the State of California (SWRCB, 2002). The study area, as mentioned, is located near the eastern boundary of the Delta. All Delta waterways have been designated as impaired for a variety of contaminants, including pesticides (Chlorpyrifos, DDT, Diazinon, and Group A pesticides, resulting from agricultural and urban runoff/storm sewers), mercury (from abandoned mine drainage), electrical conductivity (agriculture), organic enrichment/low dissolved oxygen (municipal point sources and urban runoff/storm sewers), and unknown toxicity (unknown cause).

Groundwater Resources

The primary source of municipal water supply for the study area is groundwater. Due to this reliance on groundwater supply, groundwater use throughout the study area and the larger Greater Central Valley Basin has increased until pumping now exceeds replenishment rates in many areas. According to available data for the area, groundwater levels in Sacramento County were relatively stable at an average -30 feet mean sea level (msl) between 1930 and 1940. Between 1941 and 1970, however, the county-wide average groundwater elevations declined about -5 feet msl. Since then, with increasing levels of groundwater pumping, groundwater levels and groundwater storage have declined throughout Sacramento County and other areas of the Central Valley.

Based on hydraulic continuity, the groundwater basin in Sacramento County has been subdivided into three areas:

- Sacramento North Area
- South Sacramento Area
- Galt Area

Each area is characterized by a cone of depression, resulting from the prolonged pumping of groundwater. According to 1990 data (SCWA, 1993), the Galt Area's cone of depression extends to -40 feet mean sea level (msl). This has resulted primarily from agricultural pumping. In order to stabilize groundwater levels in the Galt Area, the Water Forum Proposal (City-County Office of Metropolitan Water Planning, 1999) recommended an estimated sustainable yield of 115,000 acre feet (AF), based on 1990 pumping amounts. If implemented, the Water Forum theorized that the Galt area would stabilize at a minimum elevation of approximately -64 feet msl with a range of -50 to -70 feet msl, with the decline of 21 feet occurring at the lowest level within the cone of depression. Annual stabilization data is available for

the Galt area. According to the Urban Water Management Plan (2005), the ground water level has stabilized since 1993-94.

Groundwater recharge zones are areas in which surface water is able to percolate downward to sub-surface water bearing formations (see Figure 8.2). Areas adjacent to local watercourses provide moderate to high recharge capability. Within the study area, the primary recharge zones include areas adjacent to most watercourses including Badger Creek, Willow Creek, Laguna Creek, and Dry Creek. Other high recharge areas include the confluence of these smaller watercourses with the larger Cosumnes River. Groundwater in the study area is recharged by local precipitation, and through percolation from the surrounding surface waters. The thickness of the alluvial aquifer ranges from around surface / -200 feet to -1,000 feet.

Groundwater Quality

Overall, the quality of groundwater in the study area is considered to be good. City testing of local groundwater wells for a variety of organic and inorganic constituents have shown that local water supplies meet Primary Drinking Water Standards (City of Galt, 2005). However, some wells in the northeastern portion of the City have not passed Secondary Standards for iron and manganese concentrations (City of Galt, 1990). Potential issues of concern for the study area's future groundwater quality include the leakage of waste materials from local industrial/manufacturing processes, and the use of septic systems in rural areas. Effective 2007, the EPA adopted a new standard for arsenic in drinking water at 10 parts per billion (ppb), replacing the old standard of 50 ppb. Six of the City's eight water wells have post-treatment levels slightly above the new threshold. A pilot project using oxidation filtration in order to lower arsenic levels was implemented in 2006 (City of Galt, 2005).

REGULATIONS THAT ADDRESS HYDROLOGIC RESOURCES

The Federal Clean Water Act and the Federal Safe Drinking Water Act have established water quality standards and attainment programs, which are administered by the EPA. At the statewide level, the California Water Code provides a legal framework and the California State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB) serve as the administrative vehicle for regulating water resources. A brief overview of these regulations follows.

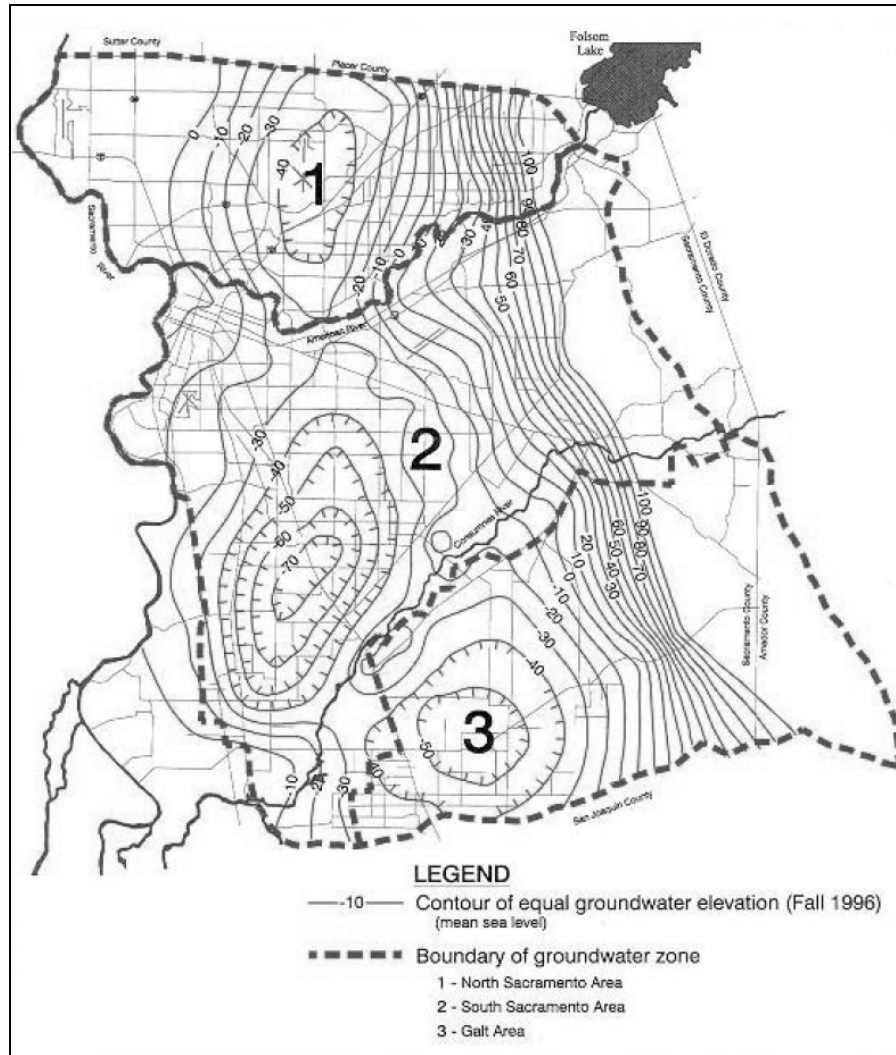
Federal Regulations

Clean Water Act

The federal Clean Water Act ((CWA, 33 USC 1251–1376), as amended by the Water Quality Act of 1987) is the major Federal legislation governing water quality. The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the nation's water.” Important applicable sections of the Federal CWA are as follows:

- Section 401: Requires an applicant for any Federal permit that proposes an activity which may result in a discharge to “waters of the United States” to obtain certification from the State that the discharge will comply with other provisions of the Act. The RWQCB provides certification.

FIGURE 8.2
Groundwater Zones and Elevations



Sources: Montgomery Watson, 1997; and Environmental Science Associates, 2003.

- Section 402: Establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by the RWQCB, and is discussed further below.
- Section 404: Establishes a permit program for the discharge of dredge or fill material into waters of the United States. The U.S. Army Corps of Engineers (Corps) administers this permit program.

State Regulations

California Water Code

Derived from several sources, including the riparian doctrine taken from English common law, Spanish pueblo rights, the appropriative doctrine of western mining and irrigation tradition, and the correlative doctrine as it related to groundwater, the California Water Code establishes the foundation for acquisition and protection of water rights. These water doctrines, with some originating hundreds of years ago, remain relevant to current water law discussions to varying degrees, and they have been used over the years to resolve conflicts and establish legal precedents.

During the mid to late 1800s, when the mining and agricultural industries were growing throughout California, questions often arose about who had rights to how much water. In general, the deciding factor was who was there first. This is characterized as the appropriate doctrine of water rights: “first in time, first in right.” Currently, new acquisitions of surface water are obtained under the appropriate doctrine, as constrained by the reasonable and beneficial use test and California’s public trust doctrine.

Rights to groundwater are more complex and groundwater as a resource is generally considered in three separate classes: (1) as stream underflow, (2) as definite underground streams, and (3) as percolating waters. The first two are treated legally as surface water, and all underground water is considered percolating water unless proven otherwise.

Landowners whose property overlies an aquifer have rights to develop the water. That right is conditional, however, through provisions of the correlative doctrine. Under the correlative doctrine, all landowners must share scarce water resources during shortages and must limit their use to the amount of water reasonably required to meet each landowner’s beneficial needs. This doctrine assumes that all landowners have similar and equal rights to the underlying groundwater.

Urban Water Management Planning Act (UWMPA)

In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code Sections 10610 – 10656). The UWMPA states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The UWMPA requires that urban water suppliers adopt and submit an urban water management plan at least once every five years to the California Department of Water Resources. Non-compliant urban water suppliers are ineligible to receive funding pursuant to Division 24 (commencing with section 78500) or Division 26 (commencing with

section 79000), or receive drought assistance from the State until a urban water management plan is submitted pursuant to the UWMPA.

Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000.

The Cortese-Knox-Hertzberg Governmental Reorganization Act of 2000 requires California Local Agency Formation Commission's (LAFCO) to conduct municipal service reviews for specified public agencies under their jurisdiction. One aspect of a municipal service review is to evaluate an agency's ability to provide public services within its ultimate service area. A municipal service review is required before an agency can update its sphere of influence.

Senate Bills (SB) 610 and SB 221.

SB 610 and SB 221 amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 are companion measures that seek to promote more collaborative planning between local water suppliers, cities, and counties. Both statutes require detailed information regarding water availability to be provided to the appropriate city and county decision-makers prior to the approval of specified large development projects. Both statutes also require that this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Under SB 610, water assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912) subject to the California Environmental Quality Act (CEQA). Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply.

Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater. Waste Discharge Requirements (WDRs) resulting from the report are issued by the Regional Water Quality Control Board (RWQCB).

California State Water Resources Control Board

Responsibility for administering California water rights procedures lies with the SWRCB, which also is responsible for managing and administering various Federal and State water quality control programs (see Table 8.1). Procedures are provided by statute, but the Board has the authority to establish rules and regulations to help it carry out its work. All Board activities are governed by State of California water policy and are administered in accordance with policies and procedures in the California Water Code.

TABLE 8.1
Summary of State Agency Responsibilities

State Agency	Primary Responsibilities
State Water Resources Control Board	Administers water rights, water pollution control, and water quality functions.
Regional Water Quality Control Board	Conducts planning, permitting, and enforcement activities.

Source: Environmental Science Associates, 2003.

Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (CVRWQCB) is responsible for the protection of beneficial uses of water resources within the study area (see Table 8-1). Designation of beneficial uses defines the resources, services, and qualities of the aquatic system that are the ultimate goals of protecting and achieving high water quality. The CVRWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the Central Valley Region Water Quality Control Plan (Basin Plan) to implement plans, policies, and provisions for water quality management. Beneficial uses of surface waters are described in the Basin Plan and are designated for major surface waters and their tributaries. In addition to identification of beneficial uses, the Basin Plan also contains water quality objectives that are intended to protect the beneficial uses of the Basin. The CVRWQCB has region-wide and water body beneficial use-specific water quality objectives.

Beneficial uses of the surface waters of the Delta include municipal, agricultural, industrial, and recreational uses, freshwater habitat, migration, spawning, wildlife habitat, and navigation. Beneficial uses for all groundwater resources in the Central Valley region include or potentially include municipal, agricultural, and industrial uses.

The CVRWQCB has set water quality objectives for all surface waters in the region concerning bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, salinity, sediment, settleable material, suspended material, sulfide, tastes and odors, temperature, toxicity, turbidity, and ammonia. Water quality objectives for groundwater include standards for bacteria, chemical constituents, radioactivity, tastes and odors, and toxicity.

The CVRWQCB also administers the NPDES stormwater permitting program for both construction and industrial activities. NPDES requirements for these two activities are more fully described below.

Construction Activities

Construction sites disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). For qualifying projects, a project applicant must submit a Notice of Intent (NOI) to the RWQCB to be covered by the General Construction Permit prior to the beginning of all construction activities. A General Construction Permit requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which also must be completed before construction begins. Implementation of the plan starts with the commencement of construction and continues through the completion of the

project. Upon completion of the project, the applicant must submit a Notice of Termination to the RWQCB to indicate that construction is completed.

Industrial Activities

Stormwater discharges associated with industrial facilities are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Associated with Industrial Activities excluding Construction Activities (General Industrial Permit). The regulations defining “storm water discharges associated with industrial activity” were published on November 16, 1990, with the EPA identifying eleven categories of industrial activities that are required to obtain permit coverage. To obtain authorization for continued and future storm water discharge under the General Industrial Permit, each facility operator must submit a NOI. All storm water discharges from industrial sites must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act. These provisions require control of pollutant discharges using the best available technology (BAT) that is economically achievable and best conventional pollutant control technology (BCT) to prevent and reduce pollutants and to meet water quality standards. Stormwater discharges from an industrial site shall not cause or contribute to a violation of all applicable water quality standards, which include all federal receiving water standards and all state standards under the RWQCB’s Basin Plan. The General Industrial Permit generally requires facility operators to:

- eliminate unauthorized non-storm water discharges;
- develop, retain on site, and implement a SWPPP to identify sources of pollution and to prescribe implementation of best management practices (BMPs) to reduce or prevent pollutants in industrial storm water discharges and authorized non-storm water discharges; and
- perform monitoring of storm water discharges and authorized non-storm water discharges.

Areas of industrial activity where surface runoff must be controlled and treated include all storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, cleaning and rinsing areas, and all other areas of industrial activity that are potential pollutant sources. Any changes to the industrial site or activity require an update of the SWPPP and implementation of new control measures.

Local Regulations

City of Galt Public Works Department

The City has adopted standard specifications as a guide for the standardization of public works installations within the city. These specifications outline requirements for clearing, grubbing and earthwork, stormwater drainage facilities, including detention and retention basins. Compliance is monitored by the City of Galt Public Works Department.

Additional Regulations Administered by a Variety of Public Agencies

Best Management Practices

The term “Best Management Practices” or BMPs refers to a wide variety of measures taken to reduce pollutants in stormwater and other non-point source runoff. As shown in Table 8.2, measures range from source control, such as use of permeable pavement, to treatment of polluted runoff, such as detention or retention basins and constructed wetlands. Maintenance practices (e.g., street sweeping) and public outreach campaigns also fall under the category of BMPs. In general, data establishing the effectiveness of BMPs in reducing target pollutants is scarce. Further, the effectiveness of a particular BMP is highly contingent upon the context in which it is applied and the method in which it is implemented. In general, the City is responsible for implementing a variety of BMPs. However, in some cases, implementation of specific project-related BMPs may be delegated to the project proponent, with compliance monitored by the City. BMPs are described and implemented as part of the SWPPP, which must be completed prior to the construction phase of specific projects.

TABLE 8.2
BMP Expected Pollutant Removal Efficiency

Construction Site BMP	Typical Pollutant Removal (percent)				
	Suspended Solids	Nitrogen	Phosphorus	Pathogens	Metals
Silt Fence	50–80				
Sediment Basin	55–100				
Sediment Trap	60				
Structural BMP					
Dry Detention Basins	30 – 65	15 – 45	15 – 45	<30	15 – 45
Retention Basins	50 – 80	30 – 65	30 – 65	<30	50 – 80
Constructed Wetlands	50 – 80	<30	15 – 45	<30	50 – 80
Infiltration Basins	50 – 80	50 – 80	50 – 80	65 – 100	50 – 80
Infiltration Trenches / Dry Wells	50 – 80	50 – 80	15 – 45	65 – 100	50 – 80
Porous Pavement	65 – 100	65 – 100	30 – 65	65 – 100	65 – 100
Grassed Swales	30 – 65	15 – 45	15 – 45	<30	15 – 45
Vegetated Filter Strips	50 – 80	50 – 80	50 – 80	<30	50 – 80
Surface Sand Filters	50 – 80	<30	50 – 80	<30	50 – 80
Other Media Filters	65 – 100	15 – 45	<30	<30	50 – 80

Source: EPA, 1999; EPA, 1993.

8.3 BIOLOGICAL RESOURCES

The City’s study area contains a variety of biological communities and wildlife habitats that contribute to the overall functionality of Central Valley ecosystems. This section describes biological resources in the study area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that will affect biological resources in the study area.

METHODS AND DATA SOURCES

Biological resources within the study area were identified by ESA biologists through field reconnaissance, a review of pertinent literature, and database queries. The primary sources of data referenced for this report are listed in the Bibliography:

A review of the California Natural Diversity Database (CNDDDB) (2007), the USFWS endangered and threatened species database (2007) and the California Native Plant Society (CNPS) electronic inventory were conducted in July 2007 to determine the potential for special-status species or other sensitive biological resources to occur in the study area.

ENVIRONMENTAL SETTING

The General Plan study area encompasses a portion of the southern Sacramento Valley. Characteristic vegetation communities in the region include agriculture, annual grassland, riparian woodland, and seasonal wetland. The climate of this region is characterized by hot, dry summers and cool, moist winters. The average annual minimum temperature at the nearest weather station in Lodi (approximately 20 miles south of Galt) is 46.1°F and the average annual maximum temperature is 73.9°F. Average annual precipitation is 17.5 inches (Western Regional Climate Center, 2003).

Biological Communities

Biological communities within the study area include plant communities and wildlife habitats. Plant communities are assemblages of plant species that occur together in the same area. Both species composition and relative abundance define them. The plant community descriptions and nomenclature used in this section were based on *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995). The vegetative communities described below generally correlate with wildlife habitat types. The wildlife habitats identified in this section were described using the California Department of Fish and Game’s *A Guide to Wildlife Habitats* (Mayer and Laudenslayer, 1988). Table 8.3 summarizes the major plant communities within the study area and lists some representative wildlife species that may occur within these communities.

**TABLE 8.3
Dominant Plant Communities in the City’s Study Area**

Plant Community / Wildlife Habitat	Characteristic Plant Species	Common Wildlife Species
Annual grassland	Brome, California poppy, dogtail, hairgrass, filaree, lupine, mustard, wild oat, clover, ryegrass, star thistle.	Small mammals, black-tailed jackrabbit, burrowing owl, red-tailed hawk, barn owl, western meadowlark, Brewer’s blackbird, western fence lizard, gopher snake, western toad.
Cropland	Includes a variety of cropland plants, generally annuals, of various composition.	Wild pig, raptors, doves, ring-neck pheasant, waterfowl, jackrabbit, ground squirrels and many other species of rodents and birds have become adapted to croplands.
Freshwater Marsh	Big leaf sedge, bulrush, common cattail, tule, baltic rush, saltgrass	Waterfowl, shorebirds, egrets and herons, raptors, wrens, belted kingfisher, giant garter snake, western pond turtles, bullfrog, fish, small mammals.
Lauustrine (Open Water)	Filamentous green algae, phytoplankton, duckweed, pondweeds, water lilies.	Salamanders, western pond turtle, garter snakes, king snakes, morning dove, gulls, terns, osprey, swallows, dragonflies and damselflies.
Riverine (Open Water)	Pondweeds, cattails, sedge, cottonwood, box elder, elderberry, white alder.	Gulls, terns, osprey, herons, shorebirds, belted kingfisher, swallows, swifts, flycatchers, hawks, river otter, muskrat, dragonflies, damselflies, caddisflies, water striders.
Urban	Various landscape plants including tree groves, shade trees, lawns, and shrub cover	Rock pigeon, house sparrow, European starling, western scrub jay, northern mockingbird, house finch, raccoons, opossum, striped skunk, gopher snake, western fence lizard, black-tailed jackrabbit.

Plant Community / Wildlife Habitat	Characteristic Plant Species	Common Wildlife Species
Riparian	Cottonwood, California sycamore, valley oak, white alder, box elder, elderberry, Oregon ash, wild grape, California blackberry, poison oak, buttonbrush, willows, sedges, rushes, and grasses.	Ringtail, striped skunk, raccoon, muskrat, tree swallow, flycatchers, warblers, Cooper’s hawk, garter snake, salamanders, western toad.
Vernal Pools	Orcutt grass, goldfields, owl’s-clover, popcorn flower, meadowfoam, legenere	Fairy shrimp, salamander, newt, spadefoot toad, waterfowl, shorebirds, other crustaceans and invertebrates.
Vineyards	Single species tree or shrub dominated habitats.	Black-tailed jackrabbit, small mammals, morning dove, California quail, northern flicker, western scrub jay, American crow, oak titmouse, Brewer’s blackbird, house finch, yellow-billed magpie, western bluebird, American robin, northern mockingbird, cedar waxwing, black-headed grosbeak, western gray squirrel, coyote, raccoon.

Source: Sawyer and Keeler-Wolf, 1985 and Mayer and Laudenslayer, 1988.

Vegetation data from the draft South Sacramento Habitat Conservation Plan (SSHCP) was used to quantify the acreage of various habitat types within the study area. As shown in Table 8.4, approximately 60 percent of the City’s study area is composed of urban and agricultural lands. The study area contains approximately 30 percent annual grasslands. The Cosumnes River system and Dry Creek, which flows into the Mokelumne River, contribute to the next most abundant habitat type, open water. Although riparian habitats (see Figure 8.3) make up only one percent of the total study area, they have the highest concentration of plant communities and wildlife species. The following section provides a more detailed description of each habitat type.

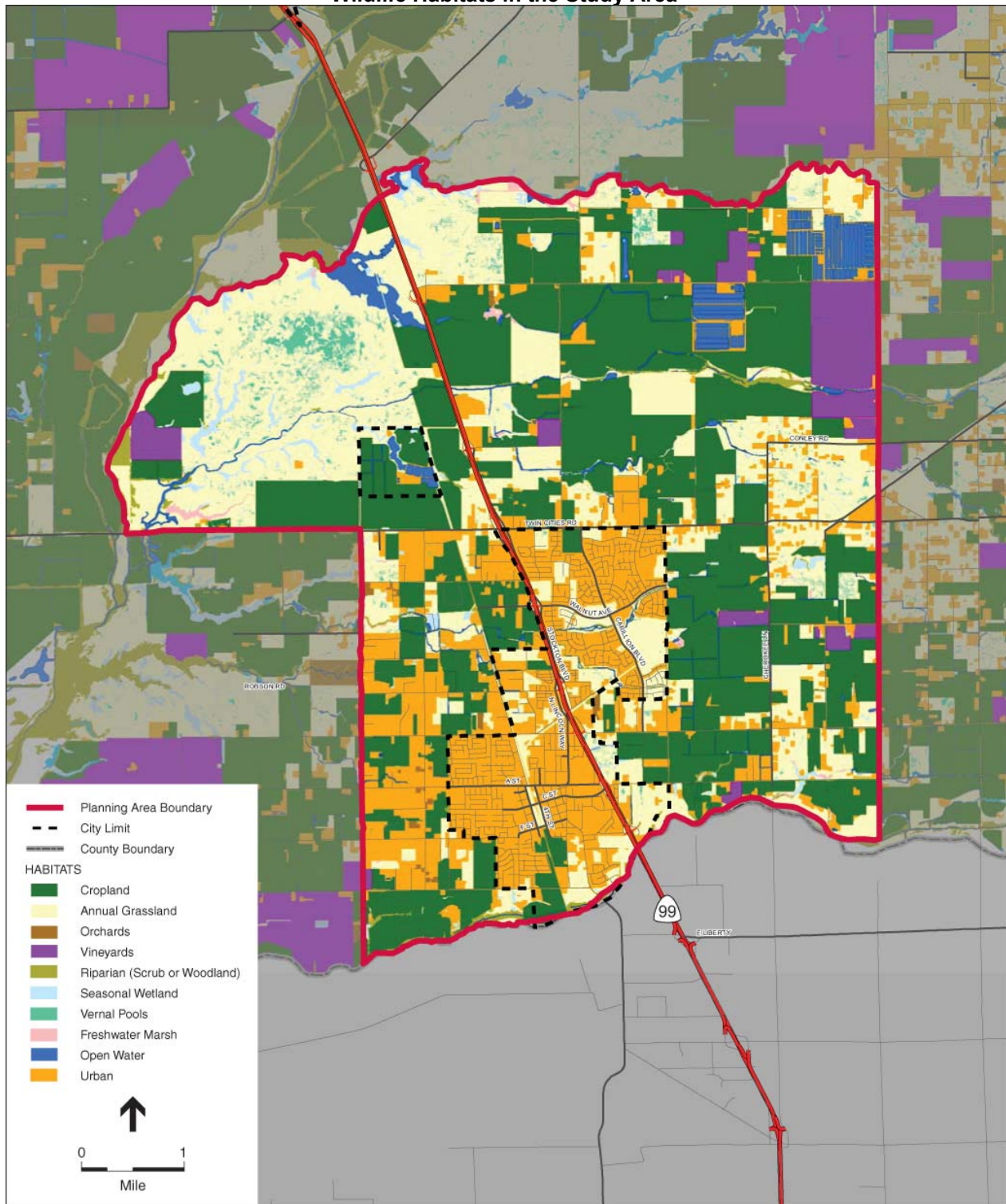
TABLE 8.4
Habitat Types within the General Plan Study Area

Habitat Type	Acre (Approximate)	Percent Study Area
Annual Grassland	7,550	30%
Cropland	9,276	37%
Disturbed	21	<1%
Freshwater Marsh	135	<1%
Open Water	767	3%
Orchards	51	<1%
Other	10	<1%
Riparian (Scrub or Woodland)	320	1%
Seasonal Wetland	431	2%
Urban	5,232	21%
Vernal Pools	258	1%
Vineyards	954	4%
Total	25,006	100%

Note: “Other” includes those areas designated as recreational areas, the TNC Reserve, and roads.

Source: Draft South Sacramento County Habitat Conservation Plan – vegetation data interpreted from 1997-1998 aerial photos (minimal ground-truthing)

FIGURE 8.3
Wildlife Habitats in the Study Area



Sources: Sacramento County , 2007; City of Galt, 2007; Mintier & Assoc., 2007; and Environmental Science Associates, 2007.

Annual Grassland (including both disturbed and vernal pool grasslands)

Annual grassland habitats are open grassland communities dominated mostly by non-native annual grasses such as wild oats, soft chess, ripgut brome, and ryegrass. These areas were often historically native annual and perennial grasslands. Perennial grasses are abundant in moist areas that experience light grazing, and may include species such as purple needlegrass and Idaho fescue. Some forbs commonly found in grasslands include California poppy, broad-leaved filaree, clovers, turkey mullein, and lupines. Species composition of grasslands varies greatly with seasonal weather patterns. Some grasslands support seasonal wetlands or vernal pools, in which many rare plants and wildlife may occur in shallow depressions where there is an underlying impermeable layer (such as clay or rock). Vernal pools are often found in annual grasslands, and a portion of the study area is considered vernal pool grassland.

Annual grassland areas are foraging habitat for many wildlife species such as rodents, birds, lizards, snakes, coyotes and foxes. Features such as ponds, fence posts, burrows, trees, logs, or snags may occur within or near grasslands, providing essential habitat for breeding or cover. Species that are commonly found in annual grassland areas include red-tailed hawk, western rattlesnake, common garter snake, California ground squirrel, western burrowing owl, California vole, western fence lizard, and a variety of songbirds. Vernal pools support a diverse suite of flora and fauna, as described below.

Within the study area, disturbed annual grassland can occur adjacent to urban or developed areas. A pocket of undisturbed annual grassland is located in the western-most corner of the study area (see Figure 8.3). Total disturbed and native grassland make up approximately 7,550 acres or 30 percent of the study area.

Cropland

Cropland habitat is extremely variable within the study area. The structure and composition is dependent on the type of crop, and can range from fields of clover measuring a few inches in height to tall rows of corn ten feet high. The land is usually leveled, irrigated, and may be treated for weed and pest control. Most crops are annual species, with the type of crop grown dependent on the type of soil and the length of the growing season. In California, most cropland occurs in the Central Valley where the terrain is relatively flat, the soils are fertile, and conditions are ideal for a long growing season.

Generally, cropland supports low species diversity. Wildlife species that may use this habitat type include ring-necked pheasant, mourning dove, black-tailed deer, black-tailed jackrabbit, small mammals, waterfowl, and raptors. These are species that have adapted to the regular disturbance from agricultural activity. However, cropland is important habitat for a few special status species such as Swainson's hawk, which forages in alfalfa and other annual fields, and giant garter snake, which can inhabit irrigation ditches and drainages.

Cropland makes up a significant portion (37 percent) of the study area, and is located in the northcentral, northeastern, and eastern portions of the study area (see Figure 8.3). Much of the cropland is field crops, grain and hay crops, and pasture, but also includes truck, nursery, and berry crops, as well as idle fields.

Orchard

Orchard habitat typically is comprised of an open, single-species tree dominated, habitat with an open understory to facilitate harvest. Tree crowns often do not touch, and trees are usually spaced uniformly in a linear pattern. The understory is managed for bare ground or is composed of low-growing grasses and other herbaceous plants.

Generally, orchard habitats support low species diversity. Wildlife species that may use this habitat type are often considered pest species and include black-tailed deer, black-tailed jackrabbits, California ground squirrels, mourning doves, American crow, house finch, and American robin.

Orchard habitat makes up 51 acres (<1% percent) of the study area, and is primarily dispersed throughout the southwestern portion of the study area (see Figure 8.3).

Freshwater Marsh

Freshwater marsh or fresh emergent wetland habitats are generally dominated by erect, rooted hydrophytic vegetation. This habitat is frequently flooded and the vegetation grows in clumps or vast mats, adapted to the anaerobic conditions of the habitat. Such adaptations may include hollow stems or buoyant leaves. Big leaf sedge, bulrush, common cattail, tule, baltic rush, and saltgrass are several species that comprise this habitat. Wildlife species that may use freshwater marsh include a diversity of waterfowl, shorebirds, raptors, and other birds, as well as mammals, reptiles, and amphibians. This habitat type is ideal for aquatic giant garter snakes.

In the study area, 135 acres (0.5 percent) is considered freshwater marsh. As shown in Figure 8.3, freshwater marsh can be found throughout the study area but it primarily occurs in small areas along the northern edge and in the western half of the study area.

Open Water (including both lacustrine and riverine habitats)

Lacustrine habitats include permanent and intermittent ponds and lakes, as well as reservoirs. The open water habitat supports aquatic organisms such as filamentous green algae, phytoplankton, diatoms, and zooplankton. Algae, pondweeds, and water lilies may cover the water surface or be submerged, providing food and support for invertebrates such as insects and snails. Permanent bodies of water usually support a variety of fish as well. Other wildlife species that may occur include waterfowl, shorebirds, and amphibians.

The majority of lacustrine habitat in the project area is located in the northwest corner, surrounded by riparian habitat and vernal pool grassland. As described above, lacustrine habitat is included with riverine habitat (see Figure 8.3).

Riverine habitats are aquatic habitats that consist of open water, a submerged zone, and the shore of rivers and streams. Open water is two or more meters deep and may not occur in smaller rivers and streams. The submerged zone is between open water and shore. The shore is inundated only at higher flows or by wave action, and has canopy closure of less than ten percent. Within the stream, substrate varies from large boulders and cobble to finer gravel and sandy bottoms. Submerged logs and woody debris are important habitat features, as are pool and riffle complexes. Moss and algae grow on moist rocks and logs or in slower moving water.

A diversity of invertebrates use riverine habitat for foraging, shelter, and egg-laying sites. Common species include nymphs of dragonflies, damselflies, caddisflies, and stoneflies. Mollusks and crustaceans are adapted to the slower moving waters, as

are plankton and some beetles. Fish species such as salmon and trout may inhabit some streams. Emergent vegetation and woody debris may provide foraging habitat or cover for waterfowl, herons, shorebirds, and belted kingfisher. Flycatchers and other insectivorous birds and bats forage over the open water, and in larger systems, hawks, shorebirds, and gulls hunt in open water. Riverine mammals may include river otter, muskrat, and beaver.

The Cosumnes River (in the western portion of the study area) and Dry Creek (along the southern boundary of the study area) make up the majority of riverine habitat. Also included are the Cosumnes River tributaries such as Badger Creek, Laguna Creek, Skunk Creek, and Deadman Gulch (see Figure 8.3). Open water habitat occupies 767 acres (three percent) of the study area. Surrounded by riparian habitat and vernal pool grassland, the Cosumnes River system is a rich and diverse area for several plant and animal species.

Riparian (Scrub or Woodland)

Riparian habitats support a rich diversity of vegetation and wildlife. Plant species adapted to this habitat include valley oak, California sycamore, and cottonwood, which are dominant, and willow, alder, and box elder in the subcanopy. Understory plants include blackberry, wild grape, wild rose, blue elderberry, poison oak, and a variety of sedges and rushes. These species are adapted to moist conditions that occur near rivers, streams, seeps, and floodplains. The structure of riparian habitat can be complex, providing food, cover, water, migration and dispersal corridors, and nesting habitat for insects, birds, mammals, reptiles, and amphibians. Species that may occur within this habitat type include hawks, flycatchers, woodpeckers, a variety of songbirds, ringtail, coyote, voles, small mammals, bats, wood rats, black-tailed deer, frogs, salamanders and newts, snakes, lizards, and the Federally threatened valley elderberry longhorn beetle, whose host plant is blue elderberry.

Riparian habitat makes up approximately 1% percent of the study area and is located adjacent to riverine areas, particularly in the northwestern portion (within the floodplain of the Cosumnes River system), along Dry Creek at the southern boundary, and along Laguna Creek in the northern portion of the study area (see Figure 8.3). Creeks shown without riparian habitat area are channelized or maintained free of vegetation that might obstruct flow.

Urban/Developed Areas

Urban habitat is highly variable and includes several types of landscape vegetation which generally fall into one of the following categories: lawn, shade tree/lawn, shrub cover, tree grove, and street strip. The structure of each type of landscape depends on species composition and landscape architecture. Lawns are the most uniform and least diverse, usually consisting of continuous cover of an area with one grass species. Shade tree/lawn habitats are usually composed of many different species and are found in residential areas and parks. Shrub cover usually occupies a limited area and is used mainly as hedges, borders, or is incorporated into small-scale landscaping. Tree groves may be composed of several species, but generally have a continuous canopy and are found in parks, greenbelts, and cemeteries. Street strips consist of trees planted in long rows with or without a grass/groundcover understory. Landscaping is usually irrigated, and most landscape plants are ornamental and non-native.

Wildlife use of urban areas is grouped into three zones: downtown, urban residential, and suburbia. Generally, species richness and diversity is lowest downtown, where development is highest, and increases toward urban residential and suburban areas

where there is more vegetative cover and less high density development. Wildlife in urban areas is limited to generalist species such as rock pigeons, house sparrows, European starlings, opossums, raccoons, and striped skunk.

Urban habitat is the next most abundant habitat type in the study area after cropland. Urban areas occupy 5,232 acres (21 percent) of the study area, and typically cover large continuous blocks of land. Located mainly in the central and central-south portions of the study area (see Figure 8.3), urban areas are bordered by cropland and annual grassland.

Vernal Pools

Vernal pools are seasonal wetlands that are defined by a combination of hydrologic, soil, and climatic factors. Although once common throughout the Central Valley, vernal pools are now scattered and reduced in number as grasslands are converted to other uses. Vernal pools support a unique and often rare collection of plant and animal species. When these pools are full of water they may be used by waterfowl and shorebirds, fairy shrimp, frogs, salamanders, Orcutt grass and various aquatic insects and plants. As the water in the pool evaporates concentric circles of flora such as goldfields, downingia, or owl's clover appear.

There are numerous vernal pools scattered throughout the grasslands associated with the Cosumnes River system floodplain located in the northwest portion of the study area. Large areas of grassland in the northern portion of the study area east of Highway 99 also contain numerous vernal pools as well. The total acreage of vernal pools is estimated at 258 (approximately 1%) of the study area (see Table 8.4).

Vineyards

Vineyards, like croplands, are irrigated and receive regular disturbance from trimming, harvesting, and weed/pest control activities. Vineyards are usually a monoculture of vines that are planted in regular, well-spaced rows. Vineyards are either maintained with no understory or with a cover of low grasses and forbs for weed and erosion control.

Vineyards have little habitat value for wildlife due to the management practices described above. Many wildlife species that have adapted to this environment are considered pests – these include rabbits, deer, squirrels, and nut-eating birds such as scrub jay, and American crow. Wildlife such as California quail and mourning dove use this habitat for cover and nesting. Vineyards occupy approximately 954 acres or 4 percent, and are located throughout the study area, although the largest continuous vineyards are in the northeastern portion.

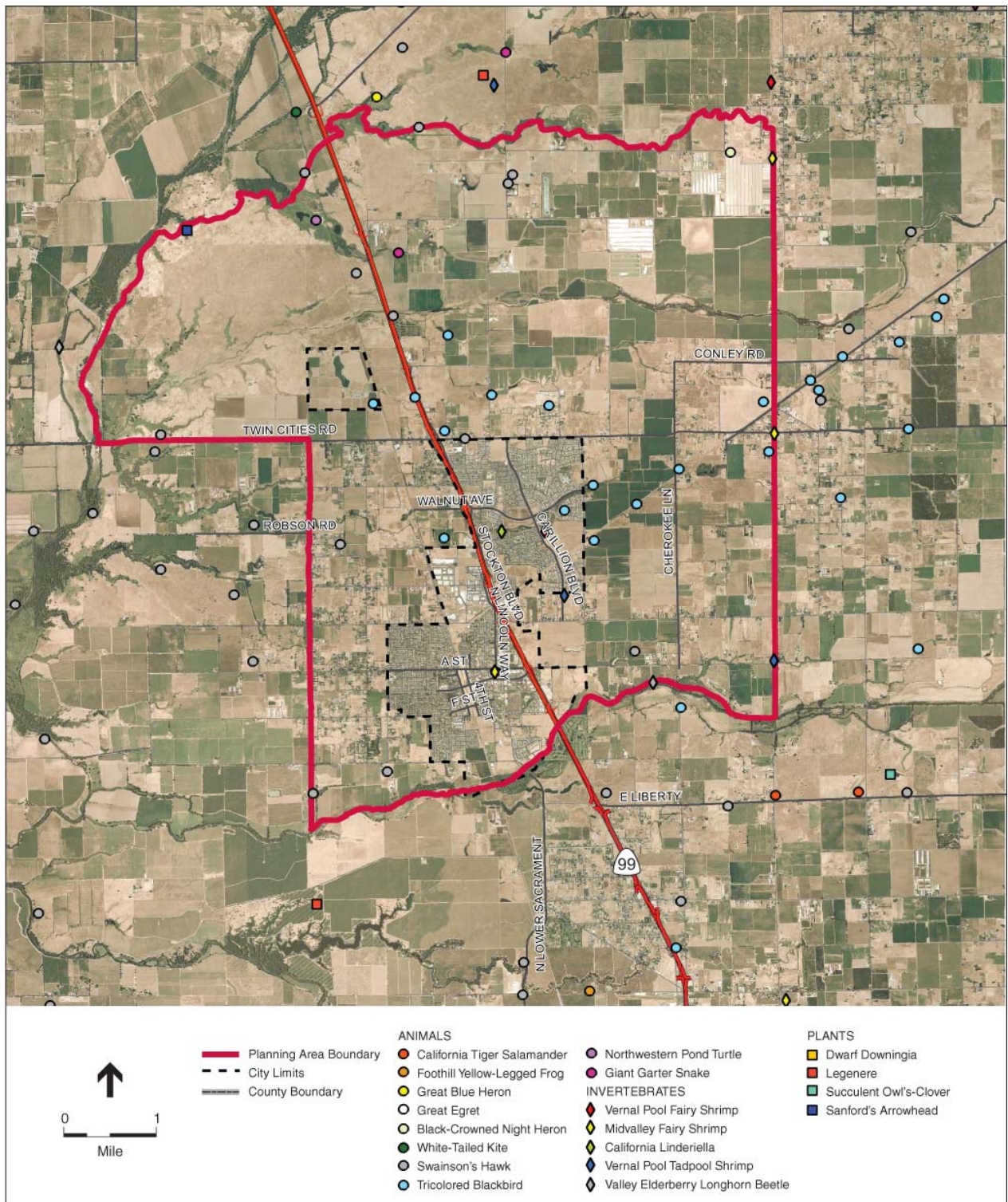
Special-Status Species

A list of special-status plant and animal species with potential to occur within the vicinity of the study area was compiled based on data from the CNDDDB (2007), CNPS electronic Inventory of Rare and Endangered Plants (CNPS, 2007), the USFWS (2007), and biological literature pertaining to the region. Table 8.5 lists those special-status species with at least a low likelihood for occurring within the study area. The locations of these species can be seen in Figure 8.4 below.

The CNDDDB is a positive-sightings database, meaning that only known occurrences of special-status species are recorded. CNDDDB (2007) records for species occurring within 3-miles of the study area include dwarf downingia, Sanford's arrowhead, succulent owl's-clover, valley elderberry longhorn beetle, California linderiella,

legene, midvalley fairy shrimp, vernal pool fairy shrimp, California tiger salamander, foothill yellow-legged frog, giant garter snake, Swainson's hawk, tricolored blackbird, and white-tailed kite. Most of these species are associated with vernal pool, riparian, and other aquatic habitats.

FIGURE 8.4
CNDDB Species



Sources: CNDDB, 2007; City of Galt, 2007; Sacramento County, 2007; Mintier & Assoc., 2007; and ESA, 2007.

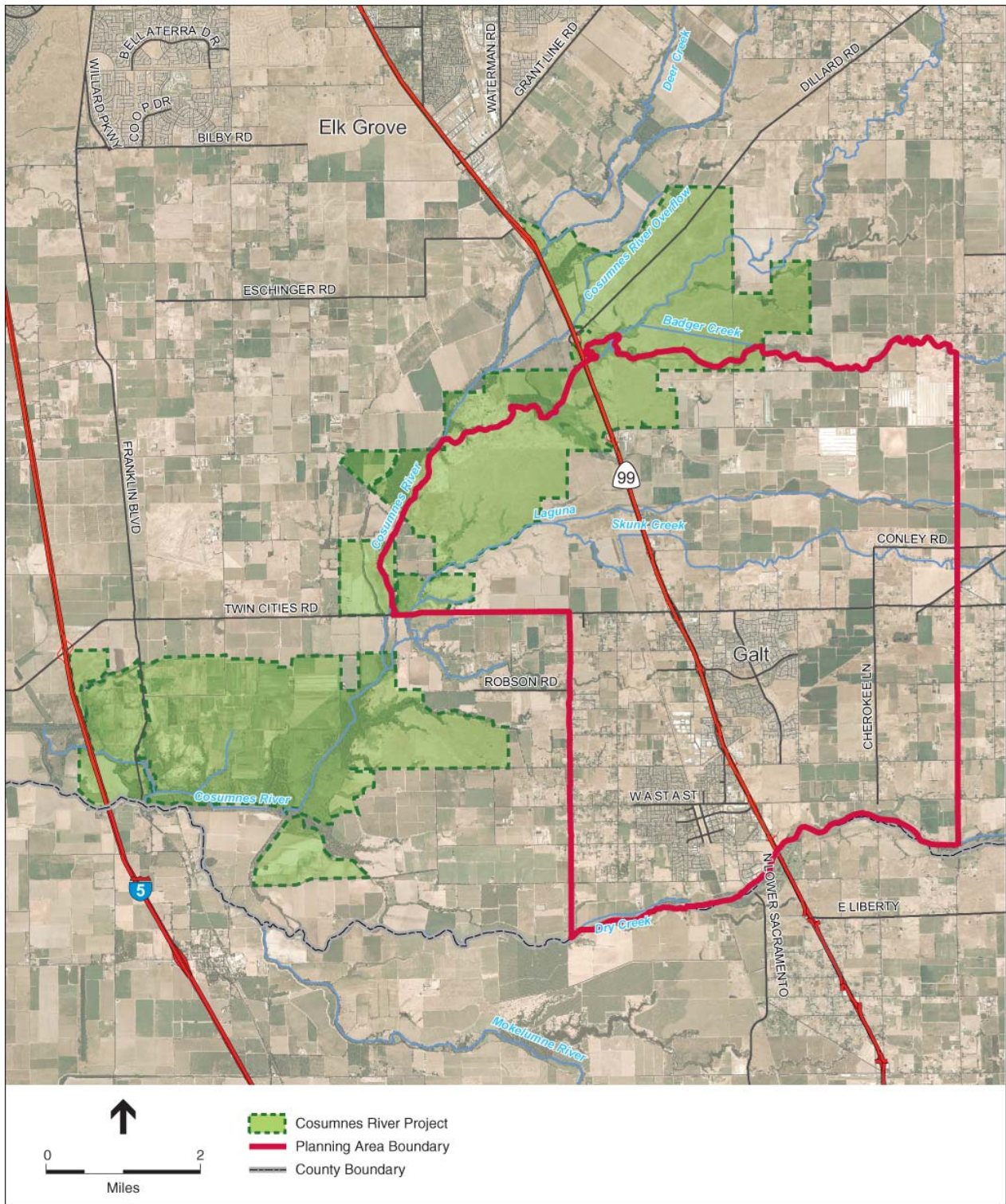
Critical Habitat

Critical habitat is a Federal designation under the Endangered Species Act to protect habitat essential for the survival of threatened or endangered species. Within the vicinity of the study area, several species have designated critical habitat. These include the California tiger salamander, delta smelt, Sacramento Orcutt grass, vernal pool fairy shrimp, and vernal pool tadpole shrimp. California tiger salamander critical habitat includes areas bordered on the south by the Sacramento-San Joaquin County line, Laguna Creek on the north, the Sacramento and Amador County border dividing line on the east, and Alta Mesa Road on the west. Delta smelt critical habitat includes waters contained in Suisun Bay, and sloughs and contiguous waters contained within the Delta (FR 59:65256). The Sacramento Orcutt grass critical habitat is located in the area south of Laguna Creek and north of the Sacramento-San Joaquin County line along Dry Creek, this critical habitat is bound on the east by the western Amador County foothills and on the west by the urban and agricultural areas outside of the Cities of Elk Grove and Galt. The vernal pool fairy shrimp and vernal pool tadpole shrimp critical habitats encompass the same areas, these unit begins at Deer Creek and the Cosumnes River and continues south to just past the Sacramento-San Joaquin County line, and is bound on the west by the western Amador County foothills.

Cosumnes River Project

Lands within The Cosumnes River Project (Figure 8.5) are jointly owned by The Nature Conservancy, The Bureau of Land Management, Ducks Unlimited, the California Department of Fish and Game, State Lands Commission, the California Department of Water Resources, Sacramento County, and various private owners. These lands are managed jointly, with each partner contributing to the maintenance and design of the Project. For example, Ducks Unlimited and the Bureau of Land Management are working to create and enhance the seasonal and perennial wetlands on the Project lands to enhance habitat for waterfowl and other migratory birds.

FIGURE 8.5
Cosumnes River Project Lands



Sources: CaSil, 2005; City of Galt, 2007; Sacramento County, 2007; Mintier & Associates, 2007; and ESA, 2007

REGULATIONS THAT ADDRESS BIOLOGICAL RESOURCES

Federal Regulations

Clean Water Act Sections 401 and 404

Wetlands and other waters of the U.S. (as defined below under “Key Terms”) are subject to jurisdiction by the Corps and EPA under Section 404 of the Clean Water Act. Wet areas that are not regulated under this act would include stock watering ponds, agricultural ditches created in upland areas, and isolated wetlands that do not have a hydrologic link to other waters of the U.S., either through surface or subsurface flow. The discharge of fill into a jurisdictional feature requires a permit from the Corps.

The Corps has the option to issue a permit on a case-by-case basis (individual permit) or at a program level (general permit). Nationwide permits (NWP) are an example of general permits; they cover specific activities that generally have minimal environmental effects. Activities covered under a particular NWP must fulfill several general and specific conditions, as defined by the NWP. If a proposed project cannot meet these conditions, an individual permit may be required.

The RWQCB certifies Section 404 permits under Section 401 of the CWA. Because the State of California has not certified the Corps Nationwide Permit Program, all Section 404 permits, including NWPs, require individual certification by the RWQCB.

Federal Endangered Species Act

The USFWS administers the Federal Endangered Species Act (16 USC Section 153 et seq.) or (FESA) and thereby has jurisdiction over Federally listed threatened, endangered, and proposed species. Projects that may result in “take” of a listed species must consult with the USFWS. Federal agencies that propose a project that may affect a listed species are required to consult with the USFWS under Section 7 of the Federal Endangered Species Act. If it is determined that a Federally listed species may be adversely affected by the Federal action, the USFWS will issue a Biological Opinion to the Federal agency that describes minimization and avoidance measures that must be implemented as part of the Federal action. Projects that do not have a federal nexus must apply for a take permit under Section 10 of the Act. Section 10 of the Act requires that the project applicant prepare a habitat conservation plan as part of the permit application.

Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act (MBTA, 16 USC Section 703–711) and the Bald and Golden Eagle Protection Act (16 USC Section 668) protect certain species of birds from direct take. The MBTA protects migrant bird species from take through setting hunting limits and seasons and protecting occupied nests and eggs. The Bald and Golden Eagle Protection Act prohibits the take or commerce of any part of these species. The USFWS administers both acts, and reviews federal agency actions that may affect species protected by the acts.

TABLE 8.5
Special-Status Species with Potential to Occur in the General Plan Study Area

Species	Status: Fed/ State/CNPS	General Habitat
Animals		
Mammals		
<i>Taxidea taxus</i> American badger	--/CSC/--	Occurs in a wide variety of open forest, shrub, and grassland habitats that have friable soils for digging.
Birds		
<i>Accipiter cooperii</i> (nesting) Cooper's hawk	--/CSC/--	Nests in riparian areas and oak woodlands, forages at woodland edges.
<i>Agelaius tricolor</i> (nesting colony) Tricolored blackbird	---/CSC/--	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.
<i>Ardea alba</i> (rookery) Great egret	--/--/--	Fresh and salt marshes, marshy ponds and tidal flats, nests in trees or shrubs.
<i>Ardea herodias</i> (rookery) Great blue heron	--/--/--	Groves of tall trees, especially near shallow water foraging areas such as marshes, tide-flats, lakes, rivers/streams and wet meadows.
<i>Athene cunicularia hypugaea</i> (burrow sites) Western burrowing owl	---/CSC/--	Forages in open plains, grasslands, and prairies; typically nests in abandoned small mammal burrows.
<i>Buteo swainsoni</i> (nesting) Swainson's hawk	--/ST/--	Forages in open plains, grasslands, and prairies; typically nests in abandoned small mammal burrows.
<i>Dendroica petechia brewsteri</i> (nesting) Yellow warbler	--/CSC/--	Nests in dense riparian cover.
<i>Elanus leucurus</i> (nesting) White-tailed kite	--/CFP/--	Forages in open plains, grasslands, and prairies; typically nests in trees..
<i>Nycticorax nycticorax</i> (rookery) Black-crowned night heron	--/--/--	Forages in marshes swamps and wooded streams; nests in thickets or reedbeds.
<i>Phalacrocorax auritus</i> (rookery) Double-crested cormorant	--/CSC/--	Uses wide rock ledges on cliffs; rugged slopes; and live or dead trees. Feeds underwater on fish and crustaceans.
<i>Riparia riparia</i> (nesting) Bank swallow	--/ST/--	Banks of rivers, creeks, lakes, and seashores; nests in excavated dirt tunnels near the top of steep banks.
<i>Xanthocephalus xanthocephalus</i> (nesting) Yellow-headed blackbird	--/--/--	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.
Reptiles		
<i>Emys (=Clemmys) marmorata</i> Western pond turtle	FSC/CSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Requires aquatic habitats with suitable basking sites. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.
<i>Thamnophis gigas</i> Giant garter snake	FT/ST/--	Generally inhabits marshes, sloughs, ponds, slow-moving streams, ditches, and rice fields that have water from early spring till mid-fall. Emergent vegetation (cattails and bulrushes), open areas for sunning and high ground for hibernation and cover.
Amphibians		
<i>Ambystoma californiense</i> California tiger salamander	FT/CSC/--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.

Species	Status: Fed/ State/CNPS	General Habitat
<i>Rana aurora draytonii</i> California red-legged frog	FT/CSC/--	Breeds in slow moving streams, ponds, and marshes with emergent vegetation; forages in nearby uplands within about 200 feet.
<i>Rana boylei</i> Foothill yellow-legged frog	--/CSC /--	Breeds in shaded stream habitats with rocky, cobble substrate, usually below 6,000 feet in elevation. Absent or infrequent when introduced predators are present.
<i>Spea hammondi</i> Western spadefoot toad	--/CSC/--	Occurs seasonally in grasslands, prairies, chaparral, and woodlands, in and around wet sites. Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.
Fish		
<i>Hypomesus transpacificus</i> Delta smelt	FT/ST/--	Open surface waters in the Sacramento/San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Found in Delta estuaries with dense aquatic vegetation and low occurrence of predators. May be affected by downstream sedimentation.
<i>Oncorhynchus mykiss</i> Central Valley ESU steelhead	FT/--/--	This ESU enters the Sacramento and San Joaquin Rivers and their tributaries from July to May; spawning from December to April. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.
<i>Oncorhynchus tshawytscha</i> Central Valley spring-run chinook	FT/ST/--	This ESU enters the Sacramento and San Joaquin Rivers and tributaries March to July; spawning from late August to early October. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.
<i>Oncorhynchus tshawytscha</i> winter-run chinook, Sacramento River	FE/SE/--	This ESU enters the Sacramento River December to May; spawning peaks May and June. Upstream movement occurs more quickly than in spring run population. Young move to rearing areas in and through the Sacramento River, Delta, and San Pablo and San Francisco Bays.
<i>Oncorhynchus tshawytscha</i> Central Valley fall/late-fall-run chinook	FC/CSC/--	This ESU enters the Sacramento and San Joaquin rivers and their tributaries from July to April; spawning October to February. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	FD/CSC/--	Currently known only from the Delta, Suisun Bay and associated marshes. Prefers slow moving river sections and dead end sloughs. Requires flooded vegetation for spawning and juvenile foraging habitat. Spawning occurs over flooded vegetation in tidal freshwater and euryhaline habitats of estuarine marshes and sloughs, and slow-moving reaches of large rivers.
Invertebrates		
<i>Andrena blennospermatis</i> A vernal pool andrenid bee	--/--/--	Collects pollen from vernal pool flowers, especially <i>Blennosperma</i> . Bees nest in the uplands around vernal pools.
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	--/--/--	Lifecycle restricted to vernal pools.
<i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	FSC/--/--	Lifecycle restricted to vernal pools in the Central Valley.
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT/--/--	Breeds and forages exclusively on elderberry shrubs (<i>Sambucus mexicana</i>) typically associated with riparian forests, riparian woodlands, elderberry savannas, and other Central Valley habitats. Occurs only in the Central Valley of California. Prefers to lay eggs in elderberries 2–8 inches in diameter; some preference shown for “stressed” elderberries.
<i>Hydrochara rickseckeri</i> Ricksecker’s water scavenger beetle	--/--/--	Occurs in slow moving waters, adults and larvae are aquatic.
<i>Lepidurus packardii</i> Vernal pool tadpole shrimp	FE/--/--	Lifecycle restricted to vernal pools.
<i>Linderiella occidentalis</i> California linderiella	--/--/--	Lifecycle restricted to vernal pools.
Vascular Plants		
<i>Aster lentus</i> Suisun Marsh aster	--/--/1B.2	Rhizomatous herb occurring in tidal brackish and freshwater marshes. Found at 0-10 feet in elevation. Blooms May-Nov.

Species	Status: Fed/ State/CNPS	General Habitat
<i>Carex comosa</i> Bristly sedge	--/--/2.1	Generally found in lake-margin and edge habitats, Below 1,400 feet in elevation. Blooms May-Sept.
<i>Castilleja campestris</i> ssp. <i>succulenta</i> Succulent owl's-clover	FT/SE/1B.2	Occurs under vernal-flooded conditions in vernal-pool habitats such as valley and foothill grassland. Blooms Apr-May.
<i>Downingia pusilla</i> Dwarf downingia	--/--/2.2	Prefers lake margins, vernal pools and wet places sometimes playas and grasslands. Blooms Mar-May.
<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	FSC/SE/1B.2	Marshes and swamps, lake margins, and in clay substrate in vernal pools. Blooms Apr-Aug. 30-7,800 feet in elevation.
<i>Hibiscus lasiocarpus</i> Rose-mallow	--/--/2.2	Prefers freshwater marshes and swamps. Blooms Jun-Sep. Found below 100 feet..
<i>Juglans hindsii</i> Northern California black walnut	--/--/1B.1	Occurs in riparian forest and woodland, Found below 1,500 feet elevation. Blooms April-May.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	FSC/--/1B.2	Occurs in both tidal freshwater and brackish marshes in the Central and San Joaquin Valleys and in the Bay Area. Blooms May-Sept.
<i>Legenere limosa</i> Legenere	FSC/--/1B.1	Occurs in vernal pool beds. Blooms Apr-Jun.
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	FSC/SR/1B.1	Generally occurs in riparian scrub, freshwater-marsh and brackish-marsh habitats, Found below 33 feet in elevation. Blooms Apr-Nov.
<i>Limosella subulata</i> Delta mudwort	--/--/2.1	Generally occurs under wet conditions in tidal freshwater-marsh habitats, Found below 9 feet in elevation. Blooms May-Aug.
<i>Orcuttia tenuis</i> slender Orcutt grass	FT/SE/1B.1	Annual herb occurring in vernal pools. Found between 100 and 5,800 feet in elevation. Blooms May-October.
<i>Orcuttia viscida</i> Sacramento Orcutt grass	FE/SE/1B.1	Occurs in vernal pools. Blooms Apr-Jul.
<i>Sagittaria sanfordii</i> Sanford's arrowhead	FSC/--/1B.2	Found in assorted freshwater habitats including marshes, swamps and seasonal drainages. Blooms May-Oct.
<i>Scutellaria lateriflora</i> Blue skullcap	--/--/2.2	Meadows and seeps, marshes and swamps. Blooms Jul-Sep. Found below 1,700 feet in elevation.

STATUS CODES

Federal

FE = Endangered
 FT = Threatened

FC = Candidate
 FD = Federally Delisted

State

SE = Endangered
 ST = Threatened
 SR = Rare
 CSC = California Special Concern species
 SFP = Fully Protected Species

CNPS

List 1B = Plants rare, threatened, or endangered in California and elsewhere
 List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere
 List 3 = Plants about which we need more information--a review list
 List 4 = Plants of limited distribution--a watch list

Source: CNDDDB 2007, CDFG 2007, CNPS 2007, USFWS 2007

State Regulations

California Fish and Game Code – Sections 1601 – 1607

The CDFG regulates the modification of streams, rivers, and lakes under Sections 1601–1607 of the California Fish and Game Code. Modification includes diverting, obstructing, or changing the natural flow or bed, channel, or bank of a regulated feature. While most of the features regulated by the Fish and Game Code meet the definition of other waters of the U.S., the Code may regulate some ephemeral features that do not have all the criteria to qualify as “other waters of the U.S.” A project proponent that proposes an activity that may modify a feature regulated by the Fish and Game Code must notify the CDFG before project construction. The CDFG will then decide whether to enter into a Streambed Alteration Agreement with the project applicant either under Section 1601 (public entities) or Section 1603 (private entities) of the Fish and Game Code.

California Endangered Species Act

The CDFG administers the California Endangered Species Act of 1984 (Fish and Game Code Section 2080), which regulates the listing and “take” of endangered and threatened species. A “take” may be permitted by CDFG through implementing a management agreement. Under the State laws, the CDFG is empowered to review projects for their potential impacts to listed species and their habitats.

CDFG maintains lists for Candidate-Endangered Species (SCE) and Candidate-Threatened Species (SCT). California candidate species are afforded the same level of protection as listed species. California also designates Species of Special Concern (CSC) which are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species, but may be added to official lists in the future. The CSC list is intended by CDFG as a management tool for consideration in future land use decisions.

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific Federal and State statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on a Federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. Section 15380(d) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFG (i.e., candidate species) would occur. Thus, CEQA provides a Lead Agency with the ability to protect a species from a project’s potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

Local Regulations

Sacramento County General Plan: Conservation and Open Space Elements

The General Plan study area includes unincorporated land subject to County of Sacramento plans and policies. The Sacramento County General Plan has adopted a conservation element and an open space element which provides a strategy for vegetation and wildlife conservation. The conservation element includes policies and

programs for protecting and preserving such biologically diverse habitats as marshlands, riparian areas, oak woodlands, and vernal pools and ephemeral wetlands. Policies for enhancement of urban trees and protection of landmark trees and urban streams are also included.

The conservation element details policies and guidelines for conservation of rare and endangered species through long-term habitat management and protection. Special status species include the threatened Valley elderberry longhorn beetle which lives exclusively on blue elderberry shrubs, and the threatened Swainson's hawk, which nests in riparian trees and forages in open grassland and croplands. Several vernal pool species are classified as threatened or endangered, such as the vernal pool fairy shrimp, or the succulent owl's-clover. For these and several other special status species the preservation of riparian, wetland, and grassland habitat is important for their survival. Within the City's study area, the Cosumnes River, its associated drainages, and Dry Creek, a tributary to the Mokelumne River, provide some of the most important habitat areas for rare, threatened, and endangered species.

The County is currently in the process of updating its general plan which was last adopted in 1993. Although, the process is anticipated to be a minor update to the existing general plan, the overall goal of the update will be to plan for growth out to 2030. Several topics to be addressed include smart growth planning and an analysis of the planning area's capacity to accommodate future growth within the urban policy area and the urban service boundary. As part of the update, existing general plan policies will be reviewed and evaluated in context with current environmental and regulatory conditions. On May 30, 2007 a draft version of the General Plan Update was released to the public. This plan is currently undergoing the environmental review process, which is expected to be completed in the summer of 2008.

Sacramento County: Draft South Sacramento Habitat Conservation Plan (SSHCP)

Sacramento County is in the process of developing the SSHCP, which would provide a regional approach to addressing issues related to urban development, habitat conservation and agricultural protection. The goal of the SSHCP will be to consolidate environmental efforts that protect and enhance wetlands (primarily vernal pools) and upland habitats to provide ecologically viable conservation areas. The SSHCP will cover 41 different species of plants and wildlife including 12 that are State or Federally listed as threatened or endangered.

The SSHCP will represent an agreement between State/Federal regulators and the County to allow land owners to engage in the "incidental take" of listed species (i.e., to destroy or degrade habitat in connection with economic activity) in return for conservation commitments from the County. These commitments will be identified prior to adoption of the plan and will be fulfilled using funds from a per-acre fee paid by developers to mitigate habitat impacts from new development. Fees collected will be directed to both public and private mitigation sites that provide large-scale habitat preservation and limited habitat restoration opportunities. The geographic scope of the SSHCP includes the unincorporated County area bounded by Hwy 50 to the north, the County line to the east and south; excluding the Delta, and Interstate 5 to the west. The County is partnering with the incorporated cities of Elk Grove, Rancho Cordova, and Galt to further advance the regional planning goals of the SSHCP, and is hoping to include the City of Elk Grove in the planning process.

City of Galt Municipal Code: Street Trees and Cutting and Removal of Oak Trees

The City of Galt Municipal Code (Code) contains provisions for the protection of all public trees (as defined in the Code including street trees), oak trees on public

property, and oak trees on private property unless specifically exempted for situations of public endangerment or maintenance of utility lines, or on certain city lots. The approving body (the City Council, the Planning Commission, or the Planning Director) has discretionary authority to protect species of trees other than oaks and public trees by requiring the adoption of mitigation measures for trees on development projects. Chapter 12.20 outlines specific provisions applicable to public/streets trees (as defined in the Code). Chapter 12.28 of the Code includes specific procedures for obtaining permits for tree trimming, removal, or destruction, grading and planting beneath drip lines, and provisions for a Tree Preservation Fund. Violation of any of the provisions in the Code is against the law and is subject to penalty.

Approval for a permit application is contingent on the approving body's determination of whether the tree(s) can/should or cannot/should not be preserved. Criteria used in this determination includes consideration of the health and status of the tree; the necessity of the requested action; the effects of the requested action to topography, soil and water retention, and flow or diversion of surface waters; the number, species, size, and location of existing trees in the area and the effects of the requested action on shade, air pollution, and historic and scenic values; and good forestry practices.

Grading beneath a saved tree's dripline must have the approving body's authorization. When grading beneath the tree's dripline, efforts must be made to not disturb major roots during excavation, to protect support roots, and to hand-dig in the vicinity of major trees. In areas adjacent to roadways and new slopes, design drawings must be provided that show cross-sections and dimensions to critical points. Any conditions related to grading in the vicinity proposed by the approving body must be incorporated into improvement standards and verified in writing by the consulting engineer for the project. Plantings within the tree's dripline must be tolerant of semi-arid conditions and sustainable with limited drip irrigation.

The Tree Preservation Fund receives money collected as fines for illegal tree removal and that collected in lieu of replacement trees. These monies are used solely for the planting, enhancement, and maintenance of trees on public property, easements, and rights of way.

8.4 SOILS AND AGRICULTURAL RESOURCES

Agriculture has played an important role in the City's economic, cultural, and environmental framework since the first mass arrivals of settlers to the area. The City's climate, water availability, and proximity to transcontinental transportation routes made it a premier location for agricultural land development for over a century. A general description of the soils resources that comprise the study area is provided in this section. Topics covered in this section include a general description of the soil resources and associated characteristics within the City's study area and the geographic location of soil types found within the study area as delineated by the Natural Resource Conservation Service.

Agricultural issues addressed in this section include providing a general description of existing agricultural operations in the County and the study area. Specific topics include discussions regarding the viability of local soil resources, trends in agricultural production, current applications of the Williamson Act, and conversion issues associated with regional population growth.

For information specific to geologic and seismic issues please refer to Section 10.3 "Geologic and Seismic Hazards" of this report.

METHODS AND DATA SOURCES

The information contained in this section was compiled from a variety of sources including: the United States Department of Agriculture (UDSA), Soil Conservation Service (NRCS), California Department of Conservation Farmland Mapping and Monitoring Program, California Department of Water Resources, and the Sacramento County Agricultural Commissioner's Office.

Data used for the production of the maps included in this section were obtained from the State Soil Graphic (STATSGO) database.

ENVIRONMENTAL SETTING

This section provides an overview of the existing soils and agricultural resource characteristics of the study area. The section begins with a discussion of the study area's existing soil characteristics (e.g., types/classes, erosion susceptibility/K factor, etc.) and concludes with a discussion of the important farmlands found within the study area.

The City's study area is located within Sacramento County. This section describes agricultural resources for both the larger regional setting (Sacramento County) and the local study area.

Soil Types and Characteristics within the Study Area

With a few exceptions, the topography within the study area is generally level to gently sloping. In many places, the natural topography has been altered somewhat by human activities such as agriculture, flood control projects, transportation projects, and urban development in general.

The United States Department of Agriculture (USDA) Soil Conservation Service has assigned the study area as a "San Joaquin" general soil type (Sacramento County, 1994). This general soils type includes level to gently rolling soils on low terraces, and is composed of moderately well drained soils that are moderately deep over a cement hardpan.

Certain soil characteristics affect specific uses identified as important or potentially important to users of soil survey information. Important uses for which soils are typically rated include building site and recreational development, placement of sanitary sewer facilities, waste management, water management, agricultural suitability, and water quality. For example, the Natural Resource Conservation Service (NRCS) has classified soils within the study area according to a particular Soil Capability Class to determine land suitability for agricultural operations or in its limitations for crop management. A soil rated as a Class I would have few limitations whereas a soil rated as a Class VIII could have severe limitations that in most circumstances would preclude it from commercial crop production. Table 8.6, below, identifies the various soil capability classes as defined by the USDA and NRCS.

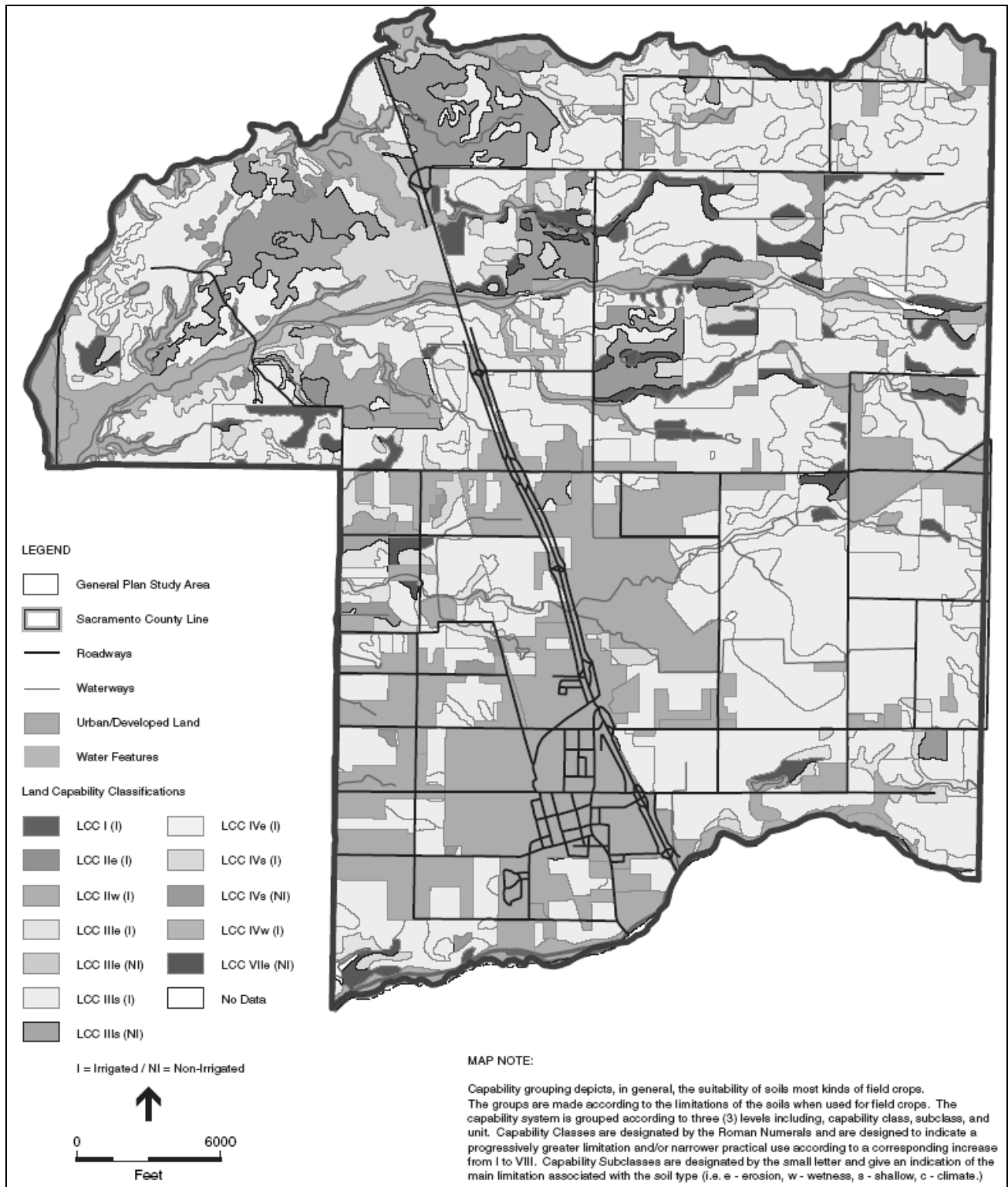
TABLE 8.6
Soil Capability Classification System

Soil Type (or Class)	Definition/Limitations
Class I	Soils with few limitations that restrict their use.
Class II	Soils with moderate limitations that reduce the choice of plants or that require moderate conservation practices.
Class III	Soils with severe limitations that reduce the choice of plants or that require special conservation practices (or both).
Class IV	Soils with very severe limitations that reduce the choice of plants or that require very careful management (or both).
Class V	Soils that are not likely to erode but have other limitations or are impractical to move, that restrict their use.
Class VI	Soils with severe limitations that make them generally unsuitable for cultivation.
Class VII	Soils with severe limitations that make them unsuitable for cultivation.
Class VIII	Soils with limitations that nearly preclude their use for commercial crop production.

Source: USDA, 1961.

Figure 8.6 provides the land capability classification for all soils within the study area, assuming irrigation was utilized. Most of the soils within the study area are in the Class III and IV categories, with a small area of Class I and II soils. Overall, soils within the study area are considered suitable for most agricultural uses with some limitations that require the need for special conservation practices to increase the range of agricultural commodities that may be farmed on the land. Further information on soil characteristics for specific uses, such as average depth, hydrologic response, and unique characteristics can be found in the Soil Survey of Sacramento County (NRCS, 2003).

FIGURE 8.6
Land Capability Classifications in the Study Area



Sources: NRCS, 2003; and Environmental Science Associates, 2005

Erosion

Erosion is the detachment and movement of soil materials through natural processes (e.g., rainfall, wind, etc.) and human activities (e.g., grading, etc.). Rates of erosion can vary depending on the soil material and structure, and human activity. The erosion potential for soils in the study area depends on several soil characteristics, including surface texture, overall permeability, organic matter content, depth, and quantity and type of ground cover. Depending on the local landscape and climatic conditions, erosion may be very slow to very rapid. The City's study area is located within a Mediterranean climatic regime, which is characterized by moist winters and dry summers. The study area is, therefore, subject to both types of erosion depending on the time of year. Excessive soil erosion can lead to damage of building foundations, roadways, dam embankments, and result in increased sedimentation to local drainage ways.

The study area encompasses a large level area and includes numerous types of land uses ranging from large industrial and business park areas to low density residential subdivisions and park/open space settings. Open space, parks, and construction areas comprise areas where soil surfaces could be exposed to the elements or slope gradients are increased. A particular soil's susceptibility to erosion (see Section 8.6, Glossary, for a definition of K-factor) for soil surfaces within the study area is identified in Figure 8.7. As shown in the figure, several locations are identified as areas easily susceptible to erosion processes. However, erosion is not considered a substantial limitation within the study area.

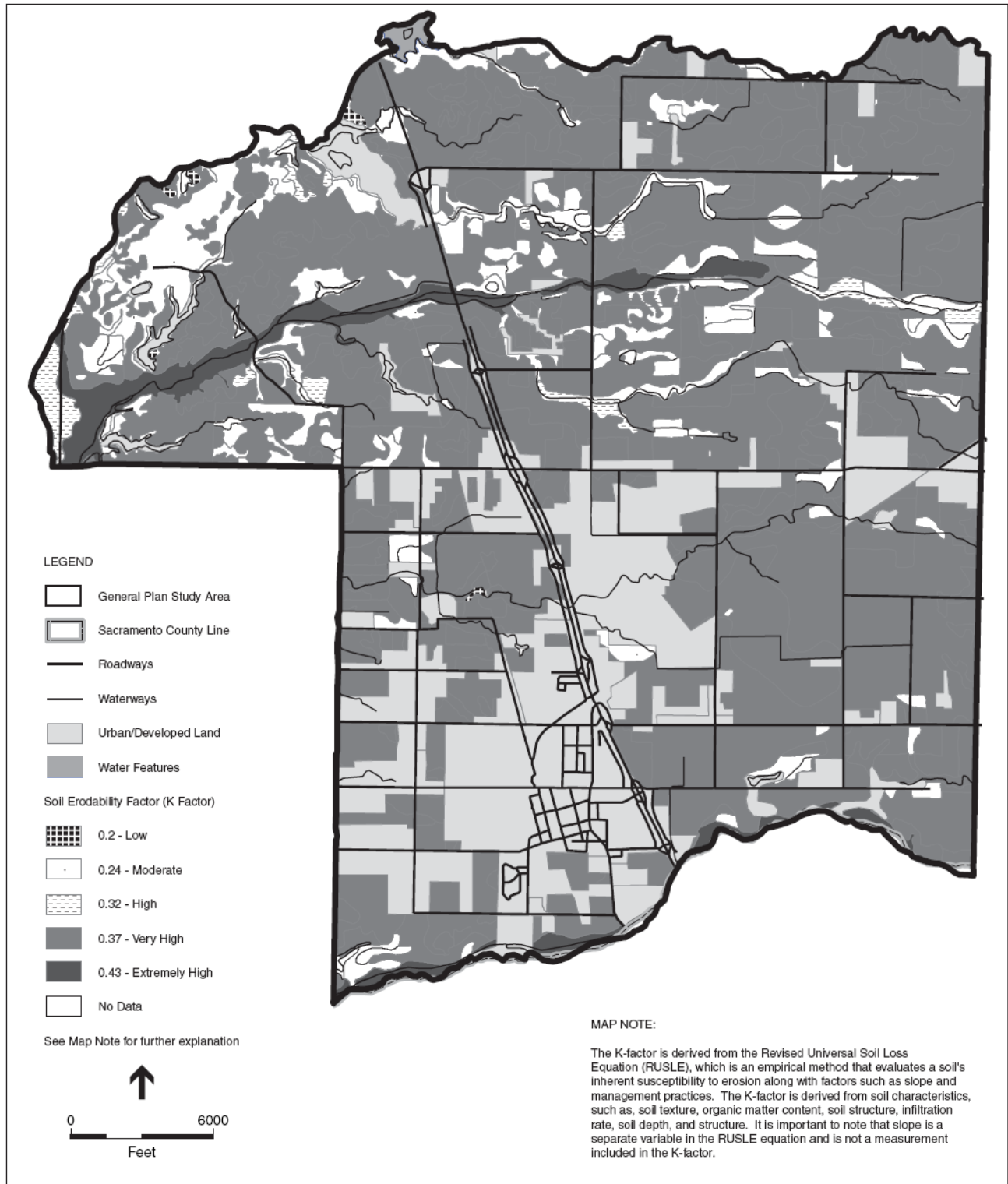
Expansive Soils

Expansive soils possess a shrink-swell characteristic. Structural damage may result over a long period of time, usually resulting from inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils are largely comprised of clay, which expand in volume when water is absorbed and shrink when dried. A number of the soil types located within the study area are comprised of potentially expansive materials. As such, these areas would be considered more likely to contain expansive clays, and, therefore, these factors should be taken into consideration during future planning activities and site-specific project design. In a majority of the developed portions within the study area, this layer of clay has been blended into more granular soils during site excavation or buried beneath more granular soils during excavation operations to reduce the soil's overall expansiveness (NRCS, 1992). Further information on the potential expansiveness for each of the soil types found within the study area can be found in the Soil Survey for Sacramento County.

Agricultural Production - Sacramento County

According to the California Agricultural Statistical Review, Sacramento County ranked 23rd out of the 58 counties in California in gross value agricultural production for 2004-2005 (CASS, 2005). Agricultural production for 2005 is estimated at \$348 million, resulting in the second successive year of increased crop values. (see Table 8.7). Leading crops produced in 2005 include wine grapes (\$108 million), milk (\$51 million), nursery stock (\$36 million), and Bartlett pears (\$19 million)(Sacramento County, 2005).

FIGURE 8.7
Soil Erodability Factors in the Study Area



Sources: NRCS, 2003; and Environmental Science Associates, 2005

TABLE 8.7
Sacramento County Major Agricultural Commodities and Gross Production Values
2004–2005

Commodity Type	2004	2005
Apiary	\$30,000	\$35,000
Field Crops	\$46,850,000	\$43,362,000
Fruit and Nut Crops	\$105,585,000	\$136,190,000
Livestock and Poultry	\$35,855,000	\$44,458,000
Livestock Products	\$56,192,000	\$52,100,000
Nursery Products	\$35,220,000	\$36,544,000
Seed Crops	\$5,902,000	\$4,000,000
Vegetable Crops	\$38,534,000	\$32,196,000
Total	\$324,168,000	\$348,885,000

Source: Sacramento County 2005.

Much of the County contains productive soils. These soils along with available irrigation water and a favorable growing season combine to produce large areas (within the southern portion of the County) of farmlands ideally suited for agriculture.

Agricultural Production - Study Area

According to the California Department of Water Resources current (2000) land allocations, a large portion of the study area's total acreage (approximately 45 percent) is used for agricultural uses (Figure 8.8); with only 446 acres categorized as idle during the reporting period. As shown in the figure and Table 8.8, field crops, pasture, and grain/hay crops account for the largest use. Vineyards accounted for 4 percent of total land used for agricultural purposes during the reported period. Overall, most the agricultural operations are relatively small and family oriented-operations. Urban uses account for 24 percent of the study area (Table 8.8).

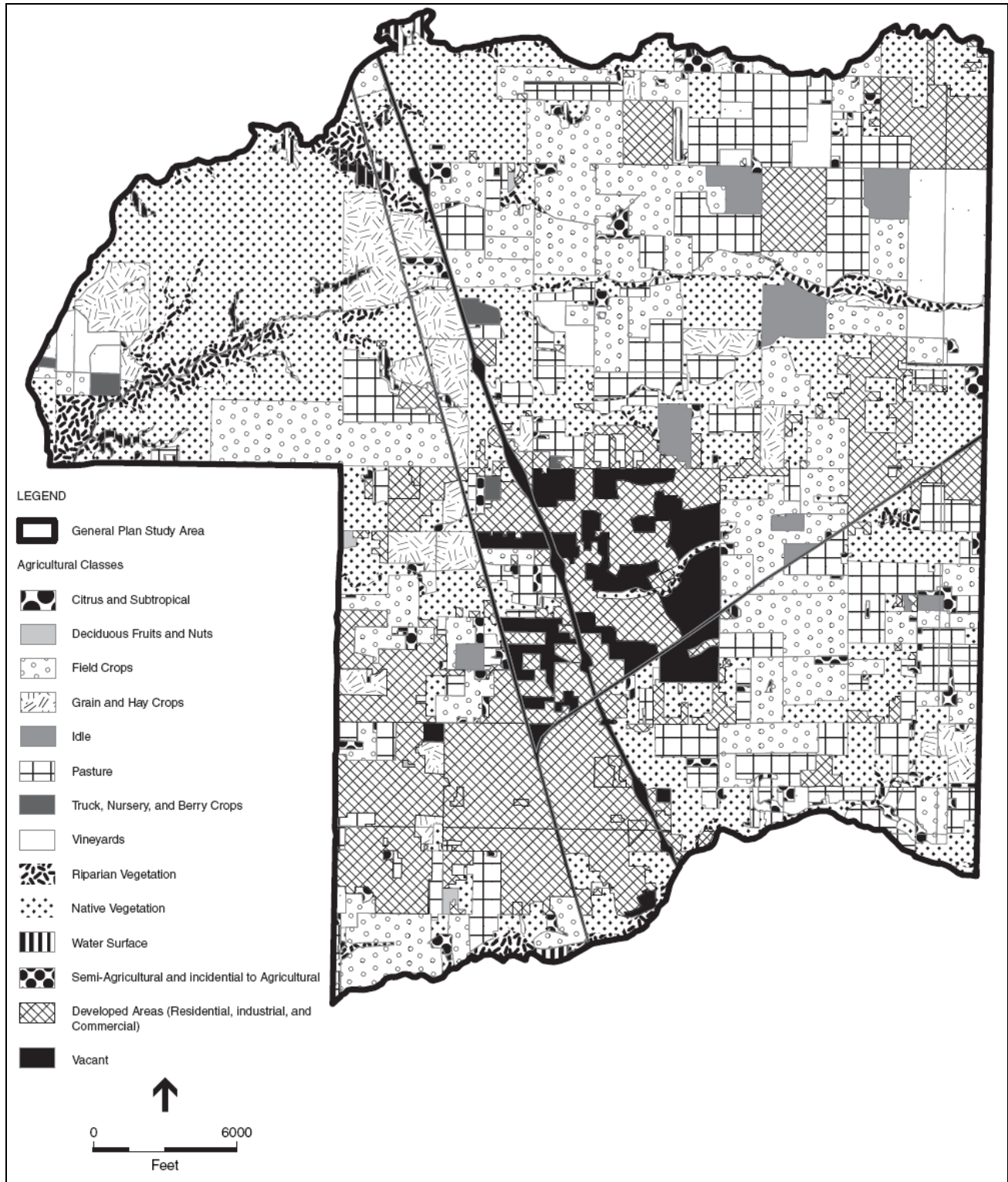
TABLE 8.8
Land Use within the City of Galt's Study Area

Land Use Class	Acreage Within Study Area*	Percentage of Study Area*
Citrus and Subtropical	16	Less than 1%
Deciduous Fruits and Nuts	32	Less than 1%
Field Crops	4,565	18%
Grain and Hay Crops	1,328	5%
Idle	446	2%
Pasture	3,301	13%
Truck, Nursery and Berry Crops	85	Less than 1%
Vineyards	918	4%
Riparian Vegetation	955	4%
Native Vegetation	6,391	26%
Water Surface	304	1%
Semi agricultural & Incidental to Agriculture	468	2%
Urban Uses	6,070	24%
Total	24,879	100%

* Acreages presented in this table have been calculated using DWR's spatial data for the study area. Only lands within the study area are included in the table above; parcels extending past the planning boundary have been measured accordingly. Consequently, the total study area may vary from the total represented in other sections of this report. The data presented in this table do not account for duplicative increases in crop acreage due to double or triple cropping.

Source: Acreage and designation information presented in this table were originally developed by the California Department of Water Resources Land Use Data for Sacramento County, 2000.

FIGURE 8.8
Crop Types in the Study Area



Sources: California Department of Water Resources, 2000; and Environmental Science Associates, 2005

Important Farmlands within the Study Area

As identified in Table 8.9, soils designated as “Farmland of Statewide Importance” by the California Department of Conservation accounted for almost half (an estimated 42 percent) of the study area. Soils designated as “Prime Farmland” accounted for only three percent of the total land within the study area (see Table 8.9). In comparison, land designated as “Urban/Built-Up Land” and “Other Land” accounts for roughly 22 percent the total land within the study area.

Agricultural lands classified as “Important and Unique Farmlands” and other land use designations are identified in Figure 8.9. As shown in the figure, land designated as “Prime Farmland” is located along Dry Creek, Laguna Creek, Skunk Creek, and the Cosumnes River.

**TABLE 8.9
Farmland Mapping and Monitoring Program (FMMP)
Land Use Designations within the City of Galt’s Study Area**

FMMP Designation	Acreage Within Study area	Percentage of Study Area*
Prime Farmland	706	3%
Farmland of Statewide Importance	10,210	41%
Unique Farmland	821	3%
Farmland of Local Importance	3,148	13%
Grazing Land	4,474	18%
Urban/Built-Up Land	2,876	12%
Water	52	Less than 1%
Other Land	2,738	11%
Total	25,023	100%
Important Farmlands**	11,744	47%

* Percentages may not total 100 due to rounding

** Important Farmlands. This total includes the acreage for prime farmland, farmland of statewide importance, and unique farmland.
Source: Acreage and designation information presented in this table were originally presented by the California Department of Conservation’s Farmland Mapping Monitoring Program Data for Sacramento County, 2004.

Williamson Act Lands within the Study Area

A Williamson Act contract represents agreements to restrict land to agricultural or open space uses in return for lower than normal property tax assessments. The regulatory background and important terms are discussed below under “Regulations That Address Soils and Agricultural Resources”. Figure 8.9 provides the locations of parcels within the study area that have an active Williamson Act Contract or a Williamson Act Contract in non-renewal status (California Department of Conservation 2006). An estimated 4,443 acres (or approximately 18% of the total study area) of land are currently under an active Williamson Act Contract. A total of 631 acres (or 2.5% of the total County land) of land are currently in Non-renewal for Williamson Act contracts. (California Department of Conservation 2005)

REGULATIONS THAT ADDRESS SOILS AND AGRICULTURAL RESOURCES

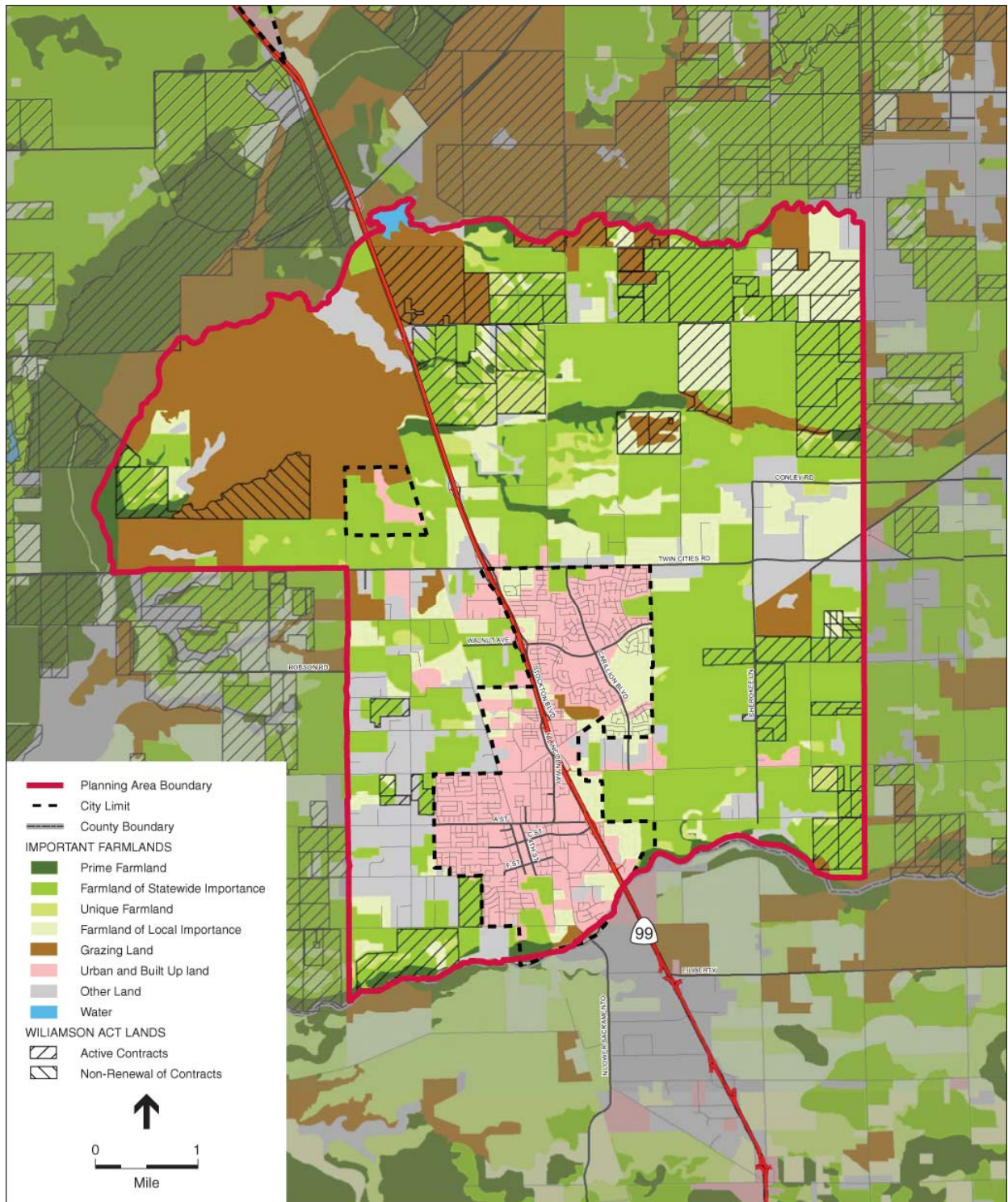
This section focuses on State and local regulations that affect soils and agricultural resources.

State Regulations

California Department of Conservation - Farmland Mapping and Monitoring Program.

The California Department of Conservation (DOC), under the Division of Land Resource Protection, has developed the Farmland Mapping and Monitoring Program (FMMP) which monitors the conversion of the State's farmland to and from agricultural use. Data is collected at the county level to produce a series of maps identifying eight land use classifications using a minimum mapping unit of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of State agricultural land and updates the "Important Farmland Series Maps" every two years (Department of Conservation, 2000).

FIGURE 8.9
Important Farmlands and Williamson Act Lands in the Study Area



Sources: California Department of Conservation, 2004; California Department of Conservation 2005; City of Galt 2007; Sacramento County 2007; Mintier & Associates 2007; and Environmental Science Associates, 2007

The FMMP is an informational service only and does not constitute State regulation of local land use decisions. Agricultural land is rated according to several variables including soil quality and irrigation status with Prime Farmland being considered the most optimal for agricultural production. Table 8.10 provides a summary of the rating categories used by the FMMP.

**TABLE 8.10
Description of Farmland Designations**

Farmland Designation	Description
Prime Farmland	Land that has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained yields of crops when treated and managed, including water management, according to current farming methods. It must have been used for the production of irrigated crops within the last three years. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.
Farmland of Statewide Importance	Similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to hold and store moisture. Considered to have an excellent combination of physical and chemical characteristics for the production of crops.
Unique Farmland	Land of lesser quality soils used for the production of specific high-economic value crops at some time during the monitoring program’s two update cycles prior to the mapping date. It has the special combination of soil quality, location and growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. Unique farmland is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California.
Farmland of Local Importance	Farmlands not covered by the categories of Prime, Statewide, or Unique. They include lands zoned for agriculture by County Ordinance and the California Land Conservation Act as well as dry farmed lands, irrigated pasture lands, and other agricultural lands of significant economic importance to the County and include lands that have a potential for irrigation from Sacramento County water supplies.
Grazing Land	Grazing Land is land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock. The minimum mapping unit for Grazing Land is 40 acres.
Urban and Built-up Land	Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
Other Land	Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
Water	Perennial water bodies with an extent of at least 40 acres.

Source: California Department of Conservation, 2000.

California Land Conservation Act of 1965 – “Williamson Act”

The California Land Conservation Act (CLCA) of 1965, Sections 51200 et seq. of the California Government Code, commonly referred to as the “Williamson Act,” enables local governments to restrict the use of specific parcels of land to agricultural or related open space use. Landowners enter into contracts with participating cities and counties and agree to restrict use of their land to agricultural or open space uses for a minimum of 10 years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market (speculative) value. Local governments receive an annual subvention of foregone property tax revenues from the State via the Open Space Subvention Act of 1971.

The DOC reports that the Land Conservation Act Program has remained stable and effective as a mechanism for protecting agricultural and open space land from premature conversion of land to urban uses. DOC indicates that the program might have remained small if not for the addition of Article 28 (now part of Article 13) to the State Constitution. Article 13 declares the interest of the state in preserving open space land and provides a constitutional basis for valuing property according to its actual use. The amendment originated with groups interested in the preservation of open space land. Agricultural interests added their support after recognizing the importance of a constitutional backing for preferential tax assessments. Article 13 allows preferential assessments for recreational, scenic, and natural resource areas as well as areas devoted to the production of food and fiber.

Farmland Security Zones – “Super Williamson Act”

In August 1998, the Williamson Act’s farmland security zone (FSZ) provisions were enacted with the passage of Senate Bill 1182 (California Government Code Section 51296–51297.4). This sub-program, dubbed the “Super Williamson Act,” enables agricultural landowners to enter into contracts with the County for 20-year increments with an additional 35 percent tax benefit over and above the standard Williamson Act contract.

Annexation of FSZs is generally not allowed. Section 56749 of the California Government Code requires Local Agency Formation Commissions (LAFCO’s) to reject plans that would result in the annexation of FSZ territory into cities. However, FSZ annexation is permissible under certain circumstances including voter approval, necessary public improvements, and landowner consent.

LOCAL REGULATIONS

Sacramento County General Plan: Agricultural, Conservation, and Open Space Elements

The Sacramento County General Plan has adopted several elements including an agricultural element to help guide open space/agricultural resource management for areas outside the City limits but within the study area. These elements include programs for the continued maintenance and enhancement of existing open space and agricultural areas. Specific policies related to agriculture include those that identify agricultural zoning designations and parcel size requirements. Other policies identify the need to support drainage improvements, and special agricultural water-improvement districts.

The County is currently in the process of updating its general plan which was last adopted in 1993. Although the process is anticipated to be a minor update to the existing general plan, the overall goal of the update will be to plan for growth out to 2025. Several topics to be addressed include smart growth planning and an analysis of the planning area’s capacity to accommodate future growth within the urban policy area and the urban service boundary. As part of the update, existing general plan policies will be reviewed and evaluated in context with current environmental and regulatory conditions.

8.5 GREENHOUSE GAS INVENTORY (Updated June 2008)

Global climate change is a problem caused by anthropogenic emissions of greenhouse gases (GHGs) into the atmosphere through combustion of fossil fuels

and other activities, such as deforestation and land use change. GHGs play a critical role in the planet's radiation budget by trapping infrared radiation emitted from the earth's surface, which could have otherwise escaped to space. Prominent GHGs contributing to this process include water vapor, carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), ozone, and certain hydrocarbons and fluorocarbons. This phenomenon, known as the "greenhouse effect", keeps the earth's atmosphere near the surface warmer than it would be otherwise and allows for successful habitation by humans and other forms of life. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the greenhouse effect and to contribute to what is termed "global warming," a trend of unnatural warming of the earth's natural climate. Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone and carbon monoxide) and toxic air contaminants which are pollutants of regional and local concern.

This section summarizes a preliminary inventory on large sources (transportation, electricity use, and natural gas combustion) of known greenhouse emissions in the city of Galt for the baseline year 2005. This inventory was performed to help facilitate the City's efforts to track and reduce citywide GHG emissions consistent with Assembly Bill 32, Global Warming Solutions Act of 2006. This bill requires jurisdiction in the State to reduce GHG to 1990 levels by 2020.

The goal of this initial inventory is to capture 80 percent of all known GHG emissions in Galt, with the intent to tier from this effort and perform a full detailed 2005 greenhouse gas inventory for the city in cooperation with the Sacramento Municipal Utility District, County of Sacramento, and the cities within Sacramento County.

METHODOLOGY

The City of Galt is a member the International Council for Local Environmental Initiatives (ICLEI). Comprising over 815 cities, towns, countries and their associations worldwide, ICLEI is an international association of local governments, as well as national and regional local government organizations, that have made a commitment to sustainable development. The Clean Air and Climate Protection (CACP) Software, developed by ICLEI, was used to estimate greenhouse gas emissions within Galt. The CACP software inventories community greenhouse gas emissions for all operations within the selected boundary of the local government.

Galt's GHG emissions were quantified in terms of CO₂ equivalents (CO₂e). Each GHG has a different Global Warming Potential (GWP) that represents its power as a GHG relative to a standard. The GWP standard for GHG emissions is CO₂, since it is the most abundant GHG in the atmosphere and has the lowest GWP. Emissions of GHGs quantified in this inventory are reported in metric tons of CO₂e based on the GWP of the gas.

This analysis uses 2005 as the baseline year for the 80 GHG emissions inventory based on the availability of complete transportation, electricity use, and natural gas combustion data. Included in this inventory are indirect emissions associated with the production of electricity used by City-owned facilities, local businesses, and residences, as well as emissions resulting from onsite combustion of natural gas and other fuels used to generate energy. Also included in the GHG inventory are direct emissions associated with the combustion of fuel for automotive transportation.

Indirect GHG emissions associated with electricity and natural gas usage were tracked using utility bill information. The Sacramento Municipal Utility District (SMUD) provides electricity to Galt, while Pacific Gas and Electric (PG&E) provides

natural gas. Energy consumption data for 2005 was obtained by sector through coordination with SMUD and PG&E staff. Emission factors for CO₂ that are area-specific and certified by an independent third-party (the California Climate Action Registry) were provided by PG&E and SMUD. The natural gas emission factor for PG&E is 11.70 pounds per therm, while the electricity emission factor for SMUD is 616.07 pounds per megawatt hour (California Climate Action Registry Database 2007; Bruso pers. comm.). These emissions factors were input into the CACP to override the default CACP emissions factors for electricity and natural gas. When available, area-specific values were substituted for CACP default values. Default emissions factors for the other greenhouse gases were used.

Direct GHG emissions associated with transportation from on-road vehicle activities, including heavy duty trucks and buses, were quantified using average annual vehicle miles traveled (VMT) within the city. The CACP software calculated transportation-related GHG emissions using default VMT percentages by vehicle type and fuel consumption. CACP software fuel economy defaults for each vehicle type were based on state averages.

RESULTS

Galt's 2005 GHG emissions from transportation, electricity use, and natural gas combustion are summarized by source in Table 8.11. As shown in the table, transportation-related GHGs represent significant sources of emissions and are expected to comprise 80 percent of the city's GHG emissions for 2005. The consumption of fuel for transportation accounted for 58.1 percent of the city's overall GHG emissions, electricity use for 31.9 percent, and natural gas combustion for 10.0 percent.

TABLE 8.11
GHG Electricity and Natural Gas Emissions for 2005¹

Source	GHG Emissions (metric tons CO ₂ e)	Percent
Transportation Fuels	106,085	58.1%
Electricity	58,167	31.9%
Natural Gas	18,185	10.0%
Total	182,437	100.0%

¹ Calculated using CACP software

Table 8.12 shows electricity and natural gas emissions broken down by residential, commercial, and industrial users. As shown in the table, residential GHG emissions amounted to 35,066 metric tons of CO₂e, which represents 19.2 percent of Galt's 80 percent inventory. Commercial GHG emissions for Galt in 2005 amounted to 41,286 metric tons of CO₂e, which represents 22.6 percent of Galt's 80 percent inventory. Greenhouse gas emissions for the industrial sector were included in the commercial sector. Industrial electricity and natural gas consumption data were unavailable due to utility database confidentiality

TABLE 8.12
GHG Electricity and Natural Gas Emissions for 2005¹

Sector	Natural Gas Emissions (metric tons CO₂e)	Electricity Emissions (metric tons CO₂e)	Total (metric tons CO₂e)	Percentage of energy use	Percentage of total emissions
Residential	20,097	14,969	35,066	45.9%	19.2%
Commercial	38,070	3,216	41,286	54.1%	22.6%
Industrial ²	N/A	N/A	N/A	N/A	N/A
Total	58,167	18,185	76,352	100.0%	41.8%

¹ Calculated using CACP software

² Industrial emissions are included in commercial emissions.

CONCLUSION

Galt's comprised 0.06 percent of the total State population in 2005. The California Energy Commission's statewide GHG emissions inventory estimates that California emitted 471 million metric tons of CO₂e in 2004. Based on the 80 percent inventory (182,437 metric tons CO₂e), Galt accounts for approximately 0.04 percent of statewide GHG emissions. The U.S. Environmental Protection Agency estimates that net emissions for the United States in 2005 was 6,431.9 million metric tons of CO₂e. Based on the 80 percent inventory, Galt accounts for approximately 2.8x10⁻³ percent of national GHG emissions. Though emissions from Galt are small compared to total State and national GHG emissions, global climate change is a cumulative problem in which every source of GHG emissions, both small and large, contributes to a significant accumulation of greenhouse gas emissions in the atmosphere.

The 80 percent Greenhouse Gas Emissions Inventory is an initial estimate of large sources of emissions within Galt. The City will use the 80 percent Greenhouse Gas Emissions Inventory to track and monitor any GHG reductions relative to the 2005 baseline GHG emissions estimate. The City will also supplement 80 percent Greenhouse Gas Emissions Inventory with a full detailed 2005 baseline GHG inventory for 2005 in cooperation with the cities in Sacramento County, County of Sacramento, and the Sacramento Municipal Utility District.

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8.6 GLOSSARY

Aquifer

An aquifer is an underground layer of permeable rock, sand, or gravel that contains water. An aquifer is the area underground that stores groundwater resources and is sometimes referred to as a water table.

Groundwater Basin

A groundwater basin is the above-ground area from which water flows or seeps into a particular aquifer or series of linked aquifers.

Important Farmlands

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

K-Factor

Provides an indication of a soil's inherent susceptibility to erosion, absent of slope and groundcover factors. Values of K range from 0.05 to 0.43. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Land Capability Classification

Grouping which depicts, in general, the suitability of soils to support most kinds of field crops under an irrigated scenario. The groups are made according to the limitations of the soils when used for field crops.

Other Waters of the U.S.

This term refers to those hydric features that are regulated by the Clean Water Act but are not wetlands (33 CFR 328.4). To be considered jurisdictional, these features must exhibit a defined bed and bank and an ordinary high-water mark. Examples of "other waters of the U.S." include rivers, creeks, intermittent and ephemeral channels, ponds, and lakes.

Overdraft

Overdraft is a condition of a groundwater basin or aquifer in which withdrawals exceed inflow (i.e., more water is removed than returns).

Shrink-Swell Potential

The cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as a result of inadequate foundation engineering.

Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as “sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as “special status species” in this report, following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term, and the legal status of each, are discussed later in this report under the “Regulations” discussion. For the purposes of this assessment, the term “special-status” includes those species that are:

- Listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11–17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596–7613);
- Listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG) as a species of concern (USFWS), rare (CDFG), or of special concern (CDFG);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under California Environmental Quality Act (CEQA Guidelines Section 15380);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik, 1994).

Sensitive Natural Community

A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, are structurally complex, or are in other ways of special concern to local, state, or federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The CDFG tracks sensitive natural communities in the CNDDDB.

Soil

(1) A dynamic natural body composed of mineral and organic materials and living forms, which serve as a medium for plant growth. (2) The collection of natural bodies occupying parts of the earth’s surface that support plant growth and that have

properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief, over periods of time.

Soil Horizon

A layer of soil, parallel to the soil surface, differing in properties and characteristics from adjacent layers below or above it.

Soil Map Units

A soil map unit is a collection of areas defined and named similarly in terms of their soil components.

Soil Quality

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

Soil Series

The soil series is the most homogenous category in the U.S. Soils Taxonomy. As a class, the soil series is a group of soils that have horizons similar in arrangement and in differentiating characteristics.

Total Maximum Daily Loads

A total maximum daily load (TMDL) refers to the amount of a specific pollutant a river, stream, or lake can assimilate and still meet federal water quality standards as provided under the Clean Water Act.

Watershed

Similar to a groundwater basin, a watershed is the area or region from which surface water flows to a particular water body.

Wetlands

Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The federal government defines wetlands in Section 404 of the Clean Water Act as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3[b] and 40 CFR 230.3). Under normal circumstances, the federal definition of wetlands requires three wetland identification parameters be present: wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to other waters of the U.S (see definition below for “other waters of the U.S.”). The Corps is the responsible agency for regulating wetlands under Section 404 of the Clean Water Act, while the EPA has overall responsibility for the Act. The CDFG does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under Streambed Alteration Agreements or they support state-listed endangered species; however, CDFG has trust responsibility for wildlife and habitats pursuant to California law.

Williamson Act Contract – Active

The minimum term for a Williamson Act contract is 10 years. Since the term automatically renews on each anniversary date of the contract, the actual term can be indefinite.

Williamson Act Contract – Cancellation

Under a set of specifically defined circumstances, a contract may be cancelled without completing the process of term nonrenewal. Contract cancellation, however, involves a comprehensive review and approval process, and the payment of fees by the landowner equal to 12 percent of the full market value of the subject property.

Williamson Act Contract – Notice of Non-Renewal

Contracts may be terminated at the option of the landowner or local government by initiating the process of term non-renewal. Under this process, the remaining contract term (nine years in the case of an original term of 10 years) is allowed to lapse, with the contract null and void at the end of the term. Property tax rates gradually increase during the nonrenewal period, until they reach normal (i.e., non-restricted) levels upon termination of the contract.

Williamson Act Contract – Expired

Expired parcels are those parcels that have previously been subject to Williamson Act contract, and have since been removed from the contract through non-renewal, cancellation or annexation.



9 | HISTORIC RESOURCES

9.1 INTRODUCTION

This chapter provides an overview of Galt's cultural and historical resources. This chapter has been divided into four sections. The first section describes cultural resources and regulations. The second section describes background information on the city's historical resources and character. The second section is a listing and description of existing historical resources. The final section describes a preservation study that was conducted by the City to identify a potential historic district.

9.2 CULTURAL RESOURCES

Cultural Resources are defined as buildings, sites, structures, objects, or places of importance to Native Americans that may have historical, architectural, archaeological, cultural, or scientific importance.

The City's planning area lies within a culturally rich province of the Central Valley. To assist in the preservation of the City's unique cultural heritage, this section discusses the federal and state requirements for identifying, evaluating, and preserving cultural resources.

METHODS AND DATA SOURCES

Information on the Study Area's cultural and historic resources was obtained from the Historic Preservation Element of the City of Galt's 1989 General Plan, and various other sources on California history. Records were also accessed and reviewed at the North Central California Information Center, including the Directory of Properties in the Historic Property Data File for Sacramento County for information on sites of recognized historical significance within the National Register of Historic Places, the California Inventory of Historic Resources, the California Historical Landmarks (2003), the California Points of Historical Interest (2003), and Information Center maps and site records.

REGULATIONS THAT ADDRESS CULTURAL RESOURCES

Federal Regulations

National Historic Preservation Act and NEPA

Most applicable federal regulations concerning cultural resources have been established to comply with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) of 1966, as amended. The NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for federal land-holding agencies, but also includes regulations (Section

106) which pertain to all projects that are funded, permitted, or approved by any federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and the NEPA requirements concerning cultural resources can be addressed through compliance with the Section 106 of the NHPA process. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Council on Historic Preservation, State Offices of Historic Preservation, and grants-in-aid programs.

Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance, which may be caused to archaeological sites on federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to “Preserve for public use historic sites, buildings, and objects of national significance.”

American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains on federal lands are protected by the Native American Graves and Repatriation Act of 1990.

State Regulations

California Environmental Quality Act

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as “unique,” “important,” listed on the California Register of Historical Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed in the appropriate environmental document. If a cultural resource is found not to be significant or unique under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to reduce the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- Identify cultural resources,

- Evaluate the significance of the cultural resources found,
- Evaluate the effects of the project on cultural resources, and
- Develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

California Register of Historic Resources (CRHR)

The CRHR was created in 1998 by an act of the State Legislature, and is administered by the State Office of Historic Preservation (OHP).

The CRHR is an authoritative guide to California's significant historical and archeological resources to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state, and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change (see California Public Resources Code §5024.1).

Historic properties listed, or formally designated for eligibility to be listed, on the National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

State Laws Pertaining to Human Remains

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Public Resources Code Section 5097) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Tribal Consultation Guidelines (Senate Bill 18)

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes, when amending or adopting a general plan or specific plan, or designating land as open space, in order to aid in the protection of traditional tribal cultural places ("cultural places"). SB 18 also requires the Governor's Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments for how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

Local Regulations

Sacramento County Requirements

The Sacramento County General Plan Cultural Resources section of the Conservation Element describes the County's policies and programs under six objectives:

- Attention and care during project review and construction to ensure that cultural resource sites, either previously known or discovered on the project site, are properly protected with sensitivity to Native American values.
- Structures with architectural or historical importance preserved to maintain exterior design elements.
- Known archaeological and historic sites protected from vandalism, unauthorized excavation, or accidental destruction.
- Comprehensive knowledge of archaeological and historic site locations.
- Properly stored and classified artifacts for ongoing study.
- Public awareness and appreciation of both visible and intangible historic and cultural resources.

The General plan also enumerates policies to implement the six objectives described above. These policies include, but are not limited to:

- Significant archaeological, prehistoric, or historic sites shall be protected as open space for potential future excavation (CO-157).
- Is a condition of approval of discretionary permits, a procedure shall be included to cover the potential discovery of archaeological resources during development or construction (CO-161).
- The discovery of archaeological remains or human remains during any development activities shall require work to stop and the immediate notification of the Sacramento County Department of Environmental Review and Assessment (CO-162).
- Conduct surveys and designate structures with architectural or historical importance on community plan maps (CO-163).
- Restrict the circulation of cultural resource locational information to prevent potential site vandalism (CO-167).

City of Galt General Plan Historic Preservation Element

It shall be the goal of the City to protect evidence of its cultural development and history.

9.3 BRIEF OVERVIEW OF GALT'S HISTORY

Prehistoric Setting

Although little is known concerning the earliest occupants of the Central Valley, it is clear that much of the Valley and the riverine environments surrounding the meandering San Joaquin and Sacramento Rivers have been occupied throughout most of the Holocene Epoch (~10,000 B.P. [Before Present] to the present). The reconstruction and understanding of pioneering cultures during the late Paleo-Indian to early Archaic Periods (~9,000 B.P. to ~3,000 B.P.) has proven difficult given erosion and depositional patterns of the Central Valley. These processes have redeposited or deeply buried the evidence of much of those early cultures. Much of the direct, dateable evidence for the Central Valley for this time period come from what has been called the Farmington Complex, placed tentatively at around 9,000 to 7,000 B.P. (Treganza and Heizer 1953). The artifact assemblage consisted of core tools and flakes of olive-green chert, which would indicate a hunting-based diet, probably augmented by gathering. Farmington-type artifacts have been discovered in other locations between the Cosumnes and Stanislaus River drainages (Johnson, 1967). However, given scant physical evidence, much of our knowledge of these early peoples has been gleaned from environmental reconstructions of the region and through theoretical explanations for predicting human behavior in specific environmental settings.

The taxonomic framework of the Central Valley has been described in terms of archaeological patterns (Moratto, 1984). A pattern is a general mode of life characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Fredrickson (1973) identified three general patterns of resource use for the time period between 4,500 B.P. and A.D. 1,500: the Windmill, Berkeley, and Augustine patterns.

The Windmill Pattern (4,500 B.P. to 2,500 B.P.) demonstrates evidence of a mixed economy that focused on game procurement and the use of wild plant foods. The archaeological record contains numerous projectile points with a wide range of faunal remains. Hunting was not limited to terrestrial animals, as is evidenced by the Windmill toolkit, which included fishing hooks and spears, with the remains of sturgeon, salmon, and other fish (Moratto, 1984). Plant resources were also used, as indicated by ground stone artifacts and clay balls that were used for boiling acorn mush. Settlement strategies during the Windmill period reflect a seasonal adaptation. Habitation sites in the valley were occupied during the winter months, but populations moved into the foothills during the summer (Moratto, 1984).

The Windmill Pattern ultimately changed to a more specialized adaptation, labeled the Berkeley Pattern (2,500 B.P. to A.D. 500). A reduction in the number of manos and metates and an increase in mortars and pestles indicate a greater dietary dependence on acorns. Although gathered resources grew in importance during this period, the continued presence of projectile points and atlatls in the archaeological record indicates that hunting was still an important activity (Fredrickson, 1973).

The Berkeley Pattern was superseded by the Augustine Pattern around A.D. 500. The Augustine Pattern reflects a change in subsistence and land use patterns similar to those of the ethnographically known people of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, and an even more intensive emphasis was placed on the use of the acorn, as is evidenced by the presence of shaped mortars and pestles and numerous hopper mortars in the archaeological record. Other notable elements of the artifact assemblage associated

with the Augustine Pattern include flanged tubular smoking pipes, harpoons, clam shell disc beads, and an especially elaborate baked clay industry, which included figurines and pottery vessels (Cosumnes Brownware). The presence of small projectile point types, referred to as the Gunther Barbed series, suggests the use of the bow and arrow. Other traits associated with the Augustine Pattern include the introduction of pre-interment burning of offerings in a grave pit during mortuary ritual, increased village sedentism, population growth, and incipient monetary economy in which beads were used as a standard of exchange (Moratto, 1984).

Many investigations into Central Valley prehistory have been conducted in Sacramento and San Joaquin Counties. Indeed, much of the literature has supported the notion that Central Valley peoples maintained large populations along the banks of major waterways, wetlands, and streams. Although many sites are more obtrusive, such as shell mounds, much of the archaeological record for the region has likely been buried beneath the vast alluvial deposits by erosion and depositional processes indicative of the valley, especially over the last 9,000 years. Consequently, archaeological materials can be revealed unexpectedly during excavation throughout the Central Valley.

Ethnographic Setting

The planning area was aboriginally inhabited by the Plains Miwok, speakers of a language belonging to the Utian language family (Shipley 1978). The Plains Miwok inhabited the lower reaches of the Mokelumne and Cosumnes Rivers, and the banks of the Sacramento River from Rio Vista to Freeport. The primary political unit of the Miwok was the tribelet. Composed of several more or less permanent settlements and numerous seasonally occupied camps, the tribelet represents an independent, sovereign group which defined and defended territory. Also of political significance are lineages which consist of localized groups, named for a specific geographic locality, usually a permanent settlement. A descriptive summary for this tribe has been compiled by R. Levy (1978), and it is upon this work that this brief ethnographic setting is based.

The basic subsistence strategy of the Plains Miwok was seasonally mobile hunting and gathering. The only cultivated crop was tobacco and the only domesticated animal was the dog. An ample supply of seed bearing annuals and forage for game was assured by intentional burning in August. Acorns, the primary staple, were gathered in the fall and stored through the winter. An important staple in the summer were seeds, gathered May through August. Plant foods included, acorns, buckeye nuts, laurel nuts, hazelnuts, seeds, roots, greens and some berries. The Miwok ate more meat in the winter, when only stored plant resources were available. Hunting was accomplished with the aid of the bow and arrow, and traps and snares. Animal foods consisted of deer; elk; antelope; rodents; water fowl; quail, pigeons, flickers and other birds; freshwater mussels and clams; land snails; fish; and a variety of insects.

Miwok technology included bone, stone, antler, wood and textile tools. Basketry items included seed beaters, cradles, sifters, rackets used in ball games, and baskets for storage, winnowing, parching, and carrying burdens. Other textiles included mats and cordage. Tule balsas were constructed for navigation on rivers and in the delta.

The Plains Miwok constructed four types of structures. Conical structures of bark were used in the mountains, while those of tule matting were used more in the lower elevations of the Central Sierra. Semi-subterranean earth-covered dwellings served as winter homes. Also within the Miwok settlement were acorn granaries, menstrual huts, sweathouses, conical grinding huts over bedrock mortars, and two types of

assembly houses. Large semi-subterranean structures were the focal point of ritual and social gatherings. Circular brush structures were used for mourning ceremonies in summer months.

The Plains Miwok first came into contact with Europeans in the second half of the eighteenth century, when Spanish explorers entered the area. It appears that many Plains Miwok tribelets disappeared through the combined effects of population removal to the missions and epidemics. Runaway neophytes were sought by military expeditions. Initially, the Miwok hid, but eventually began to fight back. Militarism grew in the 1820s and 1830s, particularly among the Plains Miwok. With the incursion of trappers, gold miners, and settlers, the Miwok were exposed to more new diseases. Although this early contact with settlers had a profound negative impact on the Miwok population both through disease and violent actions, the Miwok people survive and maintain strong communities.

MODERN SETTING

The Galt area has been typified by near constant cultivation since the 1850s with the original Spanish land grant, Rancho San Jon del los Moquelumnes. By 1861, the entire Dry Creek township was purchased by Dr. Obed Harvey, considered the founder of Galt. As of 1869, the town of Galt was established by the Western Pacific Railroad Company on an area known as Troy Place (Maki 1994). A number of basic services and civic organizations developed fairly rapidly, with several hotels, a general store, and a post office. A prominent early settler, John McFarland, named the town after his former home in Ontario, Canada, which was named after a Scottish novelist, John Galt. The combination of a favorable land for agriculture and the proximity to the railroad provided Galt with the economic support to continue to grow.

A corollary of the vital agricultural and dairy industries was the inception of new industries in the area. With the large number of dairies in the area in need of distribution services, Fred Harvey, son of Obed Harvey, convinced the Utah Condensed Milk Company to establish a plant in Galt in 1917. In 1921, the company changed its name to the Sego Milk Products Company. After many years of prosperous service to the community, the Sego plant fell into disrepair and suffered a fire in 1992. The plant was later demolished due to the damage caused by the fire. The heritage of the dairy industry and agriculture in Galt continues to be vital to Galt's appeal and economic welfare.

Native American Consultation

Cultural resource identification inquiries also included a letter to the Native American Heritage Commission requesting a review of the sacred lands file in regards to the Planning Area and a list of Native American contacts within the region. The Commission's July 12, 2007 response stated that the Sacred Lands file failed to indicate the presence of confidential sacred sites within the Planning Area, although noted that the absence of site information within the Sacred Lands file did not indicate the absence of cultural resources within the area. The NAHC response also included six contacts who have requested information on projects such as this and who may have knowledge of cultural resources within the Planning Area (please refer to Appendix 4). On July 13, 2007, ESA sent letters to designated contacts with information about the City's General Plan Update and a request that they contact us if there were any questions or concerns. On August 14, 2007, the Lone Band of Miwuks responded, stating that their Heritage Commission determined that the project area may be within their Tribe's Ancestral Territory and asked to remain updated as the project progresses. On October 4, 2007, ESA made follow up phone

calls and emails to the remaining organizations and individuals. To date, no other responses have been received.

Existing Cultural and Historic Resources

Known and recorded cultural resources within the planning area were identified through a records search of pertinent survey and site data at the North Central California Information Center, California State University, Sacramento on August 7, 2003. The records were accessed by utilizing the Bruceville, Lodi North, Galt, Clay, and Lockford USGS 7.5-minute quadrangle maps in Sacramento County. The review incorporated the entire planning area for the City of Galt. Previous surveys and studies and archaeological site records were accessed as they pertained to the planning area. Historical records, such as those found in the Directory of Properties in the Historic Property Data File for Sacramento County, were accessed. An inventory of properties listed in the National Register of Historic Places, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), the Survey of Surveys (1989), or the California Points of Historical Interest (1992 and updates) was also developed for the purposes of this report.

In areas where comprehensive archaeological surveys have not been undertaken, such as the current planning area, creating a probability model of the spatial distribution of cultural resources often has greater utility for the purposes of protection and management of the resources, rather than presenting specific site locations. The selection of variables to predict prehistoric site locations is based on the assumption that sites should occupy only a limited portion of the total variation present in the environment. Therefore, areas of relative archaeological sensitivity can be identified based on the patterns that are reflected in known site locations and by applying certain assumptions regarding the environmental factors that predict archaeological site locations. For instance, in the case of the San Joaquin Valley, areas proximal to water sources, areas where soils are less predisposed to flood, and areas of social and political importance would be factors that would predict prehistoric use.

A Geographic Information Systems (GIS) model was created to generate a spatial representation of archaeological site potential in the Galt planning area. Three variables were selected for the model: Areas of well-drained soils, proximity to water, and proximity to previously recorded prehistoric sites. According to the record search data and the GIS model, most prehistoric settlement in the area surrounding the planning area was focused along major waterways, especially within 300 meters of the Cosumnes River, and along the Dry Creek corridor. It should be noted that although some areas have been shown to possess greater sensitivity than other areas for the presence of prehistoric or historic archaeological resources, it is possible for archaeological deposits to be encountered during ground-disturbing activities in almost any location, including areas considered to have low sensitivity. Prehistoric Archaeological Resources. The evidence from previous survey work and site investigations in the planning area would indicate that the prehistoric site types would encompass the following:

- Mounded Midden sites with or without Native American burials.
- Surface scatters of lithic artifacts and debitage associated with or without associated midden accumulations, resulting from short-term occupation, and/or specialized economic activities, or long-term occupation.
- Grinding stones, such as manos, matates, mortars, etc. [give definitions]

- Isolated finds of cultural origin, such as lithic flakes and projectile points.

9.4 HISTORICAL RESOURCES

Many historic properties in the planning area have been identified through historic building surveys and previous cultural resource studies. A list of properties either listed on or found eligible for listing in the National Register of Historic Places is presented in Table 9.1. The table also includes information on properties that have not yet been evaluated for significance. The list of historic buildings in Galt presented in Table 9.1 should not be considered a comprehensive list of all historical buildings. Buildings not previously identified as historical may be present and other buildings may become historical during the passage of years.

DOWNTOWN REVITALIZATION AND HISTORIC PRESERVATION SPECIFIC PLAN

In 1995, the City adopted the Downtown Revitalization and Historic Preservation Specific Plan. The goal of this plan is to spur economic revitalization within the downtown core and preserve its historic character. During the late nineteenth and early twentieth centuries, Victorian (i.e., Queen Anne, Stick, and Greek Revival) and Italianate architectural styles were at their peak in California (see Figure 9.1). Modest examples of these styles, both commercial and residential, can be found in the Old Town area. Several examples of early (1920s) California Bungalow style residences are also found within the area.

One of the issues addressed through the Historic Preservation Specific Plan's design guidelines is the extent to which the guidelines encourage the authenticity of architectural styles and materials. This is important to promote the vitality of Downtown Galt and to establish a special commitment to the visual quality of the area.

FIGURE 9.1
Historic Victorian Homes in Galt



Source: RACESTUDIO, 2004.

FIGURE 9.2
Old Town Galt



Source: RACESTUDIO, 2003.

SPECIFIC SITES

The following is a description of historic resources within the city and surrounding areas.

Communities to the North

There have been many small communities located over the years between Galt and Elk Grove to the north. These communities were self-sufficient and never considered themselves a part of Galt. These included the small towns of Clay Station, Alta Mesa, Colony, Hicksville, Arno, Twin Cities, and Herald. Over the years, Galt continued to grow and residents in the northern communities began coming into Galt for church, shopping, medical appointments, and social activities.

All that remains today of these communities is a cluster of homes, a school, and a firehouse at the bend of Highway 104 in the town of Herald. If you drive north of Galt, you will find reminders of those small towns in the names of the streets: “Clay Station Road,” “Alta Mesa Road,” “Colony Road,” “Arno Road,” and “Twin Cities Road.”

The Town of Liberty and Liberty Cemetery

The Town of Liberty was located in the northeast section of San Joaquin County at the crossroads of Lower Sacramento Road (the old stagecoach road) and Liberty Road. It was a productive town until the year 1869 when the railroad built a depot stop in the new town of Galt. The town of Liberty was disbanded within a few years and its post office moved to Galt.

The only remaining artifact from the Town of Liberty is its cemetery. Liberty Cemetery was created in 1852 at the northeast corner of Highway 99 and Liberty Road in San Joaquin County (Figure 9.3). At present there are 425 recorded graves in the cemetery, dating back to the early 1800's.

FIGURE 9.3
Liberty Cemetery



Source: Galt Historical Society, 2004.

Rae House

The Rae House was built by pioneer John Rae as a residence for his daughter, Alice (Figure 9.4). The house is used today by the Galt Historical Society as a museum. The museum offers free admission and various sponsored art exhibits, photographic exhibits, high tea, ice cream socials, Christmas open houses, and special tours.

FIGURE 9.4
Rae House Museum



Source: Galt Historical Society, 2004.

Churches

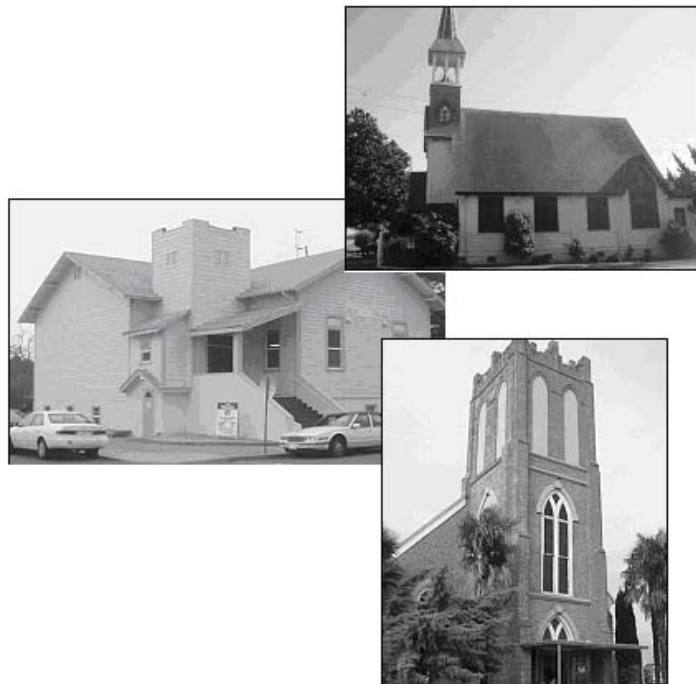
There are three churches in Galt that date back to the 1800s: St. Luke's Episcopal Church, St. Christopher's Catholic Church, and Galt Christian Church (Figure 9.5). Galt Christian Church is the oldest church building in town and is one of the original buildings of Liberty. The Christian Church was built in 1857 in Liberty and moved in 1887-1888 to the corner of 7th and B Streets in Galt. St. Luke's Episcopal Church was built in 1884 and is located on the corner of 3rd and B Streets. St. Christopher's Catholic Church was built in 1885 and is located on the corner of 3rd and F Streets.

Historic Archaeological Resources

The evidence from previous survey work and site investigations in the Study Area would indicate that the historic archaeological site types would encompass the following:

- Historic artifact scatters and buried deposits of historic debris and artifacts.
- Building foundations and associated deposits.
- Levees and roads.
- Remains of farms and ranches.

FIGURE 9.5
Collage of Galt's Churches



Clockwise from the top: St. Luke's Episcopal Church, St. Christopher's Catholic Church, and the original Galt Christian Church that was moved from the town of Liberty.

Sources: RACESTUDIO, 2003; and Galt Historical Society, 2004.

COMPLETE LIST OF RESOURCES

The following is a listing of historic resources identified within Galt, including a description of their importance and relative condition. This information was derived from the City's 1990 General Plan and side notes have been added for more recent information, including that provided by the Galt Historical Society.

TABLE 9.1
Historic Structures and Features in Galt

Number	Street Address	Description	Importance	Condition
1&2	120 7th Street	Christian Church	Early church. Architecture. Galt Local Historical Landmark #4	Good
3	236 6th Street	1920's Bungalow		
4	603 C Street	Residence	Eiler's Residence (1800s) (Sunny South)	Excellent
5	Corner 6th and C	1920's Bungalow w/ water tower		Removed
6	550 C Street	Galt Water Tower	Galt Local Historical Landmark #1	Excellent
-				
8	312 5th Street	Victorian Residence	Early residence, architecture	Good
9	318 5th Street	Victorian Residence	Early residence, architecture	Removed
10	324 5th Street	Victorian Residence	Early residence, architecture	Good
11	340 5th Street	1920's Bungalow	Early residence, architecture	Good
12	346 5th Street	Victorian Cottage	Early residence, architecture	Good
13	352 5th Street	Victorian Cottage	Early residence, architecture	Removed
14	113 4th Street	Victorian Cottage (Sperry Res)	State Point of Historical Interest, Library-School House	Fair
15,16,17	149 4th Street	Has been almost completely obscured by additions	General Store with gun slits (currently a mortuary)	Good - Building with additions would not be eligible for National Register
18	201 4th Street	2 story C. 1890's brick structure with cast iron columns and exquisite brick cornice details	National Register, Brewster Building, McFarland Building, Odd Fellows Hall	Poor
19	215 & 217 4th Street	C. 1920's one story fire brick structure w/ intricate cast iron vents. Five stores possible	Early Commercial, Dr. Harm's Office, rebuilt after 1924 fire.	Fair – 2/3 of structure painted and windows covered
20,21	227 & 229 4th Street	C. 1980's brick structure rebuild in the 1930's. Checkerboard brick pattern. Tile detail and vents, transom windows; interesting downspouts	Sawyer Building Telephone Exchange, Dr. Osler's Soda Fountain, Ray Arlin's Drug Store, rebuilt after 1924 fire.	Good – one upstairs window not original
22	409 C Street	C. 1920's light brick building w/ intricate iron vents. Three storefronts. Currently used for Galt Activity Center	Early commercial, site of Galt Hotel and Estrellita Ballroom	Good
23	4th & C Street	C. 1890's two-story Halianate Victorian	Early commercial, Bank of Galt 1890s and	Good

Number	Street Address	Description	Importance	Condition
		commercial block building. Two storefronts, plus upstairs rooms.	Steiner's Market.	
24		C. 1890's two-story Victorian commercial building. Two storefronts, apartments upstairs.	Early commercial	Fair – Brick facing of lower façade detracts
25	325 4th Street	Two-story Halianate Victorian brick commercial building. Has been converted completely (upstairs and downstairs apartments)	Early commercial	Poor – Downstairs façade has been severely altered. Upstairs bay windows also altered
26	416 B Street		Old Blacksmith Shop	Removed
27	206 5th Street	Brewster Howe OHP, 1979	Winn House, Brewster Residence, Justice Court, National Register	Excellent
28	218 5th Street		First Court House/Jail	Poor
29	417 B Street	Halianate Victorian Cottage	Early residence, architecture	Excellent
30	4th Street across from Park	Old Diamond National Limber yards – typical 1920's-40's	Example of railroad related industry frame lumber storage structure	Removed
31	3rd and F Street [destroyed by fire in 1992]	Old Sego Milk Plant	Example of railroad related industry	Removed
34,35,36	128-140	Victorian cottages	Early residence, architecture	
37	200 3rd Street	First Congregational Church, frame church w/ prominent spire	Early church, First church built in Galt by John McFarland, architecture, Galt Local Historical Landmark #2	Excellent
38	214 3rd Street	Victorian cottage	Early residence, architecture	Good
39	530 3rd Street	St. Christopher's Church, gothic brick church w/ spire	Early church, architecture, Second church built in Galt, architecture, Galt Local Historical Landmark #3	Excellent
40	119 2nd Street	1920's bungalow	Early residence, architecture	Fair
41	127 2nd Street	1920's bungalow with water tower	Early residence, architecture	Poor
42	131 2nd Street [Demolished in 2003]	Vacant frame Victorian cottage	Early residence, architecture	Removed
43	205 B Street	Residence	McAllister Property	Poor
44	205 2nd Street	1920's bungalow with water tower	Early residence, architecture, water tower	
45	NE corner 2nd & C	Victorian cottage	Early residence, architecture	
47	218 2nd Street	Residence	Granny McKinstry's home	Poor
48	244 2nd Street	Victorian cottage	Early residence, architecture	Fair
49	326 2nd Street	Residence	Dr. Obed Harvey's Office	Removed
50	204 Oak Avenue	Victorian residence	State Point of Historical Interest Rae Residence	Excellent
51	508 5th Street	Dutch Colonial with gambrel roof	State Historic Landmark, Leland	Good

Number	Street Address	Description	Importance	Condition
			Stanford / Charles Crocker owned, architectural style	

Source: Historic Element, City of Galt General Plan, 1990. OHP, Historic Properties Data File for List Sacramento County, 2007. Galt Historical Society 2007.

In addition to those listed in Table 9.1, Galt has two structures that are listed on the National Register of Historic Places. These include the Brewster Building on 4th Street and the Brewster House on 5th Street (Table 9.2). The California Office of Historic Preservation also lists the Rae House at 204 Oak Avenue and 113 4th Street as Points of Historical Interest.

TABLE 9.2
Sites Listed on the National Register of Historic Places

Resource Name	Address	Date Listed
Brewster Building	201 4th Street	08/16/2000
Brewster House	206 5th Street	06/23/1978

Source: National Park Service, 2007.

9.5 PRESERVATION

HISTORIC GALT DOWNTOWN DISTRICT STUDY (1999)

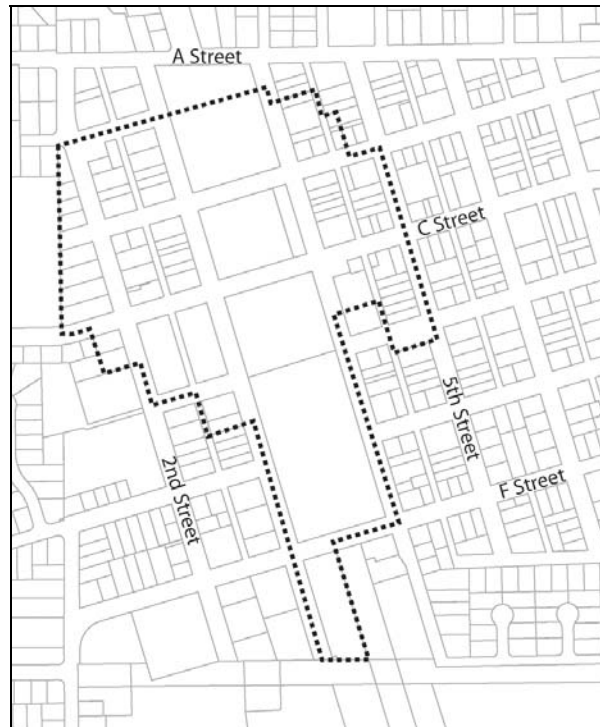
The City of Galt initiated a study in 1999 that looked at the possibility of the creation of a historic district within the downtown. In order for the district to be considered a significant resource, it would have to meet certain criteria set forth by local government and/or the National Register of Historic Places. The study focused primarily on structures that were within the boundary of the Historic Preservation District’s Downtown Revitalization Historic Plan (see Figure 9.6). The study was never completed, but does provide a background on potential preservation techniques that could be used in the future.

The study determined that there are a significant number of structures within the Historic Preservation Specific Plan that would not contribute to a historic district. Non-contributing properties are those that do not have any significant historic or cultural value. In fact, this study concluded that non-contributing properties within the Specific Plan outnumber those that would actually contribute. This is significant since the requirements of a recognized Historic District, as outlined by the National Parks Department, states that over half of historic district properties must contribute.

The report suggested instead that the City could pursue the establishment of a California Register of Historic Resources District. The State has less restrictive requirements that could include a number of properties within the original “town square.” The California Register of Historical Resources is an authoritative guide to the State’s significant historical and archeological resources. The Register defines a historical resource as “any object, building, structure, site, area or place which is historically or archeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or

cultural annals of California.” This option can aid the City in the preservation of many of these resources within the downtown core area.

FIGURE 9.6
Boundaries of the Historic Business District



Source: City of Galt, 1995; and Mintier & Associates, 2005.

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9.7 GLOSSARY

Archaeology

The study of historic or prehistoric peoples and their cultures through the analysis of their artifacts and monuments.

Bedrock Milling Station (Mortar)

An outcrop of bedrock containing one or more mortar cups, milling slicks or other features related to food grinding or crushing.

California Register of Historical Resources

The California Register of Historical Resources is an authoritative guide to California’s significant historical and archeological resources to be used by State and

local agencies, private groups, and citizens in identifying the existing historical resources of the State, and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change. (See *California Public Resources Code* §5024.1)

The California Register Program encourages public recognition and protection of resources of architectural, historical, archeological and cultural significance, identifies historical resources for State and local planning purposes, and defines threshold eligibility for State historic preservation grant funding. The State Historical Resources Commission (SHRC) oversees the California Register program, which the State Office of Historic Preservation (OHP) administers.

Complex

A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

Ethnography

The study of contemporary human cultures.

Historic Site

A property, site, neighborhood or area having historic, cultural or geographic significance; structures on historic sites do not necessarily relate to the site's significance.

Landmark

Any structure or natural feature designated as a Cultural or Historic Monument as listed in *California Historical Landmarks*.

Midden

A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

National Register of Historic Places

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

State Historical Landmark

A historic structure or site of local or state-wide interest.

State Point of Historical Interest

A historic structure or site of local or county-wide interest.

“Victorian” Architectural Style

An architectural style that originated in England during the reign of Queen Victoria (1837-1901). The style was characterized by massive construction and elaborates ornamentation.



10 | PUBLIC HEALTH AND SAFETY

10.1 INTRODUCTION

The protection of public safety and property from natural and human-made hazards is a concern that will be addressed in the General Plan Update. To assist in the development of General Plan goals and policies related to the protection and enhancement of public safety, this chapter identifies the hazards that the City of Galt could reasonably expect to face in the future. This chapter is divided into the following sections: noise, geologic and seismic hazards, flooding, wildland fires, human-made hazards, air quality, and global warming.

10.2 NOISE

Defining noise from a technical perspective, sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. More simply stated, sound is what we hear. As sounds reach unwanted levels, this is referred to as noise.

To develop goals and policies related to noise abatement in the updated General Plan, it is important to understand how sound and noise, are measured and compared. It is also important to understand what sound levels occur today and how they vary throughout the study area. This section provides an overview of how noise is characterized (measured), describes existing regulations that affect noise issues, and discusses current noise conditions found in the study area.

METHODS AND DATA SOURCES

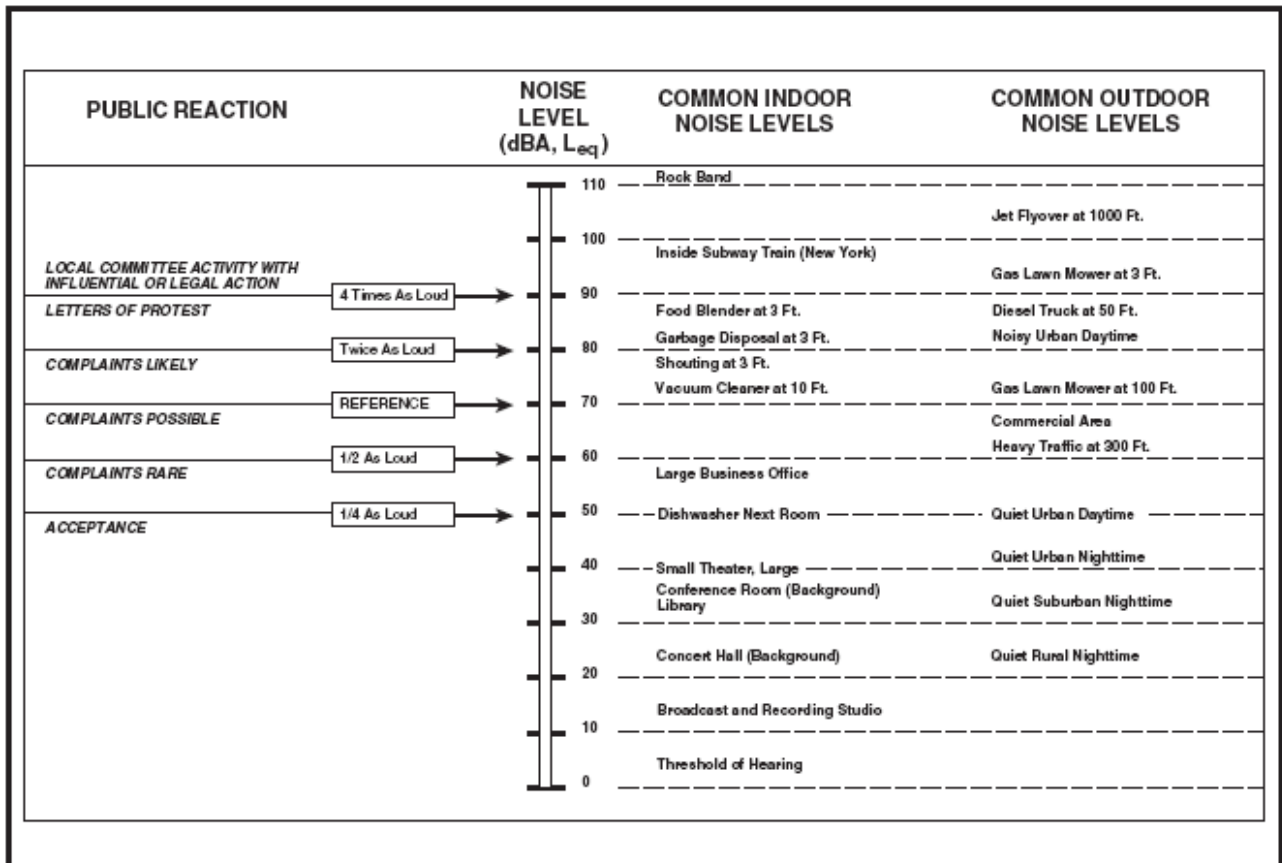
The methods used to assess noise are described throughout this section. Additionally, a community noise survey was conducted at several locations to characterize typical noise levels found throughout the study area. Instrumentation used for obtaining the measurements was a Metrosonics Model db-308 precision integrating sound level meter, which was calibrated in the field before use with a Metrosonics CL-304 acoustical calibrator.

Characteristics of Sound

Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale (i.e., dB scale) is used to keep sound intensity numbers at a convenient and manageable level.

Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called “A-weighting” written as dBA. The human ear can detect changes in sound levels of approximately 3 dBA under normal conditions. Changes of 1 to 3 dBA are typically noticeable under controlled conditions, while changes of less than 1 dBA are only discernable under controlled, extremely quiet conditions. A change of 5 dBA is typically noticeable to the general public in an outdoor environment. Figure 10.1 summarizes typical A-weighted sound levels for both indoor and outdoor activities.

FIGURE 10.1
Typical A-Weighted Sound



Source: Environmental Science Associates, 2004

Environmental noise fluctuates over time. While some noise fluctuations are minor, others can be substantial. Some noise levels occur in regular patterns, others are random. Some noise levels fluctuate rapidly, others slowly. Some noise levels vary widely, others are relatively constant. Various noise descriptors (i.e., Leq, Lmax, Lmin, etc.) have been developed to describe time-varying noise levels, and are listed in the glossary.

Calculating Attenuation

Noise may be generated from a point source, such as a piece of construction equipment, or from a line source, such as a road containing moving vehicles. Because of spreading losses, noise attenuates (decreases) with distance. The typical atmospheric attenuation rate for point source noise is 6 dBA per doubling of the distance as predicted by the following equation:

$$\text{dBA reduction} = 20 \text{ Log } \frac{[\text{measured distance}]}{\text{reference distance}}$$

(Lower bracket to include both
reference distance quantities)

Noise from a line source will also attenuate with distance, but the rate of attenuation is a function of both distance and the type of terrain over which the noise passes. Hard sites, such as developed areas with paving, attenuate noise at a rate of 3 dBA per doubling of the distance as predicted by the following equation:

$$\text{dBA reduction} = 10 \text{ Log } \frac{[\text{measured distance}]}{\text{reference distance}}$$

Soft sites, such as undeveloped areas (e.g., open space, and vegetated areas, etc.) attenuate line-source noise at a rate of 4.5 dBA per doubling of the distance, as predicted by the following equation:

$$\text{Attenuated dBA} = 15 \text{ Log } \frac{[\text{measured distance}]}{\text{reference distance}}$$

True hard sites are fairly rare, particularly in rural areas. Accordingly, soft site attenuation is typically assumed for planning level analyses in rural areas. Objects such as walls, topography, and buildings which block the line-of-sight between a source and a receptor will attenuate the noise source. If a receptor is located behind the object, but has a view of the source, the wall will do little to attenuate the noise. Additionally, a receptor located on the same side of the object as the noise source may experience an increase in the perceived noise level as the object may reflect noise back to the receptor, possibly increasing the noise.

Noise Contours

The interpretation of noise contours is a generalization, not an exact science. The measurements by sophisticated instruments are affected by many variables in a particular area. However, these individual effects are generalized so that noise contours describes the impact that can generally be expected. Noise contour lines themselves are not specific boundaries of noise tolerance. A contour line denoting a 65 dBA limit, for example, does not imply that residents on one side of the line are seriously affected, while on the other side of the line tolerable conditions exist. Rather, the area between 75 dBA and 65 dBA indicates that residents within this vicinity may experience a high level of noise and potential interference with daily functions.

Effects of Noise on Public Health

High noise levels can interfere with a broad range of human activities in a way which degrades public health and welfare. Such activities may include:

- Speech communication in conversation and teaching;
- Telephone communication;
- Listening to television and radio;
- Listening to music;
- Concentration during mental and physical activities;
- Relaxation; and
- Sleep.

Interference with listening situations can be determined in terms of the level of the environmental noise and its characteristics. The amount of interference in non-listening situations is often dependent upon factors other than the physical characteristics of the noise. These may include attitude toward the source of an identifiable noise, familiarity with the noise, characteristics of the exposed individual, and the intrusiveness of the noise.

Hearing loss, either total or partial, and either permanent or temporary, is a well established effect of noise on human health. The primary measure of hearing loss is the hearing threshold level - the level of a tone that can just be detected by an individual. As a person is exposed to increased noise levels, that person may experience a shift in the threshold at which sound can be detected. Exposure to very high noise levels for lengthy periods of time can generate threshold shifts, which can be temporary or permanent. In general, A-weighted sound levels must exceed 60-80 decibels before a person will experience temporary threshold shifts. The greater the intensity level above 60-80 decibels and the longer the exposure, the greater length of the temporary threshold shift.

REGULATIONS THAT ADDRESS NOISE

This section focuses on the federal, state, and local regulations that address noise conditions within the study area.

Federal Regulations

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the federal code of regulations (23CFR772). These noise criteria are based on Leq (h) and are summarized in Table 10.1.

**TABLE 10.1
FHWA Noise Abatement Criteria**

Activity Category	Design Noise Levels	Description of Activity Category
A	Leq (h) (dBA) 57 (exterior)	Lands on which serenity and quiet are of extraordinary significance.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas.
C	72 (exterior)	Developed lands.
D	---	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Federal Highway Administration, 1982.

Environmental Protection Agency

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior sound levels are maintained at an Leq of 55 dBA and interior sound levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA Ldn as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as the difficulty of actually achieving a goal of 55 dBA Ldn, have generally agreed on the 65 dBA Ldn level as being appropriate for residential uses. At 65 dBA Ldn activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the USEPA. Noise exposure of this type is dependant on work conditions and is addressed through a facility’s or construction contractor’s health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

Department of Housing and Urban Development (HUD)

HUD was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA Ldn or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area.
- Exceeding 75 dBA Ldn - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA Ldn is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction, any building will provide sufficient attenuation so that if the exterior level is 65 dBA Ldn or less, the interior level will be 45 dBA Ldn or less. Thus, structural attenuation is assumed at 20 dBA. Note that HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

State Regulations

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of General Plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

Local Regulations

Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances often set forth the specific standards and procedures for addressing particular noise sources and activities. As part of the general plan, specific policies can be developed to help provide guidance so that future projects are evaluated by comparison to a set of standards such as those provided in Figure 10.2.

General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are considered to be the most sensitive type of land use to noise and industrial/commercial areas are considered to be the least sensitive. Local noise ordinances typically set forth standards related to construction activities, and industrial property-line noise levels.

Sacramento County Noise Element

A community noise survey was conducted during preparation of the recent update (1993) to Sacramento County’s General Plan. The survey results indicate that typical noise levels in noise sensitive areas (e.g., residential) of the County are in the range of 50-60 dBA Ldn. Overall, the areas of Sacramento County that contain noise-sensitive land uses are relatively quiet except near roadways, airports, railroad tracks, and industrial areas.

The Sacramento County General Plan Noise Element states that noise created by new non-transportation noise sources may not exceed the noise level standards identified below in Table 10.2, as measured immediately within the property line of any affected property designated for residential land uses.

TABLE 10.2
Noise Level Performance Standards¹ for Residential Areas Affected by Non-Transportation Noise²

Noise Level Descriptor	Exterior Noise Level Standards (dBA)	
	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
L50	50	45
Lmax	70	65

Notes:

¹ These standards are for planning purposes and may vary from standards of the County Noise Ordinance (see below) which are for enforcement purposes.

² These standards apply to new or existing residential areas affected by new or existing non-transportation sources.

Sources: Sacramento County, 1998.

Sacramento County Noise Ordinance

Noise standards (see Table 10.2) for Sacramento County indicate that a noise source which generates a constant noise level for more than 30 minutes in an hour (L50) would be allowed to produce 50 dBA at a residential property line during daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.). Additionally, a noise source is allowed to produce a sound of no more than 70 dBA at a residential property line during daytime hours, and 65 dBA during nighttime hours. Construction activities between 7:00 a.m. and 8:00 p.m. on Monday through Friday and between 7:00 a.m. and 8:00 p.m. on weekends are exempt from this ordinance. The ordinance further states that internal combustion engines in use on construction sites must be equipped with “suitable exhaust and intake silencers which are in good working order”.

City of Galt Noise Level Performance Standards

The City of Galt has developed noise standards for proposed industrial and commercial land uses and other land uses involving new locally-regulated noise sources which have the potential to affect noise sensitive land uses (e.g., residential, etc.). As defined in the City’s existing General Plan, “locally regulated noise sources” are typically non-transportation related noise sources and include noise generated by manufacturing plants, mechanical equipment, and sirens. The noise standards are identified in Table 10.3.

TABLE 10.3
City of Galt Noise Level Performance Standards

Cumulative Number of Minutes in Any One-Hour Time Period	Exterior Noise Level Standards (dBA)	
	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
30 minutes	50 dBA	45 dBA
15 minutes	55 dBA	50 dBA
5 minutes	60 dBA	55 dBA
1 minutes	65 dBA	60 dBA
0	70 dBA	65 dBA

Source: City of Galt, 1990.

ENVIRONMENTAL SETTING

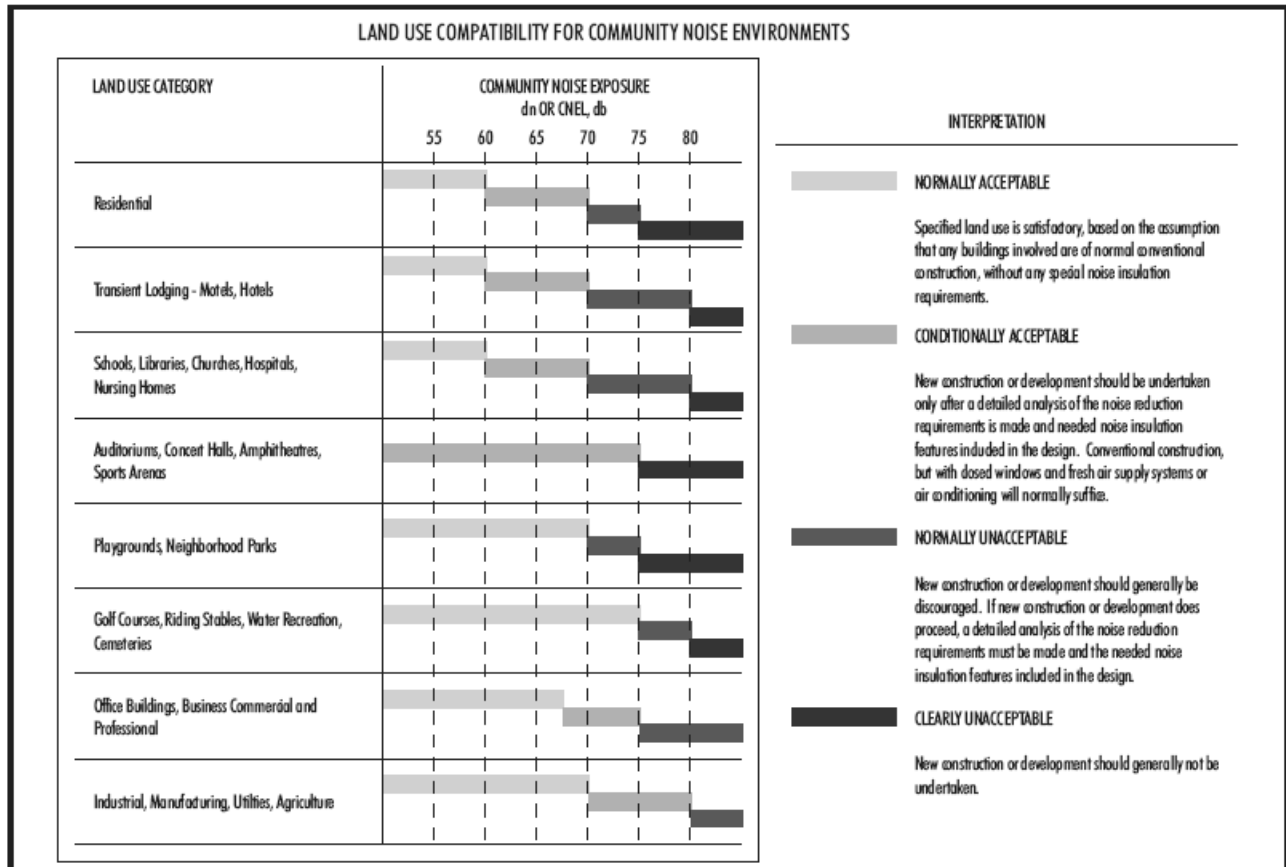
This section describes the primary noise sources within the City’s study area.

Traffic Noise

Roadways and traffic noise are the dominant source of ambient noise in the study area. The major sources of vehicular traffic noise within the City include State Route 99 (SR 99), SR 104 (Twin Cities Road), Lincoln Way, Simmerhorn Road, and a number of other local roadways (e.g., A Street, Harvey Road, etc.).

Noise level projections were made using the Federal Highway Administration’s (FHWA) Noise Prediction Model and traffic information provided in Chapter 5 “Transportation and Circulation”. Table 10.4 identifies existing (2003) noise levels and contour data for state and local roadways in the City’s study area. Table 10.4 also identifies the average daily traffic volumes for modeled roadway segments, and the corresponding noise levels (in Ldn) at a distance of 100 feet from the centerline of the applicable roadway segment. The table also shows the distances from the roadway centerline in feet to the 60, 65 and 70 Ldn contours for all modeled highways and arterials in the City of Galt. The FHWA Model is generally considered to be accurate within 1 to 2 dBA for free-flowing traffic conditions. Because these contours do not take into account shielding caused by local buildings, walls, or topographical features, the distances should be considered to be worst case estimates of noise exposure along roadways in the study area.

FIGURE 10.2
Land Use Compatibility for Community Noise Environment



Source: Environmental Science Associates, 2003

TABLE 10.4
Traffic Noise Levels Along Regional and Local Roadways in the Study Area

Roadway/Segment	Daily Traffic Volume	Ldn @ 100 feet from Roadway Centerline	Distance (feet) to 70 Ldn Contour from Roadway Centerline	Distance (feet) to 65 Ldn Contour from Roadway Centerline	Distance (feet) to 60 Ldn Contour from Roadway Centerline
SR 99					
b/w County line and Fairway Drive	58,000	79	375	810	1,750
b/w Fairway Drive and C Street	58,000	79	375	810	1,750
b/w C Street and Elm Ave.	58,000	79	375	810	1,750
b/w Elm Ave and Pringle Ave.	57,000	79	370	800	1,725
b/w Pringle Ave. and Walnut Ave.	58,000	79	375	805	1,725
b/w Walnut Ave. and Twin Cities Road	57,000	79	370	800	1,725
North of Twin Cities Rd.	61,000	79	380	815	1,775
SR 104-Twin Cities Road					
East of East Stockton Blvd	12,700	69	80	172	370
West of West Stockton Blvd	5,700	65	47	100	215
A Street					
East of McFarland Street	7,250	60	23	49	105
East of Lincoln Way	5,820	59	20	42	91
C Street					
East of 3rd Street	5,620	59	19	41	89
East of Civic Drive	12,470	63	33	70	150
F Street					
East of 3rd Street	6,130	60	20	44	94
3rd Street					
South of A Street/Harvey Road	2,110	55	10	22	46
Amador Avenue					
b/w Lincoln Way/Elm Avenue	4,160	58	16	34	73
Carillion Boulevard					
South of Walnut Avenue	3,100	57	13	28	60
Walnut Avenue/SR 104	3,060	57	13	28	59
Elm Avenue					
East of McFarland Street	6,720	60	22	47	100
West of Lincoln Way	4,480	58	17	36	76
Harvey Road					
b/w Western City Limit/MacFarland St.	2,830	56	12	26	56
Industrial Drive					
North of Elm Avenue	2,720	56	12	26	55
Kost Road					
West of Western City Limits	1,360	53	7	16	35
Lincoln Way					
b/w F Street and Southern City Limits	7,580	61	24	50	108
South of A Street	10,070	62	28	61	130
b/w A Street/Elm Avenue	10,100	62	28	61	132

Marengo Road	1,350	53	7	16	35
South of Walnut Avenue					
New Hope Road					
West of Western City Limits	2,100	55	10	22	46
Pringle Avenue					
b/w Industrial Drive/SR 99 SB Ramp	2,630	56	12	25	54
Simmerhorn Road					
East of SR 99 NB Ramps	3,000	57	13	27	58
Stockton Blvd (East)					
b/w Walnut Avenue/Carol Drive	2,600	56	12	25	53
Stockton Blvd (West)					
b/w Walnut Avenue/Pringle Avenue	1,950	55	10	20	44
Walnut Avenue					
West of West Stockton Blvd.	350	47	3	7	14
East of East Stockton Blvd.	4,220	58	16	34	73

Notes: b/w = between

Sources: Omni-Means, 2003; Environmental Science Associates, 2004

Railroad Operations Noise

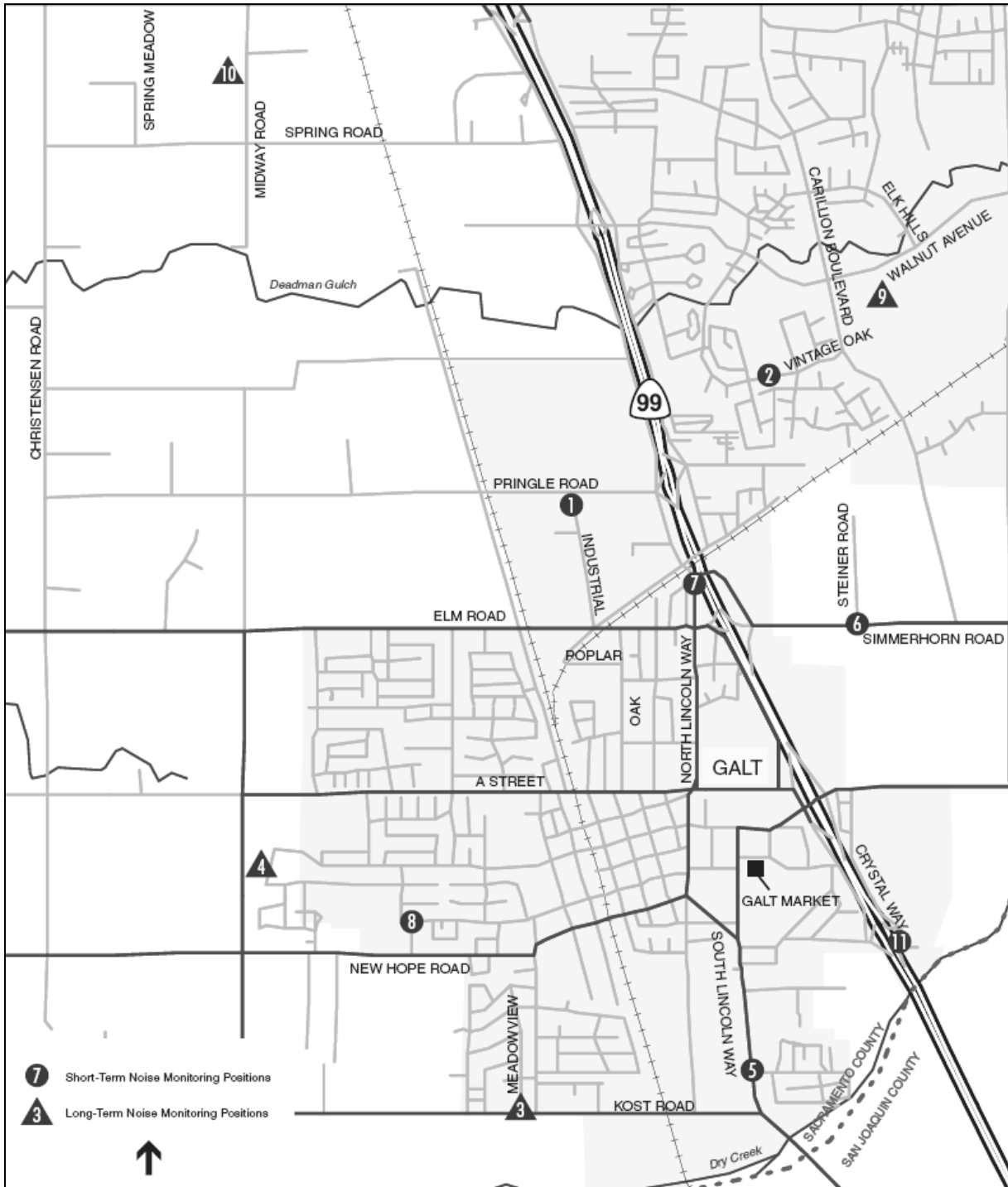
Railroad noise within the study area primarily occurs from existing operations along the Union Pacific Railroad line, which runs north to south within the study area. Several factors combine to produce railroad noises including length of train, speed, grade, type of track, number of engines, and number of trips. Currently railroad operations through the study area average 27 trains per day on an unscheduled basis (Bromley, personal communication). Train speeds in the study area are maximum 70 mph for freight trains, which average 6,000 feet in length, and 79 mph for passenger trains. Measurements of individual train passages in the study area indicated that maximum noise levels ranged from 83 dBA without use of the horn to 92 dBA with the horn at a distance of 100 feet (City of Galt, 1990).

Existing Noise Levels within the Study Area

A community noise survey was conducted at 11 locations throughout the study area to characterize typical noise levels at noise-sensitive receptor locations (residences, schools, and parks). Instrumentation used for obtaining the measurements was a Metrosonics Model db-308 precision integrating sound level meter, which was calibrated in the field before and after use with a Metrosonics CL-304 acoustical calibrator.

The results of the survey are shown in Table 10.5. The corresponding noise measurement positions are shown in Figure 10.3. As shown in the table, short-term (approximately 10 minute) measurements were conducted at nine of the 11 monitoring positions and long-term monitoring (24-hour measurements) was conducted at four of the locations. In areas where the noise environment is dominated by traffic, as is the case at most of the measurement locations, the Leq during the peak traffic hour is roughly equivalent (within about 2 dBA) to the Ldn at that location.

FIGURE 10.3
Noise Monitoring Positions within the Study Area



Source: DeLorme Street Atlas USA, 2000; and Environmental Science Associates, 2004

As such, using noise measurements collected during the p.m. peak hour (4:00 to 6:00 p.m.), an approximate Ldn measurement was calculated for all positions identified in Table 10.5. The results of the noise survey indicate that typical noise levels in the areas measured range from about 54 to 70 dBA, Ldn.

TABLE 10.5
Summary of Measured Noise Levels for Selected Noise Sensitive Land Use Areas within the City of Galt Study Area

Location	Date Measured	Length of Measurement	P.M. Peak-Hour Leq	Lmax	L(10)	L(90)	Ldn
Position (1) – Pringle Ave and Industrial Dr	May 5, 2004	10 minutes	62	70	64	55	62
Position (2) – 905 Vintage Oak Ave	May 5, 2004	10 minutes	54	65	57	51	54
Position (3) – Meadowview Park	May 12, 2004	10 minutes	44	57	46	40	NA
Position (3) – same as above.	May 12, 2004	24 hours	60	86	56	45	56
Position (4) - West C St	May 12, 2004	24 hours	54	82	52	44	56
Position (5) – S. Lincoln Wy and Ranch Rd	May 12, 2004	10 minutes	58	68	61	50	58
Position (6) – Steiner Rd and Simmerhorn Rd	May 5, 2004	10 minutes	58	71	61	53	58
Position (7) – N. Lincoln Wy at Trail Ridge Apts.	May 5, 2004	11 minutes	65	74	67	62	65
Position (8) – West E St and Village Run Dr	May 5, 2004	11 minutes	55	70	59	46	55
Position (9) – Galt Community Park (Walnut Ave and Carillion Blvd)	May 12, 2004	11 minutes	51	66	53	47	NA
Position (9) – same as above.	May 12, 2004	24 hours	55	81	55	49	60
Position (10) – Midway Rd	May 12, 2004	24 hours	52	76	50	43	55
Position (11) – 421 Crystal Wy	May 12, 2004	10 minutes	70	76	72	65	70

Notes:

All short-term measurements were collected on a Wednesday during the p.m. peak-hour. Long-term measurements were initiated on a Wednesday and concluded on a Thursday.

- Leq = equivalent continuous sound pressure level
- LMax = maximum noise level recorded during a noise event
- L(10) = sound pressure level exceeded for 10% of the time
- L(90) = sound pressure level exceeded for 90% of the time
- Ldn = calculated noise level

NA = Not applicable.

10.3 GEOLOGY AND SEISMIC HAZARDS

This section provides an overview of the general topographical, geologic, and seismic conditions that characterize the City’s study area. Specific topics addressed under this section include a description of the regulations that affect geology and seismicity;

the locations of active and potentially active faults and associated seismic hazards, and a listing of any other geologic hazards unique to the study area. Additional information related to the study area's soil conditions (e.g., erosion, expansive soils) are more fully described in Chapter 8 "Conservation and Open Space".

METHODS AND DATA SOURCES

Information for this section was collected from the United States Geological Survey, California Department of Conservation - Division of Mines and Geology, and the City of Galt General Plan (1990).

REGULATION THAT ADDRESS GEOLOGIC AND SEISMIC CONDITIONS

This section focuses on state regulations that address geologic and seismic conditions of the study area.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure/hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

California Building Code

The California Building Code is another name for the body of regulations known as the California Code of Regulations (C.C.R.), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988).

Published by the International Conference of Building Officials, the Uniform Building Code is a widely adopted model building code in the United States. The California Building Code incorporates by reference the Uniform Building Code with necessary

California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions.

California Department of Transportation

Caltrans has developed roadway design standards including those for seismic safety. Consideration of earthquake hazards in roadway design is detailed in the Highway Design Manual published by Caltrans. Modifications to local highways and roads would be required to adhere to Caltrans engineering standards to minimize settlement.

ENVIRONMENTAL SETTING

The study area is located in the southern center portion of the Sacramento Valley, a large northwest trending structural trough filled with sediment and sedimentary rocks that extend to depths of more than 50,000 feet. The sediment and sedimentary rocks that fill the valley are derived largely from the Sierra Nevada and Klamath Mountain Ranges, and are from Jurassic (150 – 200 million years old) to Holocene (fewer than 10,000 years old) in age.

A “geomorphic province” is an area comprised of similar geologic origin and erosional history. The study area is located in the Great Valley province, one of two geomorphic provinces in Sacramento County. The Great Valley province can be further subdivided into other geomorphic subunits. The study area is situated within an area where the River Floodplain (Cosumnes River) and the Alluvial Plain subunits come together. The study area is located on a nearly level surface with elevations ranging from at sea level to 30 feet above mean sea level. This area is currently protected from flooding through a series of levees, which provide flood protection to the urban areas of the study area.

Seismicity

The study area is located 70 miles east of the Bay Area and lies within Seismic Risk Zone 3. Earthquakes in Seismic Risk Zone 3 pose a lesser risk than those experienced in Zone 4 (such as the San Francisco Bay Area). The estimated maximum (moment) magnitudes (M_w) (Table 10.6) represent characteristic earthquakes on particular faults. The study area may be affected by regionally occurring earthquakes. However, impacts resulting from these regional events would be less destructive in nature than those experienced closer to the earthquakes point of origin.

TABLE 10.6
Modified MERCALLI Intensity Scale

Intensity Value	Intensity Description	Average Peak Acceleration
I.	Not felt except by a very few persons under especially favorable circumstances.	< 0.0015 g
II.	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.0015 g
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to a passing of a truck. Duration estimated.	< 0.0015 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.015 g-0.02 g ¹
V.	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03 g-0.04 g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.06 g-0.07 g
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.10 g-0.15 g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.25 g-0.30 g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50 g-0.55 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 0.60 g

XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 0.60 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 0.60 g

Note: g is gravity = 980 centimeters per second squared.

Source: Bolt, Bruce A., Earthquakes, W. H. Freeman and Company, New York, 1988.

Shaking Intensity

Earthquakes on various active and potentially active San Francisco Bay Area fault systems could produce a wide range of ground shaking intensities within the study area. Shaking intensity can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. While the magnitude is a measure of the energy released during an earthquake event, intensity is a measure of the ground shaking effects at a particular location.

The Modified Mercalli (MM) intensity scale (Table 10.6) is commonly used to measure earthquake effects due to ground shaking. As shown in the table, the MM values for intensity range from I (earthquake not felt) to XII (damage nearly total). MM intensities ranging from IV to X could cause moderate to significant structural damage.

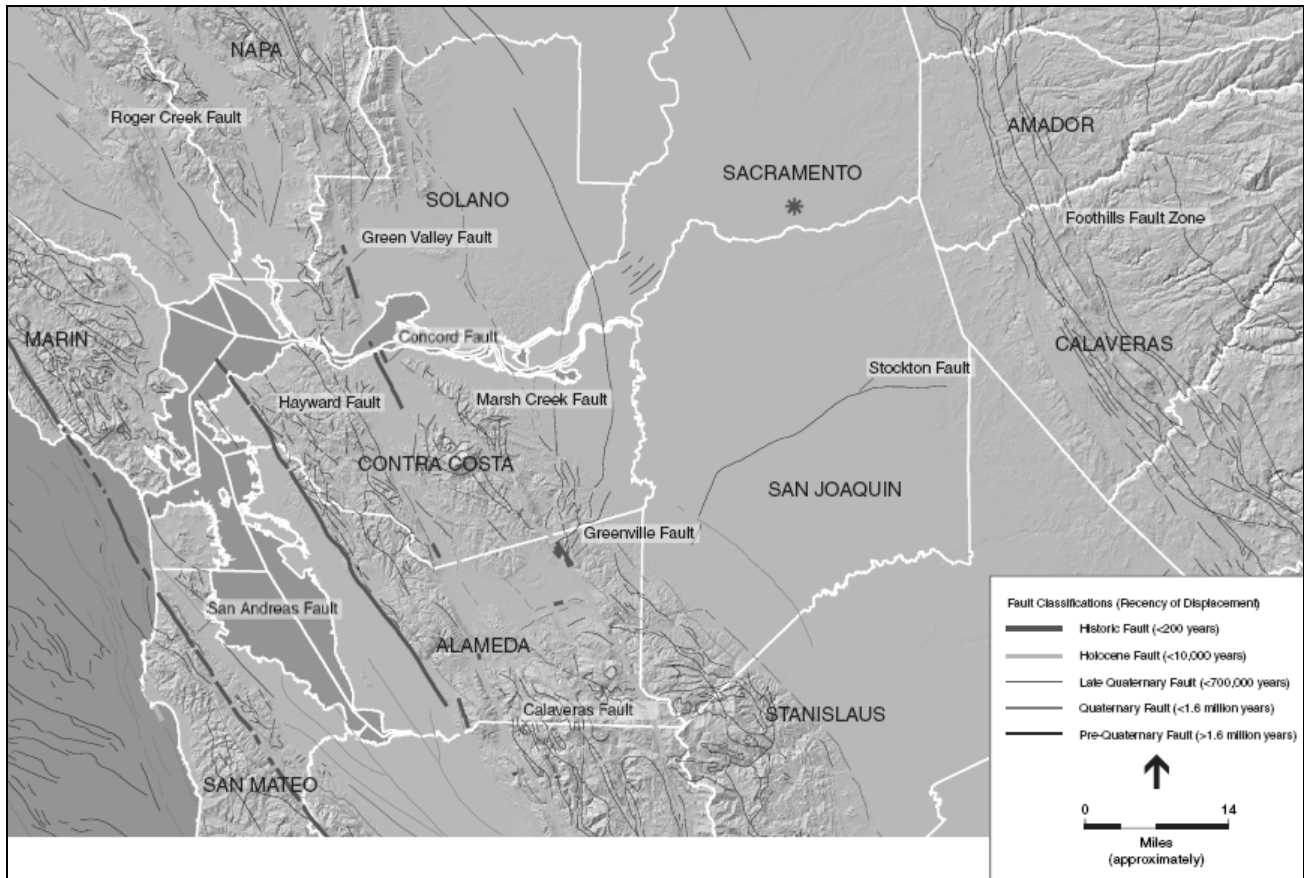
The composition of the underlying soils in a particular area can have a dramatic affect on the intensity of a ground shaking event. In some instances, areas that experience the worst structural damage are not those closest to the fault, but rather those with soils that magnified the effects of ground shaking. Peak acceleration, peak velocity, and peak displacement values for a given earthquake are typically measured with the use of strong-motion detectors.

Regional Faults

According to the Fault Activity Map of California (Jennings, 1994), the nearest active fault is the Greenville Fault, located approximately 42 miles southwest of the study area, which has been considered part of the San Andreas Fault system. The Maximum Moment magnitude of the maximum probable earthquake on the Greenville Fault is estimated to be 6.0 (Carey, 1992); however, the largest historic earthquake on the Greenville Fault was a Richter magnitude 5.8 (comparable to a 6 MM) earthquake that occurred in 1980. That earthquake produced a peak ground acceleration of 0.15g in Brentwood, approximately 50 miles west of the study area. Other faults in the region exhibiting historic displacement (activity within the last 200 years) are the Concord-Green Valley and Hayward faults located approximately 45 miles west-southwest and 60 miles southwest of the study area, respectively. Portions of the Calaveras fault zone have also been rated as active within the last 200 years and those portions are located approximately 56 miles southwest of the study area. Figure 10.4 illustrates the locations of the Quaternary or younger faults in the region.

A seismically-active, concealed (blind) fold and thrust belt, referred to as the Coast Range-Central Valley (CRCV) Geomorphic Boundary, lies approximately 30 miles southwest of the study area. Earthquakes associated with this fault system include the 6.1 (Mw) Kettleman Hills and 6.5 (Mw) Coalinga events (Wakabayashi and Smith, 1994). Published estimates of the CRCV slip rate derived from previous studies range from 1 to 10 mm/year, and estimated reoccurrence intervals of the Coalinga-type events range from 200 to 2000 years. The concealed CRCV thrust is speculated to have produced the Vacaville-Winters earthquake (estimated 6.75 MM intensity) (Wakabayashi and Smith, 1994). Table 10.7 illustrates the active 7 and potentially active faults in the vicinity of the study area.

FIGURE 10.4
Locations of Quaternary or Younger Faults



Sources: California Geological Survey, 2003; and Environmental Science Associates, 2003.

TABLE 10.7
Active and Potentially Active Faults in the Vicinity of the Study Area

Fault Zone	Location Relative to Galt	Recency of Faulting^a	Historical Seismicity^b	Slip Rate^c (mm/year)	Maximum Moment Magnitude^d
San Andreas (Peninsula and Golden Gate segments)	80 miles west	Historic	M 7.1: 1989 M 8.25: 1906 M 7.0: 1838 Many <M 6	17.0	7.3
Hayward	60 miles west	Historic	M 6.8: 1868 M 7.0: 1838 Many <M 4.5	9.0	6.9
Calaveras	56 miles west	Historic	M 6.1: 1984 M 5.9: 1979 Many <M 6.5	15.0 (Maximum)	6.8
Concord–Green Valley	45 miles northwest	Historic	Active Creep ^e	6.0	6.9
Dunnigan Hills	45 miles west	Holocene	N/A	N/A	N/A
Healdsburg–Rodgers Creek	70 miles west	Holocene	NA	9.0	7.0
Marsh–Greenville	42 miles southwest	Historic	5.8	2.0	6.9
Ortivalita	60 miles southwest	Holocene	N/A	1.0	6.9
CRCV (segments 8-9)	30 miles west	Holocene	Coalinga: 6.5 Kettleman Hills: 6.1	3-8	6.0
West Napa	34 miles west	Holocene	N/A	1.0	6.5

Notes:

^aRecency of faulting from Jennings, 1994. Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).

^bRichter magnitude (M) and year for recent and/or large events.

^cSlip Rate = Long-term average total of fault movement including earthquake movement, slip, expressed in millimeters.

^dThe Maximum Moment Magnitude is an estimate of the size of a characteristic earthquake capable of occurring on a particular fault. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CDMG, 1997). Richter magnitude estimations can be generally higher than moment magnitude estimations.

^eSlow fault movement that occurs over time without producing an earthquake.

N/A: Not applicable and/or not available.

Sources: Jennings, C. W. 1994, Fault Activity Map of California (with Appendix), California Division of Mines and Geology, Geologic Data Map No. 6; Peterson, M.D., Bryant, W. A., Cramer, C. H., 1996, Probabilistic Seismic Hazard Assessment for the State of California by the California Department of Conservation, Division of Mines and Geology, Open File Report 96-08, USGS Open-File Report 96-706.

Seismic Structural Safety

The CDMG has determined the probability of earthquake occurrences and their associated peak ground accelerations throughout the State of California. According to the CDMG probabilistic seismic hazard map for California, peak ground accelerations in the study area could range from 0.20 g to 0.30 g (Peterson, et. al, 1999).

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions, which affect low-rise buildings more than tall, flexible ones. A deep layer of saturated alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings (ABAG, 1998). Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and, above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Additional Seismic Hazards

Surface Fault Rupture

Surface expression of fault rupture is typically observed and is expected on or within close proximity to a causative fault. The study area is neither located within, nor crosses, a delineated Alquist-Priolo Earthquake Fault Zone and the Greenville fault zone lies over 40 miles southwest of the study area (CDMG, 1997). For this reason, the risk of surface fault rupture within the study area is considered low (CDMG, 1997).

Liquefaction

Liquefaction is a process whereby unconsolidated, granular and saturated soil lose strength and fail when subjected to ground motion. The evaluation of potential for liquefaction considers soil type, soil density, groundwater table, and the duration and intensity of shaking. The areas which are believed to have the greatest potential for liquefaction are those areas in which the water table is less than 20 feet below ground and the soils are predominately clean, relatively uniform low-density sands. Clayey type soils are generally not subject to liquefaction. The probability of soil liquefaction actually taking place in the study area is considered to be a low to moderate hazard, due to the substantial distance from the active Hayward and Calaveras Fault zones, the type of ground shaking expected from those faults, and the soils conditions of the study area.

Subsidence

Subsidence is the gradual settling or sinking of the earth's surface with little or no horizontal motion. Subsidence typically occurs in formations that overlie an aquifer where the groundwater level is gradually and consistently decreasing. Outside of the Delta, subsidence is generally attributed to consistent and long-term overdraft of the groundwater basin. Within the Delta, subsidence can be caused by oxidation, anaerobic decomposition, shrinkage, and wind erosion. The study area is considered a potential subsidence area due to the underlying groundwater basin and the rates of groundwater withdraw that have occurred over the past several years.

Landslides (Slope Failure)

Landslide is a general term used for a falling mass of soil and rock. The study area is relatively level and therefore, landslide events within the immediate area would consist primarily of minor slumping along riverbanks drainages, and levees.

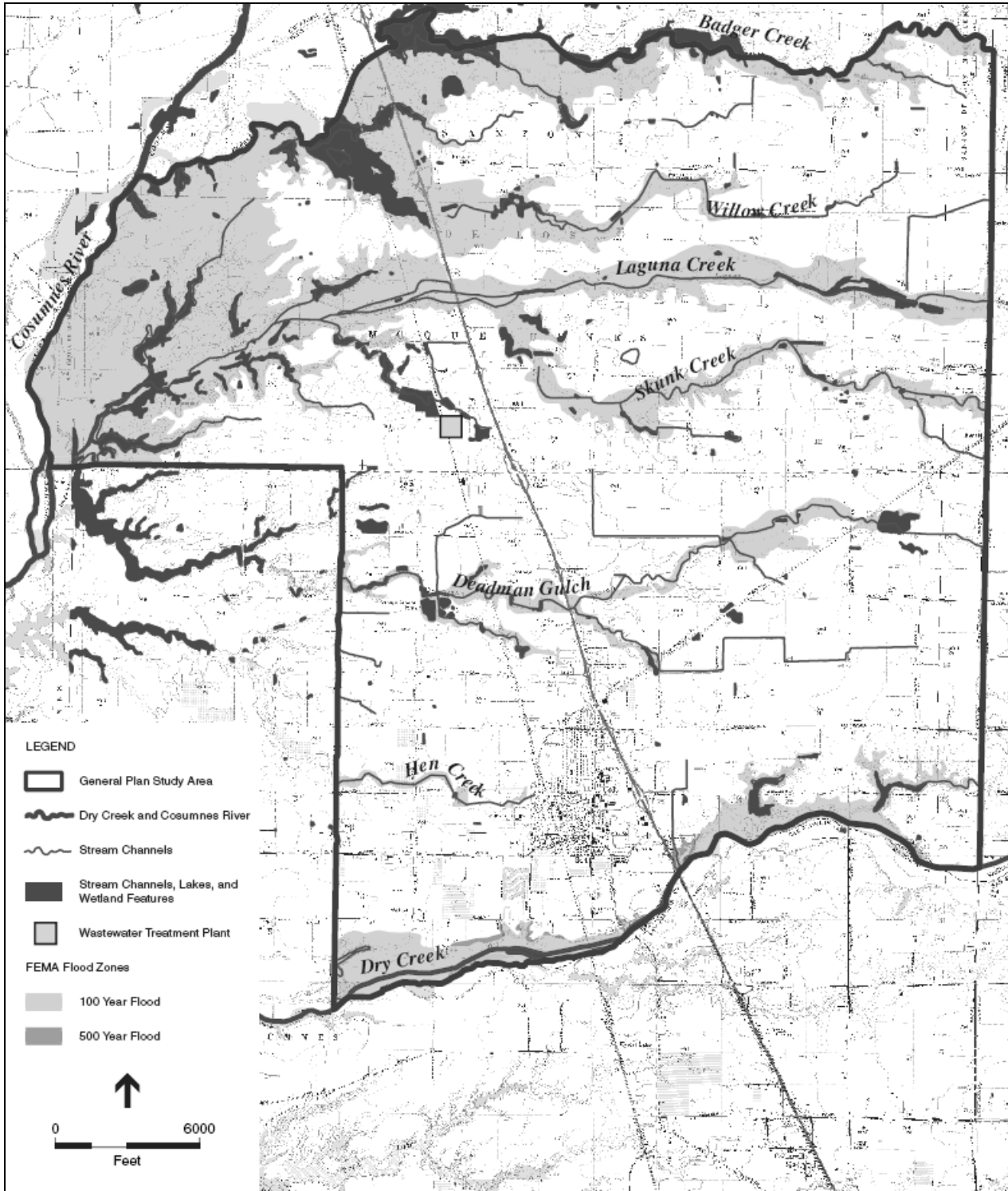
Earthquake-Induced Inundation

Earthquakes can cause tsunami ("tidal waves"), seiches (oscillating waves in enclosed water bodies), and landslide splash waves in enclosed water bodies such as lakes, reservoirs, and large channels. Earthquakes can also result in dam failures at reservoirs. Tsunami and seiches are not considered to be a significant threat to the study area.

10.4 FLOODING

As more fully described in Section 8.2 "Hydrology", runoff from the City's study area is drained by a variety of local streams and creeks including Badger Creek, Willow Creek, Laguna Creek, Skunk Creek, Deadman Gulch, and Dry Creek, which drain to the Cosumnes River. The areas near the confluence of these smaller water courses with the Cosumnes River includes large areas of flood plain, which absorb excess flows from local watersheds during heavy rains and spring floods (see Figure 10.5). Much of the storm water of this flood plain is maintained through a complex system of levees and dikes.

FIGURE 10.5
Hydrological Features and Flood Plains



Source: USFWS NWI Date, 1994; FEMA Floodplain Data, 1993; USGS 7.5' Quads, Teale Hydro Data; and Environmental Science Associates, 2003

Although the City is located outside of the major flood plain area, the City experiences two types of flooding. The first is associated with local water courses. The second is associated with localized flood events resulting from inadequate surface flow. Heavy rainfall causes these types of flooding events.

Flooding events can occur any time during the rainy season (November to April). These events result from prolonged, heavy rainfall and are characterized by high peak flows of moderate duration and large volumes of runoff. Flooding is more severe when prior rainfall has resulted in saturated ground conditions. Other localized flooding hazards are caused by obstacles to natural drainage flows, such as small creek dams and dikes formed by freeway and railroad fills.

Cloudburst storms, sometimes lasting as long as three hours, can occur any time from the late fall to early spring, and may occur as an extremely severe sequence within a general winter rainstorm. Flooding from cloudburst activity is characterized by high peak flow, short duration of flood flow, and a small volume of runoff.

The Federal Emergency Management Agency (FEMA) has prepared Flood Insurance Rate Maps for the study area. Flood zones identified to occur within the 100 year flood hazard area include areas adjacent to the confluence of smaller water courses with the larger Cosumnes River. Figure 10.5 illustrates the 100 year floodplain areas within the study area. More detailed information can be found by consulting the Flood Insurance Rate Maps, which are available at the City of Galt Public Works Administration.

Potential issues of concern include a general lack of curbs and gutters in portions of the City. The lack of curb and gutters along with inadequate or incomplete storm drains can result in standing water that is both a public health nuisance and a potential hazard. Other sources of flooding concern are the size and capacity of small agricultural drainage structures that do not accommodate large storm flows.

10.5 WILDLAND FIRES

As more fully described in Chapter 6 “Public Facilities and Services”, the Galt Fire District serves the study area. Wildland fires are common in open space areas with vegetation that exhibits low fuel moisture (percentage of water in vegetation). High winds can also contribute to the severity of the fire. Generally, the undeveloped portions of the study area do not pose a high risk due to existing agricultural practices on the land. Most lands are actively cultivated with irrigated crops that have little fire fuel. However, grass fires can occur on uncultivated lands, particularly where there is native vegetation, such as the riparian corridors near local water courses.

Fire hazards can also occur in urbanized areas of the study area. Residential and commercial structure fires can occur particularly in older neighborhoods. Additionally, some industrial processes can include the use or storage of flammable liquids. The storage of propane gas can also create a fire hazard.

To reduce the risk of fire hazard within the study area, the Galt Fire District has implemented a number of programs including public education, fire prevention training, and fire suppression training. Fire prevention also occurs through the control of building construction. The Uniform Building Code specifies permissible building materials and requires the installation of smoke detectors in new developments.

10.6 HUMAN-MADE HAZARDS

The primary human-made hazard concerns for the study area include hazards associated with accidents, fire, crime, and the potential exposure to hazardous materials. This section focuses on those hazards associated with the potential use, exposure, or release of hazardous materials. Additional public safety concerns (e.g., fire, accidents, law enforcement response times, etc.) are discussed in Section 6 “Public Facilities and Services”. This section provides an overview of federal, state, and local hazardous material and hazardous waste regulations and describes existing known hazardous materials in the study area.

METHODS AND DATA SOURCES

The information contained in this section was obtained from various sources, including the City of Galt General Plan. Additional information was obtained from state agencies (e.g., CVRWQCB) that monitor or compile information related to the locations of hazardous waste generators, hazardous materials treatment, storage and disposal facilities, underground storage tank locations, landfills, and contaminated sites.

REGULATIONS THAT ADDRESS HUMAN-MADE HAZARDS

The storage, use, and handling of hazardous materials by industries and businesses are subject to various federal, state, and local regulations. A brief overview of these regulations follows.

Federal Regulations

The principal federal legislation is the Resource Conservation and Recovery Act (RCRA), which is administered by the United States Environmental Protection Agency (EPA). RCRA places reporting, permitting, and operational control requirements on those who generate, treat, store, or dispose of hazardous waste. The federal Hazardous Materials Transport Act, administered by the U.S. Department of Transportation, requires detailed manifesting and reporting of hazardous materials shipped on the U.S. highway system; it also contains packaging requirements for shipped materials. The Clean Water Act, also administered by the EPA, controls the discharge of hazardous materials or hazardous waste to waters of the U.S. or to local wastewater treatment plants.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA, commonly referred to as Superfund, was enacted on December 11, 1980. The purpose of CERCLA was to provide authorities the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. Additionally, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also provides for the National Priorities List, a

list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action.

The Superfund Amendments and Reauthorization Act (SARA)

SARA amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund to \$8.5 billion, expanded EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required EPA to revise the Hazard Ranking System to ensure that the system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the National Priorities List.

Resource Conservation and Recovery Act of 1976 (RCRA)

RCRA is the nation's hazardous waste control law. It defines hazardous waste, provides for a cradle-to-grave tracking system and imposes stringent requirements on treatment, storage and disposal facilities. RCRA requires environmentally sound closure of hazardous waste management units at treatment, storage, and disposal facilities. The EPA is the principal agency responsible for the administration of RCRA, SARA, and CERCLA.

Occupational Safety and Health Administration (OSHA)

Through the enactment of this act, OSHA was obligated to prepare and enforce occupational health and safety regulations with the goal of providing employees a safe working environment. OSHA regulations apply to the work place and cover activities ranging from confined space entry to toxic chemical exposure. OSHA regulates workplace exposure to hazardous chemicals and activities through promulgating regulations specifying work place procedures and equipment.

U.S. Department of Transportation (DOT)

The DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA, discussed previously.

STATE REGULATIONS

At the state level, there is legislation that allows state agencies to accept delegation of federal responsibility for hazardous materials and hazardous waste management. The Porter-Cologne Water Quality Control Act allows the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) to accept responsibility for the implementation of the Clean Water Act. The Hazardous Waste Control Act of 1977, and recent amendments to its implementation regulations, has given the Department of Health Services (DHS) the lead role in administering the RCRA (RCRA) program. The Hazardous Substances Highway Spill Containment Act gives the California Highway Patrol (CHP) the authority to respond to spills of hazardous materials on the state's highway system.

Hazardous Substance Account Act (1984), California Health and Safety Code Section 25300 ET SEQ (HSAA)

This act, known as the California Superfund, has three purposes: 1) to respond to releases of hazardous substances; 2) to compensate for damages caused by such releases; and 3) to pay the state's 10% share in CERCLA cleanups. Contaminated sites that fail to score above a certain threshold level in the EPA's ranking system may be placed on the California Superfund list of hazardous wastes requiring cleanup.

California Environmental Protection Agency (CAL/EPA)

The Cal/EPA was created in 1991 to better coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental/health risks. Cal/EPA unifies the state's environmental authority under a single accountable, Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: Air Resources Board, Integrated Waste Management Board, Department of Pesticide Regulation, State Water Resources Control Board, Department of Toxic Substances Control, and Office of Environmental Health Hazard Assessment.

Department of Toxic Substance Control (DTSC)

Cal/EPA has regulatory responsibility under Title 22 of the California Code of Regulations (CCR) for administration of the state and federal Superfund programs for the management and cleanup of hazardous materials. The DTSC is responsible for regulating hazardous waste facilities and overseeing the cleanup of hazardous waste sites in California. The Hazardous Waste Management Program (HWMP) regulates hazardous waste through its permitting, enforcement and Unified Program activities. HWMP maintains the EPA authorization to implement the RCRA program in California, and develops regulations, policies, guidance and technical assistance/training to assure the safe storage, treatment, transportation and disposal of hazardous wastes. The State Regulatory Programs Division of DTSC oversees the technical implementation of the state's Unified Program, which is a consolidation of six environmental programs at the local level, and conducts triennial reviews of Unified Program agencies to ensure their programs are consistent statewide and conform to standards.

State Water Resources Control Board

Acting through the RWQCB, the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, RWQCB is authorized to supervise the cleanup of hazardous wastes sites referred to it by local agencies in those situations where water quality may be affected.

Depending on the nature of contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, RWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by DTSC or referred for evaluation by the RWQCB. In general, contamination affecting soil and groundwater is handled by RWQCB and contamination of soils is handled by DTSC.

California Occupational Safety and Health Administration (Cal/OSHA)

Cal/OSHA and the Federal OSHA are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. Pursuant to the Occupational Safety and Health Act of 1970, Federal OSHA has adopted numerous regulations pertaining to worker safety, contained in the Code of Federal Regulations Title 29 (29 CFR). These regulations set standards for safe workplaces and work practices, including standards relating to hazardous material handling. Cal/OSHA assumes primary responsibility for developing and enforcing state workplace safety regulations. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR. Cal/OSHA standards are generally more stringent than federal regulations.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets (MSDSs) be available to employees and that employee information and training programs be documented.

California Office of Emergency Services (OES)

The California Office of Emergency Services (OES) coordinates overall state agency response to major disasters in support of local governments. The OES is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts. During major emergencies, OES may call upon all state agencies to help provide support. Due to their specialized capabilities and expertise, the California National Guard, CHP, Department of Forestry and Fire Protection, Conservation Corps, Department of Social Services, Department of Health Services and Caltrans are the agencies most often asked to respond and assist in emergency response activities.

Hazardous Materials Transport

California law requires that Hazardous Waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. Additional requirements can be found in Title 22 CCR, Chapter 13.

State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the CHP and Caltrans. Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads. The CHP only designates state and federal roadways as hazardous materials truck

routes. The CHP classifies hazardous materials into three categories: explosives, poisons that can be inhaled, and radioactive material.

LOCAL REGULATIONS

Sacramento County Environmental Management Department (SCEMD)

The Unified Hazardous Waste and Hazardous Management Regulatory Program (SB 1082, 1993) is a state and local effort to consolidate, coordinate, and make consistent existing programs regulating hazardous waste and hazardous materials management. Cal/EPA adopted implementing regulations for the Unified Program (CCR, Title 27, Division 1, Subdivision 4, Chapter 1) in January 1996. The Unified Program is implemented at the local level by Certified Unified Program Agencies.

The SCEMD is the CUPA for cities and unincorporated areas within Sacramento County. Through their Hazardous Materials Division, the SCEMD regulates the use, storage and disposal of hazardous materials by issuing permits, inspecting facilities, and investigating complaints. The SCEMD issues permits for installation and removal of underground storage tanks. The SCEMD inspects businesses for compliance with the Hazardous Waste Control Act. Hazardous waste is subject to storage time limits, disposal requirements and labeling requirements on containers. The SCEMD also requires that businesses who handle hazardous materials and hazardous wastes to submit a Hazardous Materials Plan (HMP). The HMP includes an inventory of hazardous materials and hazardous wastes, as well as an emergency response to incidents involving those hazardous materials and wastes.

Under a contract with the SWRCB, the SCEMD conducts the Local Oversight Program to oversee the abatement and cleanup of hazardous substance releases onto the ground or from underground storage tanks in the County that do not involve chemical releases to water. The California RWQCB is the lead agency for chemical releases to water throughout the County. The Cal/EPA DTSC is responsible for overseeing the cleanup of hazardous waste sites in California.

Sacramento County Office of Emergency Services (SCOES)

The SCOES's responsibility includes effective planning for emergencies including those related to hazardous material incidents. The SCOES coordinates planning, response to emergencies, improves procedures for incident notification and provides training and equipment to safety personnel. The SCOES is required by California Health and Safety Code Section 25500 to: 1) prepare an inventory and information system for the storage and location of hazardous materials in the County; 2) oversee the preparation and collection of plans for those businesses that use hazardous substances; 3) prepare area response plans that will incorporate inventory data, training for emergency responses and evacuation plans; and 4) present an inspection plan and data management plan for approval to the State.

Sacramento County Hazardous Waste Management Plan (HWMP)

Assembly Bill 2948 (Tanner, 1986) established procedures for the preparation of a County Hazardous Waste Management Plan (CHWMP). The CHWMP is intended to serve as the primary planning document for hazardous waste management within a County, and contains goals, policies and recommended programs for the management, recycling and disposal of hazardous wastes. The CHWMP principally governs the coordination and planning of hazardous waste disposal capacity

between the County and state. The California Department of Health Services must give its approval to the plan before the document becomes effective.

The Sacramento County HWMP (adopted January 24, 1989) was jointly prepared by the SCEMD, Hazardous Materials Division, and the Sacramento County Planning and Community Development Department. While the County's HWMP identifies general geographic locations where hazardous waste facilities are unsuitable, the Plan does not provide specific facility sites. Specific site proposals will be subject to the following assessments: 1) consistency with the Plan, 2) site specific analysis, and 3) preparation of a site specific environmental document (Sacramento County Hazardous Waste Management Plan, 1989).

Sacramento County Risk Management Plans

SB 1889 required businesses that handle threshold quantities of regulated substances on the federal ARPP to submit RMPs by June 21, 1999. SB 1889 also requires businesses that handle more than a threshold quantity of a state regulated substance that is not also over the federal threshold to implement the ARP program upon request by the local government implementing agency. Where a CUPA has been established, they will be the first contact for a business. The SCEMD is the CUPA for the County. The SCOES Hazardous Materials Division administers the RMP program which requires businesses that use specific extremely hazardous substances to prepare a comprehensive plan to reduce the risk of an accident.

A RMP includes safety information, hazard review, operating procedures, training, maintenance, compliance audits, and incident investigation. The RMP must consider the proximity to sensitive populations located in schools, residential areas, general acute care hospitals, long-term health care facilities, and child day care facilities. The RMP must also consider external events such as seismic activity. There are three program levels depending on the type of business, potential impact, accident history, etc.

Sacramento County Underground Storage Tank (UST) Local Oversight Program (LOP)

The SCEMD Underground Storage Tank LOP is designed to ensure adequate and appropriate cleanup of petroleum contamination associated with leaks from underground storage tanks. The SCEMD performs oversight of investigation and cleanup activities at soil and groundwater contaminated sites under a contract with the SWRCB. The contract provides reimbursement of SCEMD staff costs and associated service, supply and equipment costs. Authority: California Health and Safety Code Section 25297.1.

Emergency Response

Local emergency response programs are often coordinated at the City, County or regional level. These programs addressing local emergency response include the following:

- General disaster planning by the Sacramento County Office of Emergency Operations.
- Air pollution Emergency Episode Plan (Rule 701) by the Sacramento Metropolitan Air Quality Management District, control and advisory

procedures that reduces air pollutants which may reach or have reached levels harmful to health and to protect the population at risk.

- The Galt Fire Protection District participates in countywide disaster planning throughout Sacramento County.

Galt Fire Protection District

The Galt Fire Protection District provides limited oversight of hazardous materials. The fire protection district is responsible for conducting inspections for code compliance and fire-safe practices, and for the investigation of fire and hazardous materials incidents.

ENVIRONMENTAL SETTING

Hazardous wastes generated by residents and businesses contribute to environmental and human health hazards that have become an increasing public concern. However, proper waste management and disposal practices can minimize public concern over toxicity and the contamination of soils, water, and air. The following section provides information on facilities within the City’s study area known to use, store, and or generate hazardous materials/wastes.

Contaminated and Impaired Sites

Lists of contaminated sites in the study area are available through the Sacramento County Environmental Management Department (SCEMD), the Regional Water Quality Control Board (RWQCB), and the California Department of Toxic Substance Control (DTSC). Table 10.8 lists active contaminated sites identified by the SCEMD, RWQCB, and the DTSC within the study area.

TABLE 10.8
Listed Contaminated Sites in the City’s Study Area

Business Name	Address	Status
Ace Oil Company	323 A Street	Closed by DTSC
Denier Property	13269 Marengo	Remedial Investigation
Jay’s Auto Repair	952 Simmerhorn Road	LUST/Leak being confirmed
Twin Cities Service	12801 Stockton Boulevard	LUST/Preliminary Investigation report submitted
Express Lane Chevron	301 Pine Street	LUST/Remediation underway
Galt Gas & Food	800 Pringle Avenue	LUST/Leak being confirmed
City of Galt Corp. Yard	550 Elm Avenue	LUST/Leak being confirmed
Galt High School Bus Stop	117 Camellia Way	LUST/Leak being confirmed
Lincoln & C Street	227 Lincoln Way	LUST/Site Status unclear
Cheaper #183	702 N. Lincoln Way	LUST/Remediation underway

Sources: California Regional Water Quality Control Board, Leaking Underground Storage Tanks list, October 2003; California Regional Water Quality Control Board, Site Cleanup List, 1st Quarter 2003; California Department of Toxic Substances Control Site Mitigation and Brownfields Reuse Program Database (also known as CalSites), 2003.

Underground Storage Tanks

The SCEMD issues permits for the installation and removal of underground storage tanks. Farm tanks and home heating oil tanks that hold no more than 1,100 gallons of motor vehicle fuel or home heating oil are exempt from state underground storage tank regulations (LG 109-1, 1984). The SCEMD Underground Storage Tank Program is designed to protect public health and the environment from exposure to hazardous materials stored in underground storage tanks. The primary focus is on protection of groundwater from contamination. Activities include inspection, permitting, monitoring, repair, installation and removal of underground storage tanks. Table 10.9 provides a list of registered underground storage tanks within the City’s planning area.

The owners and operators of underground storage tanks are required to comply with federal, state, and local laws with respect to the design, construction and monitoring for new and existing underground storage tanks. Federal underground storage tank laws and regulations are contained in 40 Code of Federal Regulations (CFR) Part 280 and 40 CFR Part 281. State underground storage tank laws and regulations are contained in Title 23, Division 3, Chapter 16 of the California Code of Regulations, and the California Health and Safety Code Section 25280 et seq.

**Table 10.9
Registered Underground Storage Tank Listings within the City’s Planning Area**

Business Name	Address	Number of Tanks
Sego Milk Plant	621 – 3 rd Street	Not listed
Quick Stop Market	602 4 th Street	2
Don’s Dandy Mart	700 C Street	3
Galt High School	109 N. Camellia Way	2
City of Galt Jail/Police	380 Civic Drive	Not listed
Building Material Distributors	225 Elm Avenue	1
City of Galt Corp. Yard	553 Elm Avenue	Not listed
Air Products & Chemicals Inc.	98 Industrial Court	2
Galt High School District	145 N. Lincoln Way	Not listed
More for Less	702 N. Lincoln Way	4
Express Lane Chevron	301 Pine Street	3
Galt Gas & Food	800 Pringle Avenue	3
Jay-s Auto Repair and Gas Stn.	952 Simmerhorn Road	Not listed
Twin Cities Service	12801 Stockton Boulevard	Not listed

Source: SCEMD Master List, 2003.

Above Ground Storage Tanks

The Aboveground Petroleum Storage Tank Act is administered in the study area by the SWRCB and the RWQCB. All facilities storing “petroleum” in a single tank larger than 660 gallons or with a cumulative storage capacity of greater than 1,320 gallons are subject to the Act. The Act requires owners or operators of aboveground petroleum storage tanks to:

- File a storage statement;
- Pay a facility fee; and

- Prepare and implement a federal Spill Prevention Control and Countermeasure (SPCC) plan.

Landfill and Disposal Site Locations

The City of Galt has adopted the Sacramento County Solid Waste Management Plan. Both State and County standards have established criteria to address the siting of solid waste facilities.

The California Integrated Waste Management Board (CIWMB) is responsible for managing California's solid waste stream. The CIWMB works in partnership with local government, industry, and the public to reduce waste disposal and ensure environmentally safe landfills. The CIWMB maintains a Solid Waste Information System (SWIS) database that contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal facilities. Table 10.10 presents the facilities listed by the CIWMB that are within the City's study area.

The CIWMB also has a Solid Waste Disposal and Co-Disposal Site Cleanup Program. The primary purpose of this program is to clean up sites where there is a threat to public health and safety and/or the environment and where responsible parties either cannot be identified or are unable or unwilling to pay for timely remediation. Since its 1994 inception, the CIWMB's cleanup program has remediated more than 80 old landfills and illegal disposal sites (IDS) throughout the state. The program has provided funds to directly cleanup disposal sites, provided matching grants to local governments, provided local enforcement agency grants, and made loans available to local governments to remediate landfills.

TABLE 10.10
Landfills and Disposal Sites within the City's Study area

Name of Facility	Location
Galt Transfer Station	104 Industrial Court
G&G Tire & Lube Service	321 A Street

Source: California Integrated Waste Management Board. Solid Waste Information System (SWIS) database, 2003.

Household Hazardous Materials

The City of Galt has a Household Hazardous Waste program in place that provides for hazardous waste collection events in the City.

Railroads

The Union Pacific Railroad operates on tracks through the study area. The U.S. Department of Transportation regulates transport of hazardous materials across state lines and all hazardous material transport by rail. Federal law requires that railroads accept all hazardous materials shipments that are offered them. The relevant federal regulations are contained in the Code of Federal Regulations, Title 49.

Pipelines

Hazardous materials pipelines carrying natural gas, crude oil, and other petroleum products in the study area are typically operated in rights-of-way and maintained by the owners and operators of the pipelines. Pipeline safety is regulated by the federal government for both interstate and intrastate pipelines under the Natural Gas Pipeline Safety Act of 1968 and the Hazardous Liquid Pipeline Safety Act of 1979. Federal safety regulations cover design, construction, and operation of pipelines, pipeline testing and operator reporting requirements.

10.7 AIR QUALITY

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. The primary factors that determine local air quality are the locations of air pollutant sources and the amounts of air contaminants emitted. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

To provide a better understanding of the current air quality conditions in the study area, this section describes existing regional topography and climate, federal and state ambient air quality standards, local air quality planning and management, and existing air quality conditions for the study area.

METHODS AND DATA SOURCES

The information contained in this section was obtained from various sources, including the City of Galt 1989 General Plan. Additional information is based on printed reports and monitoring data from the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the California Air Resources Board (CARB).

REGULATIONS THAT ADDRESS THE PROTECTION OF AIR QUALITY

Air quality in a given location is described as the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or in micrograms per cubic meter (ug/m³). The type and amount of regulated air pollutants emitted into the atmosphere, the size and topography of the regional air basin, and the prevailing meteorological conditions, contribute in determining the air quality conditions of a particular location.

The significance of a given pollutant's concentration is determined by comparison with federal and state ambient air quality standards. Both the State of California and the federal government have established ambient air quality standards for several different pollutants, expressed as maximum allowable concentrations. For some pollutants, separate standards have been set for different periods of time. Most standards have been set to protect public health, although for some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of state and federal ambient air quality standards is shown in Table 10.11.

**TABLE 10.11
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES**

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm –	– 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 Hour Annual	0.25 ppm –	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM10)	24 Hour Annual	50 µg/m ³ 20 µg/m ³	150 µg/m ³ 50 µg/m ³	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
Fine Particulate Matter (PM2.5)	24 Hour Annual	– 12 µg/m ³	35 µg/m ³ 15 µg/m ³	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including nitrogen oxides, sulfur oxides, and organics.
Lead	Month Quarter	1.5 µg/m ³ –	– 1.5 µg/m ³	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

Note: ppm = parts per million; µg/m³ = micrograms per cubic meter.

Source: *California Air Resources Board, 2007b. Ambient Air Quality Standards, available at <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>, February 22, 2007; California Air Resources Board, 2001. ARB Fact Sheet: Air Pollution Sources, Effects and Control, <http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm>, page last updated December 2005.*

Federal Regulations

Federal Clean Air Act

The federal Clean Air Act, adopted in 1970 amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The act directs the Environmental Protection Agency (EPA) to establish ambient air standards for six pollutants: ozone, carbon monoxide, lead, nitrogen dioxide, particulate matter, and sulfur dioxide. The standards are divided into primary and secondary standards; the former are set to protect human health with an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

Areas that do not meet the ambient air quality standards are called “attainment areas.” The federal Clean Air Act requires each state to submit a state implementation plan (SIP) for nonattainment areas. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. For cases in which the SIP is submitted by the state but fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan.

State Regulations

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 establishes an air quality management process that generally parallels the federal process. The CCAA, however, focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods are more stringent than the comparable federal standards. Responsibility for meeting California’s standards is addressed by the CARB and local air pollution control districts (such as the SMAQMD, which covers the study area). Compliance strategies are presented in district-level air quality management plans that are incorporated into the state implementation plan.

The CCAA requires that air districts prepare an air quality attainment plan if the district violates state air quality standards for carbon monoxide, sulfur dioxide, nitrogen dioxide, or ozone. No locally prepared attainment plans are required for areas that violate the state PM10 standards. The CCAA requires that the state air quality standards be met as expeditiously as practicable but does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

The air quality attainment plan requirements established by the CCAA are based on the severity of air pollution problems caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts.

California Air Resources Board

The CARB is responsible for establishing and reviewing the state ambient air quality standards, compiling the California SIP and securing approval of that plan from U.S.

EPA. The CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. The county or regional air quality management districts are primarily responsible for regulating stationary emissions sources at industrial and commercial facilities within their jurisdiction and for preparing the air quality plans that are required under the federal Clean Air Act and state California Clean Air Act.

Local Regulations

Sacramento Metropolitan Air Quality Management District

The SMAQMD is primarily responsible for regulating stationary source emissions within the study area and preparing the air quality plans (or portions thereof) for its jurisdiction. SMAQMD's primary means of implementing local air quality plans is by adopting rules and regulations. Stationary sources within the jurisdiction are regulated by the SMAQMD's permit authority over such sources and through its review and planning activities.

LOCAL AIR QUALITY PLANS, POLICIES AND REGULATIONS

The study area is located near the geographic boundary between the Sacramento Valley Air Basin and the San Joaquin Valley Air Basin. The SVAB is currently designated as being in serious nonattainment for ozone and in nonattainment for PM10. Sacramento County is in federal and state attainment for CO. The EPA has designated Sacramento County as being in severe nonattainment for ozone and in moderate nonattainment for PM10. The SVAB is an attainment or unclassified zone for the other ambient air quality standards. Table 10.12 below identifies the attainment status of Sacramento County for regulated air pollutants.

TABLE 10.12
Sacramento County Attainment Status

Pollutant	Designation/Classification	
	State Standards	National Standards
Ozone – one hour	Nonattainment	No Federal Standard ^a
Ozone – eight hour	Unclassified	Nonattainment/Serious
PM10	Nonattainment	Nonattainment/Moderate
PM2.5	Nonattainment	Unclassified/Attainment
CO	Maintenance/Moderate	Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified/Attainment
Lead (particulate)	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	No Federal Standard
Sulfates	Attainment	No Federal Standard
Visibility-Reducing Particles	Unclassified	No Federal Standard

- a. Federal One Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.

Source: CARB 2007

As noted above, federal and state air quality laws require regions designated as nonattainment to prepare plans that demonstrate how the region will attain individual air quality standards or that demonstrate reasonable improvements in local air quality conditions. A series of air quality plans have been developed by the SMAQMD. The following section describes the most current federal and state air quality plans as they apply to the City's study area:

1994 Sacramento Area Regional Ozone Attainment Plan

Several air districts including the SMAQMD, the ARB, and the Sacramento Area Council of Governments (SACOG) have contributed to the preparation of the Sacramento Area Regional Ozone Attainment Plan (El Dorado County Air Pollution Control District et al. 1994). The plan was prepared to fulfill the requirements of the federal Clean Air Act and was submitted to EPA on November 15, 1994, as part of California's SIP.

The SIP consists of several adopted measures, commitments to adopt new measures, emission inventories, air quality modeling results, contingency measures, and a demonstration of emission reductions sufficient for attainment and rate-of-progress milestones. The measures proposed build on existing state and local air quality programs. The SIP is updated triennially and was most recently updated in 2005 as the 2003 Triennial Report. (SMAQMD 2005b)

Based on historic ozone levels recorded between 1988 through 1991, the Sacramento County portion of the SVAB was classified by the federal Clean Air Act as a severe nonattainment area, with an attainment goal of 1999. However, no feasible controls could be identified that would provide the needed reductions by 1999. The earliest possible attainment date identified was 2005.

The shift to 2005 requires that several additional controls be implemented in the Sacramento County portion of the SVAB. The emission offset requirement for new and modified sources would be increased from a ratio of 1.2:1 to 1.3:1. To achieve attainment by 2005, the SMAQMD has committed to reducing emissions from construction sources by two tons of NO_x per day. Also the region would be required to establish employer-based trip reduction rules. Implementation of these emission reducing measures will contribute to helping this nonattainment area achieve emission reductions consistent with the 1994 SIP attainment strategy. However, a review of past air quality trends, underestimates in motor vehicle emissions, and additional impacts from transported air pollutants, it is unlikely that attainment will be achieved by 2005.

In July 1997, EPA initiated a new 8-hour standard for ozone. This change would lower the standard for ambient ozone from 0.12 parts per million of ozone averaged over one hour to 0.08 parts per million of ozone averaged over eight hours. In general, the 8-hour standard is more protective of public health and more stringent than the federal 1-hour standard. Key aspects of the 8-hour ozone rule are the new designations and nonattainment classifications in June 2004, and the revocation of the 1-hour ozone standard in June 2005. However, the new rule also addresses anti-backsliding provisions in the Clean Air Act, so 8-hour ozone nonattainment areas remain subject to control measure commitments that applied under the 1-hour ozone standard. The Sacramento region has been designated as a "serious" nonattainment area for the federal 8-hour ozone standard with a new attainment deadline of June

2013. The Sacramento Metropolitan Air Quality Management District is in the process (2005) of updating the regions Clean Air Plan. This plan should be adopted in early 2007 (SMAQMD 2005a).

Sacramento Area PM10

Sacramento County is also federally designated as a moderate nonattainment area for PM10. Consequently, a PM10 SIP is also required. However, monitoring data have verified that no violation of the federal PM10 standards has occurred in the 4 most recent years for which data are available. This has allowed the SMAQMD to request a redesignation from nonattainment to attainment of the federal standards.

ENVIRONMENTAL SETTING

Climate and Atmospheric Conditions

As previously described, the study area lies within the SVAB, a basically flat area bordered on the east by the Sierra Nevada range; on the west by the Coast Ranges; and to the north by the Cascade Range. To the south is the San Joaquin Valley Air Basin. The region's topographic features act to restrict air movement through and out of the basin. Airflow in the SVAB is primarily influenced by marine air that enters through the Carquinez Straits where the Delta empties into the San Francisco Bay. Wind speed and direction play an important role in air pollutant dispersion and transport. As a consequence, the SVAB is highly susceptible to pollutant accumulation over time. Frequent transport of pollutants into the SVAB from upwind sources also contributes to poor air quality.

The Sacramento Valley is characterized by an inland Mediterranean climate that is typified by warm, dry summers and cooler winters. Summer high temperatures often exceed 100 degrees Fahrenheit (F), averaging from the low 90s in the northern part of the valley to the high 90s in the south (NWS, 1999). During the winter months, the North Pacific storm track intermittently dominates area weather, with fair weather alternating with periods of extensive clouds and precipitation. Periods of dense and persistent fog are also characteristic of winter weather in the valley. Fog conditions are most prevalent between storms and the frequency and persistence of heavy fog in the valley diminishes with the approach of spring. The average yearly temperature range for the Sacramento Valley is between 20 F and 115 F, with summer high temperatures often exceeding 90 F and winter low temperatures occasionally dropping below freezing.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During summer periods airflow in the study area is primarily influenced by marine air that enters through the Carquinez Straits. Incoming airflow strength varies daily with a pronounced diurnal cycle. Influx strength is weakest in the morning and increases during the evening hours. Summer transport of pollutants into the study area from upwind sources sometimes contributes to poor ozone air quality. Conversely, emissions originating from the study area may also impact downwind communities.

Temperature inversions are formed when the vertical dispersion of air pollutants is inhibited. As a rule of thumb, air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Air above and below an inversion does not mix because of differences in air density thereby restricting air pollutant dispersal. Low

wind speeds, combined with low inversion heights, create a winter climate conducive to high concentrations of certain air pollutants (e.g., carbon monoxide).

Existing Air Emission Sources

Air emissions are divided into two main categories: stationary and mobile. Stationary sources are those emission sources, such as industrial buildings, burning crop residuals, and exposed soils or minerals (sources of dust). Within the study area, the primary stationary-source pollutants are ozone precursors from local industrial processes and those associated with the use of cleaning and surface coatings. Other stationary sources include PM10 emissions resulting from road dust, local burning, construction/demolition activities, and fuel combustion occurring from stationary sources (e.g., industrial or residential uses). Natural sources of PM10 emissions include those resulting from wildfires.

The primary source of mobile emissions is generated from the use of operation of vehicles (automobiles, passenger trucks, transport trucks, and buses). Vehicle emissions are the primary source of ozone precursors and account for roughly 70 percent of the Sacramento Valley's total ROG and NO_x emissions (SMAQMD, 2003).

Air Quality Monitoring and Existing Emission Levels

The CARB compiles air quality data from a regional air quality monitoring network that provides information on ambient concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. Table 10.13 presents a six-year summary of air pollutant data collected at the two monitoring stations located nearest the study area that actively collect data. At the present time no monitoring stations are located within the study area. As shown in Table 10.13, the Elk Grove-Bruceville Road and Sloughhouse stations measure concentrations of ozone only.

The number of days during which ozone concentrations violated the state standard in the areas monitored fluctuated over the six year period. Based on the data from 2001 through 2006, ozone concentrations violate the state ozone standard an average of seven days per year at the Elk Grove-Bruceville Road station and 18 days per year at the Sloughhouse station.

TABLE 10.13
Summary of Monitoring Data for the Study Area, 1997-2002

Pollutant	State Standard	National Standard	Pollutant Concentration by Year ^a					
			2001	2002	2003	2004	2005	2006
<i>Ozone (Elk Grove-Bruceville Road)</i>								
Highest 1-hour observed, ppm ^b	0.09	0.12	0.11	0.10	0.11	0.10	0.11	0.14
Days over State Standard			10	1	10	1	7	10
Days over National Standard			0	0	0	0	0	1
Highest 8-hour average, ppm	NA	0.08	0.09	0.08	0.09	0.09	0.10	0.11
Days over National Standard			3	0	5	1	2	7
<i>Ozone (Sloughhouse)</i>								
Highest 1-hour average, ppm ^b	0.09	0.12	0.12	0.13	0.13	0.11	0.11	0.11
Days over State Standard			19	22	27	11	11	20
Days over National Standard			0	2	1	0	3	3
Highest 8-hour average, ppm	NA	0.08	0.10	0.11	0.11	0.09	0.10	0.11
Days over National Standard			16	16	19	8	10	17

Note: **Bold** values are in excess of state or federal standard. NA = Not Applicable or Not Available.

^aData was collected at the monitoring station indicated. Both stations monitor for ozone only.

^bppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

Source: California Air Resources Board, 2007a. Summaries of Air Quality Data, 2001, 2002, 2003, 2004, 2005, 2006; http://www.arb.ca.gov/adam/php_files/aqdphp/sc8start.php.

Sensitive Receptors in the Study Area

Sensitive receptors are typically defined as populations or uses that are more susceptible to the effects of air pollution than the general population. For the study area, sensitive receptors include the following populations or uses:

- Long-term healthcare facilities;
- Rehabilitation centers;
- Retirement homes;
- Convalescent homes;
- Residences;
- Schools;

- Childcare centers; and
- Playgrounds.

Sensitive receptors are located throughout the study area. These types of receptors and their location within the study area will be taken into consideration as the general plan land use map is developed. Specific policies will be prepared to address air quality issues as part of the general plan update. The City is one of many other local jurisdictions participating in the Sacramento Area Council of Government's (SACOG's) Sacramento Region Blueprint Project. This multi-county regional project includes the collection of detailed land-use and travel data that will be used to help influence future regional growth patterns, promote smart growth, and ultimately help the region achieve air quality attainment status.

10.8 GLOBAL WARMING

This section provides a discussion of greenhouse gas (GHG) emissions and global climate change. This information is included in light of recent increased awareness of the threat of global warming and climate change and in response to recent efforts by the State of California to reduce emissions of global warming gases, such as through the passage of AB 32.

METHODS AND DATA SOURCES

The information contained in this section was obtained from various sources, including the California Climate Action Team. Additional information is based on printed reports and monitoring data from the California Climate Change Center, Department of Water Resources, California Energy Commission, and Intergovernmental Panel on Climate Change as well as a few other additional sources.

REGULATIONS THAT ADDRESS GLOBAL WARMING

There have been several initiatives at the federal level to research the effects of global warming, such as the Global Climate Change Research Act of 1990, and provide a voluntary greenhouse gas reporting program, such as the Federal 1605(b) program. However, the State of California has passed several initiatives that may have a greater impact to the operations of state and local agencies and businesses in California. These are further described below.

State Regulations

Assembly Bill 1493. Governor Gray Davis signed AB 1493, addressing vehicular emissions contributions to greenhouse gases, on July 22, 2002. AB 1493 requires the California Air Resources Board to develop carbon pollution (greenhouse gas) standards that achieve the maximum feasible, cost-effective, and technologically achievable reductions of greenhouse gas pollution emitted by new passenger vehicles in model year 2009 and beyond. The standards are to apply to automakers' fleet averages, rather than each individual vehicle, and carmakers will be able to partially achieve the standards by reducing pollution from non-auto sources, such as factories. Californians are free to continue to choose and purchase the vehicle of their choice. The bill is not intended to impose new vehicle or gasoline taxes and will not limit miles driven or require smaller, lighter or slower vehicles.

Executive Order S-3-05. The Governor of California signed Executive Order S-3-05 on June 1, 2005. This Order establishes greenhouse gas emission reduction targets that are later adopted as required by law in AB 32. The Order recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snow pack in the Sierra Nevada, which contributes a primary source of water supply in the State. Additionally, according to this Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield.

Assembly Bill 32. In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emission reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

ENVIRONMENTAL SETTING

Greenhouse Gas Emissions and Global Climate Change

Global climate change refers to alterations in weather features that occur across the Earth as a whole, such as temperature, precipitation, and wind patterns. Naturally occurring atmospheric gases, such as water vapor, carbon dioxide, methane and nitrous oxide modulate global temperatures. These gases prevent radiative heat from escaping the Earth's atmosphere, while allowing sunlight to enter into the atmosphere. This blanketing is known as the greenhouse effect, a natural phenomenon necessary to keep the Earth's surface warm.

During the past century, average global temperatures have risen by more than one degree Fahrenheit (F). In California, observational trends show warmer winter and spring temperatures, reduced spring snow levels in mid and lower elevation mountains, earlier snowpack melting and flowers blooming a week or two earlier than under historical conditions (Cayan et al. 2006b).

The world's leading climate scientists have reached consensus that global climate change is "very likely" caused by humans, and hotter temperatures and rises in sea level "would continue for centuries" even if humans control future emissions of GHGs. The most recent report of the Intergovernmental Panel on Climate Change (IPCC), an international group of scientists and representatives of 113 countries, concludes that "[t]he widespread warming of the atmosphere and ocean, together with ice-mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone." (IPCC 2007).

Separate discussions for both GHG emissions and global climate change effects (specifically related to water resource topics) are provided below. **Greenhouse Gas Emissions**

Global climate change is, as the name implies, a global phenomenon. The global nature of the problem poses particular challenges to Lead Agencies under CEQA to translate the issue to the level of a CEQA document for a specific project in a way that provides meaningful and useful information to decision-makers and the public. To provide a context of the Proposed Project's GHG emissions, it is useful to consider the state of California as a whole. California is the 12th to 16th largest emitter of CO₂ in the world and produced 492 million gross metric tons of carbon dioxide equivalents¹ in 2004 (California Energy Commission 2006a). California has relatively low carbon emissions intensity, however, ranking fourth lowest in the United States in per capita emissions from fossil fuel combustion. In addition, California was the fifth lowest state in the nation in carbon emissions from fossil fuel combustion per unit of gross state product in 2001, largely as a result of the state's energy efficiency and renewable energy programs (California Energy Commission 2007).

Feedback Mechanisms and Uncertainty

Several complex mechanisms interact with Earth's energy balance to establish global average temperature. A change in ocean temperature, for example, would be expected to lead to changes in ocean current circulation that, in turn, would further alter ocean temperatures. Certain factors and phenomenon have the potential to both enhance and to neutralize future climate warming, adding to uncertainties associated with predicting global climate change. Scientists continue to study factors leading to uncertainty and positive and negative feedback mechanism to gain more through understanding of their potential effects on global climate change. Examples of these factors are described below.

- **The Cloud Effect.** As global temperatures rise, the air's capacity to hold moisture increases, facilitating cloud formation. If cloud cover increases at low or middle altitudes, resulting in clouds with greater liquid water content, such as stratus or cumulus clouds, greater radiation would be reflected back to space, resulting in a negative feedback mechanism wherein side effects associated with increased cloud cover caused by global warming acts to balance further warming. In contrast, if clouds are formed at higher altitudes in the form of cirrus clouds, these clouds allow greater solar radiation to pass through than they reflect, and ultimately act as a GHG themselves. This results in a positive feedback mechanism in which the side effects of global warming further enhance the warming process.
- **Thawing of permafrost.** Thawing of permafrost attributed to global warming is expected to accelerate and enhance global warming trends because CH₄

¹ Carbon dioxide equivalents is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. As described in Appendix C, "Calculation Referenced," of the General Reporting Protocol of the California Climate Action Registry (2006), one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted. Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (California Energy Commission 2006a). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%) (California Energy Commission 2006a).

currently trapped in permafrost would be released into the atmosphere when areas of permafrost thaw.

- **Direct and Indirect Effects of Aerosols.** Aerosols, including particulate matter, reflect sunlight back into space.² As fewer emissions of particulate matter occur, such as through the attainment of particulate matter designations, the cooling effect of anthropogenic aerosols would be reduced, and the greenhouse effect would be amplified. Likewise, as particulate matter emissions are reduced, the indirect positive effect of aerosols on clouds would be reduced, potentially further enhancing the greenhouse effect. This result is due to the fact that aerosols act as cloud condensation nuclei, aiding in cloud formation and increasing cloud lifetime. Clouds can efficiently reflect solar radiation back to space, and as such, a reduction in clouds could lead to increases in the greenhouse effect.
- **Earth's Albedo.** The Earth's albedo, or reflectivity, is anticipated to decrease as polar and sea ice diminishes. As a result, more incoming solar radiation will likely be absorbed by the Earth instead of reflected back into space, further enhancing the greenhouse effect.

GLOBAL CLIMATE CHANGE–EFFECTS ON WATER RESOURCES

Modeling of Climate Change Impacts on Water Resources

General Circulation Models (GCMs) are the first tool used to assess possible regional impacts of climate change. These models are large in scale, and develop large-scale scenarios of changing climate parameters, and typically compare scenarios with different GHG concentrations in the atmosphere. Because they are global in nature, GCMs cannot readily be used to examine regional effects. Because many policy decisions concerning water and other resources are made at a local level, much effort has been put into increasing the resolution of the models to help assess regional impacts of climate change. These local models can incorporate information concerning a specific watershed. After deciding which parameters to incorporate in a given model and their weighting, researchers further refine the model by comparing the historical climate records with the results obtained by the model when run over that same period (Kiparsky and Gleick 2003).

Hydrologic models are often coupled with GCMs to represent climate change impacts on the hydrologic cycle. Hydrologic models incorporate many parameters reflecting soil conditions, snow pack levels and topography in order to represent this complex cycle, and can produce output that is useful for local planners interested in water quality and supply (see Kiparsky and Gleick 2003). However, downscaling GCMs to a hydrologic scale can result in greater uncertainties and difficulties than use of GCMs alone. One of the key difficulties of downscaling global climate information to hydrologic scales is a lack of data within the global length scales that are needed to understand processes that are sensitive to climate change at a finer scale.

It is important to note that these models cannot offer specific predictions of future climate states. They produce potential scenarios that incorporate many assumptions

² Aerosols are particles of matter, solid or liquid, larger than a molecule but small enough to remain suspended in the atmosphere. Natural sources include salt particles from sea spray and clay particles as a result of weathering of rocks, both of which are carried upward by the wind. Aerosols can also originate as a result of human activities and in this case are often considered pollutants.

about the natural variables (such as runoff volume or sea level) that are impacted by climate change. Models are, nonetheless, useful for assessing potential possible future conditions (Kiparsky and Gleick 2003).

Despite modeling related difficulties and uncertainties, there is broad consensus among current models that global climate change could potentially alter the hydrologic cycle in many important ways. For instance, it is generally agreed that higher temperatures will lead to changes in snowfall and snowmelt dynamics in watersheds with substantial snow (Kiparsky and Gleick 2003). One of the most common projections of potential impacts of climate change is that warming will decrease the volumes and persistence of snowpacks in the western United States. Studies suggest this reduction in snowpack and shift in stream-flow seasonality could have dramatic impacts on future water availability (Barnett 2005).

In recent years, evidence that global climate change will impact California's water resources has continued to accumulate. Over 150 peer-reviewed scientific articles on climate and water in California have been published, and many more are in preparation. These studies span a wide range of topics, from improvements in downscaling of general circulation models to understanding how reservoir operations might be adapted to changing conditions (Kiparsky and Gleick 2003).

There are, however, still many gaps and unknowns. In some cases, uncertainties are the result of models' inability to reproduce today's climate, casting doubt on predictions of future climate (Barnett 2005). In other cases, uncertainties are a result of the difficulties associated with projecting regional impacts. High-spatial resolution models are required to quantitatively estimate potential future water problems (Barnett 2005). Scientists are only beginning to develop such high-spatial resolution models. These models carry a whole set of problems on top of the problems associated with GCMs used to develop large-scale scenarios (Barnett 2005). In addition, current models are unable to fully assess the potential impacts of climate change on California's water system, because none of the existing models have the ability to accept input from climate change impact studies pertaining to the Central Valley (See CEC 2003).

In summary, global climate change will influence many interconnected phenomenon, which in turn, will affect the rate of climate change itself. Faced with this complex system, climatologists make decisions about how to simplify the phenomenon, such as assuming a fixed rate of temperature change or a particular level of aerosol production and/or a prediction of cloud formation. These assumptions allow the models to apply to particular aspects of the changing ecosystem and particular regions given an educated guess about how the future will be. Rather than try to be predictive, the models represent possible scenarios that come with a set of presuppositions. Even when results are quantified, the results are meaningless unless viewed in the light of those presuppositions. For these reasons, a range of models must be examined when attempting to assess the potential effects of global climate change and the resulting analysis is most appropriately qualitative.

Potential Effects on Water Resources

From a statewide perspective, global climate change could affect California's environmental resources through potential, though uncertain, changes related to future air temperatures and precipitation and their resulting impacts on water temperatures, reservoir operations, sea levels and stream runoff (Kiparsky and Gleick 2003). Such changes could threaten California's economy, public health and environment (California Energy Commission 2003). The types of potential effects of global climate change on California's water resources include:

- **Water Supply.** Global climate change is expected to impact California's water supply through a diminishing Sierra snowpack. Although much uncertainty remains with respect to the effects of global climate change on California's water supplies, it is expected that increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control instead of using the water for supply conservation, as is the standard practice. This change in water management could, in turn, lead to more frequent water shortages during high water demand periods (Brekke 2004). Many regional studies have shown that only small changes in inflows into reservoirs could result in large changes in the reliability of water yields from those reservoirs (Kiparsky and Gleick, 2003; see also Cayan et al. 2006a).
- **Surface Water Quality.** Water quality is affected by several variables, including runoff volume and timing, the physical characteristics of the watershed and water temperature. A combination of changes to these factors could affect several natural processes that serve to eliminate pollutants in water bodies. For example, an overall decrease in stream flows could concentrate pollutants and prevent contaminants from flushing from point sources (Kiparsky and Gleick 2003).
- **Groundwater.** Few scientific studies have been performed on the effects of global climate change on specific groundwater basins, groundwater quality or groundwater recharge characteristics (Kiparsky and Gleick 2003). Warmer temperatures could increase the period where water enters the ground by reducing soil freeze. Conversely, warmer temperatures could also lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Reductions in spring runoff and higher evapotranspiration would likely reduce the amount of water available for recharge; but additional winter runoff could increase the amount of runoff available for recharge (Kiparsky and Gleick 2003).
- **Sea Levels.** Global climate change is expected to cause a 4 to 33-inch rise in sea level as a result of thermal expansion of ocean waters and melting of ice from land surfaces (California Climate Change Center 2006). Among the risks of sea level rise would be threats to levee integrity and tidal marshes and increased salinity in the Sacramento River Delta (DWR, 2006).
- **Sudden Climate Change.** Most global climate models project that anthropogenic climate change will be a continuous and fairly gradual process through the end of this century (DWR 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even at warmer and dryer projections. Sudden and unexpected changes, however, could leave water managers unprepared, which, in extreme situations could have significant implications for California's water supplies.

Potential Effects on Water Resources

The following section summarizes current scientific literature related to the effects of global climate change on water resources in California's Central Valley.

Progress on Incorporating Climate Change into Management of California's Water Resources: Preliminary Climate Change Impacts Assessment for CVP/SWP Operations

The California Department of Water Resources (DWR) (2006) recent study of climate change impacts on California's water supply suggests several climate change impacts on overall SWP and CVP operations and deliveries. In three of the four climate scenarios simulated, CVP north-of-Delta reservoirs experiences shortages during droughts. Changes in annual average SWP south-of-Delta Table A deliveries ranged from a slight increase of about 1% for a wetter scenario to about a 10% reduction for a drier scenario. Under the three drier scenarios, increased winter runoff and lower Table A allocations resulted in somewhat higher annual average Article 21 deliveries, though these increases did not fully offset losses to Table A. In contrast, the wetter scenario with higher Table A allocations resulted in fewer Article 21 delivery opportunities and decreased annual average Article 21 deliveries. Changes in annual average CVP south-of-Delta deliveries ranged from increases of about 2.5% for wetter scenarios and decreases of up to 10% for drier scenarios. Water stored from one year over the next, called "carryover storage," was negatively affected for both the SWP and CVP in drier scenarios and slightly increased in the wetter scenario. DWR cautions that the results of its study reflect only a limited number of climate change scenarios and do not address the probability of each scenario. DWR (2006) states, therefore, that the results are not sufficient alone to provide a basis for policy decisions.

Climate Warming and Water Management Adaptation for California

Tanaka et al. (2006) studied the ability of California's water supply system to adapt to long-term climatic and demographic changes using the California Value Integrated Network (CALVIN) a statewide economic-engineering optimization model of water supply management. The results show agricultural water users in the Central Valley to be the most vulnerable to climate change, especially under the driest and warmest scenario (i.e. PCM 2100) predicting a 37% reduction of Valley agricultural water deliveries and a rise in water scarcity costs by \$1.7 billion. Though the results are only preliminary, they suggest that California's water supply system appears "physically capable of adapting to significant changes in climate and population, albeit at significant cost." Such adaptation would entail changes in California's groundwater storage capacity, water transfers, and adoption of new technology.

Simulated Hydrologic Responses to Climate Variations and Change in the Merced, Carson, and American River Basins, Sierra Nevada, California, 1900-2099

Dettinger et al. (2004) consider the hydrologic responses of river basins in the Sierra Nevada to historical and future climate changes. An historical run showed stationary climate and hydrological variations through the first part of the 20th century until roughly 1975 when temperatures increased and snowmelt and snowflow peaks began to occur progressively earlier. The results of a "business as usual" run showed a continuance of the historical trend through the 21st century with a +2.5 degree Celsius (C) warming and a hastening of snowmelt and streamflow within the seasonal cycle by nearly one month. In contrast, the future control run, in which GHG concentrations were fixed at 1995 levels, climate and streamflow timing conditions were shown to be very similar to those of the 1980s and 1990s throughout its duration.

Potential Implications of PCM Climate Change Scenarios for Sacramento-San Joaquin River Basin Hydrology and Water Resources

Using five PCM scenarios, VanRheenen et al. (2004) studied potential effects of climate change on the hydrology and water resources of the Sacramento-San Joaquin River Basin. The results showed that most mitigation alternatives examined satisfy only 87 to 96% of the environmental targets in the Sacramento system, and less than 80% in the San Joaquin system. Therefore, system infrastructure modifications and improvements could be necessary to accommodate the volumetric and temporal shifts in flows predicted to occur with future climates in the Sacramento-San Joaquin River basins.

Trends in Snowfall versus Rainfall in the Western United States

Knowles et al. (2002) addressed historical changes in the relative contributions of rainfall and snowfall to better understand the nature of the observed change in snowpack and streamflow timing in the west. The study documented a regional trend toward smaller ratios of winter-total snowfall water to winter-total precipitation during the period of 1949-2004. The trends toward decreased winter-total snowfall are the result of warming across the region. The most significant decreases in snowfall occur where wet-day minimum temperatures were on average more than -5 degrees over the study period. Knowles et al. suggest that if warming trends continue, the snowfall fraction of precipitation is likely to continue to decline, which, combined with earlier melting of the remaining accumulations of snowpack, will diminish the West's natural freshwater storage capacity.

Climate Change Impacts on Water for Agriculture in California: A Case Study in the Sacramento Valley

Joyce et al. (2006) employ the Water Evaluation and Planning (WEAP) system, a hydrologic model that was developed for the Sacramento River Basin to study the impacts of climate change on the Sacramento River Basin. The results showed increasing temperatures could put a strain on the Sacramento River basin's water resources. Assuming an increasing in urban demand for water, the study showed that the effects of climate change could be mitigated if the agricultural sector makes adaptations. The study considered the effect of increased efficiency in agricultural irrigation as well as shifts in cropping. The results showed that groundwater pumping between 2070 and 2100 was reduced when these practices were adopted.

Climate Warming and Water Supply Management in California in California

Medellin et al. (2006) employ the CALVIN model under a high emissions "worst case" scenario, called a dry-warming scenario. The results showed that climate change would reduce water deliveries by 17 % by 2050. This reduction in deliveries was not equally distributed between urban and agricultural areas. Water deliveries would drop by 24% for agricultural areas, while urban areas, in contrast, would only see a 1% reduction. A geographic difference in water deliveries was also shown, with urban water scarcity almost absent outside southern California.

Climate Scenarios for California

Cayan et al. (2006b) evaluate a medium-high and a low GHG scenario. The results show a warming trend in California from 2000 to 2100. Temperatures are shown to rise between 1.7 and 5.8° C, depending on the model and the scenario used. This increase in temperature could impact snowpack levels as the state experiences less snow and more rain. The study also found that snowpack in the Sierra Nevada could

be reduced 32 to 79%, depending on the model and scenario chosen. The study did not consider California's ability to adapt to these changes with respect to water supply.

Our Changing Climate - Assessing the Risks to California, California Climate Change Center 2006 Biennial Report

This report, prepared by the California Climate Change Center in response to Executive Order S-3-05, considers a wide-range of potential effects of climate change on California's resources. With respect to the most severe consequences of global climate change on California's water supplies, the study concludes that major changes in water management and allocation systems could be required in order to adapt to the change. As less winter precipitation falls as snow, and more as rain, water managers would have to balance the need to construct reservoirs for water supply with the need to maintain reservoir storage for winter flood control. Additional storage could be developed, but at high environmental and economic costs.

Climate Warming & California's Water Future

Lund et al. (2003) examine the effects of a range of climate warming estimates on the long-term performance and management of California's water system. The study estimates changes in California's water availability, including effects of forecasted changes in 2100 urban and agricultural water demands using a modified version of the CALVIN model. The study concludes that in terms of methodology, it is useful and realistic to include a wide range of hydrologic effects, changes in population and water demands, and changes in system operations in climate change studies.

A broad range of climate warming scenarios show significant increase in wet season flows and significant decreases in spring snowmelt. The magnitude of climate change effects on water supplies is comparable to water demand increases from population growth in 21st century. The study further concluded that California's water system would be able to adapt to the severe population growth and climate change modeled. This adaptation would be costly, but it would not threaten the fundamental prosperity of the state, although it could have major impacts on the agricultural sector. The water management costs represent only a small proportion of California's current economy. Under the driest climate warming scenarios, Central Valley agricultural users could be quite sensitive to climate change, though wetter hydrologies could increase water availability for these users. The balance of climate change effects on agricultural yield and water use is unclear - while higher temperatures could increase evapotranspiration, longer growing seasons and higher carbon dioxide concentrations could increase crop yield.

California's water system could economically adapt to all the climate warming scenarios examined in the study. New technologies for water supply, treatment, and water use efficiency, implementation of water transfers and conjunctive use, coordinated operation of reservoirs, improved flow forecasting, and the cooperation of local regional, state and federal government can help California adapt to population growth and global climate change. Even if these strategies are implemented, however, the costs of water management are expected to be high and there is likely to be less "slack" in the system compared to current operations and expectations.

EXISTING GREENHOUSE GAS EMISSION SOURCES

The major sources of GHG emissions in the study area are vehicle transportation, building energy use, industrial operations, and to a lesser extent agricultural operations (including livestock grazing). These GHG emission sources within Galt may produce emissions locally within the vicinity of Galt. In the case of building energy use, emissions may occur remotely outside of California.

Vehicle emissions are likely one of the major contributors to GHG emissions in the vicinity of the City of Galt due to the minimal industrial operations within the study area. Vehicle emissions primarily contain CO₂ and exit the tailpipe during vehicle operation. Generally, commercial, industrial, and institutional buildings are a more significant source of GHG emissions than households. This is primarily from CO₂ emissions as a result of energy use.

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John Bromley, Director of Public Affairs, Union Pacific. Written communication. February 2, 2005.

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10.10 GLOSSARY

Alquist-Priolo Fault Zone

The Alquist-Priolo Earthquake Fault Zoning Act, passed in 1972, requires the State Geologist to identify zones of special study around active faults.

Ambient Noise

The total noise associated with a given environment and usually comprising sounds from many sources, both near and far.

Attenuation

Reduction in the level of sound resulting from absorption by the surrounding topography, the atmosphere, distance, barriers, and other factors.

A-Weighted Decibel (dBA)

A unit of measurement for noise having a logarithmic scale and measured using the A-weighted sensory network on a noise-measuring device. An increase or decrease of 10 decibels corresponds to a tenfold increase or decrease in sound energy. A doubling or halving of sound energy corresponds to a 3-dBA increase or decrease.

Community Noise Equivalent Level (CNEL)

CNEL is used to characterize average sound levels over a 24-hour period, with weighting factors included for evening and nighttime sound levels. Leq values (equivalent sound levels measured over a 1-hour period - see below) for the evening period (7:00 p.m. to 10:00 p.m.) are increased by 5 dB, while Leq values for the nighttime period (10:00 p.m. to 7:00 a.m.) are increased by 10 dB. For a given set of sound measurements, the CNEL value will usually be about 1 dB higher than the Ldn value (average sound exposure over a 24-hour period – see below). In practice, CNEL and Ldn are often used interchangeably.

Day-Night Average Sound Level (Ldn)

Ldn represents an average sound exposure over a 24-hour period. Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10:00 p.m. to 7:00 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

Equivalent Sound Level (Leq)

The level of a steady-state sound that, in a stated time period and at a stated location, has the same sound energy as the time-varying sound (approximately equal to the average sound level). The equivalent sound level measured over a 1-hour period is called the hourly Leq or Leq (h).

Fault

A fault is a fracture in the Earth's crust that is accompanied by displacement between the two sides of the fault. An active fault is defined as a fault that has moved in the last 10,000 to 12,000 years (Holocene time). A potentially active fault is one that has been active in the past 1.6 million years (Quaternary period). A sufficiently active fault is one that shows evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

Hazardous Materials

A hazardous material is defined by the California Code of Regulations (CCR) as a substance that, because of physical or chemical properties, quantity, concentration,

or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10).

Hazardous Wastes

Similarly, hazardous wastes are defined as materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. According to Title 22 of the CCR, hazardous materials and hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3).

Liquefaction

Liquefaction in soils and sediments occurs during some earthquake events, when material is transformed from a solid state to a liquid state because of increases in pressure in the pores (the spaces between soil particles). Earthquake-induced liquefaction most often occurs in low-lying areas with soils or sediments composed of unconsolidated, saturated, clay-free sands and silts, but it can also occur in dry, granular soils or saturated soils with some clay content.

L_{max} and L_{min}

The maximum and minimum sound levels, respectively, measured during the measurement period. When a sound meter is set to the “slow” response setting, as is typical for most community noise measurements, the L_{max} and L_{min} values are the maximum and minimum levels measured over a 1-second period.

Magnitude

Earthquake magnitude is measured by the Richter scale, indicated as a series of Arabic numbers with no theoretical maximum magnitude. The greater the energy released from the fault rupture, the higher the magnitude of the earthquake. Magnitude increases logarithmically in the Richter scale; thus, an earthquake of magnitude 7.0 is thirty times stronger than one of magnitude 6.0. Earthquake energy is most intense at the point of fault slippage, the epicenter, which occurs because the energy radiates from that point in a circular wave pattern. The farther an area is from an earthquake’s epicenter, the less likely it is that ground shaking will occur.

Ozone

Ozone is a pungent, colorless toxic gas created in the atmosphere rather than emitted directly into the air. Ozone is produced in complex atmospheric reactions involving oxides of nitrogen and reactive organic gases with ultraviolet energy from the sun. Motor vehicles are the major sources of ozone precursors.

Percentile-Exceeded Sound Level (L_x)

The sound level exceeded during a given percentage of a measurement period. Examples include L₁₀, L₅₀, and L₉₀. L₁₀ is the A-weighted sound level that is exceeded 10% of the measurement period, L₅₀ is the level exceeded 50% of the period, and so on. L₅₀ is the median sound level measured during the measurement period. L₉₀, the sound level exceeded 90% of the time, excludes high localized

sound levels produced by nearby sources such as single car passages or bird chirps. L90 is often used to represent the background sound level. L50 is also used to provide a less conservative assessment of the background sound level.

Photochemical. Some air pollutants are direct emissions, such as the carbon monoxide (CO) that is part of the exhaust from an automobile. Other pollutants, primarily ozone, are formed when two or more chemicals react (using energy from the sun) in the atmosphere to form a new chemical. This is a photochemical reaction.

PM10

Dust and other particulates come in a range of particle sizes. Federal and state air quality regulations reflect the fact that smaller particles are easier to inhale and can be more damaging to health. PM10 refers to dust/particulates that are 10 microns in diameter or smaller.

PM2.5

The federal government has recently added standards for smaller dust particles. PM2.5 refers to dust/particulates that are 2.5 microns in diameter or smaller.

Sacramento Metropolitan Air Quality Management District

The SMAQMD is the regulatory agency responsible for developing air quality plans, monitoring air quality, and reporting air quality data for the study area.

Sacramento Valley Air Basin

An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist with the statewide regional management of air quality issues. Sacramento County (including the City's study area) is at the southern end of the Sacramento Valley Air Basin (SVAB). The SVAB extends from Shasta County (northernmost boundary) to Sacramento County (southernmost boundary).

Sensitive Receptors

Sensitive receptors are defined to include residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses.