LIVERMORE DRAFT GENERAL PLAN AND DOWNTOWN SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORT

VOLUME I: MASTER ENVIRONMENTAL ASSESSMENT



SCH No. #2003032038

LSA

June 2003

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SCH No. #2003032038

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1. INTRODUCTION

This document is the Master Environmental Assessment (MEA) for the City of Livermore General Plan and Downtown Specific Plan update processes. The MEA represents the compilation of data and information collected on conditions that existed from January 2001 to March 2003 within and in the vicinity of the City of Livermore. The existing conditions data and information found in this MEA were presented to the General Plan Steering Committee in individual working papers in July 2002. Individual working papers were posted on the Livermore General Plan Update website (www.livermoregeneralplan.org). This document is intended to inform the General Plan and Downtown Specific Plan update processes and provide the existing setting section for the Environmental Impact Report (EIR) prepared for the General Plan and Downtown Specific Plan.

A. CITY OF LIVERMORE LOCATION

Situated in the eastern portion of the San Francisco Bay Area, the City of Livermore is located in the Tri-Valley area, consisting of the Livermore, Amador, and San Ramon valleys. The Tri-Valley area is generally bounded by the Mount Diablo Range to the north and east, the Mount Hamilton Range to the south, and the East Bay Hills to the west. The City occupies the eastern portion of Alameda County, and is approximately 45 miles from San Francisco. The incorporated area of the City is approximately 24 square miles.

The nearest neighboring City is Pleasanton, located directly to Livermore's west. The Cities of Dublin and Hayward, and the unincorporated area of Castro Valley are further west of the City. The Contra Costa County Cities of San Ramon, Danville, Walnut Creek, Concord, and Martinez are northwest of the City. The City of Tracy in San Joaquin County is located to the east. Unincorporated areas of Alameda County surround Livermore to the north, east, south, and west.

Livermore is accessible to the region via Interstate 580 (I-580), which provides an east-west connection to San Francisco, other areas in the San Francisco Bay metropolitan region, and the San Joaquin Valley to the east. Other regional access routes include State Highway 84 (SH-84), and County Road J2. Figure 1-1 shows the regional location of the City in relation to the San Francisco Bay region.

Figure 1-2 shows the Planning Area for the General Plan Update, as well as Livermore's city limit, sphere of influence, and newly adopted Urban Growth Boundary (UGB). In December 2002, the City Council voted to adopt the North Livermore Urban Growth Boundary Initiative in order to extend the existing South Livermore UGB and form a UGB around the entire City. Adoption of this initiative made the following major changes to the existing General Plan:

- Deleted the entire northside Area "A" General Plan Amendment, as well as the majority of the North Livermore General Plan Amendment, as parts of the General Plan. The lands within the City's sphere of influence in North Livermore were designated by the initiative as Large Parcel Agriculture.

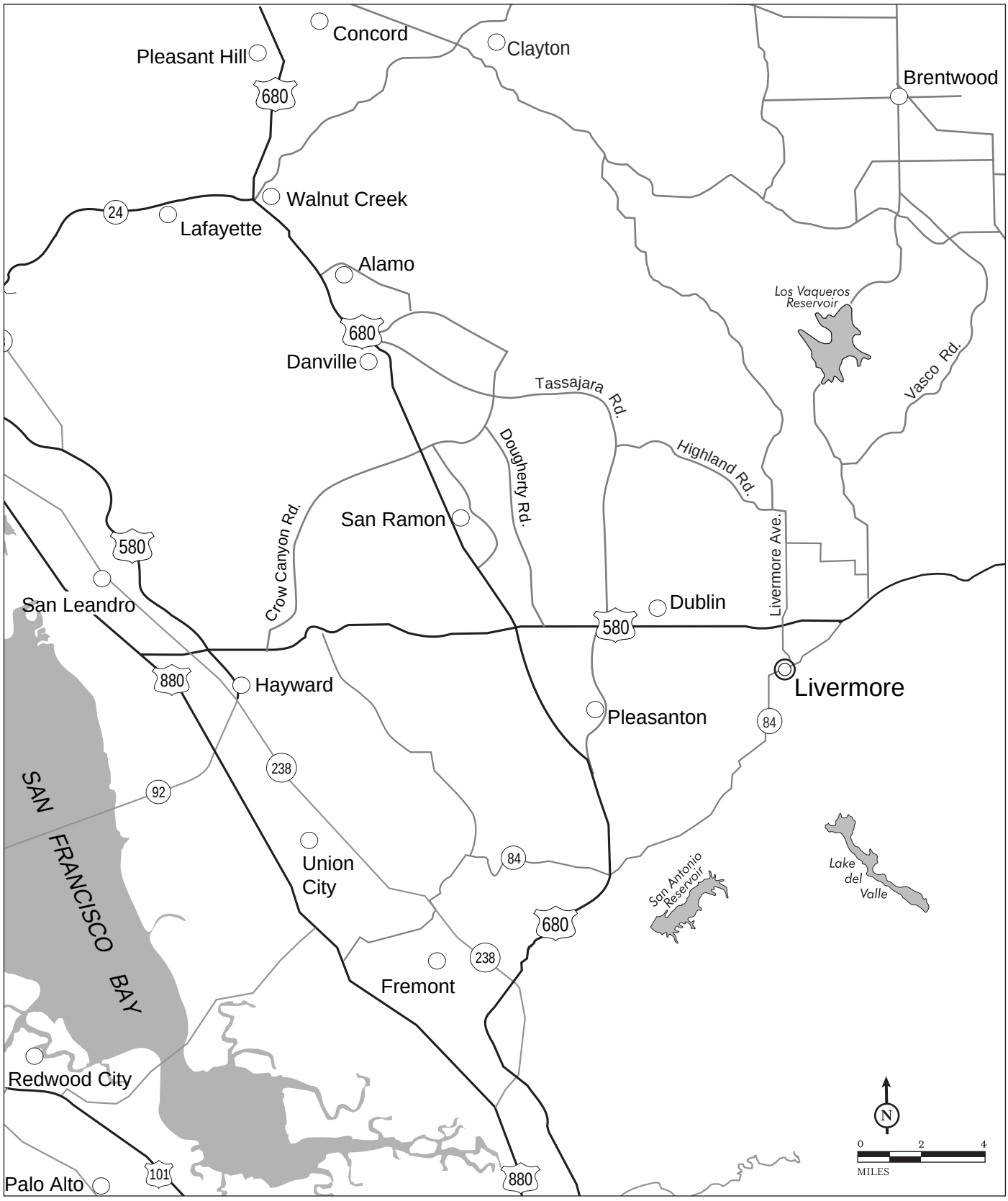

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FIGURE 1-1

Livermore General Plan Update
Master Environmental Assessment
Regional Location

SOURCE: LSA ASSOCIATES, INC., 2001.

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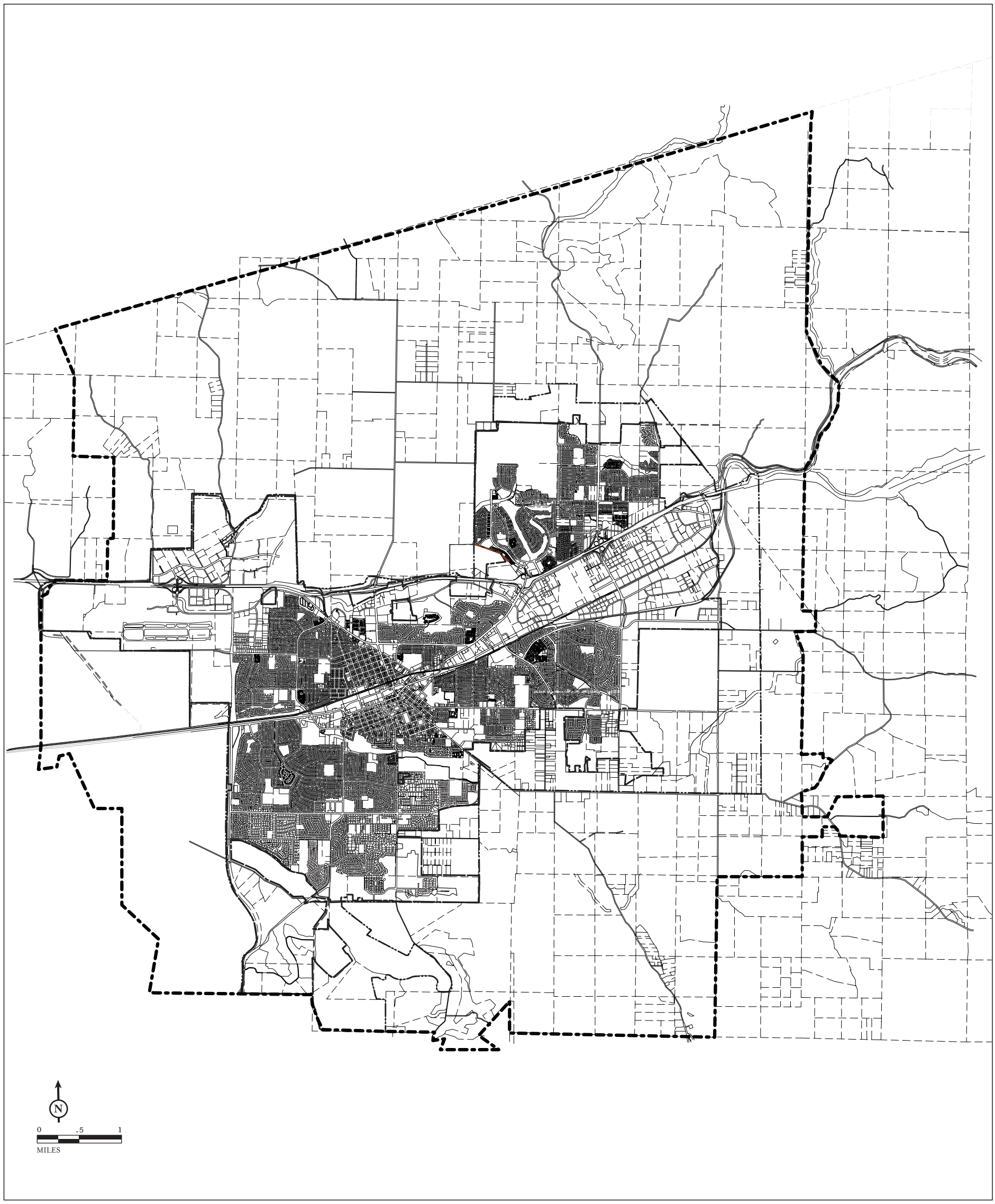

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FIGURE 1-2

Livermore General Plan Update
Master Environmental Assessment
Planning Area

PLANNING AREA BOUNDARY

CITY LIMIT LINE

SPHERE OF INFLUENCE

URBAN GROWTH BOUNDARY

SOURCE: DESIGN, COMMUNITY, AND ENVIRONMENT, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP\ILLUS\FIGURES\NEW MEA FIGURES\FIG_1-2.AI (06/09/03)

- Established a North Livermore Urban Growth Boundary (UGB) that connects to the existing South Livermore UGB to form a UGB around the entire City.
- Required that development in areas outside the North Livermore UGB be consistent with provision in the East County Area Plan (part of the Alameda County General Plan) or follow land uses and regulations established in the initiative, if ever annexed to the City.
- Placed restrictions on development affecting wetlands, riparian corridors and wildlife habitats, and on slopes.

The UGB is shown on Figure 1-2. The initiative effectively eliminated the areas outside the current City limit for consideration for future development in the General Plan.

In addition to lands within Livermore's city limit and sphere of influence, the Planning Area includes unincorporated areas of Alameda County to the north, east, south, and west of the City. All these areas are referred to collectively in this report as the "Planning Area."

B. GENERAL PLAN UPDATE AND DOWNTOWN SPECIFIC PLAN

The City of Livermore adopted its General Plan in February 1976. As required by State law, the City began the process to update the General Plan and to develop a Downtown Specific Plan in Spring 2002. The primary purpose of updating the General Plan is to provide a comprehensive, long-range declaration of goals, objectives, policies, and actions for the physical development of the City, as well as lands outside of the City's boundaries that are relevant to its long-range planning. The primary purpose of developing the Downtown Specific Plan was to create a vision for the Downtown and provide a comprehensive framework of policies and programs that address a wide range of issues associated with future development in Downtown.

A Steering Committee of 16 persons (one member was non-voting) appointed by the City Council was charged with 2003-2025 General Plan recommendations. These recommendations were based on direction from the City Council, information and recommendations presented by consultants, and comments from the public. The General Plan update process included several phases. The first phase involved a review and compilation of data and information describing the 2002 existing conditions of the Planning Area with respect to a number of environmental topics. Based on a review of existing conditions, various issues were identified and discussed. Based on the issues identified, Committee members developed and discussed various new goals and policies. Land use alternatives were formulated and evaluated, and a preferred alternative was developed and carried forward for inclusion in the General Plan. Goals and policies were formulated.

The Downtown Specific Plan public workshop process was conducted concurrent with the General Plan Steering Committee process. A total of five public workshops were held for the Specific Plan process. All of these workshops were open to the public and designed to engage the public in the formulation of land use and design concepts for the Downtown.

An EIR for both the General Plan and Downtown Specific Plan was prepared and made available for public review in mid-2003. As of May 2003, the final versions of both Plans were anticipated to be adopted and the EIR certified in late-Fall 2003.

C. REPORT ORGANIZATION

The general context and existing conditions in the Planning Area in January 2001 through May 2003 are reviewed in this document. The following 14 environmental topics are documented in separate chapters in this report, as they relate to the General Plan and Downtown Specific Plan processes:

- Land Use
- Open Space and Agricultural Resources
- Demographic, Economic and Market Conditions
- Transportation
- Infrastructure and Utilities
- Public Services
- Paleontological and Cultural Resources
- Air Quality
- Noise
- Biological Resources
- Geology, Soils, and Seismicity
- Hydrology and Water Quality
- Hazardous Materials
- Visual Resources

Information provided in this MEA serves as the existing setting section for each environmental topic reviewed in the EIR. The General Plan and Downtown Specific Plan EIR were published as separate documents. The EIR identifies potential impacts that may result from the implementation of both Plans and recommends mitigation measures necessary to reduce those impacts. The identification of impacts and mitigation measures was based in part on the findings of this MEA.

2. LAND USE

This chapter describes existing land use and land use designations in the City of Livermore and adjacent unincorporated areas as of 2002. The chapter also includes a brief discussion of existing buildout and applicable land use regulations.

A. EXISTING LAND USES

This section includes a qualitative description of existing land uses and a quantitative description of existing land uses by designation and acreage.

1. Land Use

In order to identify how land was used in the City of Livermore and the surrounding Planning Area, a field reconnaissance consisting of a windshield survey, aerial photography review, and analysis of the City's land use database was conducted in the Summer of 2002.

The existing land uses are grouped in the following general categories:

- **Single-Family Residential.** This is the predominant existing land use in the City. It refers to parcels which contain a single residence and related structures, such as garages and sheds. Some single-family residential parcels—especially those on the edges of the City limits—are referred to as rural residential because they also contain orchards, vineyards, gardens and/or structures related to raising animals. Any in-law dwellings and other units not readily discernible from the street were also included in this category. Mobile homes and townhouses are also included in this category. However, relatively few mobile homes exist in Livermore.
- **Multi-Family Residential.** Refers to parcels containing more than one residence in the form of condominiums, apartments, and group housing. Multi-family housing is found primarily on major streets such as East Avenue, Murietta Boulevard, and Portola Avenue.
- **Office.** Parcels containing structures which are used to conduct business but do not contain a retail component are included in this category. Office buildings are located primarily in the western part of the City north and south of I-580 and in the Downtown.
- **Retail.** Parcels which are used for the purposes of buying or selling goods and services, e.g., food markets, restaurants, banks, and car dealerships. Service commercial uses and lodging are also included in this category. Retail uses are concentrated along major streets including First Street, Portola Avenue, and Livermore Avenue.
- **Industrial.** Refers to parcels used for production and manufacturing, and includes warehouses, self-storage facilities, and production-oriented small businesses. Industrial uses are located primarily in the eastern side of the City near I-580. The portion of the Lawrence Livermore National Laboratory that is within the City limits also falls within this description of existing land use. Additional industrial uses are found in the western part of the City near the Airport.

- **Public.** Public uses are government-owned and operated facilities, such as public schools, post offices, the Civic Center, and fire stations.
- **Church and Other Religious Institutions.** Parcels used for the practice of religion or spirituality, including churches, synagogues, and religious residences. This category also includes cemeteries and private clubs.
- **Parks, Recreation, and Open Space.** Includes recreational spaces like Robertson Park, the Las Positas and Springtown Golf Courses, and the Rodeo Grounds. This category also includes trails and areas of protected habitat.
- **Agriculture.** Agricultural uses such as vineyards and orchards. This use also includes tasting rooms and touring facilities. Some parcels appear to be completely undeveloped or are utilized for grazing and other low-intensity agriculture.
- **Airport.** Livermore's municipal airport is located three miles northwest of Downtown. Operations at the airport include flight instruction, fuel sales, and aircraft rental, maintenance, and storage.
- **Undeveloped Land.** This designation includes land inside the urbanized area that is being held for development but is not yet developed.

The land uses described above largely exist separately from one another. Because large areas of land are occupied by a single, dominate land use, Livermore's overall land use pattern generally lacks connectivity between land uses. This pattern is typical of suburban development and is characterized by a lack of connection between complementary land uses and low intensity development.

2. Existing Land Use By Categories

Table 2-1 quantifies how much land within the City limits is used by each major land use. Figure 2-1 shows the existing land uses within the City. A graphic showing existing development in the Downtown is included as Figure 2-2. Single-family residential land uses occupy 5,123 acres, the largest use of land in the City. Multi-family residential occupies 400 acres. Parks, recreation and open space are the second major use in the City,

Table 2-1: Existing Land Use[a]

Existing Land Use	Rounded Net Acres Within City Limits
Single-family Residential	
Detached Single-Family	3,919
Couplet and Zero Lot Line	123
Townhouse	172
Mobile Home	63
Rural	846
Total	**5,123**
Multi-family Residential	
Condominium	55
Duplex, Triplex or Fourplex	83
Apartment (5 or more dwellings)	241
Group Quarters	21
Total	**400**
Office	**248**
Retail	**561**
Industrial	
Manufacturing	369
Research and Development	23
Warehousing	118
Construction Services	241
Repair Services	78
Wholesale Trade	131
Total	**960**
Public Uses	
Educational	414
Governmental Offices	41
Utility, Government Service	252
Medical	26
Total	**703**
Churches and Institutions	
Religious Uses and Private Clubs	132
Cemeteries, Crematories, Mortuaries	17
Total	**149**
Parks and Recreation	
Recreational Park (Golf Course)`	353
Private Recreational	195
Entertainment and Recreation	62
Local Park	331
Trailways and Creeks	473
Habitat Areas	282
Total	**1,696**
Agriculture	
Agricultural Uses	1,061
Agricultural Product Sales	7
Total	**1,068**
Airport	400
Undeveloped Parcels	1,785
Total	**13,123**

[a] Total acres provided are net and exclude public right-of-way.

Source: City of Livermore, 2003.

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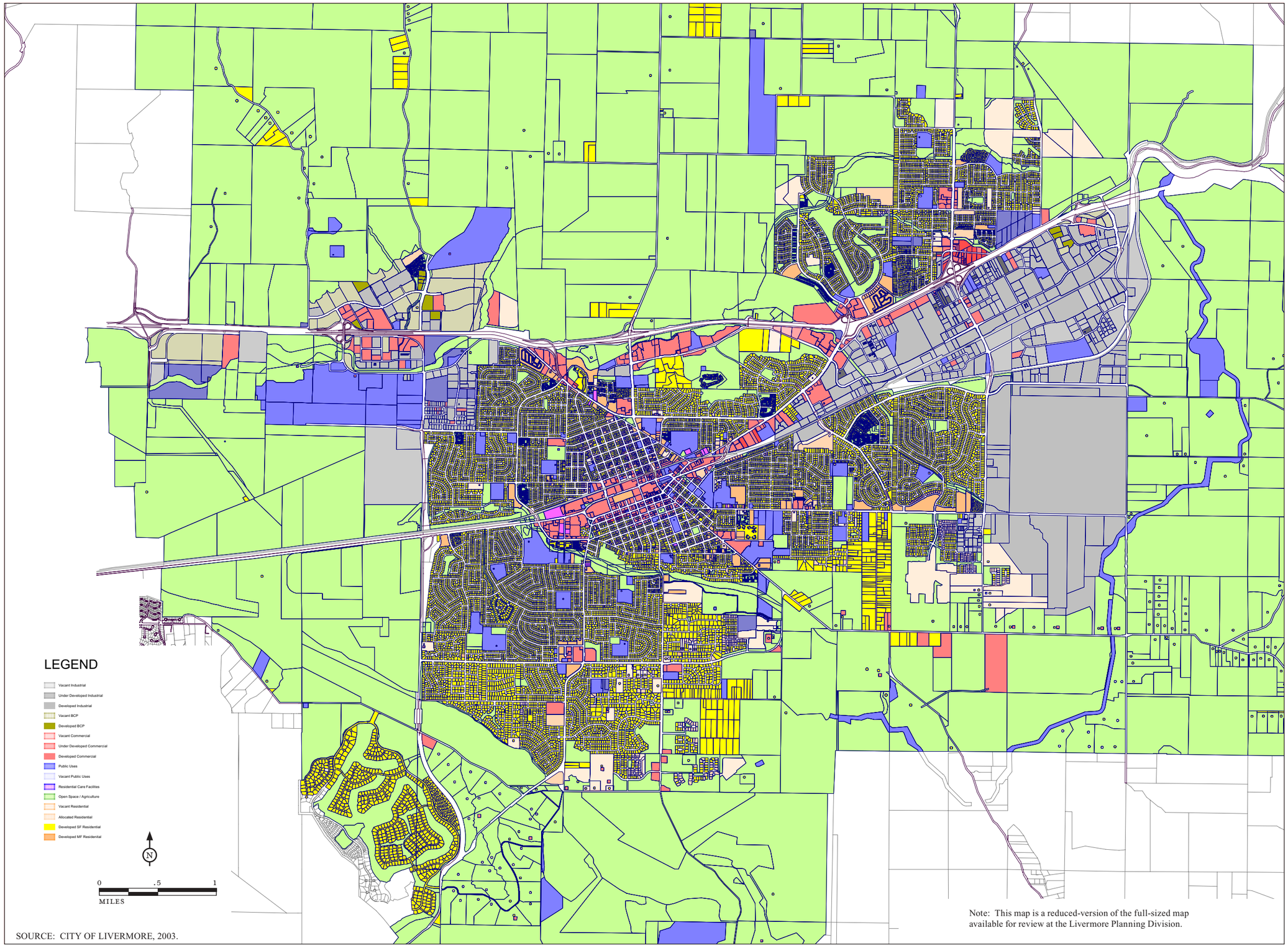

SOURCE: CITY OF LIVERMORE, 2003.

Note: This map is a reduced-version of the full-sized map available for review at the Livermore Planning Division.

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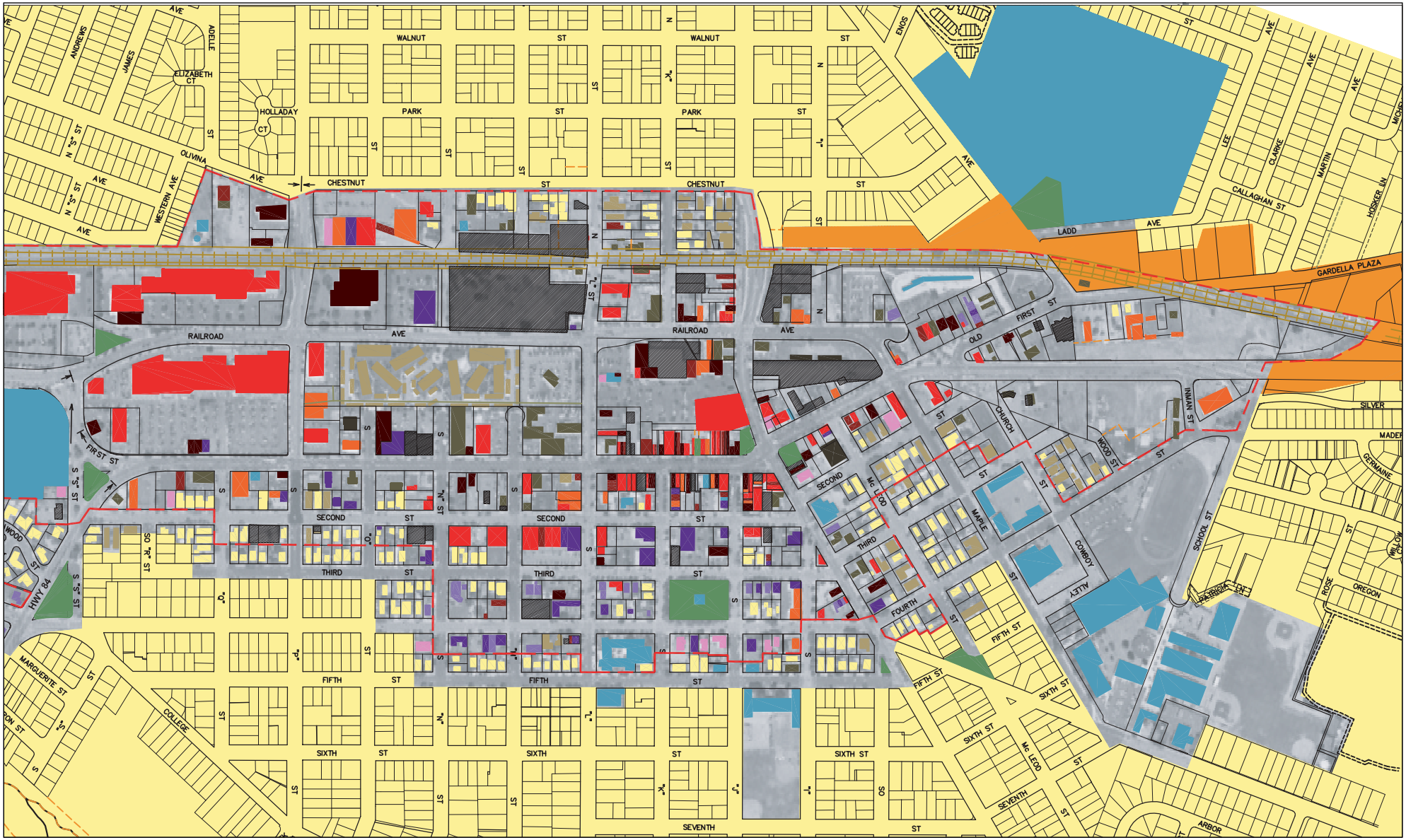
FIGURE 2-1

Livermore General Plan Update
Master Environmental Assessment
Existing Land Use Map



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C - Commercial uses (lodging, health clubs, wholesale sales and services)

R - General Retail

RS - Retail Service (business and personal services, convenience retail)

ER - Entertainment-oriented retail (restaurant, bars, nightclubs, bowling alleys, rinks)

O - Office (business and professional/research offices)

OMS - Office Medical Service (hospitals, medical/dental offices, vetinary clinics)

OFS - Office Financial Service (banks, real estate, general finance offices)

SRes - Single Family Residential

MRes - Multi-Family Residential

I - Institutional (public and quasi- public buildings, recreational, religious, or cultural uses, day/child care centers, adult education, AA/support centers)

OS - Open Space

IndS - Industrial Services (auto service, construction/ tool/equipment sales)

IndW - Industrial Warehousing and Storage

V- Vacant

Proposed Projects

Residential Neighborhood

Institutional

Commercial District

N

0 350 700

FEET

SOURCE: FREEDMAN, TUNG & BOTTOMLEY, 2002.

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FIGURE 2-2

Livermore General Plan Update

Master Environmental Assessment

Existing Downtown Development

occupying 1,696 acres, while undeveloped parcels occupy 1,785 acres, and agriculture occupies 1,068 acres. Public uses occupy 703 acres and industrial uses occupy 960 acres. Office uses occupy 248 acres, retail 561 acres and churches and other institutional uses occupy 149 acres.

3. Major Features

The following section describes some of the major features within and in the vicinity of the Planning Area.

a. Altamont Pass. The Altamont Pass is located to the northeast of the Planning Area, and the adjacent ridgelines are an area utilized for wind generated energy. The Pacific Gas and Electric company has constructed one of the largest wind farms along the Altamont Pass ridgeline. The wind farm is 54 square miles in size, and the grassland below the wind turbines is used for grazing. Since 1981, over 20 manufacturers have installed over 7,300 wind turbines over the Altamont Pass. These turbines have produced more than six billion kilowatt-hours of electricity; enough electricity to meet the energy needs of approximately 800,000 California homes for one year.

b. Brushy Peak. The Brushy Peak Regional Preserve is located in the northeastern portion of the Planning Area at the end of Laughlin Road and southeast of the Los Vaqueros Reservoir. Brushy Peak is a landmark at the juncture of three distinct geographic regions: the greater Bay Area, the Delta, and the San Joaquin Central Valley. The 2,000-acre preserve is owned and managed by the East Bay Regional Park District. Elements in the preserve landscape include steep slopes, sandstone outcrops, rolling grasslands, oak woodlands, and seasonal wetlands ranging in elevation from 1,700 feet to 550 feet. The Brushy Peak Regional Preserve provides outdoor recreation and regional trails for the public while protecting a large area of open space that contains habitat for numerous special-status animal and plant species such as the tiger salamander, red-legged frog, fairy shrimp, the kit fox, golden eagle, burrowing owl, and the Livermore tarplant. The establishment of the Brushy Peak Regional Preserve provides land for an extension of a major wildlife corridor that includes the Mt. Diablo State Park and Black Diamond Preserve. In addition, Brushy Peak Regional Preserve also provides public access to a multiple-use trail system and four potential regional trails linking the preserve to Livermore, Contra Costa Water District watershed lands, and other regional parks in Contra Costa and Alameda Counties.

c. Lawrence Livermore National Laboratory. Lawrence Livermore National Laboratory (LLNL) is located in unincorporated Alameda County, directly adjacent to the eastern City limit, and has a job base of approximately 8,100 persons. LLNL is a U.S. Department of Energy national laboratory operated by the University of California. LLNL was founded in September 1952 as the second nuclear weapons design laboratory to promote innovation in the design of the nation's nuclear stockpile through creative science and engineering. LLNL has become a premier scientific center for the study of energy, biomedicine, and environmental science.

d. South Livermore Valley. The South Livermore Valley is an important agricultural and wine producing region of approximately 14,000 acres with scenic and historic resources. The *South Livermore Valley Area Plan*, part of the Alameda County General Plan, was prepared in 1993 by the County to preserve remaining vineyards and wineries, create incentives for investment in agriculture, establish a land trust, and coordinate policies of Alameda County, Livermore, and Pleasanton. This plan establishes goals, objectives and policies to guide development within an agricultural setting.

e. Vasco Road Landfill. The Vasco Road Sanitary Landfill is located in the northeastern portion of the Planning Area adjacent to North Vasco Road. The landfill encompasses 435 acres of land with 246 acres utilized for solid waste disposal in 2002. Vasco Road Sanitary Landfill is designated as a Class III disposal facility that permits the disposal of nonhazardous industrial waste, including non-friable asbestos, contaminated soil, municipal wastewater treatment sludge, construction and demolition wastes, empty containers and other industrial and special wastes. Municipal solid waste is also accepted for disposal at the facility. Wastes are directly landfilled on-site, in bulk or in drums (with lids). Separate disposal areas are designated for specific types of wastes, such as asbestos and auto-shredder waste. Some industrial waste is suitable for use as daily cover. The landfill is open to the public and provides residents living in the East Bay with a centrally located solid waste disposal facility.

B. APPLICABLE LAND USE REGULATIONS

The current General Plan for the City of Livermore was adopted in 1976. The Land Use Element was adopted at that time and has been extensively amended since then to reflect land use changes. The Land Use Element "analyzes the extent and distribution of every land use category involved in the community's future and relates the plans and policies of each of the other General Plan Elements to many interacting land uses."

Land use regulations that apply to the southern area of the City are provided in the *South Livermore Valley Specific Plan* (Specific Plan). Land uses in the Downtown are specified in the *Redevelopment Strategy and Urban Design Plan* (Urban Design Plan) for the Downtown, last amended in September 1998. In general, land uses as observed in the field are consistent with existing General Plan designations. The current General Plan does not include a specific designation that allows for complementary mixed uses on a parcel.

1. South Livermore Valley Specific Plan

The Specific Plan guides land use within a 1,891-acre area in the southern portion of the City. The Specific Plan was adopted on November 17, 1997, and has periodically been amended since that time to make minor adjustments. The purpose of the Specific Plan is to preserve natural and agricultural resources in the South Livermore Valley area while allowing for development that has a minimal impact on these resources. To achieve this goal, the Specific Plan establishes a variety of open space designations that would preserve approximately two-thirds of the area as open space. The development vision of the Specific Plan is one where vineyards and existing natural features are preserved in a way that limits future urban expansion into the South Livermore Valley, and maintains and enhances the area's rural character.

2. Livermore Redevelopment Strategy and Urban Design Plan

The Urban Design Plan was initially prepared in June 1984 for the City's Redevelopment Agency and has been amended a few times since adoption. The Urban Design Plan, which is part of the City's General Plan, is a land use policy document that guides development, redevelopment, and urban design within the Downtown. The Downtown Redevelopment Area was adopted in 1982 and amended in 1992 as part of the Urban Design Plan.

3. Livermore Planning and Zoning Code

The broad purpose of the City's zoning code is to implement the policies of the City's General Plan. The zoning code establishes land use districts that regulate the location, size, bulk, and uses of land and buildings, requires permits for certain buildings and land uses, and imposes penalties for the violation of any provisions set by the zoning code.

4. General Land Use Designations

The following land use designations are included in the existing General Plan:

a. Residential. Six levels of residential development are shown on the General Plan Land Use map in order to accommodate different densities of housing.

- **Rural Residential (RR):** This designation was intended as a transition area and to establish an urban limit line between more developed areas and agricultural and open areas surrounding the community. The designation encourages large lot development of a rural character. Standard density is one dwelling unit per acre (du/acre) to 1 du/5 acres. Minimum lot size is one acre.
- **Urban Low Residential (UL):** Designates areas in which low-density residential development is the most appropriate use, due to existing amenities that should be preserved, or to environmental constraints on development. There are two sub-classifications: Urban Low Residential–1 which allows a density of 1 to 1.5 du/acre, and Urban Low Residential–2, which allows 1.5 to 2.0 du/acre. This density may be achieved by developing on large lots, or by developing on smaller lots and providing compensable open space through density clustering.
- **Urban Low Medium Residential (ULM) and Urban Medium Residential (UM):** These are the two most commonly used designations for residential areas. Both are intended as transition designations from low-density uses on the edges of the City to higher-density uses in the center of the community. Permitted Densities are from 2.0 to 3.0 du/acre for Urban Low Medium Residential and 3.0 to 4.5 du/acre for Urban Medium Residential.
- **Urban Medium High Residential (UMH):** This designation is intended for higher density development, particularly "cluster" residential development which incorporates urban open spaces as part of the overall site design. Standard densities are 4.5 to 6.0 du/acre. This designation is applied to areas where such densities currently exist, as well as to areas in which the potential for such densities exists.
- **Urban High Residential (UH):** This designation provides a range of higher density residential and is divided into four density categories:
  - Category #1 has a density of 6 to 8 du/acre.
  - Category #2 has a density of 8 to 14 du/acre.
  - Category #3 has a density of 14 to 18 du/acre.
  - Category #4 has a density of 18 to 22 du/acre.

  Categories #1 and 2 are intended for use in outlying areas within the City. Categories #3 and #4 are intended for areas close to major roads and existing services and amenities which can support higher density residential development. Categories #3 and #4 are also intended to provide affordable housing opportunities for all income groups in the community.

- **High Density Village (HDV):** The "village" concept is intended to encourage a compact, transit- and pedestrian-oriented residential neighborhood with a mix of commercial, civic and open space uses at the core. Appropriate locations for the HDV designation are near the potential BART corridor and within easy access to I-580. HDV permits an average maximum density of 18 du/acre. Typical uses are apartments and townhomes.

b. Commercial. There are six basic commercial land use designations listed in the General Plan:

- **Central Commercial (CC)**: This designation applies to the Central Business District. It is implemented through the Urban Design Plan, which divides this area into distinct subareas permitting a variety of retail, service, professional office, financial uses, and cultural and public facilities typically found in a Downtown. The Central Commercial designation is also intended as the office and financial center of the community.
- **Service Commercial (SC)**: This designation is proposed for commercial uses not feasible in the Central Commercial area due to their need for larger areas of land and greater accessibility to the community. Typical uses foreseen for this category include auto sales and service, nurseries, home maintenance and improvement centers and wholesale establishments.
- **Highway Commercial (HC)**: The Highway Commercial designation is intended solely for uses serving and convenient to travelers along I-580. For this reason, the designation is limited to freeway interchange locations only. Uses appropriate in this designation include hotels and motels, restaurants, and service stations.
- **Neighborhood Commercial (NC)**: Contain those retail and personal service activities which meet convenience needs for people relatively close to their homes. Appropriate uses include food, liquor, drug stores, beauty salons, laundromats, and day care centers. Neighborhood commercial uses are spread throughout the Plan diagram.
- **Community-Serving General Commercial (CSGC)**: CSGC is intended to allow a mix or combination of high quality retail, office and service uses within a retail shopping environment. Appropriate locations for CSGC are outside the Central Business District (CBD) along major streets and near freeway interchanges. To ensure compatibility with surrounding commercial and an appropriate mix of uses, CSGC is to be implemented through a Planned Development Zoning District.
- **Office Commercial (OC)**: Intended for professional office uses—such as doctors, attorneys insurance and similar uses—located near residential and serving the community but with minimum adverse impact on surrounding residential neighborhoods. This designation precludes retail and commercial service uses.
- **Central/Core Commercial (CORC)**: A retail commercial center planned as the focus of the High Density Village designation. Appropriate uses in this designation include retail shops, restaurants, village greens and service and civic uses. The mix of uses is to be determined by the purpose and location of the designation, however, retail uses are to be located adjacent to or very near public transit.

c. Industrial. The following industrial designations are included in the General Plan:

- **Low Intensity Industrial (LII)**: Identifies areas for modern professional and administrative facilities, manufacturing operations, warehousing and distribution facilities, and research and development facilities, which are not detrimental to adjacent properties or surrounding uses.

- **High Intensity Industrial (HII)** : Provides areas for industrial and manufacturing uses that store and/or process raw materials into semi-finished or finished products. Areas designated for High Intensity Industrial uses are concentrated between Mines Road and Greenville Road.
- **Business and Commercial Park (BCP)**: Identifies those areas along major streets and near freeway interchanges where a mix of commercial, retail, office and light industrial uses may be appropriate. Encourages the development of employment-generating uses adjacent to destination-oriented and limited retail commercial uses. Designation requires 20-acre minimum and is implemented through either the Planned Development or Highway Service Commercial Zoning Districts.

d. Open Space. The following open space land use designations are included in the General Plan:

- **Viticulture (VIT)**: 100-acre minimum site. This designation is intended to protect existing vineyards from urban encroachment. It also reflects the community's interest in encouraging expansion of viticulture.
- **Limited Agriculture (LDAG)**: 20-acre minimum site.
- **General Agriculture (GNAG)**: 100-acre minimum site. Includes lands with Class I and II soils, as well as lands, which qualify for rating as Class I and Class II in the Soil Conservation Service's land use capability classification. This designation is also given to most land, which qualifies for rating 80 to 100 in the Storie Index Rating, as well as to non-prime agricultural lands that are now in agricultural use other than vineyards.
- **Range and Grassland**: 100-acre minimum site.
- **Parks, Trailways, Recreation, Corridor and Protected Areas, Creeks and Drainage Ways (OSP).** This is a general open space designation and is applied to areas maintained as permanent or semi-permanent open space. Areas with valuable natural or scenic resources, or which are unsuitable for development due to environmental sensitivities or hazards have this designation. OSP includes parks, trailways, recreation corridors, and protected areas, such as creeks and arroyos.
- **Sand and Gravel Resources Overlay:** The sand and gravel operations on the west side of the City have been identified as an overlay designation to minimize potential conflicts with other uses.
- **Hillside Conservation (HLCN):** Intended to limit development on environmentally-sensitive lands and protect the viability of small-scale agriculture and grazing practices. Unconstrained sites with slopes below 20 percent gradient are permitted up to 1 du/20 acres. Sites with steeper slopes and/or other environmental constraints are permitted 1 du/100 acres. No development is permitted on the steepest slopes, however, these areas can receive a density credit of 1 du/100 acres.

e. Community Facilities. Community facility designations identify areas for specific public uses, as follows:

- CF – Elementary School
- CF – Intermediate School
- CF – High School
- CF – Post Office
- CF – Civic Center
- CF – Cemetery
- CF – Airport
- CF – Las Positas College

- CF – Fire Station
- CF – Hospital
- CF – Federal Communications Center
- CF – Government Services

5. South Livermore Valley Land Use Designations

The South Livermore Valley Specific Plan, adopted in November 1997, was developed utilizing General Plan policies and designations as a regulatory framework. The following General Plan designations are applicable to the South Livermore Valley planning area.

a. Agriculture/Viticulture (AGVT). This is the overarching designation for the South Livermore Valley. Areas that have been designated AGVT are intended to preserve and promote agriculture and viticulture uses in locations suitable for cultivated agriculture, and to protect sensitive or unique environmental and land characteristics, including the area's rural character. The agriculture/viticulture density is 1 du/100 acres (100-acre site minimum). A Rural Density Program and two overlay districts (Conditional Urban and Transferred Development) were established to provide alternatives to implement the AGVT policies for South Livermore. All three alternatives are briefly discussed below:

- **Rural Density Program –** This program allows a density bonus of up to four additional home sites per 100 acres (1 du/20 acres maximum average density), as long as specific criteria established in the General Plan are followed.
- **Conditional Urban Overlay District –** This overlay identifies seven geographical subareas that permit urban development utilizing four AGVT sub-designations, identified below. Each subarea utilizes two or more of these sub-designations and permitted densities are described fir each subarea. Identification of acceptable urban densities was based on minimizing and mitigating impacts of such development on the rural nature of the area through the preservation of agricultural, environmental, and scenic resources in the South Valley. The AGVT sub-designations are as follows:
  - Residential Development Area (RDA) – RDA consists primarily of residential development and those ancillary uses that support it, such as schools, parks, and trails.
  - Vineyard Commercial (VC) – VC permits limited development of wine country commercial uses that directly support the South Livermore Valley wine region.
  - Agriculture Preserve (AP) – AP allows intensive agriculture, particularly viticulture. In order to mitigate the loss of agricultural land to development, these areas will be placed under permanent conservation easements.
  - Regional Open Space (ROS) – ROS areas are set aside for the protection of environmental, visual, and open space resources. In order to mitigate the impacts of urban development, these areas will be placed under permanent open space easements and dedicated to and accepted by the Livermore Area Regional Park District as regional parkland.

b. Transferred Development Overlay District. This overlay permits an urban density bonus of up to 350 units in areas determined suitable for development at urban densities provided the impacts of such development are mitigated through preservation of agricultural, regional parkland, environmental, and scenic resources elsewhere in the City. This overlay is applied to the area south of Alden Lane to facilitate transfer of dwelling units from Subarea 7 to preserve land for Sycamore Grove Regional Park.

6. Lands Designated within the City

Table 2-2 lists the General Plan land use designations and acreages applicable within the City limits. Figure 2-3 shows the General Plan land use designations.

C. URBAN GROWTH BOUNDARY

Livermore has an Urban Growth Boundary (UGB) that extends around the entire City. On December 16, 2002, the City Council voted to adopt the North Livermore Urban Growth Boundary Initiative in order to connect to the existing South Livermore UGB to form a complete UGB around the entire City. Adoption of this initiative made the following major changes to the existing General Plan:

- Deleted the northside Area "A" General Plan Amendment in its entirety, as well as the majority of the North Livermore General Plan Amendment, as part of the General Plan. The lands within the City's Sphere of Influence in North Livermore were designated by the initiative as Large Parcel Agriculture.
- Established a North Livermore UGB that connects to the existing South Livermore UGB to form a UGB around the entire City.
- Required that development in areas outside the North Livermore UGB be consistent with provisions in the *East County Area Plan* (part of Alameda County's General Plan) or follow land uses and regulations established in the initiative, if ever annexed to the City.
- Placed restrictions on development affecting wetlands, riparian corridors, and wildlife habitats, and on slopes.

Under Measure D (discussed in more detail in Section E, Alameda County Land Use Regulations), a County urban growth boundary that generally coincides with the City's UGB was established. New urban development in North Livermore will generally be diverted to urban areas within UGB's.

Table 2-2: General Plan Designations[a]

General Land Use Designations	Rounded Net Acres Within City Limits
Residential	
Rural Residential	293
Urban Low Residential – 1	73
Urban Low Residential – 2	934
Urban Low Medium Residential	1,123
Urban Medium Residential	1,823
Urban Medium High	754
Urban High Residential – 1	158
Urban High Residential – 2	308
Urban High Residential – 3	58
Urban High Residential – 4	35
High Density Village	26
South Valley Subarea 1	121
South Valley Subarea 2	210
South Valley Subarea 3	89
South Valley Subarea 4	284
South Valley Subarea 5	131
South Valley Subarea 7	124
Commercial	
Neighborhood Commercial	66
Community Serving General Commercial	139
Office Commercial	16
Downtown Urban Design Plan (UDP)	278
Service Commercial	165
Highway Commercial	80
Core Commercial	17
Industrial	
High Intensity Industrial	1,077
Low Intensity Industrial	946
Business and Commercial Park	660
Community Facilities	
Elementary School	133
Intermediate School	69
High School	65
Fire Station	3
Civic Center	32
Government Services	13
Cemetery	25
Airport	400
Las Positas College	131
Agriculture and Open Space	
Limited Agriculture	241
Agriculture/Viticulture	670
Parks, Trailways, Recreation, Corridor and Protected Areas, Creeks and Drainage Ways	1,135
Greenbelt/Buffer	15
Hillside Conservation	203
Total	**13,123**

[a] This table lists only those land use designations that occur inside the City limits. Total acres included are net and exclude public right-of-ways.

Source: City of Livermore, 2003.

D. EXISTING DEVELOPMENT AND BUILDOUT POTENTIAL

This section describes the existing amounts of development for commercial, industrial, and residential land uses in the City, as of 2002, and provides the remaining potential for buildout within the City limits under the 1976 General Plan.

1. Commercial and Industrial Land

Table 2-3 provides the City's commercial and industrial square footages, as they existed in 2002. Industrial uses have the highest square footage. Retail commercial has the second highest square footage, most likely due to regional retail establishments.

As shown in Table 2-4, 1,100 acres of commercial and industrial land within the City limits were vacant in 2002. Assuming a typical base floor area ratio of .35, an additional 16.7 million square feet, or 80 percent of the existing commercial and industrial space, could be accommodated. Higher densities than those provided would result from more intensive Downtown and/or office development. In 2002, there were 41,500 jobs within the City of Livermore.

Table 2-3: Existing Commercial and Industrial Square Footage[a]

Type of Use	Square Footage (Within City Limits)
Commercial	237,000
Office	1,102,000
Retail	3,033,000
Service	1,196,000
Eating and Drinking	383,000
Lodging	482,000
Industrial	3,109,000
Manufacturing	3,021,000
Research, Development, and Testing	132,000
Warehousing and Transportation	1,760,000
Office	896,000
Construction Services	1,308,000
Repair Services	986,000
Wholesale Trade	2,441,000
Total	**20,086,000**

[a] Square footages in this table do not include uses outside of the City limits such as the Lawrence Livermore National Laboratory or the Sandia Laboratory.

Source: Design, Community & Environment, 2002.

2. Dwelling Units

In 2002, there were 28,300 housing units in the City. Under 1976 General Plan designations, the City could add a maximum of approximately 3,638 units within the City limits, for a total of 31,930 housing units.[1]

Table 2-4: Vacant Commercial and Industrial Land

General Plan Designation	Vacant Properties with Approved Projects (Acres)	Vacant Properties with Projects in Review (Acres)	Vacant Properties (Acres)	Total (Acres)
Industrial	54	196	371	620
Commercial	74	9	109	193
Business Commercial Park	91	28	148	267
Urban Design Plan	2	5	14	20
Total	**221**	**238**	**642**	**1,100**

Source: Design, Community & Environment, 2002.

E. ALAMEDA COUNTY LAND USE REGULATIONS

The County of Alameda General Plan applies to land outside of the Livermore city limits. In November 2000, the voters of Alameda County passed Measure D, which amended the County's *East County Area Plan*. Most important for Livermore, Measure D directed the County to withdraw from the North Livermore Joint Planning Agreement and remove urban land uses and Urban Reserve Areas from unincorporated areas of Alameda County.

[1] DC&E and BAE determined the projected amount of housing that could be developed under the existing General Plan through an analysis conducted in the spring of 2003.

LSA

RESIDENTIAL

- RR — RURAL RESIDENTIAL 1 to 5 Acre Site
- UL-# — URBAN LOW RESIDENTIAL #1 = 1.5 d.u./ac, #2 = 2.0 d.u./ac
- ULM — URBAN LOW MEDIUM RESIDENTIAL 3.0 d.u./ac Average Density
- UM — URBAN MEDIUM RESIDENTIAL 4.5 d.u./ac Average Density
- UMH — URBAN MEDIUM HIGH RESIDENTIAL 6.0 d.u./ac Average Density
- (M) — URBAN MEDIUM HIGH RESIDENTIAL 6.0 d.u./ac Average Density
- UH-# — URBAN HIGH RESIDENTIAL #1=6 - 8 d.u./ac, #2=8 - 14 d.u./ac, #3=14 - 18 d.u./ac, #4=18 - 22 d.u./ac
- VDSF — VERY LOW DENSITY SINGLE FAMILY 4 d.u./ac
- LDSF — LOW DENSITY SINGLE FAMILY 6 d.u./ac
- HDV — HIGH DENSITY VILLAGE 18 d.u./ac

COMMERCIAL

- NC — NEIGHBORHOOD COMMERCIAL
- SC — SERVICE COMMERCIAL
- HC — HIGHWAY COMMERCIAL
- OC — OFFICE COMMERCIAL
- CSGC — COMMUNITY SERVING GENERAL COMMERCIAL
- UDP # — See Downtown Urban Design Plan
- CORC — CORE COMMERCIAL
- SUPC — SUPPORT COMMERCIAL

INDUSTRIAL

- BCP — BUSINESS AND COMMERCIAL PARK
- LII — LOW INTENSITY INDUSTRIAL
- HII — HIGH INTENSITY INDUSTRIAL

OPEN SPACE

- OSP — PARKS, TRAIL WAYS, RECREATION CORRIDORS, AND PROTECTED AREAS
- SPK — SPORTS PARK
- LDAG — LIMITED AGRICULTURE 20 Acre Minimum Site
- VIT — VITICULTURE 100 Acre Minimum Site
- GNAG — GENERAL AGRICULTURE 100 Acre Minimum Site
- S & G — SAND AND GRAVEL RESOURCES
- AGVT — AGRICULTURE / VITICULTURE 1 - 5 d.u./ 100 ac.
- HLCN — HILLSIDE CONSERVATION
- (blank) — RANGE AND GRASSLAND 100 Acre Minimum Site
- LPA — LARGE PARCEL AGRICULTURE
- RMG — RESOURCE MANAGEMENT
- WML — WATER MANAGEMENT LANDS

COMMUNITY FACILITIES

- CF-E — ELEMENTARY SCHOOL K -6
- CF-I — INTERMEDIATE SCHOOL 7 - 8
- CF-H — HIGH SCHOOL 9 - 12
- CF-JC — COMMUNITY COLLEGE
- PO — POST OFFICE
- FS — FIRE STATION
- HOSP — HOSPITAL
- CF-CC — CIVIC CENTER
- CF-CE — CEMETERY
- CF — GOVERMENT SERVICES

CIRCULATION

- FREEWAY
- HIGHWAY
- MAJOR STREET
- COLLECTOR STREET
- RURAL COLLECTOR STREET
- RURAL ENTRY ROAD
- INTRACOUNTY ROUTE
- SPECIAL RURAL ROUTE
- RAILROAD
- BART
- LIGHT RAIL

- FREEWAY INTERCHANGE
- GRADE SEPARATED INTERSECTION
- BART STATION
- LIGHT RAIL STATION
- INTERMODAL TRANSPORTATION FACILITY

SOUTH LIVERMORE VALLEY SPECIFIC PLAN

- SV-# — SOUTH LIVERMORE VALLEY SPECIFIC PLAN (# = Subarea Number)
- (SV-# TDR) — SLV Transferrable Development Rights (# = Subarea Number)

SLVSP Conditional Urban Overlay Districts

- SVT — WINE COUNTRY RESIDENTIAL
- SVC — WINE COUNTRY COMMERCIAL
- SVS — SCHOOL
- SVp — PARK
- SVOS — OPEN SPACE
- SVA — AGRICULTURE

0 2000 4000
FEET

NOTE: A FULL SIZE VERSION OF THIS MAP IS AVAILABLE AT THE CITY PLANNING OFFICES.

SOURCE: CITY OF LIVERMORE, 2003.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_2-3.AI (05/02/03)

FIGURE 2-3

Livermore General Plan Update
Master Environmental Assessment
General Plan Land Use Designations

With the passage of Measure D, the remaining designations in the unincorporated areas outside of Livermore are:

- **Large Parcel Agriculture:** Allows for a minimum parcel size of 100 acres. Residential buildings are limited to 12,000 square feet including accessory buildings. Non-residential buildings are allowed a maximum FAR of .01, but not less than 20,000 square feet.
- **Resource Management:** Allows for a minimum parcel size of 100 acres and a maximum building intensity of .01. Residential buildings are limited to 12,000 square feet in area.
- **Water Management Lands:** Residential and residential accessory buildings are limited to 12,000 square feet, located on a contiguous development envelope not to exceed two acres.
- **Rural Density Residential:** Minimum parcel size is five acres and no more than one residential unit is allowed on the parcel, except for allowable secondary units. Residential buildings including accessory buildings are capped at 12,000 square feet.

Measure D also created the following series of new requirements that must be met before any new development parcels are created in the North Livermore Intensive Agriculture Zone:

- The County Board of Supervisors must find that an adequate, sustainable and safe supply of water exists for both agriculture and other new uses.
- Parcel owners must agree to transfer to a land trust a land conservation easement that bars development not included in the initiative.
- Agricultural land must be cultivated for a minimum time period.
- The County is to establish a trail system in intensive agricultural zones for public education purposes.
- Commercial uses are to be limited to agriculture-enhancing uses.
- Irrigation uses in the area will not diminish the quality of the drinking water supply.
- Customary development fees must be paid.

These conditions, combined with the agricultural and resource management designations applied in North Livermore, effectively limit the potential for new residential uses in North Livermore under County jurisdiction. For the South Livermore Valley Vineyard Area, Measure D requires that expansion of residential uses occur within the South Livermore Urban Growth Boundary.

3. OPEN SPACE AND AGRICULTURAL RESOURCES

Open space, as defined by the City's 1976 General Plan, other City planning documents, and the State General Plan Guidelines, includes land used for the preservation of natural resources, the managed production of resources, outdoor recreation, and/or to preserve public health and safety. Based on this definition, this chapter describes the open space resources within and in the vicinity of the City of Livermore, as well as open space programs and initiatives, as they were known in 2002.

A. OPEN SPACE USED FOR THE PRESERVATION OF NATURAL RESOURCES

Open space for the preservation of natural resources includes natural areas, wildlife habitats, and areas protected for their visual resources. Much of the open space used for the preservation of natural resources is found north or south of the City of Livermore. Because Livermore is largely urbanized, the majority of natural, open space areas within the City are those adjacent to creeks and arroyos. Existing open space serving as habitat within the Livermore city limits amounts to approximately 282 acres.[1]

Natural area open spaces in the vicinity of Livermore include Lake Del Valle and Cedar Mountain in the South Valley region, and Corral Hollow east of the City. Open spaces drainages areas include: Altamont Creek, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, Arroyo Del Valle, Collier Canyon Creek, Corral Hollow Creek, Cottonwood Creek, Dry Creek, and other creeks in the Livermore Valley. Watershed areas, such as Lake Del Valle, San Antonio Reservoir, and Las Vaqueros, are also designated as permanently protected open space. In addition to these areas, Brushy Peak and Sycamore Grove are designated as open space in the *Alameda County East County Area Plan*, as are regional parks owned and managed by the Livermore Area Recreation and Park District.

Some hills in the North Livermore area and specific areas along I-580 are designated as open space in the City's Land Use Element to ensure that the scenic qualities of the I-580 corridor are maintained.

B. OPEN SPACE USED FOR THE MANAGED PRODUCTION OF RESOURCES

Open space used for the managed production of resources within and in the vicinity of Livermore includes agricultural and sand and gravel resources of Statewide importance.

[1] City of Livermore, 2003.

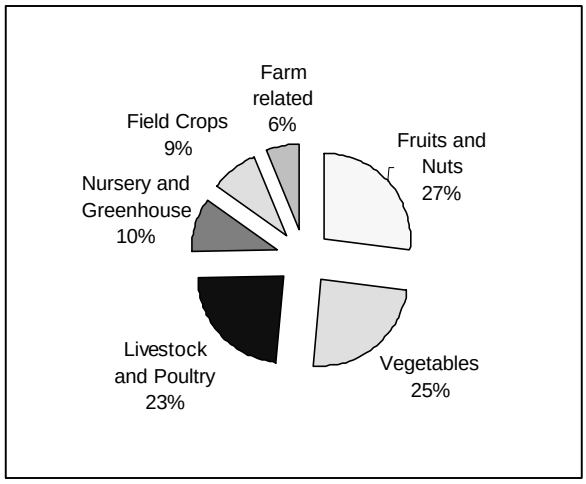
1. Agricultural Resources

The State's agricultural economy and farmland categories, Alameda County's agricultural resources, and the City of Livermore's agricultural resources are summarized below.

a. The State's Agricultural Economy.

California is home to the largest food and agricultural economy in the United States and leads the country in agricultural production. The 87,500 farms in California constitute about four percent of the nation's total, but accounted for 13 percent of the national gross cash receipts from farming. California's agricultural production and gross cash income in 2000 was $27.2 billion. Figure 3-1 indicates the total gross cash income broken down by agricultural products. Grapes (raisin, table, and wine) fall under the fruits and nuts category.

Figure 3-1: California's Gross Cash Income by Agricultural Product, 2000



Source: California Department of Food and Agriculture, 2001. *California Department of Food and Agriculture Resource Directory 2001*. Resource Directory 2001.

Table 3-1: Alameda County Leading Commodities by Value of Production, 2000

Rank	Commodity	Production Value ($ Million)
1	Nursery, woody ornamentals	8.7
2	Grapes, wine	6.5
3	Cattle and calves	6.3
4	Nursery products	3.7
5	Pasture and range	2.9
6	Flowers, cut	1.6
7	Vegetables	1.0
8	Hay, other	0.5
9	Field crops	0.5
10	Hay, alfalfa	0.2

Source: California Department of Finance, 2002. *Economic Research Statistics for Alameda County*.

California accounts for the largest production of a large number of specialty crops in the nation. The State's top 20 crop and livestock commodities account for 72 percent of the State's gross farm income. California's two leading commodities in cash receipts are milk, at $3.70 billion annually, and grapes, at $2.84 billion annually. California's grape receipts account for 91 percent of the nation's grape receipts.[2]

Of California's 58 counties, Alameda County ranked 44th with respect to the value of its agricultural production in 2000.[3] Alameda County's agricultural production in 2000 was valued at $31.9 million, approximately 0.1 percent of the State's total.[4] Table 3-1 shows Alameda County's leading commodities by value of production in 2000.

[2] California Department of Food and Agriculture, 2001. *California Department of Food and Agriculture Resource Directory 2001*.

[3] California Agricultural Statistics Service, 2000. *Summary of County Agricultural Commissioners' Reports, 2000.*

[4] California Department of Finance, 2002. *Economic Research Statistics for Alameda County*. February.

b. State Farmland Categories. Farmland is classified and mapped by the State Department of Conservation, Division of Land Resource Protection, into six categories:

- Prime Farmland is land with the best combination of physical and chemical features to sustain long-term production of agricultural crops. It has the soil quality, growing season, and moisture supply needed to produce sustained yields of crops when treated and managed according to current farming methods.
- Farmland of Statewide Importance is similar to Prime Farmland, but either has greater slopes or less ability to store moisture.
- Unique Farmland consists of lesser quality soils that are used for the production of the State's leading agricultural crops.
- Farmland of Local Importance is land that has been determined to be important to the local economy, as defined by each county's local advisory committee and adopted by its board of supervisors.
- Grazing Land is land on which the existing vegetation is suitable for the grazing of livestock.
- Urban and Built Up Land is land that is occupied by structures with a building density of at least one unit per acre.

These categories are based on qualifying soil types, as determined by the Natural Resources Conservation Service (U.S. Department of Agriculture), as well as current land use. Table 3-2 shows the soil candidate listing for Prime Farmland and Farmland of Statewide Importance in Alameda County. The classification can change over time as factors affecting the property, such as the availability of water supply, land use changes, and erosion, occur.

The Natural Resources Conservation Service maps soils utilizing the *Land Capability Classification System* based solely on soils characteristics, such as chemistry, acidity, depth, drainage, susceptibility to erosion, permeability, and texture. This system recognizes eight classes of soils (I to VIII). Only Class I and II soils are considered to be prime.

Table 3-2: Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance in Alameda County

Symbol	Name
Prime Farmland	
Cc	Clear Lake clay, 0 to 3 percent slopes
CdA	Clear Lake clay, drained, 0 to 3 percent slopes
CdB	Clear Lake clay, drained, 3 to 7 percent slopes
DaA	Danville silty clay loam, 0 to 3 percent slopes
Lg	Livermore gravelly loam
PgA	Pleasanton gravelly loam, 0 to 3 percent slopes
Rc	Rincon loam, 0 to 3 percent slopes
RdA	Rincon clay loam, 0 to 3 percent slopes
RdB	Rincon clay loam, 3 to 7 percent slopes
SI	Sunnyvale clay loam
Sm	Sunnyvale clay loam over clay
Sn	Sunnyvale clay loam, drained
So	Sycamore silt loam
Sy	Sycamore silt loam over clay
YmA	Yolo loam, 0 to 3 percent slopes
Yo	Yolo loam over gravel
Yr	Yolo gravelly loam, 0 to 3 percent slopes
Ys	Yolo sandy loam, 0 to 3 percent slopes
Za	Zamora silt loam, 0 to 4 percent slopes
Zc	Zamora silty clay loam, 0 to 3 percent slopes
Farmland of Statewide Importance	
AaC	Altamont clay, 3 to 15 percent slopes
DaB	Danville silty clay loam, 3 to 10 percent slopes
DbC	Diablo clay, 7 to 15 percent slopes
DvC	Diablo clay, very deep, 3 to 15 percent slopes
LaC	Linne clay loam, 3 to 15 percent slopes
Lm	Livermore very gravelly coarse sandy loam
PgB	Pleasanton gravelly loam, 3 to 12 percent slopes
YmB	Yolo loam, 3 to 10 percent slopes

Source: California Department of Conservation, Farmland Mapping and Monitoring Program, 1995. *Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, Alameda County*.

c. Alameda County Agricultural Resources. In 2002, the Natural Resources Conservation Service conducted a soil survey for approximately 20,000 to 30,000 acres of land in the areas ringing the cities of Dublin, San Ramon, Livermore (areas north, east, and south), Sunol, and Pleasanton (southern areas). The soil survey focused on land with less than 30 percent slopes, and included soil samples and GIS mapping of the soil suitability of areas for irrigated agriculture.[5] This analysis was completed for the Tri-Valley Business Council and concluded that the Tri-Valley areas studied have the climate and soil needed for competitive agricultural growth and expansion, but also found that water resources are constrained to accommodate this agricultural growth and expansion.[6]

For the year 2000, Alameda County contained approximately 257,575 acres of agricultural land uses, including 247,227 acres in grazing land, 7,222 acres of prime farmland, 1,484 acres of farmland of Statewide importance, and 1,642 acres of unique farmland.[7] Authority to adopt or to recommend changes to the category of farmland of local importance rests with the board of supervisors in each county. Within Alameda County, there is no farmland of local importance, as the County's Board of Supervisors have determined that there will be none within the County.[8]

From 1998 to 2000, Alameda County lost a net total of 1,299 acres of agricultural land. Approximately 1,128 acres of grazing land was converted to other uses. As for prime farmland, 338 acres were lost to other agricultural and urban land uses. Farmland of Statewide importance and unique farmland increased by 125 acres and 42 acres, respectively, over the same 2-year period.[9]

By 2000, a total of 3,958 acres of agricultural land had been committed to non-agricultural uses. The California Department of Conservation's Farmland Mapping and Monitoring Program defines land committed to non-agricultural use as existing farmland, grazing land, and vacant areas which are permanently committed by local officials to non-agricultural development by virtue of decisions which cannot be reversed by a majority vote of a city council or county board of supervisors.[10] Most of this acreage (3,631 acres, or 92 percent) was grazing land, 210 acres were prime farmland, 77 acres were farmland of statewide importance, and 40 acres were unique farmland.[11]

d. Livermore Valley Agricultural Resources. The following subsection describes agricultural resources within and in the vicinity of the City of Livermore.

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[5] Huff, Terry, 2002. United States Department of Agriculture Natural Resources Conservation Service. Personal communication with LSA Associates, Inc. May.

[6] Agland Investment Services, Inc., 2002. *Tri-Valley Phase I Report Draft as of September 6, 2002.* September 6.

[7] California Department of Conservation, Division of Land Resources Protection, 2000. *1998-2000 Land Use Conversions in Alameda County, Table A-1.*

[8] California Department of Conservation, Farmland Mapping and Monitoring Program, 1994. *A Guide to the Farmland Mapping and Monitoring Program. Appendix C: Farmland of Local Importance Definitions.* November. Website: www.consrv.ca.gov/dlrp/fommp/pubs/fmmp_guide.pdf.

[9] California Department of Conservation, Division of Land Resources Protection, 2000. Op cit.

[10] California Department of Conservation, Farmland Mapping and Monitoring Program, 1994, op.cit.

[11] Ibid.

(1) Agricultural Resources in the City of Livermore. The City of Livermore and its surrounding area is located in an area of Alameda County that has traditionally contained areas of land used for grazing, orchards, vineyards, and field and row crops. Land in the Livermore Valley was used for grazing throughout the Spanish Mission and Mexican rancho periods and later was cultivated for wheat and barley.

Much of the area within Livermore's city limits has been urbanized or developed. The creation of the Lawrence Livermore National Laboratory (LLNL), located directly east of the City limits, and the subsequent increase in migration of people and jobs to the Livermore Valley resulted in pressure to develop housing and commercial establishments on agricultural land. Nevertheless, agricultural resources remain. In recent years, initiatives and policies have been put into place and organizations have arisen to ensure the preservation and expansion of Livermore Valley's agricultural heritage. As of 2002, approximately 1,061 acres of land within the Livermore city limits were in agricultural uses.[12]

The City's 1976 General Plan and Land Use Diagram defines agriculture in the following categories, under open space:

- Limited agriculture – 20-acre minimum site
- Viticulture – 100-acre minimum site
- General agriculture – 100-acre minimum site
- Range and grassland – 100-acre minimum site
- Agriculture/viticulture – One du/100 acres (100-acre minimum site). Up to 5 du/100 acres is permitted with density bonus (subject to meeting criteria outlined in the General Plan).

Figure 3-2, the Important Farmland Map for the Livermore planning area in the year 2000, was prepared by the Department of Conservation, Farmland Mapping and Monitoring Program. Pockets of prime farmland, farmland of Statewide importance, and unique farmland are located along the interface of the City and adjacent unincorporated areas of Alameda County.

(2) Agricultural Resources in the Vicinity of the City of Livermore. Outside the Livermore city limits, much of the land is used for grazing, with areas of prime farmland, farmland of Statewide importance, and unique farmland to the south and west of the City.

As shown in Figure 3-2, the unincorporated areas north of I-580 are largely comprised of grazing land. The area is also currently used for rangeland, dry farmland, irrigated crop land, and uncultivated farmland. Most of the hillsides to the north and east, the Altamont Hills to the west, and the majority of the Las Positas Valley, are used as open grazing lands. One small area of prime farmland exists on North Livermore Road, approximately two miles north of I-580.

The Valley's remaining prime farmlands, farmlands of Statewide importance, and unique farmlands are primarily located south of Livermore's city limits and the Urban Growth Boundary (UGB). Agricultural land uses there include vineyards, orchards (mainly olives and nuts), rangeland, and

[12] Design, Community and Environment, op.cit.

uncultivated farmland. The Alameda County *South Livermore Valley Area Plan* has designated this area as the "Vineyard Area,"[13] and it is now home to many wineries and vineyards, including Wente Vineyards Estate Winery and Tasting Room, Fenestra Winery, Thomas Coyne Winery, Livermore Valley Cellars, Retzlaff Winery, Concannon Vineyard, Murrieta's Well, Stony Ridge Winery, Iván Tamás Steven Kent Winery, Rios-Lovell Estate Winery, Cedar Mountain Winery, and Garré Vineyard and Winery, and Jackson Cellars. Further south, in the hills and along the ridgelines, the land is used for grazing. There are approximately 4,000 acres of vineyards within the *South Livermore Valley Area Plan*.

2. Sand and Gravel Resources

The sand and gravel deposits located between the cities of Livermore and Pleasanton contain important mineral resources of Statewide importance. These resources are valuable because of their economic worth and their non-renewable status. The quarries also act as an open space buffer between Livermore and Pleasanton and are designated as "secondary open space" in the *Alameda County General Plan*, Open Space Element. The 1976 *Livermore General Plan* designates these quarries as "Sand and Gravel Resources" under the Open Space land use category. More detailed discussion of the sand and gravel pits is included in the *Geologic and Seismic Hazards* chapter. With the passage of Measure D, Alameda County's revised *East County Area Plan* designates the quarry areas as Large Parcel Agricultural and Water Management Lands. The Large Parcel Agricultural designation permits quarries compatible with agriculture. The Water Management Lands designation provides for sand and gravel quarries, which allow a range of uses including sand and gravel processing, associated manufacturing and recycling uses requiring proximity to quarries, reclamation pits, and public use areas.[14]

C. OPEN SPACE FOR OUTDOOR RECREATION

Parks and trail corridors are also considered open space. The open space within the City limits are mostly managed by the Livermore Area Recreation and Park District or the East Bay Regional Park District. These open space resources are discussed in more detail in the *Public Services* chapter.

D. OPEN SPACE FOR PUBLIC HEALTH AND SAFETY

Open space areas on hillsides and adjacent to creeks are designated as open space to protect public health and safety from slope instability and flooding hazards. More discussion on slope instability is included in the *Geologic and Seismic Hazards* chapter and flooding hazards are discussed in the *Hydrology and Water Quality* chapter. Additionally, watershed land areas are open space areas which have water provision and flood protection functions.

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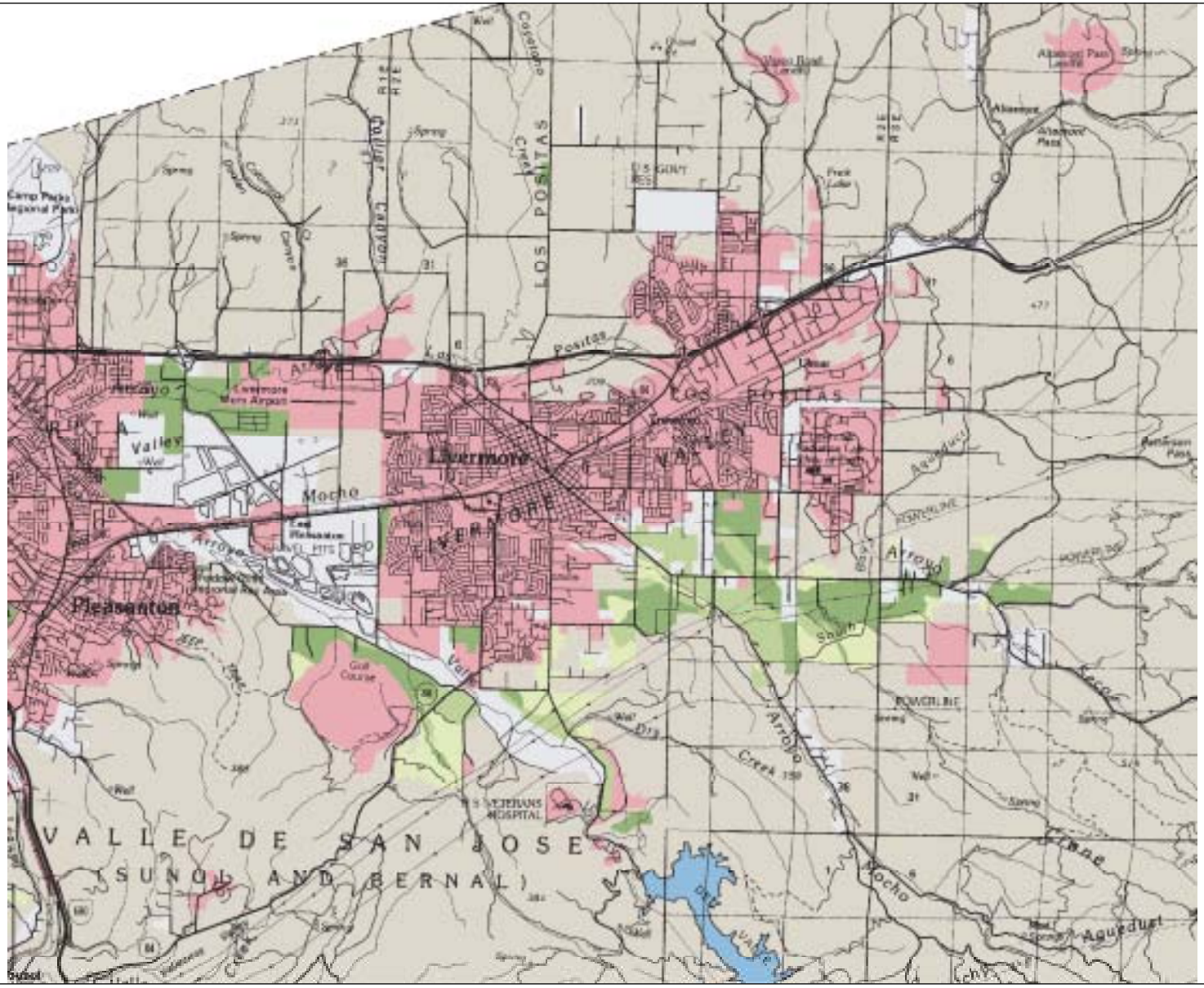
[13] Alameda County Planning Department, 1993. *South Livermore Valley Area Plan, Livermore-Amador Valley Planning Unit, Alameda County General Plan*. February 22.

[14] Alameda County Planning Department, 2002. *Draft Revised East County Area Plan, Volume I: Goals, Policies, and Programs*. March.



LSA

FIGURE 3-2

Livermore General Plan Update
Master Environmental Assessment
Important Farmland Map

SOURCE: FARMLAND MAPPING AND MONITORING PROGRAM, DIVISION OF LAND RESOURCE PROTECTION, DEPARTMENT OF CONSERVATION, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\FIG_3-2.AI (04/22/03)

E. OPEN SPACE PROTECTION PROGRAMS AND INITIATIVES

The City places a high priority on permanently protecting open space. Figure 3-3 shows permanently protected open space. These include lands that are designated as parks, trailways, recreation corridors, and protected areas; village greens; village parks; neighborhood parks; community open space; sports parks; hillside conservation; and greenbelt/buffer overlay in the Livermore General Plan. The City requires open space fees and land dedications as conditions of approval for specific development projects. Several open space protection programs and initiatives are discussed below.

1. South Livermore Valley Specific Plan

The *South Livermore Valley Specific Plan* was adopted in November 1997. The policies contained within the *South Livermore Valley Specific Plan* are a key element of the City's open space and agricultural protection program. Agricultural programs of the *South Livermore Valley Specific Plan* seek to introduce (or reintroduce) intensive agricultural production with the planting or expansion of vineyards and orchards. The *South Livermore Valley Specific Plan* also includes an agricultural mitigation program to secure permanent agricultural easements and impose fees for development.

2. Tri-Valley Conservancy

Incorporated in September 1994, the Tri-Valley Conservancy (previously referred to as the South Livermore Valley Agricultural Land Trust) was established to preserve and protect critical agricultural and open space lands in the South Livermore Valley. The Conservancy was established as part of a policy in the *South Livermore Valley Area Plan* (prepared and adopted by Alameda County in February 1993). The mission of the Conservancy is "to ensure the viability of the South Livermore Valley as a premier agricultural region by working with willing property owners to permanently protect, through conservation easement or fee simple acquisition, its fertile soils, rural ambience, scenic open space, and important biological resources."[15] As of June 2002, the Conservancy held easements on a total of 3,400 acres.[16]

Figure 3-3 shows permanently protected agricultural lands. These lands are farmland that are under easement or trust with the Conservancy. Under these agreements, the land must remain under an agricultural use for a minimum of eight years, at which time it can remain in agricultural production or be converted to a non-agricultural open space. These lands are permanently protected.

3. Urban Growth Boundary Initiatives

As described previously, in December 2002, the City Council voted to adopt the North Livermore Urban Growth Boundary Initiative in order to connect to the existing South Livermore Urban Growth Boundary (UGB) (established by the South Livermore Urban Growth Boundary Initiative in March 2000), and form a complete UGB around the entire City. Both initiatives seek to preserve open space and agricultural uses outside of the UGB. Figure 3-3 identifies the location of the UGB.

[15] South Livermore Valley Agricultural Land Trust, 2000. *Annual Report Fiscal Year 2000*. October.

[16] Norwood, John, 2002. Executive Director, South Livermore Valley Agricultural Land Trust. Personal communication with LSA Associates, Inc. July 11.

4. Measure D and the North Livermore Intensive Agricultural Area

Measure D, proposed as an initiative and passed by Alameda County voters in November 2000 established a County UGB that generally coincides with existing City boundaries and/or City limits.[17] Measure D required that the County redesignate undeveloped lands outside the UGB from urban development or "Urban Reserve" to agricultural and open space uses. Any new urban development in Alameda County was directed to areas within the new UGB.[18] With the passage of Measure D, the North Livermore Intensive Agriculture Area was also established, enabling a minimum parcel size in the area of 20 acres per unit, provided that these parcels be used primarily for cultivated agriculture, and that achievement of numerous economic and environmental criteria pertaining to cultivated agriculture could be demonstrated.[19]

5. Williamson Act Contracts

The Williamson Act (*Government Code Section 51200 et seq.*) enables local jurisdictions to establish programs for protection of agricultural land by providing tax benefits in exchange for the owner's agreement to limit the use of the land to agricultural and compatible uses for a minimum period of ten years. The local jurisdiction agrees to assess and tax the land at its agricultural value rather than its potential development value. As partial compensation for lost tax revenues, the State pays a sub-vention to cities and counties for properties enrolled in the program. Williamson Act contracts are entirely voluntary and self-renewing. Contracts are automatically renewed each year unless the owner or the county files a request for non-renewal. Once a non-renewal notice is filed, a ten-year period of tax adjustments is initiated to bring the assessments to full market value before the land is removed from the program.

Alameda County and the City's policies with regard to Williamson Act contracts include the following:

- Restriction on use of the property to agriculture;
- A maximum density of one single-family residence per 40 acres; a residence on less than 40 acres is allowed if it is accessory to an existing commercial agricultural use;
- New structures are limited to an area of two acres or less, and must not take lands out of productive agricultural use; and
- Lands under contract must be zoned Agriculture (A) unless the land has not been used for intensive agricultural use for the past 10 years, or the zoning requires dedicated agricultural easements. [20, 21]

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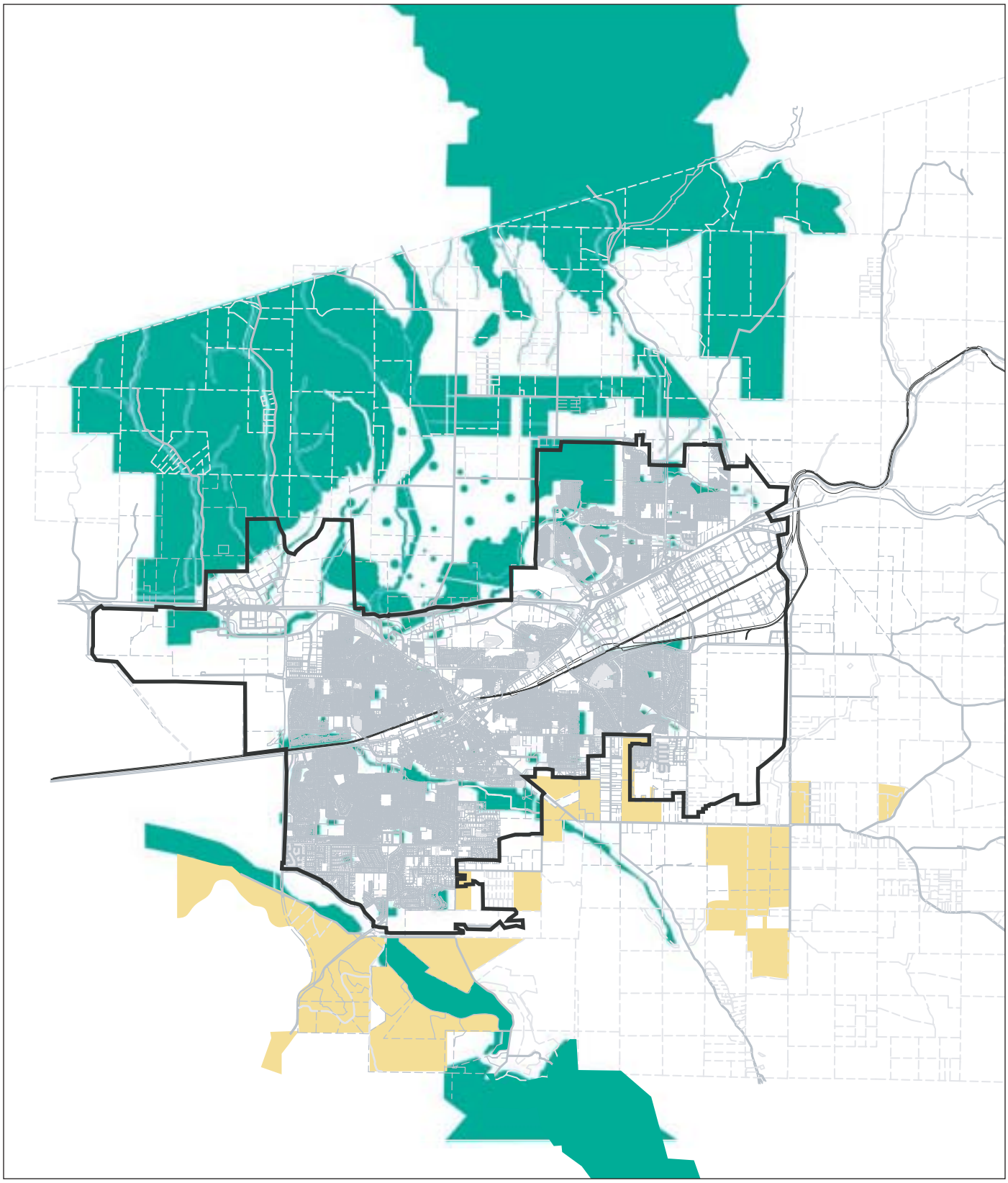
[17] Alameda County Planning Department, 2002. *Draft Revised East County Area Plan. Volume I: Goals, Policies, and Programs.* March 18.

[18] Design, Community and Environment, 2001. *Livermore Vision Project Briefing Book.* August.

[19] Alameda County Planning Department, op.cit.

[20] Alameda County, City of Livermore, SWA Group, and Lamphier & Associates, 2000. *North Livermore Specific Plan Draft Environmental Impact Report – Parts 1 and 2.* April.

[21] Livermore, City of, 1997. *South Livermore Valley Specific Plan and General Plan Amendment Draft Environmental Impact Report.* May.



LSA

FIGURE 3-3

Livermore General Plan Update
Master Environmental Assessment
Livermore Valley Open Space

SOURCE: DESIGN, COMMUNITY AND ENVIRONMENT, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\FIG_3-3.AI (06/09/03)

A Williamson Act contract may be cancelled prior to expiration of a 10-year non-renewal period only under limited circumstances. Early cancellation of a contract may be approved if it can be found that the cancellation is consistent with all provisions of the Williamson Act, is in the public interest, and is consistent with the Measure D initiative. Policy 89 of the 2002 *Draft Revised East County Area Plan* says that, ". . . in no case shall contracts outside the Urban Growth Boundary be cancelled for purposes inconsistent with agricultural or public facility uses."[22] These findings must be based on the following conclusions:

- Cancellation is for land on which a notice of non-renewal has been served;
- Cancellation will not result in removal of adjacent lands from agricultural use;
- Cancellation is for an alternative use consistent with the applicable local general plan;
- Cancellation will not result in discontiguous patterns of urban development;
- There is no proximate non-contracted land available and suitable for the alternative use proposed, or that development of the contracted land would provide more contiguous patterns of urban development than development of proximate non-contracted lands; and
- Other public concerns substantially outweigh the objectives of the Williamson Act.

Within Alameda County, there were approximately 139,060 acres of land under Williamson Act contracts in the 1998 tax year.[23] This figure includes both continuing and non-renewal contracts. Of those 139,060 acres, 11,620 acres are prime land, defined in terms of higher production capacity, and 127,440 are non-prime land, generally rangeland, low-yielding cropland, and open space.

As of 2000, there were approximately 3,500 acres of land, under Williamson Act contract provisions within the North Livermore Specific Plan area. Approximately 90 percent (3,200 acres) were under on-going contract status. The majority of lands under on-going contracts are located within the western hills, the northernmost area of North Livermore adjacent to the Contra Costa County line, and in the Altamont Hills. The remaining 300 acres had Notices of Non-Renewal filed within the last 10-year period. These lands are primarily located within or at the fringe of the Las Positas Valley.[24]

The 1997 *South Livermore Valley Specific Plan EIR* identified nine parcels that were under Williamson Act contracts. However, eight of those nine contracts were not renewed and are thus in the 10-year transition period before culmination of the agreement. The eastern ±48-acre Crohare parcel in Subarea 7 of the *South Livermore Valley Specific Plan* is the only parcel under an on-going Williamson Act contract.[25]

[22] Alameda County Planning Department, op.cit.

[23] California Department of Conservation, Division of Land Resource Protection, 1999. *Total Williamson Act Contract Enrollment*. Website: www.consrv.ca.gov/dlrp.

[24] Alameda County, City of Livermore, SWA Group, and Lamphier & Associates, 2000. *North Livermore Specific Plan Draft Environmental Impact Report – Parts 1 and 2*. April.

[25] Livermore, City of, op.cit.

4. DEMOGRAPHIC, ECONOMIC, AND MARKET CONDITIONS

Livermore has long been known as a residential community, with a diverse array of entry-level, move-up, and luxury housing types. Livermore has also attracted a strong employment base, initially concentrated in agriculture and then the national defense industry. Livermore's economy has evolved over time into a diverse array of warehousing, distribution, and retail services.

This chapter summarizes data and conclusions regarding recent demographic and economic trends, based partially on recently-released Census data from 2000. The real estate market for residential, office, and industrial uses is also profiled in this chapter. This summary of economic conditions in 2002 was intended to inform the Livermore General Plan update, which will set a policy framework for future land use, transportation, open space, and related decisions. Demographic trends and real estate market conditions are an important part of this process because this information describes how market forces shape or may respond to policies in the General Plan.

This chapter analyzes the City of Livermore. Much of the analysis compares Livermore to the Tri-Valley subregion as a whole, comprised of the Livermore, Amador, and San Ramon Valleys, which contain the surrounding communities of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon. The Tri-Valley area has developed with similar characteristics and market conditions over time.

In order to place Livermore's trends into perspective, this chapter also analyzes a Commute Region, comprised of the counties of Alameda, Contra Costa, and Santa Clara. Together, these counties represent a large geographic area within which most of Livermore's residents commute for employment. In most categories of the analysis, a comparison to the entire Bay Area is also provided. The Bay Area consists of the nine counties bordering the San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

A. DEMOGRAPHIC TRENDS

Demographic data are presented for Livermore in this section and are also compared with the Tri-Valley communities of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon, and the Commute Region (Alameda, Contra Costa, and Santa Clara counties). For key variables, Bay Area composite data are also provided for benchmark purposes.

1. Population

During the last decade, the City of Livermore's population has grown rapidly. From a population of 56,741 residents in 1990, Livermore added an estimated 16,604 persons, resulting in a total population of 73,345 in 2000. The population growth rate for Livermore, a 2.6 percent average annual increase (compounded), matched the Tri-Valley area for the period, but was dramatically higher than the Commute Region, which was 1.3 percent annually, and the Bay Area as whole, which grew at 1.2 percent annually. Information on population, growth rates and households is shown in Table 4-1.

Table 4-1: Population and Household Trends

	Livermore			Tri-Valley[a]			Commute Region[b]			Bay Area[c]		
Trends	**1990**	**2000**	**Annual Growth '90-'00**	**1990**	**2000**	**Annual Growth '90-'00**	**1990**	**2000**	**Annual Growth '90-'00**	**1990**	**2000**	**Annual Growth '90-'00**
Population	56,741	73,345	2.6%	203,331	263,457	2.6%	3,580,491	4,075,142	1.3%	6,023,577	6,783,760	1.2%
Households	20,643	26,123	2.4%	71,859	93,845	2.7%	1,299,986	1,467,549	1.2%	2,246,242	2,466,019	0.9%
Average Household Size	2.74	2.8	0.2%	2.77	2.74	-0.1%	2.69	2.80	0.4%	2.61	2.69	0.3%
Household Type												
Families	74.4%	74.7%		76.5%	75.1%		67.8%	68.2%		64.9%	64.7%	
Non-Families	25.6%	25.3%		23.5%	24.9%		32.2%	31.8%		35.1%	35.3%	
Household Tenure												
Owner	67.1%	72.2%		72.1%	75.0%		58.9%	60.2%		56.4%	57.7%	
Renter	32.9%	27.8%		27.9%	25.0%		41.1%	39.8%		43.6%	42.3%	

[a] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[c] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.

Sources: U.S Census, 1990 & 2000; BAE, 2002.

2. Household Size and Composition

Livermore's household size tends to be about the same as the surrounding areas. In 2000, Livermore averaged an estimated 2.80 persons per household, while the Tri-Valley averaged 2.74 persons and the Commute Region averaged 2.80 persons (see Table 4-1). The Bay Area overall averaged 2.69 persons per household in 2000, a slightly smaller figure reflecting household composition in heavily urbanized areas.

Household size information can reveal underlying trends toward increasing or decreasing household sizes, which in turn, can influence housing demand. During the 1980s and 1990s, demographers expected household sizes to decrease in future years, due to shifts in the composition of single person households as well as divorce and low birth rates. This expectation was countered by two other trends – a baby boom "echo" and rising immigration, bringing a new mix of populations to the region. In Livermore, these trends combined to create a slight upward trend in average household size between 1990 and 2000. Household sizes also increased in the Commute Region and the Bay Area as a whole. In the Tri-Valley, there was a slight overall decrease in average household size between 1990 and 2000, which most likely reflected an aging population.

As of 2000, most of Livermore's households, 74.7 percent, were families with related individuals. This is similar to the 75.1 percent family households in the Tri-Valley, and higher than the proportions of family households in the Commute Region and Bay Area, which were 68.2 percent and 64.7 percent, respectively.

3. Housing Tenure

In 2000, 72.2 percent of Livermore's households were owner households. This homeownership rate increased a substantial 5.1 percentage points during the 1990s, from Livermore's 1990 level of 67.1 percent. While both Tri-Valley and the Commute Region also increased ownership rates during the 1990s, neither area experienced the same degree of change. In 2000, homeownership rates were 75.0 percent in the Tri-Valley, 60.2 percent in the Commute Region and 57.7 percent in the Bay Area.

4. Age Distribution

Residents in Livermore tend to be relatively young, in terms of median age, compared to the Bay Area as a whole. In 2000, the median age for Livermore residents was 35.7 years old, compared to 36.9 for the Bay Area. Age distribution analysis indicates that Livermore has both a higher percentage of children age 19 or younger, and a lower percentage of empty nesters (age 55 to 64) and seniors (age 65 and older) than the larger analysis areas. The age profile for Livermore and Tri-Valley tend to follow similar patterns, but both areas vary somewhat from the Commute Region and the Bay Area as a whole. Table 4-2 shows age distributions for all four analysis areas.

5. Household Incomes

According to 2000 Census data, Livermore's median household income in 1999 was $75,027. With respect to income distribution, 10.5 percent of Livermore households earned less than $25,000, and 11.3 percent of households earned $150,000 or more.

Table 4-2: Age Distribution

	Livermore		Tri-Valley[a]		Commute Region[b]		Bay Area[c]	
Age Distribution	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**
Under 10	16.1%	16.2%	14.7%	15.1%	14.4%	14.3%	13.7%	13.3%
10 – 19	13.7%	14.2%	14.1%	14.1%	12.6%	13.3%	11.9%	12.7%
20 – 34	26.9%	19.7%	24.9%	17.7%	27.7%	22.8%	27.1%	22.9%
35 – 44	17.5%	20.3%	20.0%	20.6%	16.9%	17.4%	17.3%	17.3%
45 – 54	11.8%	14.0%	13.8%	16.3%	10.9%	13.8%	11.1%	14.2%
55 – 64	7.0%	8.1%	6.7%	8.8%	7.6%	8.2%	7.9%	8.4%
65 & Over	7.0%	7.5%	5.9%	7.4%	9.9%	10.2%	11.0%	11.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Median Age	**31.6**	**35.7**	**33.1**	**35.6**	**32.4**	**34.7**	**33.4**	**36.9**

[a] The Tri-Valley area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[c] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.

Sources: U.S Census, 1990 & 2000; BAE, 2002.

Median household income levels vary widely among the four areas analyzed. Livermore's median income level was lower than the Tri-Valley level, but higher than that of the Commute Region or the Bay Area overall. Livermore's 10.5 percent of households earning under $25,000 was a slightly higher proportion than the Tri-Valley and the Commute Region, but a lower concentration than the Bay Area. There were almost twice as many homes in the Tri-Valley earning over $150,000, 20.5 percent, as there were in Livermore. Livermore's income levels and distribution, as well as those of the other three analysis areas, are shown in Table 4-3.

6. Employment and Unemployment

Employment and unemployment data for 1990 and 2000 are shown in Table 4-4. According to data from the California Employment Development Department, Livermore's labor force grew 20.8 percent during the 1990s. While the labor force in the Tri-Valley area overall expanded by 22.2 percent, labor in the Bay Area and the Commute Region grew only 6.6 percent during the decade.

Livermore's unemployment rate in 2000 was 3.4 percent. This rate is higher than the 2.8 percent reported for the Tri-Valley, but lower than the 4.7 percent for the Commute Region and 4.5 percent for the Bay Area overall. Unemployment rates for Livermore are historically more similar to Tri-Valley than to the Commute Region or the Bay Area, but all areas' rates were relatively low in 2000. All four analysis areas have seen increased unemployment since 2000; Livermore's most recently reported unemployment rate was 4.2 percent as of May 2002.

Table 4-3: 1999 Household Income Distribution

	Livermore		Tri-Valley[a]		Commute Region[b]		Bay Area[c]	
Income Range	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Less than $10,000	824	3.2%	1,870	2.0%	84,331	5.9%	151,526	6.1%
$10,000 to $14,999	590	2.3%	1,604	1.7%	51,921	3.6%	93,685	3.8%
$15,000 to $24,999	1,318	5.0%	3,797	4.0%	106,513	7.4%	191,343	7.8%
$25,000 to $34,999	1,873	7.2%	4,570	4.9%	118,366	8.3%	212,650	8.6%
$35,000 to $49,999	2,795	10.7%	8,597	9.2%	182,127	12.7%	324,833	13.2%
$50,000 to $74,999	5,598	21.4%	16,617	17.7%	279,565	19.5%	482,228	19.5%
$75,000 to $99,999	5,204	19.9%	16,111	17.1%	207,397	14.5%	347,356	14.1%
$100,000 to $149,999	4,992	19.1%	21,514	22.9%	229,071	16.0%	372,910	15.1%
$150,000 to $199,999	1,761	6.7%	9,703	10.3%	90,107	6.3%	142,421	5.8%
$200,000 and above	11,094	4.6%	9,563	10.2%	85,296	5.9%	149,072	6.0%
Total	**26,149**	**100.0%**	**93,946**	**100.0%**	**1,434,694**	**100.0%**	**2,468,024**	**100.0%**
Median Income	**$75,027**		**$90,390**		**$65,568**		**$63,478**	

[a] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[c] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.

Sources: U.S Census, 1990 & 2000; BAE, 2002.

7. Educational Attainment

Educational attainment data are shown in Table 4-5. Education levels of Livermore residents in 2000 indicate slightly less attainment than the other areas analyzed. Just over 40 percent of Livermore's residents have earned either associate or four-year college degrees or higher, and 11.5 percent of Livermore's residents have attained a graduate or professional degree. By comparison, 45 percent of the population of the Commute Region and the Bay Area, and over 53 percent of Tri-Valley residents, have achieved a college degree, and 15.1 percent of Tri-Valley residents and 14.1 percent of Bay Area residents have graduate or professional degrees.

8. Resident Occupations

In 2000, 41.8 percent of Livermore's employed residents worked in management, professional, and related occupations, as shown in Table 4-6. In 2002, management and professional occupations increased t 41.8 percent from 31.3 percent of Livermore's employed residents in 1990. The other areas analyzed registered slightly higher proportions in this category and a similar or slightly higher increase from 1990. In contrast, Livermore's employed residents had a greater proportion of occupations, 10.3 percent, classified as construction, extraction, and maintenance (including machine operators, assemblers, handlers, equipment cleaners, inspectors, and laborers) than in the other geographies. These occupations have also shown higher increases in Livermore than in the other geographies.

9. Commute Time

Livermore's employed residents exhibited about the same average commute time to work as the other geographies analyzed, according to the 2000 Census, as shown in Table 4-6. Livermore residents traveled an average of 31.3 minutes to work, compared to 31.9 minutes for Tri-Valley residents, and under 30 minutes for the Commute Region and the Bay Area. Commute times have risen dramatically for Livermore employed residents from 24.7 minutes in 1990. Significant increase in commute times have also occurred in the Tri-Valley and Commute Region.

10. Projections of Future Growth

The Association of Bay Area Governments (ABAG) is a regional agency that projects trends of future growth. ABAG's latest forecast was published in *Projections 2002* and is excerpted in Table 4-7. According to ABAG, Livermore's population is projected to grow 37.3 percent between 2000 and 2020, and the number of households is expected to increase by 35.9 percent. The Tri-Valley is expected to experience similar population growth of 41.2 percent, and increase of households of 39.6 percent. In contrast, the Commute Region's population is expected to grow at half this rate, rising only 18.1 from 2000 to 2020. Growth in the Commute Region's households is projected to be 17.4 percent. Population per household is projected to grow 1.1 percent in all three areas.

Table 4-4: Employment and Unemployment

Labor Force Data[a]	1990	2000	% Change 1900-2000
LIVERMORE			
Civilian Labor Force	33,020	39,874	20.8%
Civilian Employment	32,100	38,525	20.0%
Civilian Unemployment	920	1,349	46.6%
Civilian Unemployment Rate	2.8%	3.4%	21.4%
TRI-VALLEY[b]			
Civilian Labor Force	116,280	142,055	22.2%
Civilian Employment	113,620	138,048	18.7%
Civilian Unemployment	2,660	4,007	50.6%
Civilian Unemployment Rate	2.3%	2.8%	23.3%
COMMUTE REGION[c]			
Civilian Labor Force	1,962,900	2,085,337	6.2%
Civilian Employment	1,884,300	1,988,102	5.5%
Civilian Unemployment	78,600	97,235	23.7%
Civilian Unemployment Rate	4.0%	4.7%	16.4%
BAY AREA[d]			
Civilian Labor Force	3,307,400	3,524,565	6.6%
Civilian Employment	3,182,200	3,366,503	5.8%
Civilian Unemployment	125,200	158,062	26.2%
Civilian Unemployment Rate	3.8%	4.5%	18.5%

[a] Civilian Labor Force refers to workers by place of residence.
[b] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[c] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[d] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.

Sources: California Employment Development Department; BAE, 2000.

Average household income, expressed in constant 1999 dollars, is projected to grow 13.8 percent in Livermore, lagging behind projected Tri-Valley household income growth of 19.9 percent and the Commute Region's growth of 18.1 percent.

B. ECONOMIC TRENDS

This section profiles employment trends in Livermore from 1990 to the present and beyond. First, data from the 1990 Census are presented for the types of jobs held by Livermore residents and the types of jobs located in Livermore to provide a baseline measure of the extent to which Livermore's local jobs matched its resident labor force in 1990. Next, estimates from ABAG, and the California Employment Development Department are utilized to show changes since 1990 in the City's employment base and jobs/housing balance. Based on County Business Patterns data from 1999, this

Table 4-5: Educational Attainment

	Livermore		Tri-Valley[b]		Commute Region[c]		Bay Area[d]	
Education Level[a]	**Count**	**% of Total**	**Count**	**% of Total**	**Count**	**% of Total**	**Count**	**% of Total**
Less than 9th Grade	1,798	3.8%	3,532	2.0%	198,707	7.4%	346,828	7.5%
9th to 12th Grade, No Diploma	3,139	6.6%	8,955	5.1%	236,241	8.8%	391,149	8.5%
High School Graduate (incl. equivalency)	9,467	20.0%	27,369	15.5%	482,550	17.9%	813,743	17.7%
Some College, No Degree	13,826	29.1%	42,706	24.2%	577,338	21.4%	997,910	21.7%
Associate Degree	4,240	8.9%	14,591	8.3%	195,038	7.2%	331,143	7.2%
Bachelor's Degree	9,533	20.1%	52,439	29.7%	612,944	22.8%	1,068,649	23.2%
Graduate/Professional Degree	5,450	11.5%	26,701	15.1%	389,597	14.5%	649,767	14.1%
Total	**47,453**	**100.0%**	**176,293**	**100.0%**	**2,692,415**	**100.0%**	**4,599,189**	**100.0%**
Population with College Degrees[e]	**19,223**	**40.5%**	**93,731**	**53.2%**	**1,197,579**	**44.5%**	**2,049,559**	**44.6%**

[a] Universe for this data is persons 25 years and over.
[b] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[c] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[d] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.
[e] Including Associate Degrees.

Sources: 2000 U.S Census; BAE, 2002.

Table 4-6: Occupation of Employed Residents and Journey to Work Trends 1990 to 2000

	Livermore		Tri-Valley[a]		Commute Region[b]		Bay Area[c]	
Residents' Occupants	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**
Management, Professional & Related Occupations	31.3%	41.8%	37.6%	50.4%	33.9%	44.7%	33.1%	43.7%
Service Occupations	10.9%	12.4%	9.0%	8.8%	10.4%	11.7%	11.6%	12.8%
Sales & Office Occupations	34.3%	26.0%	36.9%	28.3%	33.7%	25.2%	33.7%	25.6%
Farming, Forestry & Fishing	1.0%	0.1%	0.7%	0.1%	1.2%	0.3%	1.4%	0.4%
Construction, Extraction & Maintenance	6.8%	10.3%	4.4%	6.3%	7.7%	7.4%	7.3%	7.4%
Production, Transportation & Material Moving	15.6%	9.4%	11.3%	6.1%	13.2%	10.8%	12.8%	10.1%
Totals	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Mean Travel Time to Work (minutes)	**24.7**	**31.3**	**26.1**	**31.9**	**24.7**	**29.6**	**24.7**	**29.4**

[a] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.
[c] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.

Sources: 2000 U.S Census; BAE, 2002.

Table 4-7: ABAG Projections 2000 to 2020

	Livermore			Tri-Valley[a]			Bay Area[b]		
Growth Category	1990	2000	Percent Growth 2000-2020	1990	2000	Percent Growth 2000-2020	1990	2000	Percent Growth 2000-2020
Population	73,841	101,400	37.3%	280,507	396,000	41.2%	6,783,760	8,014,100	18.1%
Households	26,315	35,760	35.9%	99,750	139,250	39.6%	2,466,019	2,894,370	17.4%
Persons Per Household	2.80	2.83	1.1%	2.75	2.78	1.1%	2.69	2.72	1.1%
Employed Residents	39,125	59,200	51.3%	151,888	236,300	55.6%	3,605,675	4,447,100	23.3%
Mean Household Income	$97,800	$111,300	13.8%	$122,772	$147,163	19.9%	$93,800	$110,800	18.1%
Total Jobs[c]	41,500	60,720	46.3%	171,040	251,040	46.8%	3,753,670	4,709,960	25.5%
Jobs per Employed Resident	1.06	1.03		1.13	1.06		1.04	1.06	

[a] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Bay Area is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties.
[c] Jobs for Sandia Labs added to Livermore and Tri-Valley jobs total due to prior ABAG omission.

Sources: Projections 2000; BAE, 2002.

Table 4-8: Employed Residents versus Local Employment by Sector, 1990

	Employed Residents		Local Employment		#	%
Industry	Number	Percent	Number	Percent	Difference	Difference
Agriculture, Forestry, And Fisheries	389	1.2%	808	2.2%	(419)	-0.9%
Mining	114	0.4%	95	0.3%	19	0.1%
Construction	2,689	8.5%	3,119	8.3%	(430)	0.2%
Manufacturing, Nondurable Goods	1,327	4.2%	1,188	3.2%	139	1.0%
Manufacturing, Durable Goods	3,377	10.7%	3,370	9.0%	7	1.7%
Transportation	797	2.5%	1,299	3.5%	(502)	-0.9%
Communications and Other Public Utilities	1,217	3.9%	955	2.6%	262	1.3%
Wholesale Trade	1,537	4.9%	1,139	3.0%	398	1.8%
Retail Trade	4,863	15.4%	4,393	11.8%	470	3.7%
Finance, Insurance, and Real Estate	2,028	6.4%	1,560	4.2%	468	2.3%
Business and Repair Services	2,015	6.4%	2,015	5.4%	-	1.0%
Personal Services	645	2.0%	639	1.7%	6	0.3%
Entertainment and Recreation Services	313	1.0%	480	1.3%	(167)	-0.3%
Health Services	1,618	5.1%	1,758	4.7%	(140)	0.4%
Educational Services	2,058	6.5%	2,605	7.0%	(547)	-0.4%
Other Professional and Related Services	5,153	16.4%	9,815	26.3%	(4,662)	-9.9%
Public Administration	1,302	4.1%	1,984	5.3%	(682)	-1.2%
Armed Forces	49	0.2%	144	0.4%	(95)	-0.2%
Total	**31,491**	**100.0%**	**37,366**	**100.0%**	**(5,875)**	

Note: Data reflects compilation of Traffic Analysis Zones approximating Livermore incorporated area in 2000 plus the national laboratories: 5121, 5123, 5126, 5128, 5129, 5132, 5134, 5135, 5141, 5142, 5143, 5151, 5152, 5153, 5161, 5162, 5163, 5170, 5181, 5183, 5184, 5193.

Sources: 1990 Census Transportation Planning Package; BAE, 2002.

section profiles Livermore's more recent economy by major industrial sector, identifies base sectors, and highlights major shifts in the local economy during the 1990s. This section also profiles retail sales trends comparing Livermore sales with the Tri-Valley and the Commute Region. Finally, this section provides ABAG's projection of future jobs growth in Livermore and related geographies.

1. 1990 Comparison of Livermore Area Jobs with Livermore's Employed Residents

Table 4-8 explores the underlying relationships between residents' employment at all locations and the local jobs present in the City of Livermore and the immediate vicinity during 1990. This figure includes employment at Lawrence Livermore National Labs (LLNL) and Sandia National Labs, which are located outside of Livermore's city boundaries and have often been excluded from City of Livermore jobs data. Data from the 1990 Census is the most recent data available until Census releases additional data for 2000. Overall, Table 4-8 indicates that in 1990, there were a total of 37,366 jobs located in Livermore, and a total of 31,491 employed residents living in Livermore. Livermore's residents worked in jobs within the region concentrated in "other" professional and related services, retail sales, durable manufacturing, and construction. Jobs located in Livermore, which comprise the local economic base, were also concentrated in "other" professional services, but to a higher degree and with many more actual jobs than residents held in this sector, as well as retail sales and durable manufacturing. These findings indicate that even if every employed resident of Livermore held a job located in Livermore, the economic base needed to "import" 5,875 workers in 1990, especially workers concentrated in the "other professionals," education, and transportation sectors.

2. 1990 Employment by Place of Work and Residence

This analysis addresses where Livermore's employed residents actually worked, and where the holders of jobs located in Livermore lived.

Table 4-9: Livermore Jobs by Place of Residence – 1990

Worker Residence	Percent
Livermore Jobs Held by Livermore Residents	22.2%
Livermore Jobs Held by Other Tri-Valley Residents	28.2%
Livermore Jobs Held by Other Commute Region Residents	40.5%
Livermore Jobs Held by Others Living Outside Commute Region	9.2%
Total Jobs in Livermore	**100.0%**

Source: 1990 U.S. Census, CTTP; BAE, 2000.

As stated above, Livermore and the immediate vicinity had an estimated 37,366 jobs and 31,491 employed residents in 1990. This figure includes employment at LLNL and Sandia National Labs, which are located outside of Livermore's city boundaries. As shown in Table 4-9, many of the jobs in Livermore were not held by Livermore residents; other workers commuted into Livermore to work, while many Livermore residents commuted elsewhere to their jobs. Approximately 22.2 percent of the jobs in Livermore were held by Livermore residents, while 28.2 percent were held by workers living in other parts of the Tri-Valley. A total of 90.8 percent of Livermore jobs were held by residents living in the Commute Region.

Table 4-9 shows over 90 percent of the 1990 Livermore jobs are held by residents of the three-county Commute Region. Since 1990, San Joaquin County has increasingly provided housing for Livermore workers. Highway I-580 as well as SMART buses and the ACE commuter railway provide access to Livermore for San Joaquin residents. In October 2000, the San Joaquin Partnership and the San Joaquin Council of Governments released the *Altamont Pass Commuter Survey* that quantified the origin and destination of auto, bus and rail commuters from San Joaquin County to the Bay Area. The various surveys conducted in 2000 received a 19.2 percent response rate for auto commuters and

a 68.9 percent response rate for transit commuters. The survey identified 709 Altamont Pass commuters with destinations in Livermore. Extrapolating from the response rates of the surveys, approximately 8 to 10 percent of 2000 Livermore jobs are held by residents of San Joaquin and Stanislaus Counties.

As displayed in Table 4-10, only 15.7 percent of employed residents of Livermore worked in Livermore, and 27.7 percent commuted elsewhere in the Tri-Valley to their jobs. Almost all employed Livermore residents, 96.8 percent, worked within the Commute Region.

Table 4-11: Livermore Employed Residents by Place of Work – 1990

Worker Residence	Percent
Employed Livermore Residents Working in Livermore	15.7%
Employed Livermore Residents Working Elsewhere in Tri-Valley	27.7%
Employed Livermore Residents Working Elsewhere in Commute Region	53.4%
Employed Livermore Residents Working Outside Commute Region	3.3%
Total Employed Livermore Residents	**100.0%**

Source: 1990 U.S. Census; CTTP; BAE, 2000.

3. Employment and Jobs/Housing Balance

ABAG projected a total of 41,500 jobs in Livermore in 2000, compared to 26,123 occupied housing units and 38,525 employed residents. This translates to a jobs/housing ratio of 1.59 and a jobs/employed residents ratio of 1.08. A 1:1 ratio of jobs to employed residents is considered ideal for a balanced community, since it means there are enough jobs for the community's residents, and the need for in-and out-commuting is minimized. However, when comparing jobs to housing units, a ratio of 1 job to 1.5 housing units is considered desirable, since not every individual living in every household is expected to work. In both categories, Livermore's current ratios are close to the ideal.

By comparison, the jobs/housing balance ratios for the Tri-Valley and the Commute Region in 2000 were 1.82 and 1.54 respectively. Moreover, both Tri-Valley and the Commute Region had much higher jobs/employed residents ratios, at 1.24 and 1.11 respectively. Table 4-11 provides various measures of the jobs/housing balance in the City of Livermore compared to the Tri-Valley as whole, and to the combined Commute Region, based on estimates of jobs in

Table 4-10: Jobs/Housing Balance, 1990-2000

	1990	2000	Average Annual Change 1990-2000
LIVERMORE			
Jobs[a]	37,139	41,500	1.1%
Residents	56,741	73,345	2.6%
Employed Residents	31,270	38,525	2.1%
Total Housing Units[b]	20,643	26,123	2.4%
Employed Residents/Residents Ratio	0.55	0.53	
Jobs/Employed Residents Ratio	1.19	1.08	
Jobs/Housing Ratio	1.80	1.59	
TRI-VALLEY			
Jobs[a]	128,869	171,040	2.9%
Residents	203,331	263,457	2.6%
Employed Residents	113,725	138,048	2.0%
Total Housing Units[b]	71,859	93,845	2.7%
Employed Residents/Residents Ratio	0.56	0.52	
Jobs/Employed Residents Ratio	1.13	1.24	
Jobs/Housing Ratio	1.79	1.82	
COMMUTE REGION[c]			
Jobs[a]	1,849,580	2,205,120	1.8%
Residents	3,580,491	4,075,142	1.3%
Employed Residents	1,849,264	1,988,092	0.7%
Total Housing Units[b]	1,299,986	1,433,358	1.0%
Employed Residents/Residents Ratio	0.52	0.49	
Jobs/Employed Residents Ratio	1.00	1.11	
Jobs/Housing Ratio	1.42	1.54	

[a] Employment estimates from ABAG may not match Census or County Business Patterns employment figures due to independent data collection and estimation methods. Jobs for Sandia Labs added to Livermore and Tri-Valley jobs totals due to prior ABAG omission.
[b] Represents total occupied housing units according to US Census, 1990 and 2000.
[c] Alameda, Contra Costa and Santa Clara Counties.

Sources: ABAG Projections 2002; 2000 U.S. Census; BAE, 2002.

2000. For a more in-depth discussion of the jobs/housing balance and match in Livermore, see Appendix A.

4. 1999 Economic Base Analysis

As previously described, ABAG estimates that between 1990 and 2000, Livermore's employment base grew from an estimated 37,139 jobs in 1990 to an estimated 41,500 jobs in 2000. This represents an increase of 4,360 jobs, or approximately 12 percent, during the decade. Within this overall job growth, there were significant changes in the composition of Livermore's employment base as the agriculture and transportation sectors declined in importance, and the services and retail sectors experienced strong growth. Since detailed sectoral breakdowns of Livermore's employment base are not yet available from a consistent data source between 1990 and the present (e.g., Census data), this section relies on special tabulations of 1999 County Business Patterns data to: 1) describe the relationship of Livermore's current economic base to the larger region; and 2) analyze how Livermore's economy is changing in terms of employment composition and growth.

Table 4-12 presents 1999 employment by major economic sector in Livermore compared to Tri-Valley and the larger Commute Region. As shown, more than 40 percent of Livermore's jobs in 1999 were concentrated in the services sector, which includes business and personal services. This was a higher concentration in services than for the Tri-Valley or the Commute Region. Livermore also had a higher concentration than the Tri-Valley, and about the same percent as the Commute Region for jobs in the transportation and public utilities sectors.

Table 4-12 also shows a location quotient (LQ), which measures the relative importance of the sector within the Commute Region economy. Sectors with LQS of 1.0 or greater are considered "base" or "export" sectors, meaning that these sectors are strongly represented in a sub-region in relation to a larger economic region. In analyses of larger scale economies, "base" industries typically generate higher economic output than would otherwise be expected. As a result, traditional economic development strategies focus on identifying base sectors and, where these sectors produce desirable jobs that match community goals, public policies often seek to support the development of key industries within these sectors. For this sub-regional analysis, sectors identified as base industries indicate a relative strength as compared to the region.

For this analysis, LQs for Livermore and the Tri-Valley were calculated, based on the Commute Region as the benchmark. This technique identifies strong industries in Livermore that set it apart from the larger Commute Region. Livermore's major base sectors (excluding unclassified establishments) are construction, mining, agricultural support, "other" services, auxiliary services, administrative support services, wholesale trade, professional/scientific services, and retail trade.[1] In the Tri-Valley as a whole, strong sectors, in addition to those that are strong in Livermore include finance/insurance, information, management companies and real estate. In contrast to the Commute Region, both Livermore and the Tri-Valley are weak in the sectors of manufacturing, which includes computer hardware, as well as Silicon Valley support services in management and administration.

[1] Although Table 3-12 shows that the LQ for the arts, entertainment and recreation sector is 1.08. This sector is not considered a base sector because it is too localized.

Table 4-12: Employment by Major Industry Group, 1999[a]

	Livermore			Tri-Valley[b]			Commute Region[c]	
Industry Code Description	**Jobs**	**% Total**	**LQ[d]**	**Jobs**	**% Total**	**LQ[d]**	**Jobs**	**% Total**
Forestry, Fishing, Hunting, Agriculture Support	13	0.0%	1.52	34	0.0%	0.77	538	0.0%
Mining	33	0.1%	3.43	216	0.1%	4.38	607	0.0%
Utilities	22	0.1%	0.25	107	0.1%	0.24	5,371	0.3%
Construction	6,114	20.6%	3.58	15,153	10.0%	1.74	106,986	5.8%
Manufacturing	3,166	10.7%	0.58	7,177	4.8%	0.26	339,509	18.3%
Wholesale Trade	2,288	7.7%	1.10	14,390	9.5%	1.36	130,327	7.0%
Retail Trade	2,886	9.7%	0.99	16,785	11.1%	1.14	181,650	9.8%
Transportation and Warehousing	683	2.3%	0.89	2,200	1.5%	0.56	48,046	2.6%
Information	366	1.2%	0.26	11,485	7.6%	1.60	88,345	4.8%
Finance and Insurance	736	2.5%	0.66	11,271	7.5%	1.98	70,113	3.8%
Real Estate and Rental and Leasing	381	1.3%	0.75	2,965	2.0%	1.15	31,612	1.7%
Professional, Scientific, Technical Services	2,364	8.0%	0.95	15,650	10.4%	1.24	155,350	8.4%
Management of Companies and Enterprises	457	1.5%	0.39	9,755	6.5%	1.63	73,776	4.0%
Administration, Support, Waste Management, Remediation Services	4,165	14.1%	1.57	13,878	9.2%	1.02	166,507	9.0%
Educational Services	182	0.6%	0.25	1,029	0.7%	0.28	45,913	2.5%
Health Care and Social Assistance	1,546	5.2%	0.56	7,960	5.3%	0.57	173,056	9.3%
Arts, Entertainment, Recreation	413	1.4%	1.02	3,076	2.0%	1.49	25,310	1.4%
Accommodation and Food Services	1,798	6.1%	0.93	10,685	7.1%	1.09	120,867	6.5%
Other Services (Except Public Administration)	1,478	5.0%	1.39	4,963	3.3%	0.92	66,616	3.6%
Auxiliaries (Executive, Corporate, Subsidiary, Regional Management)	456	1.5%	1.28	1,651	1.1%	0.91	22,256	1.2%
Unclassified Establishments	83	0.3%	2.74	474	0.3%	3.06	1,902	0.1%
Total	**29,631**	**100.0%**		**150,903**	**100.0%**		**1,854,656**	**100.0%**

[a] City data from U.S. Census CBP zip code date. CBP reports only total employment and number of firms within a employment range. BAE calculated employment by industry using the number of firms within each range, the average number of employees of each range, and the ratio of this BAE calculated total employment versus CBP reported total employment. The ratio between this estimated total employment and reported total employment was then used to adjust the number of employees estimated by industry to equal the actual total employment for the year. Note that total jobs by geography will not total to other sources due to the exclusion of government and other jobs from the CBP database.

[b] The Tri-Valley Area is defined as the U.S. Census cities and Census Designated Places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.

[c] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.

[d] The Location Quotient (LQ) is defined as the ratio of an industry's share of the local economy to the industry's share of the Commute Region economy. This is the most commonly used approach for estimating basic employment in a local economy. Those industries with an LQ of 1.00 or greater are considered to be base or export sectors of the economy.

Sources: U.S Census County Business Patterns (CBP), 1999; BAE, 2002.

5. Retail Sales Trends

Retail has been an important economic sector in Livermore and has performed strongly during the last decade. From 1990 through 2000, Livermore experienced a 135 percent increase in retail sales, on an inflation-adjusted basis. Total taxable retail sales rose from $366 million per year to over $858 million per year, as shown in Table 4-13. This increase is attributable to both per capita spending increases of existing residents and an increased total population in Livermore. Additionally, growth in Livermore has included the expansion in the number and quality of retail centers in the City. During the 1990s, per capita taxable sales, adjusted for inflation, increased by nearly 81.5 percent. In 2000, taxable retail sales accounted for 60 percent of taxable sales.

Table 4-13: Livermore Taxable Retail Sales Trends, 1990 to 2000

Type of Retail	1990	2000	Change 1990-2000
SALES IN 2000 ($000)[a]			
Apparel Stores	$7,528,315	$2,523,000	-66.5%
General Merchandise Stores	$45,242,355	$185,555,000	310.1%
Food Stores	$39,273,985	$46,634,000	18.7%
Eating and Drinking Places	$42,546,707	$63,786,000	49.9%
Home Furnishings and Appliances	$16,325,403	$15,415,000	-5.6%
Building Materials and Farm Implements	$46,752,234	$151,461,000	224.0%
Auto Dealers and Auto Supplies	$62,446,545	$137,745,000	120.6%
Service Stations	$49,737,737	$73,356,000	47.5%
Other Retail Stores	$56,176,462	$182,090,000	224.1%
Retail Stores Total	**$366,029,743**	**$858,565,000**	**134.6%**
SALES PER CAPITA (in 2000$)[a]			
Apparel Stores	$133	$34	-74.1%
General Merchandise Stores	$797	$2,530	217.3%
Food Stores	$692	$636	-8.1%
Eating and Drinking Places	$750	$870	16.0%
Home Furnishings and Appliances	$288	$210	-27.0%
Building Materials and Farm Implements	$824	$2,065	150.6%
Auto Dealers and Auto Supplies	$1,101	$1,878	70.6%
Service Stations	$877	$1,000	14.1%
Other Retail Stores	$990	$2,483	150.8%
Retail Stores Total[b]	**$6,451**	**$11,706**	**81.5%**
Population[b]	**56,741**	**73,345**	**29.3%**

[a] Retail sales in 1990 have been adjusted to 2000 dollars using the annual average Consumer Price Index for All Items, published by the U.S. Bureau of Labor Statistics.

[b] Analysis excludes all non-retail outlets (business and personal services) reporting taxable sales (see 2000 regional comparison for data).

[c] Per capita sales calculated based on State Board of Equalization reported sales and Department of Finance population based on 1990 and 2000 census.

Sources: State Board of Equalization, U.S. Bureau of Labor Statistics, 1990 and 2000; U.S. Census, and State Department of Finance, 2000; BAE, 2002.

Growth during the past decade was uneven among retail store categories in Livermore. Taxable sales fell for apparel and home furnishings. At the same time, general merchandisers increased sales 310 percent, due to the opening of several new value-priced stores. As shown on Table 4-14, discount department stores were the leading taxable sales business category in 2000, followed by light industrial/ printing, drugs/chemicals and new motor vehicle dealers.

In 2000, Livermore's $11,706 per capita taxable sales from retail outlets was slightly above the $10,378 per capita sales in the Commute Region (Table 4-15). Tri-Valley sales were significantly higher than either area at $15,423 per person. Livermore showed strength in the general merchandise and building material groups relative to the Commute Region. Only the building materials group had higher per capita sales than the Tri-Valley.[2] These retail outlets appear to be attracting outside dollars to Livermore. Apparel stores and the household group had weak per capita sales, indicating that Livermore residents were purchasing these goods outside of the City.

[2] Table 3-15 shows that Livermore also had higher per capita sales than the Commute Region in the grocery store category, but this is not included in the discussion because grocery stores are a very localized sector. In addition, Livermore's per capita taxable service station sales were higher than both the Tri-Valley area and the Commute Region, but again, this is not considered significant. Livermore's higher sales in the "other" category are not conclusive since this category covers such broad and various sectors.

6. Projections of Future Economic Growth

According to ABAG's *Projections 2002*, 2000 to 2020 job growth and increases in employed residents in Livermore are projected at 46.3 percent and 51.3 percent, respectively (see Table 4-7 in the previous section). Job and employed resident growth is projected at 46.8 percent and 55.6 percent in the Tri-Valley and 25.5 percent and 23.3 percent in the Commute Region. The ratios of jobs to employed resident are projected to decline in Livermore from 1.06 to 1.03, and also decline slightly in the Tri-Valley from 1.12 to 1.06. The Tri-Valley is projected to continue to have more jobs per employed resident than Livermore or the Commute Region, which is projected to grow slightly from 1.04 to 1.06.

Table 4-14: Top Business Category Taxable Sales in Livermore for 2000

Business Category	Annual Total[a]	Percent Total
Discount Department Stores	$148,409,200	11%
Light Industrial/Printers	$143,736,400	10%
Drugs/Chemicals	$142,455,700	10%
New Motor Vehicle Dealers	$109,949,400	8%
Lumber/Building Materials	$75,734,100	5%
Service Stations	$73,037,700	5%
Contractors	$53,562,300	4%
Heavy Industry	$48,641,800	3%
Farm/Construction Equipment	$47,656,100	3%
Trailers and Supplies	$46,262,700	3%
Specialty Stores	$38,295,600	3%
Farm Products/Equipment	$37,612,700	3%
Grocery Stores Liquor	$36,029,100	3%
Fast Food	$31,915,100	2%
Repair Shops	$28,387,200	2%
Office Supplies/Furniture	$20,836,900	1%
Restaurants Beer and Wine	$19,000,600	1%
Percent Total Sales		**79%**
Retail Sales	$843,656,600	60%
Non-Store/Part-Time Retailers	$2,150,600	0%
Business, Service, and Repairs	$76,772,600	6%
All Other Outlets (Industrial)	$472,185,900	34%
Total All Accounts	**$1,394,765,700**	**100%**

[a] Estimated based on tax receipts equal to 1 percent of taxable sales.

Sources City of Livermore, Livermore Sales Tax, Second Quarter Receipts for First Quarter Sales (Jan. – Mar. 2000); Third Quarter Receipts for Second Quarter Sales (Apr. – June 2000) Fourth Quarter Receipts for Third Quarter Sales (July – Sept. 2000), First Quarter Receipts for Fourth Quarter Sales (Oct. – Dec. 2000); HdL Companies, 2000 and 2001; BAE, 2002.

7. Fiscal Vitality

The vitality of a community is partially attributable to the quality of the municipal services a city government can offer it citizens. General Plan decisions regarding land uses, transportation, public services, and economic development can all affect the ultimate fiscal vitality of the City's budget. This section provides basic analysis of the City's General Fund.

a. City of Livermore Fiscal Conditions. The City of Livermore General Fund provides most of the funding for public safety, libraries and other public services that are essential for the quality of life for Livermore residents. General Fund sources and uses are illustrated in Table 4-16. The City of Livermore's fiscal year 2002-2003 (FY2002/03) General Fund budget, totaling $63.8 million, anticipates $27.8 million of expenditures, or 44 percent, for pubic safety uses, including the police and fire departments. Community development accounts for 20 percent of the total uses of funds, library and general services account for 13 percent, administration accounts for 9 percent, and 8 percent is slated for public services such as the airport, golf, maintenance services, and water resources. Funding for the Capital Improvement Plan (CIP) and transfers to other City funds account for the final 6 percent of budgeted expenditures.

The source of City General Fund revenue is primarily from traditional local taxes. Sales and use tax revenues from local retail and industrial businesses account for $18.3 million, or 28 percent, of General Fund revenue. Property taxes generate $14 million, or 22 percent, of revenues. City permits and fees account for $9.5 million, or 15 percent of total funds, and the remaining 35 percent comes from other taxes, intergovernmental transfers, and inter-budgetary transfers.

Table 4-15: Comparison of Livermore, Tri-Valley and Commute Region 2000 Taxable Sales

Outlets	Livermore[a]	Tri-Valley[a,b]	Commute Region[a,c]	Per Capita Livermore Sales	Per Capita Tri-Valley Sales	Per Capita Region Sales	Livermore Injection/ (Leakage) in Tri-Valley	Livermore Injection/ (Leakage) in Commute Region
Apparel Stores Group	$2,523	$173,841	$1,700,375	$34	$686	$417	(95.0%)	(91.8%)
General Merchandise Group	$185,555	$750,482	$6,415,002	$2,530	$2,962	$1,574	(14.6%)	60.7%
Grocery Stores	$46,634	$170,966	$2,107,855	$636	$675	$517	(5.8%)	22.9%
Eating and Drinking Group	$63,786	$358,611	$4,583,594	$870	$1,415	$1,125	(38.5%)	(22.7%)
Household Group	$15,415	$229,512	$2,409,536	$210	$906	$591	(76.8%)	(64.5%)
Building Materials Group	$151,461	$375,935	$3,293,376	$2,065	$1,484	$808	39.2%	155.5%
Automotive Group	$211,101	$1,050,074	$12,206,309	$2,878	$4,144	$2,995	(30.5%)	(3.9%)
Auto Dealer and Auto Suppliers	$137,745	$834,099	$8,876,086	$1,878	$3,292	$2,178	(42.9%)	(13.8%)
Service Stations	$73,356	$215,975	$3,330,223	$1,000	$852	$817	17.4%	22.4%
Other Retail	$182,090	$798,803	$9,575,025	$2,483	$3,152	$2,350	(21.2%)	5.7%
Total Retail Sales	**$858,565**	**$3,908,224**	**$42,291,072**	**$11,706**	**$15,423**	**$10,378**		
All Other Outlets	$535,389	$2,029,417	$31,106,666	$7,300	$8,008	$7,633	(8.9%)	(4.4%)
Total Sales[c]	**$1,393,954**	**$5,937,641**	**$73,397,738**	**$19,005**	**$23,431**	**$18,011**	**(18.9%)**	**5.5%**
Livermore Population, 2000	73,345							
Tri-Valley Population, 2000[b]	253,409							
Commute Region Population, 2000[c]	4,075,142							

[a] Sales in $1,000s.
[b] For this analysis, the Tri-Valley Area is defined as the U.S. Census cities of Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[c] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.

Sources: State Board of Equalization, 2000; 2000 Census; BAE, 2002.

b. Comparison of Livermore General Fund to Other Tri-Valley Cities. For this report, BAE also analyzed data from the State Controller's Office regarding surrounding Tri-Valley cities' fiscal revenues and expenditures, as shown in Table 4-17. As shown, for FY 1998/1999, Livermore generated more revenue per capita than Danville or San Ramon, but lower revenue per capita than Pleasanton or Dublin. Operating expenditures per capita in Livermore were below the other Tri-Valley cities, except Danville and slightly above San Ramon. Generally, City revenues will exceed operating expenditures, however in a rapidly expanding city such as Dublin, capital improvements may be funded out of general revenue in anticipation of development fees collected at a later date.

Additional analysis regarding Livermore's fiscal vitality and future projections will occur in subsequent stages of the General Plan update process.

Table 4-16: City of Livermore General Fund Sources and Uses of Funds by Category FY 2002-2003

Category	Amount	Percentage
Use of Funds		
Police	$17,008,350	27
Fire	$10,811,540	17
Administration	$5,698,470	9
Community Development	$12,595,620	20
Public Services	$5,372,820	8
Library & General Services	$8,397,880	13
CIP & Transfers	$3,895,000	6
Total	**$63,779,680**	**100**
Sources of Funds		
Property Taxes	$14,004,000	22
Sales Taxes	$18,280,000	28
Use of $	$2,905,000	5
Other Taxes	$9,095,000	14
Permits & Fees	$9,500,000	15
Intergovernmental Transfers	$6,279,000	10
Transf & FB	$3,716, 680	6
Total	**$63,779,680**	**100**

Source: City of Livermore Final Two-Year Financial Plan FY 2002/2003 and FY 2003/2004.

C. MARKET CONDITIONS IN 2002

Livermore's real estate market reflects its desirable community character and its strategic position within the rapidly expanding Tri-Valley area. This section profiles existing market conditions and pipeline projects for residential, office/industrial, and retail land uses. Appendix A provides a more in-depth discussion of the Citywide real estate market demand.

1. Residential Market

Livermore has experienced very rapid residential growth since 1950, and its urban fabric reflects, to a large extent, typical postwar patterns of suburban development. Table 4-18 describes housing stock by structure type from the 2000 Census. In 2000, Livermore had a housing stock characterized by 72.7 percent single-family detached homes, 9.5 percent duplex (single-family attached or 2-units) with the remaining units in multi-family structures. The Tri-Valley had a lower proportion of single-family homes at 68.7 percent and the Commute Region had an even lower proportion of single-family homes at 57.8 percent. Recent construction of housing has built a higher proportion of single-family homes in Livermore; as shown on Table 4-19, 91.9 percent of building permits issued in Livermore since 1990 have been for single-family homes.

The following sections characterize the existing conditions in the single-family and multi-family markets in Livermore and the Tri-Valley.

Table 4-17: Comparison of Tri-Valley General Fund Revenues and Expenditures Fiscal Year 1998-1999

	Livermore	Danville	Dublin	Pleasanton	San Ramon
Population[a]	73,631	39,881	28,707	64,254	44,688
General Revenues[b]	$38,426,547	$11,029,734	$19,433,140	$50,545,355	$23,127,226
per capita	$522	$277	$677	$787	$518
Operating Expenditures[c]	$55,981,980	$15,513,357	$33,122,363	$81,116,567	$21,998,647
per capita	$760	$389	$1,154	$1,262	$492
Net Expenditures[d]	$23,135,408	$4,563,021	$28,241,445	$39,281,156	$13,448,087
per capita	$314	$114	$984	$611	$301

[a] *State of California Cities Annual Report Fiscal Year 1998-1999* estimated population June 30, 1999.
[b] General revenues are defined as revenues that cannot be associated with a specific expenditure. This excludes functional revenue, those generated in the form of fees and changes for direct services, and revenues associated with a specific service tied to external requirements such as grants, bond or sale agreements.
[c] Operating expenditures are defined as total City expenditures less capital outlays.
[d] Net expenditures are defined as total City expenditures less capital outlays and functional expenditures which are fees and charges for direct service.

Sources: State of California Cities Annual Report Fiscal Year 1998-1999; Eva Howard, City of San Ramon Finance Director, personal communication to BAE, 2002.

Table 4-18: 2000 Housing Stock by Units in Structure

	Livermore		Tri-Valley[a]		Commute Region[b]	
Number of Units in Structure	**Structures**	**%**	**Structures**	**%**	**Structures**	**%**
Single-Family Detached	19,305	72.7%	66,327	68.7%	846,863	57.8%
Single-Family Attached	2,149	8.1%	10,945	11.3%	121,181	8.3%
2 Units	378	1.4%	811	0.8%	39,845	2.7%
3 or 4 Units	766	2.9%	3,169	3.3%	92,480	6.3%
5 to 9 Units	1,130	4.3%	4,524	4.7%	79,740	5.4%
10 to 19 Units	675	2.5%	3,083	3.2%	58,866	4.0%
20 or More Units	1,717	6.5%	6,785	7.0%	190,236	13.0%
Mobile Home	430	1.6%	901	0.9%	33,220	2.3%
Boat, RV, Van, etc.	0	0.0%	23	0.0%	1,658	0.1%
Total	**26,550**	**100.0%**	**96,568**	**100.0%**	**1,464,089**	**100.0%**

[a] The Tri-Valley area is defined as the U.S. Census cities and Census-designated places of Blackhawk, Danville, Dublin, Livermore, Pleasanton, and San Ramon.
[b] The Commute Region is defined as Alameda, Contra Costa, and Santa Clara counties.

Sources: U.S Census 2000; BAE, 2002.

a. Single-Family Residential Market. The City has a relatively active single-family home sales marketplace, attracting buyers from nearby communities, the broader Bay Area region, and beyond. Table 4-20 presents recent sales data for single-family homes Livermore, obtained from First American Real Estate Solutions (FARES), a subscription service reporting County Assessor's data for recorded real estate sales. This data is more comprehensive than typical Multiple Listing Service (MLS) sales data, since FARES includes all sales, not just those involving a Realtor.

Table 4-19: Building Permits Issued – City of Livermore 1990-2002[a]

Year	Number of Units in Building				
	Single-Family	%	Total Multi-Family	%	Total
Additions to Housing Stock					
1990	254	93%	18	7%	272
1991	176	99%	2	1%	178
1992	317	100%	0	0%	317
1993	301	86%	49	14%	350
1994	414	86%	66	14%	480
1995	549	100%	0	0%	549
1996	548	100%	0	0%	548
1997	829	85%	151	15%	980
1998	632	93%	44	7%	676
1999	316	82%	70	18%	386
2000	456	89%	55	11%	511
2001	386	96%	17	4%	403
2002[a]	221	98%	4	2%	225
Total	**5,399**	**91.9%**	**476**	**8.1%**	**5,875**

[a] 2002 data reported as cumulative to April 2002.

Sources: U.S Census 2000; BAE, 2002.

As shown in Table 4-18, Livermore had a total of 713 full and verified sales of single-family residences recorded during a roughly eight-month period ending in May 2002. The median price of these single-family home sales was $368,000. The average home was 1,597 square feet, and the average price per square foot was $245. Three-bedroom units are predominant in the mix, and cost an average of approximately $251 per square foot. It should be noted that this data encompasses numerous re-sales of existing homes in Livermore, including older housing units.

Sales of single-family homes for May 2002 were also profiled for the remainder of the Tri-Valley excluding Livermore, as shown in Table 4-21. The entire market area had 168 full and verified single-family home sales during May 2002 with an overall median price of $550,000, an average size of 2,048 square feet and an average sale price of $304 per square foot. Thus, Livermore appears to be priced below the balance of the Tri-Valley single-family home market, and Livermore's housing stock appears to be generally smaller in size.

(1) 2002 Selling Single-Family Projects – Livermore and Tri-Valley. Projects selling single-family units in Livermore in 2002 are profiled in Table 4-22. Twelve housing projects were selling approximately 1,200 new homes in Livermore. These new developments generally offered three- to five-bedroom homes priced from the low $600,000s to high $1,100,000s. Homes ranged in size from 2,275 to 4,500 square feet with a sale price that ranged from $203 to $270 per square foot. Interest in these units was reportedly high. Dunsmuir, Prima, and Vintner's Green developments offered homes from $600,000s to high $700,000s. Los Olivos in South Livermore and Ponderosa Legacy offered homes from $800,000 to $1,180,000.

Projects selling single-family units in the Tri-Valley in 2002 are also profiled in Table 4-22. Dublin had seven major housing projects with approximately 780 new homes. These new developments generally offered three- to five-bedroom homes priced from the low $500,000s to high $1,200,000s.

Table 4-20: Single-Family Residence Sales in Livermore, 2001-2002[a]

Price	Total Number of Units	% of Total	Number of Units			
			One Bedroom	Two Bedroom	Three Bedroom	Four+ Bedroom
Less than $100,000	2	0.3%			2	
$100,000 to $199,999	7	1.0%		2	5	
$200,000 to $299,999	64	9.0%		25	37	2
$300,000 to $399,999	405	56.8%	1	27	289	88
$400,000 to $499,999	149	20.9%		2	65	82
$500,000 to $599,999	51	7.2%			10	41
$600,000 and above	35	4.9%		1	4	30
Total[a]	**713**	**100.0%**	**1**	**57**	**412**	**243**
Median Sale Price	$368,000		$360,000	$300,000	$355,000	$429,000
Average Sale Price	$390,553		$360,000	$307,746	$361,807	$458,840
Average Square Feet (SF)	1,597		1,096	1,071	1,441	1,988
Average Price per SF	$245		$328	$287	$251	$231

[a] Represents full and verified single-family residence sales in Livermore from August 2001 to May 2002. Total unit counts, median, and average sales price include sales for which bedroom data is not available.

Source: First American Real Estate Solutions; BAE, 2002.

Table 4-21: Single-Family Residence Sales in the Tri-Valley, May 2002[a]

Price	Total Number of Units	% of Total	Number of Units			
			One Bedroom	Two Bedroom	Three Bedroom	Four+ Bedroom
Less than $100,000	0	0.0%				
$100,000 to $199,999	0	0.0%				
$200,000 to $299,999	0	0.0%				
$300,000 to $399,999	7	4.2%			3	4
$400,000 to $499,999	46	27.4%		3	23	16
$500,000 to $599,999	51	30.4%			16	25
$600,000 and above	64	38.1%		1	8	47
Total[a]	**168**	**100.0%**	**0**	**4**	**50**	**92**
Median Sale Price	$550,000		n/a	$435,000	$490,500	$602,500
Average Sale Price	$621,595		n/a	$433,333	$524,480	$656,288
Average Square Feet (SF)	2,048		n/a	1,252	1,654	2,263
Average Price per SF	$304		n/a	$346	$317	$290

[a] Represents full and verified single-family residence sales in the Tri-Valley *excluding* Livermore including: Blackhawk, Danville, Dublin, Pleasanton and San Ramon in May 2002. Total unit counts, median, and average sales price include sales for which bedroom breakdown information is not available.

Source: First American Real Estate Solutions; BAE, 2002.

Table 4-22: Tri-Valley Single-Family Projects Currently on the Market

Project Name	Project Status	Sold	Current Available	Absorp-tion	Units	Homes/ Acre	BR/Ba	SF	Sale Price or Rent	Interest	Amenities/Comments
LIVERMORE											
Laden Lane	25 units being built	24	7	5	114	3 to 4				High	Started construction January 2002
Holmes St. @ Alden Lane											
The Verbena							4/2.5	2,661	$680,900		
The Lantana							4/3	3,068	$704,900		
The Mariposa							5/3.5	3,536-4,158	$733,900		
The Hawthorn							5/4.5	3,348	$664,900		
The Acacia							5/4.5	3,672-4,099	$845,900		
Dunsmuir	106 have sold	106	6	2	122	4 to 5				High	Open 2 years
East Ave. & Vasco Rd.											
Gregory							4/2	2,275	$605,900		
Morgan							4/3	2,845	$676,900		
Morris							5/3	3,011	$695,900		
Wright							6/3	3,522	$715,900		
Lindenwood	selling houses	12	109	4	121	N/A				High	Opened in March 2002; two sold.
Charlotte Way									Starting		
The Avondale							3+/3	2.781	from		
The Hawthorne							5/4	3,261	$679,950		
The Princeville							5+/4	3,544			
The Savoy							5/4	3,548			
Los Olivos	Selling, models	13	7		94	N/A				High	
Westmore Road	open about July 10,										13 sales with models not open yet.
Lucini	2002						3/2.5	3,079	$815,490		
Talinga							4/3.5	3,540	$865,490		
Carapelli							4/3.5	3,750	$911,490		
Lusitana							4/3.5	4,142	$958,490		
Verdala							4/2.5	4,365	$991,490		
Ponderosa Legacy		15	9	1.5	76	N/A					
Saraloga Court	In "Phase 3," 15 of										Slowed to three sales in the last four
The Bay	18 available for						4/4	3,436	$1,002,900		weeks due to lack of model availability
The Morgan	sale have sold						4/3.5	3,768	$1,075,900		during "Phase 3" – July 20th they will
The Palomino							4/4.5	4,451	$1,180,900		be releasing more units for sale.

Table 4-22 *continued*

Project Name	Project Status	Sold	Current Available	Absorp-tion	Units	Homes/ Acre	BR/Ba	SF	Sale Price or Rent	Interest	Amenities/Comments
Prima	143 sold – three	143	6		149	4					
Isabel Ave. & Concannon Blvd.	#6's left and three										Slowed down due to few remaining
Residence One	models left						3/2.5	2,424	$618,000		options.
Residence Two							3/2.5	2,834	$667,000		
Residence Three							4/3	3,017	$719,000		
Residence Four							4/2.5	3,325	$745,000		
Residence Six							5/4	3,837	$820,000		
VinSanto	20 sold	20	4	4.8	174	4					
Arroyo Road											Opened in March, selling about
Model 1							4/3	2,750	$747,000		7/month.
Model 2							4/3	2,866	$733,000		
Model 3							4/3.5	3,318	$794,500		
Model 4							4/3.5	3,125	$781,000		
Model 5							4/3.5	3,619	$845,000		
Model 6							4/4	3,749	$784,000		
Vintner's Green	129 sold	129			156	N/A				Still	HOA
Alden Lane										strong	
Napa							3/2.5	2,530	$631,950		
Sonoma							4/3	2,894	$662,950		
Monterey							4/3	2,831	$652,950		
Livermore							4/4.5	3,197	$713,950		
Pulte Homes – Sevillano		9	13	1.8	50	2.9	N/A	N/A	N/A		
2432 Pendolino											
Pulte Homes – Birchwood Park		56	6	7.85	62	13.8	N/A	N/A	N/A		
5881 Hazelwood Common											
Shea Homes – Falbrook		51	18	3.11	79	4.2	N/A	N/A	N/A		
Alden Lane & Highway 84											
Back Properties – The Reserve		29	7	10.14	50	12.45	N/A	N/A	N/A		
Livermore Avenue & Cromwell Way											
Livermore Totals		**607**	**192**		**1,247**						
DUBLIN											
Chantemar at Dublin Ranch	6 units away	85	6	2.5	91	5 to 6				Good	
Tassajra Dr.									from		
Chantemar Plan 1							5+/3	3,546	$700,000		
Chantemar Plan 2							6/4	3,770	to		
Chantemar Plan 3							6/4	3,859	$823,000		

Table 4-22 *continued*

Project Name	Project Status	Sold	Current Available	Absorp-tion	Units	Homes/ Acre	BR/Ba	SF	Sale Price or Rent	Interest	Amenities/Comments
Dublin Ranch Golf Course-Gleneagles	46 sold	48	4	4	105	10				About 100 call/day. Opened January, 40% sold	
El Charro Road											Golf, park, pool, recreational facilities, tennis.
Fairfax – Plan One							4+/3	2,830	$692,975		
Corte Madera – Plan Two							4+/2.5	2,950	$712,975		
Almonte – Plan Three							4/2.5	2,700	$714,975		
Mill Valley – Plan Four							4+/2.5	3,030	$741,975		
Dublin Ranch Golf Crse-St. Andrews	58 to 63 homes	64	7	6.5	97	4 or 5,				Very	
El Charro Rd.	currently under					maybe a				good,	Golf, park, pool, tennis.
Dublin	construction have					little	4+/3.5	3,504	$797,975	selling	
Cupertino	been sold					more	5/4.5	3,595	$822,975	quickly.	
Danville							4/4.5	3,609	$827,975		
Pleasanton							4+/3.5	3,980	$840,975		
Pinnacle at Dublin Ranch Golf Club	Plan to build	17	0	17	110	4					
El Charro Rd.											Gated, golf
Newcastle							5+/4.5	4,650	$1,159,975		
Santa Barbara							5/5.5	4,921	$1,199,975		
Atherton							5/5.5	5,035	$1,211,975		
Carlsbad							6/6.5	5,532	$1,259,975		
Rainsong	Started	17	6	3.4	73	10				Very	
Cascade Creek Lane	construction , two									good	
The Bach	completed						4/2.5	2,395	$669,950		
The Chopin							4/2.5	2,527	$649,950		
The Strauss							5/3	3,078	$674,950		
The Vivaldi							5/4	3,122	$699,450		
Riva	Started	33	10	6.6	99	12				Very	
Cascade Creek Lane	construction									good	
The Amalfi							3/2.5	1,884	$545,950		
The Como							4/2.5	1,968	$537,950		
The Napoli							4/3.5	2,179	$563,950		
The Ravello							4/2.5	2,335	$609,950		
Tassajara Meadows	30 homes left to	165	5	5	204	about				Still	
Tassajara Circle	release					13				pretty	
Plan 1							3/2.5	1,658	$514,000	good	
Plan 2							3/2.5	1,842	$531,000		
Plan 3							4/2.5	2,000	$545,000		
Plan 4							4/3	2,127	$559,995		
Dublin Totals		**429**	**38**		**779**						

Table 4-22 *continued*

Project Name	Project Status	Sold	Current Available	Absorp-tion	Units	Homes/ Acre	BR/Ba	SF	Sale Price or Rent	Interest	Amenities/Comments
PLEASANTON											
Birdle Creek	3 homes left to sell	99	3	3.3	102	3				Good	
Sycamore Creek & Hidden Creek											
The Primeur							5/3	3,229	$1,189,000		
The Carlton							6/4	3,246	n/a		
The Hillstar							6/5	4,067	n/a		
The Avalon							6/5.5	4,436	$1,349,000		
Nolan Farms	Two model homes.	29	2	2	36	2.8				Good	
Fair St. at Division St.	Sold out of										
Residence 1	residence 1, 2 & 3.						3/2.5	2,542	$925,000		
Residence 2							4/3.5	3,248	$800,000		
Residence 3							5/3.5	3,254	$1,410,750		
Residence 4							3+/4.5	3,591	$1,269,500		
Residence 5							5/4.5	4,129	$1,266,579		
Castlewood Heights		16	12	1.68	28	1.6	N/A	N/A	N/A		
Pulte Homes											22 are built or partially built.
Walnut Hills SFRs		4	82	11.5	101	5.5	N/A	N/A	N/A		Oak Knolls will be built across the street. With released lots, they are averaging 2.4 sales per week since the models opened in January 2002.
KB Home											
Norris Canyon Estates		56	35	3	289	3	N/A	N/A		Approx. 3 sales/ mo.	
Norris Canyon Rd.											Amenities: Clubhouse, common space, gated, jogging/biking trails, tennis, tot lot.
Atherton Colonial							5/5.5	5,010	$1,423,975		
Menlo Manor							4+/5.5	5,320	$1,470,975		
New Castle Manor							5+/4.5	4,610	$1,396,975		
Moraga Mediterranean							3+/2.5	3,249	$1,279,975		
Santa Barbara Elite Renaissance							5+/5.5+	6,000	$1,599,975		
Orinda Colonial							5+/5.5	6,640	$1,634,975		
Terrazzo		38	3	3.2	41	6.2				High	
Alcosta Rd											Almost sold out – started in August.
Plan One							3/3	3,001	Sold Out		
Plan Two							4/3	2,882	$774,900		
Plan Three							5/3	3,274	Sold Out		
Plan Four							5/3.5	3,394	Sold Out		
Pleasanton Totals		**242**	**137**		**597**						

Table 4-22 *continued*

Project Name	Project Status	Sold	Current Available	Absorp-tion	Units	Homes/ Acre	BR/Ba	SF	Sale Price or Rent	Interest	Amenities/Comments
SAN RAMON											
Windemere: Fiore	Started to build	22	2	15.6	68	6				Very	
Albton Road	Spring 2002									good	Central multi-use park, tot lots, ball
Lucca – Plan One							4+/3.5	3,618	$850,000		fields, and trails.
Siena – Plan Two							4+/4.5	3,838	$875,000		
Volterra – Plan Three							6+/5	4,192	$900,000		
Windemere: Taramea	Selling	50	30	10	168	13				approx.	
Bollinger Rd. & Albton Rd.										10 sales/	Central multi-use park, tot lots, ball
Arvendi – Plan One							4+/2.5	2,651	$646,900	month	fields, and trails.
Fantini – Plan Two							3+/2.5	2,850	$672,400		
Marigola – Plan Three							4+/2.5	3,135	$702,900		
Filoli – Plan Four							4+/3.5	3,149	$715,900		
Windemere: Montage	Selling	27	1	13.7	115	10.37					
Bollinger Rd. & Windemere Pkwy.											
Caymus – Plan One							3/2.5	1,938			Central multi-use park, tot lots, ball
Esquire – Plan Two							4/2.5	2,303			fields, and trails.
Sterling – Plan Three							4/2.5	2,381			
Tallisman – Plan Four							4+/3	2,383			
Windemere: Amberley	Selling	30	4	15	96	10.37					
Bollinger Rd. & Windemere Pkwy.											
Colebrook – Plane One							4+/3	2,365			Central multi use park, tot lots, ball
Roxbury – Plan Two							4+/3	2,538			fields, and trails.
Waterford – Plan Three							4+/3.5	2,697			
Windemere: Canadoro		56	0	10.9	101	14				approx.	
Bollinger Road										16 sales/	
Cartona – Plan One							3+/2.5	1,598	$501,990	month	Central multi-use park, tot lots, ball
Lugano – Plan Two							3+/2.5	1,778	$520,900		fields, and trails.
Como – Plan Three							4+/2.5	2,012	$550,900		
Verona – Plan Four							4+/2.5	1,992	$550,900		
San Ramon Totals		**185**	**37**		**548**						

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Source: BAE, 2002.

These homes in Dublin range in size from 1,658 to 5,500 square feet. Pleasanton had six housing projects with approximately 600 new homes. These new developments generally offered three- to six-bedroom homes priced from the high $1,100,000s to low $1,400,000s and ranging in size from 3,229 to 4,400 square feet. San Ramon had five major housing projects with approximately 550 new homes. These new developments generally offered three- to five-bedroom homes priced from the low $500,000s to low $1,600,000s. These homes in San Ramon ranged in size from 1,598 to 6,000 square feet.

(2) Planned Single-Family Projects – Livermore and Tri-Valley in 2002. As of mid-2002, Livermore expected to develop many new single-family homes over the next few years. As presented in Table 4-23, more than 150 single-family units were approved and in various stages of development, with an additional 47 units proposed or in different stages of approval. Table 4-23 also lists proposed projects in other Tri-Valley cities. Approximately 7,000 units were represented on this list with over 4,500 proposed in the City of Dublin.

b. Multi-Family For-Sale Market. As shown in Table 4-24, Livermore had a total of 34 full and verified sales of condominiums recorded during a roughly eight-month period ending in May 2002. The median price of these condominium units was $226,500, with an average size of 930 square feet, and the average price per square foot was $253. Interestingly, this data suggests that condominiums sell for approximately the same price per square foot or even slightly higher than single-family homes in Livermore, indicating strong potential demand for this product type.

For the remainder of the Tri-Valley excluding Livermore, during May 2002, 84 full and verified condominium sales are shown on Table 4-25. These sales yielded a median price of $344,250, with an average size of 1,287 square feet and an average price of $279 per square foot. Again, Livermore's condominium sales appear to place the City at the lower end of the Tri-Valley market, both in terms of size of units and sale price per square foot.

(1) Selling Projects in 2002 – Livermore and Tri-Valley. Table 4-26 provides details on selling attached single-family and multi-family projects in Livermore and the Tri-Valley area in 2002. As shown, no newly constructed selling multi-family projects were identified in Livermore.

In surrounding communities, three of the four phases of the Dublin Ranch Villages (The Villas, The Cottages, and The Courtyards) had opened for sale, including over 700 units available at densities ranging from 20 to 35 units per acre and prices in the mid-$300,000s to over $500,000 per unit. One other selling attached single-family project, Eleven 80, was also available in Dublin in a similar price range.

(2) Planned For-Sale Projects in 2002 – Livermore and Tri-Valley. As shown in Table 4-27, several projects were planned for Livermore in 2002 that would offer market rate multi-family for-sale units, including Creekside Villas, Vineyard Terrace, and East Town Village. As of May 2002, Vineyard Terrace planned to offer one- to three-bedroom units priced from the low $200,000s to high $300,000s. Interest in these units was reportedly high.

Table 4-23: Tri-Valley Single-Family Planned and Proposed Developments as of May 2002

Development Name and Address	Type	Units per Acre	Project Status	Approved Units
LIVERMORE				
WPH – Cornerstone Place	SFR		On sale first quarter '03.	51
Copper Ridge	SFR		Will be on sale next year as a separate property from adjacent Dunsmuir.	61
Warmington Homes	SFR		Approved by City Council, but plans are out for corrections.	38
Seven Hills Venture	SFR		Recent submittal. To be scheduled.	21
Altamont Construction, Inc. for Gabriel Silveria	SFR		Application incomplete.	4
East Bay Habitat for Humanity	SFR		Recent submittal. To be scheduled.	22
Total				**197**
DUBLIN				
Yarra Yarra Ranch Phase II	SFR	5.75	PD approved. Selling soon.	50
Yarra Yarra Ranch Phase III	SFR		Sales in second half of 2003.	193
Dublin Ranch – Areas B-E	SFR	7.77	PD approval, no subdivision maps filed.	1,875
Dublin Ranch Tower Center – Areas F&H	SFR	15.27	PD approval.	2,180
Dublin Ranch West Tassajara Rd.	SFR		Processing underway.	
Pinn Bros – Nielson/Silveria Annex.	SFR		Processing underway.	
Tassajara Meadows	SFR	8.12	Unknown	95
Schaefer Ranch	SFR		Inactive	466
Total				**4,859**
PLEASANTON				
Oak Knolls	SFR		Under construction.	102
Moller Ranch/Boulevard Dev.	SFR	0.5	Under construction.	99
Lemoine Property/4456 Foothill Blvd.	SFR	0.3	Growth Management Program approval.	13
Vineyard Hills	SFR	1.2	Growth Management Program approval.	27
Costas/Hahner/2287 Vineyard Ave.	SFR	1.12	Growth Management Program approval.	38
Apperson Ridge/2200 Vineyard Ave.	SFR	0.3	Development Plan approval.	21
Avignon/1689 Vineyard Ave.	SFR	0.74	Development Plan approval.	47
Heinz/Vineyard Ave.	SFR	1.21	MSF	18
Dublin Canyon Rd.	SFR	0.2	Development Plan approval.	12
Carlton Oaks/Canyon Oaks	SFR	3.6	Under construction.	360
TTK Partnership/Happy Valley Rd.	SFR	1.3	Development Plan approval.	12
Pleasanton Golf Course Lots	SFR	0.1	Development Plan approval.	37
Hatsushi 2798 Vineyard Ave.	SFR	1.07		14
Equus Height/Don Yu	SFR	0.2	TM approval lapsed for 15 units on remaining Yee property.	7
Lauer/221 Martin Dr.	SFR	1.2	Growth Management Program approval.	6

Table 4-23 *continued*

Development Name and Address	Type	Units per Acre	Project Status	Approved Units
Walsh/447 Kottinger Dr.	SFR	1.3	Growth Management Program approval.	2
Moreira/558 Sycamore Rd.	SFR	2	Future development.	4
Thompson/6240 Sunol Blvd.	SFR	3.1	Growth Management Program approval.	3
Miller/Vineyard Ave.	SFR	0.95	Development Plan approval.	2
Merritt Property	SFR	1.9	Project denied by voters.	89
Sycamore Heights/New Cities	SFR	1.4	Project cancelled.	49
Total				**962**
SAN RAMON				
Windemere Master Plan			The main office at Windemere said project will eventually add up to 930 SFR.	16
Windemere: Belrose	SFR	0.11	Will be open in first half '03.	
Total				**930**
TOTALS				**6,948**

Source: BAE, 2002.

c. Multi-Family Rental Market. Table 4-28 provides March 2002 information from RealFacts a private data provider, regarding large, multi-unit apartment buildings and complexes in Livermore, the Tri-Valley and the Commute Region. According to the data provided by RealFacts, Livermore had an inventory of 2,268 units in large multi-unit buildings with an average rent of $1,169 and an occupancy rate of 94.5 percent. Livermore's average apartment rents were slightly lower than the Tri-Valley average of $1,323 and the Commute Region average of $1,346. Livermore's occupancy rate as of March 2002, at 94.5 percent, was slightly higher than the Tri-Valley and the Commute Region (both at 93.6 percent occupancy). While all three geographies have experienced a softening of the rental market, average rents in Livermore declined more slowly than the Tri-Valley or the Commute Region since year-end 2001. Livermore average rents declined 7.6 percent, while the Tri-Valley experienced a 10.4 percent drop, and the Commute Region saw a 13.6 percent decline for the period. Historical vacancy rates for Livermore compared to the Tri-Valley also suggest that Livermore's apartments have experienced slightly more demand during the past several years in an already highly-demanded region.

(1) Leasing Rental Projects in 2002 – Livermore and Tri-Valley. Research indicated that there were no newly constructed market rate rental projects leasing up in Livermore, as of May 2002. One newly constructed market rate rental project was found in surrounding Tri-Valley communities. Iron Horse Trail in Dublin consists of 177 one- to three-bedroom apartment units with asking prices of $1,575 to $2,400 per month. The management for this project indicated that these rental rates would not be fixed until management had an opportunity to gauge competitive rental rates appropriate for market conditions.

Table 4-24: Condominium Sales in Livermore 2001-2002[a]

Price	Total Number of Units	% of Total	Number of Units			
			One Bedroom	Two Bedroom	Three Bedroom	Four+ Bedroom
Less than $100,000	0	0.0%				
$100,000 to $199,999	11	32.4%	8	2		
$200,000 to $299,999	15	44.1%		11	1	
$300,000 to $399,999	8	23.5%				
$400,000 to $499,999	0	0.0%				
$500,000 to $599,999	0	0.0%				
$600,000 and above	0	0.0%				
Total[a]	**34**	**100.0%**	**8**	**13**	**1**	**0**
Median Sale Price	$226,500		$179,750	$223,000	$244,000	n/a
Average Sale Price	$235,265		$174,063	$214,269	$244,000	n/a
Average Square Feet (SF)	930		642	910	1,345	n/a
Average Price per SF	$253		$271	$235	$181	n/a

[a] Represents a sample of full and verified condominium sales in Livermore from August 2001 to May 2002. Total unit counts, median, and average sales price include sales for which bedroom breakdown information is not available.

Source: First American Real Estate Solutions; BAE, 2002.

Table 4-25: Condominium Sales in the Tri-Valley, May 2002[a]

Price	Total Number of Units	% of Total	Number of Units			
			One Bedroom	Two Bedroom	Three Bedroom	Four+ Bedroom
Less than $100,000	0	0.0%				
$100,000 to $199,999	1	1.2%	1			
$200,000 to $299,999	21	25.0%	5	16		
$300,000 to $399,999	35	41.7%	1	23	9	1
$400,000 to $499,999	18	21.4%		6	8	
$500,000 to $599,999	9	10.7%			7	2
$600,000 and above	0	0.0%				
Total[a]	**84**	**100.0%**	**7**	**45**	**24**	**3**
Median Sale Price	$344,250		$250,000	$315,000	$432,500	$515,000
Average Sale Price	$359,367		$248,929	$320,256	$444,063	$460,000
Average Square Feet (SF)	1,287		859	1,115	1,641	1,843
Average Price per SF	$279		$290	$287	$271	$250

[a] Represents full and verified condominium sales in the Tri-Valley *excluding* Livermore including: Blackhawk, Danville, Dublin, Pleasanton, and San Ramon in May 2002. Total unit counts, median, and average sales price include sales for which bedroom breakdown information is not available.

Source: First American Real Estate Solutions; BAE, 2002.

Table 4-26: Tri-Valley Multi-Family and Single-Family Attached Projects on the Market, 2002

Project Name Contact Information	Project Status	Units Mix	Units/ Acre	Sq. Ft.	Sale Price or Rent	Amenities/Comments
LIVERMORE						
None selling in 2002.						
DANVILLE						
None selling in 2002.						
DUBLIN						
Dublin Ranch Villages (see below)	Four distinct communities include 1,396 condos and townhomes. Courtyards, cottages, villages available in June 2002, Terraces will release July 13, 2002.		20-35	1,240 sf-2,250 sf	150 units of the 1,396 units, below market rate	Each of the four communities has a pool, spa, clubhouse, exercise facilities. Two City parks included in the larger site. A Downtown, pedestrian-friendly street will go through the middle of the four communities.
The Villas 3501 Dublin Blvd. Dublin		Total 289 units.		1 BR, 1.5 BA - 1,240 sf 1 BR+den, 2BA - 1,300 sf 1 BR+den, 2.5 BA - 1,417 sf 2 BR, 2 BA - 1,420 sf 2 BR, 2.5 BA - 1,417 sf	$339,975 $375,975 $395,975 $405,975 $415,975	Common space, pool, recreational facilities, private garages, BART access.
The Courtyards 3501 Dublin Blvd. Dublin		Total 281 units.		2 BR, 2 BA - 1,290 sf 2 BR, 2 BA – 1,515 sf 2 BR, 2 BA – 1,530 sf 2 BR, 2.5 BA – 1,565 sf 2 BR, 2 BA – 1,661 sf 3 BR, 2.5 BA – 1,780 sf 3 BR, 2.5 BA – 1,540 sf 3 BR, 3 BA – 1,675 sf 3 BR, 3 BA – 1,915 sf 3 BR, 2.5 BA – 2,175 sf	$395,975 $399,975 $409,975 $435,975 $435,975 $449,975 $459,975 $484,975 $499,975 $509,975	Common space, pool, recreational facilities, private garages, BART access.

Table 4-26 *continued*

Project Name Contact Information	Project Status	Units Mix	Units/ Acre	Sq. Ft.	Sale Price or Rent	Amenities/Comments
The Cottages 3501 Dublin Blvd. Dublin		Total 200 units.		1 BR, 2 BA – 1,320 sf 2 BR, 2 BA – 1,634 sf 2 BR+loft, 2.5 BA – 1,906 sf 2 BR+loft, 2.5 BA – 1,979 sf 3 BR+loft, 2.5 BA – 2,112 sf 3 BR, 2 BA – 2,158 sf 3 BR+loft, 2.5 BA – 2,112 sf 3 BR+loft, 2.5 BA – 2,250 sf	$416,975 $444,975 $500,975 $515,975 $539,975 $549,975 $569,975 $579,975	Common space, pool, recreational facilities, private garages, BART access.
The Terraces 3501 Dublin Blvd. Dublin		Total 626 units.		Seven floor plans will be available. No specifics available at this time.	N/A	Common space, pool, recreational facilities, BART access.
Eleven 80 Castle Companies Dougherty Rd. @ Iron Horse Trail Dublin	Ten homes currently released.	60 attached single-family homes	25-35	3 BR, 2.5 BA – 1,396 sf 2 BR, 2.5 BA+loft – 1,792 sf	$395,000 $440,000	Each unit has two car garage, home network system, security system, designer kitchens, and home theater system.
PLEASANTON						
None selling in 2002.						
RENTAL						
Ironhorse Trail Archstone Communities 6233 Dougherty Rd. Dublin	Recently renting	177 Apts.	29	1 BR, 1BA – 65-705 sf 1 BR, 1 BA – 17-776 sf 1 BR, 1 BA – 8-830 sf 2 BR, 2 BA – 8-991 sf 2 BR, 2 BA – 2-1,077 sf 2 BR, 2 BA – 65-1,050 sf 3 BR, 2 BA, 12-1,309 sf	$1,575/mo. $1,625/mo. $1,650/mo. $1,825/mo. $1,925/mo. $1,900/mo. $2,400/mo.	Pool, spa, fitness center, clubhouse, in-unit wash/dryer. Rental rates are not fixed. Beginning to rent and rent may move lower in response to market demand.
SAN RAMON						
None selling in 2002.						

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Source: BAE, 2002.

Table 4-27: Tri-Valley Multi-Family and Single-Family Attached Planned and Proposed Developments

Project Name Contact Information	Project Status	Unit Mix	Units/ Acre	Size	Sales Price or Rent	Interest	Amenities/Comments
LIVERMORE							
Valley Care Phase I	Approved	250 sr. apts					Senior care facility – 900 E. Stanley Boulevard. Building to begin January 2003.
Valley Care Phase II	Approved	76 sr. apts	34.5	76 units on a 2-2-acre lot			Design to begin in 2003.
Creekside Villas Western Pacific Housing N. Vasco Rd, 1057 Livermore	Design Review Committee meeting 6/20/02.	116 condos	16.11	2 BR, 2 BA–19-1,023 sf 2 BR, 2 BA– 6-1,193 sf 3 BR, 2.5 BA–61-1,384-1,494 sf	Twelve units affordable. Market rate rents not available yet.		
Vineyard Terrace Western Pacific Housing Collier Canyon, No. of 580 Livermore	Approved, under construction.	96 attached condos	13.5	1 BR, 1 BA–6-580 sf 2 BR, 2 BA – 50-1,053-1.310 sf 3 BR, 2.5 BA–40-1,621 sf	Ten units – low income, market rate – low $200s – high $300s	112 calls	Near Dublin BART.
East Town Village Bancor Properties LLC 2911 First St. Livermore	Application incomplete, requesting additional units, to be determined.	68 attached, 3-story townhouses	3.78	2 BR, 2.5 BA– 2-1,100 sf 3 BR, 3 BA–28-1,421 sf 3 BR, 3 BA–28-1,728 sf	Seven units low income, prices not available.		Commercial daycare facility, number of children unknown, won't be determined until site plan approval processed.
Carmen Avenue Apts. Anita Gandalfo 2891 Carmen Ave. Livermore	Application incomplete, no entitlements processed/approved.	20 attached apts.	20	All 2 BR, 2 BA–975 sf	Three units low income, one unit disabled accessible, rental rates not available.		None known.
DANVILLE							
None planned or proposed, as of 2002.							
DUBLIN							
Dublin Ranch – The Terraces 3501 Dublin Blvd., Dublin	Under construction, release date 7/13/2002.	Total 626 units.	61	Seven floor plans will be available, no specifics available at this time.	N/A		Common space, pool, recreational facilities, BART access.
Waterford Place Shea Properties 4800 Tassajara Road, Dublin	Under construction.	390 apts.	45	1 BR, 1 BA–599-708 sf 1 BR, 1 BA+Den–807-922 sf 2 BR, 2 BA–1,040-1,097 sf 2 BR, 2BA+den–1,367 sf	All market rate.	Waiting list, first building released end of June '02.	Courtyards with pool and spa or fountain, gated, rec. room, 14-seat theater, business center, fitness center, in-unit w/d, private patio or balcony.

Table 4-27 *continued*

Project Name Contact Information	Project Status	Unit Mix	Units/ Acre	Size	Sales Price or Rent	Interest	Amenities/Comments
Ironhorse Trail Archstone Communities 6233 Dougherty Rd, Dublin	Under construction.	177 apts.	29				Pool, spa, fitness center, clubhouse, in-unit w/d.
PLEASANTON							
Carlton Oaks/Canyon Oaks Greenbriar Homes Bernal Property, Pleasanton	Approved	36 duets	3.6	3 BR, 2.5 BA–1,400 sf	$199,950	Demand far exceeded supply.	Close to Pleasanton Downtown, 50-acre sports park being planned within the property.
Walnut Hills KB Homes Bernal Property Pleasanton	Approved.	20 duets	5.5	3 BR, 2.5 BA–1,400 sf	$199,950	Demand far exceeded supply.	Close to Pleasanton Downtown, 50-acre sports park being planned within the property.
Valley Avenue Apts. Greenbriar Homes Bernal Property Pleasanton	Approved.	100 apts.	20.4	1 BR, 1 BA–738 sf 2 BR, 1 BA–895 sf 2 BR, 2 BA–1,040 & 1,100 sf 3 BR, 2 BA–1,202-1,236 sf	Thirty-one low and very-low income rentals out of 100 units.		Two tot-lots, community building.
SAN RAMON							
Windemere *Delamore* *Ambridge* *Shellbourne*	On Sale: Spring of 2003 1Q03 or 2Q03 1Q03	140 luxury condos					The project will eventually add up to have 160 town-homes, 32 condominiums, and approx. 1,000 apartments.
Valley Vista Senior Village 20801 San Ramon Valley Rd., San Ramon Durwin Shepson	EIR completed, plans being reviewed.	100 apts.		1 BR/1 BA, 2 BR/2BA, Studio 340-750 sf	N/A		Senior apartment complex.
Merrill Gardens 18888 Bollinger Canyon Rd., San Ramon Bob Price	Under construction, adding to existing residential care facility.	39 apts.		N/A	Market rate rental apts.		

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Source: BAE, 2002.

Table 4-28: Livermore, Tri-Valley and Commute Region Multi-Family Housing Market, March 2002[a]

UNIT INVENTORY:	Livermore		Tri-Valley[b]		Commute Region[c]	
Unit Type	Number	Percent of Mix	Number	Percent of Mix	Number	Percent of Mix
Studio	0	0.0%	116	1.0%	8,171	5.6%
1 BR/1BA	872	38.4%	4,896	40.6%	64,399	44.0%
1 BR Townhouse	0	0.0%	0	0.0%	32	0.0%
2 BR/1 BA	714	31.5%	1,782	14.8%	23,251	15.9%
2 BR/2 BA	597	26.3%	4,596	38.1%	41,415	28.3%
2 BR Townhouse	0	0.0%	233	1.9%	3,625	2.5%
3 BR/2 BA	85	3.7%	450	3.7%	5,126	3.5%
3 BR Townhouse	0	0.0%	0	0.0%	425	0.3%
Totals[a]	**2,268**	**100%**	**12,073**	**100%**	**146,444**	**100%**

AVERAGE RENT HISTORY:	Livermore		Tri-Valley[b]		Commute Region[c]	
Unit Type	2001	2002	2001	2002	2001	2002
Studio	N/A	N/A	$1,117	$968	$1,229	$1,016
1 BR/1BA	$1,117	$1,020	$1,296	$1,164	$1,403	$1,202
1 BR Townhouse	N/A	N/A	N/A	N/A	$1,410	$1,264
2 BR/1 BA	$1,274	$1,199	$1,403	$1,283	$1,465	$1,303
2 BR/2 BA	$1,417	$1,296	$1,662	$1,466	$1,805	$1,572
2 BR Townhouse	N/A	N/A	$1,634	$1,494	$1,738	$1,498
3 BR/2 BA	$1,641	$1,544	$1,877	$1,759	$2,117	$1,912
3 BR Townhouse	N/A	N/A	N/A	N/A	$1,985	$1,671
All	**$1,265**	**$1,169**	**$1,476**	**$1,323**	**$1,550**	**$1,346**
Percent Change 2001-2002		**-7.6%**		**-10.4%**		**-13.2%**

OCCUPANCY RATE:			
Year	Livermore	Tri-Valley[b]	Commute Region[c]
1999	97.3%	94.8%	96.6%
2000	98.2%	97.2%	98.5%
2001	95.2%	94.9%	95.2%
2002	94.5%	93.6%	93.6%

[a] Includes only large, multi-family buildings monitored by the RealFacts.
[b] The Tri-Valley area is defined as Livermore, Pleasanton, Dublin, Danville & San Ramon.
[c] The Commute Region is defined as Alameda, Contra Costa and Santa Clara Counties.

Sources: RealFacts, Inc., 2002; BAE, 2002.

(2) Planned Multi-Family Rental Projects in 2002 – Livermore and Tri-Valley. In May 2002, research indicated one planned market rate rental project in Livermore. However, the application for this project was incomplete at this time, as such, the project had not yet been processed or approved.

In the surrounding Tri-Valley communities, several market rate rental projects were identified as under construction or planned on Table 4-27, including 390 units under construction at Waterford Place in Dublin, and 100 units of mixed income rental approved at Valley Avenue Apartments in Pleasanton.

(3) Affordable Housing. Livermore has produced a large supply of affordable housing through the innovative use of federal, State, and local policies as well as assistance programs. In addition, the City has helped fund local affordable housing construction through the use of in-lieu fees, the Inclusionary Housing Ordinance (which requires a 10 percent set aside of units in market-rate projects), City rental agreements, and the Housing Implementation Program which is the City's residential growth management program. Seventeen rental housing projects totaling 1,247 units maintain 746 affordable units through deed restrictions or subsidy arrangements. An additional 220 affordable rental units have been approved in the Gardella Gardens and Valley Care developments. In addition, three existing for-sale housing projects have included 33 affordable ownership units for very low and moderate income homebuyers, and an additional 58 affordable ownership units have been approved by the City as part of other planned housing projects.

To plan for future affordable housing needs, the City of Livermore published the *Draft Housing Element* in May 2002. Specifically, Livermore's Housing Element describes methods to achieve production of the Regional Housing Needs Allocation of 875 very low, 482 low, and 1,403 moderate-income units needed for the 1999 to 2006 period.

2. Office and Industrial Market

Although Livermore has traditionally been developed to serve primarily warehouse and industrial users, recent office and business park developments in Livermore have placed the City within the Tri-Valley office market. In 2002, Livermore had a total inventory of more than 1,856,000 square feet of office space, representing approximately eight percent of Tri-Valley office space inventory.

Throughout the Tri-Valley, technology and other office-based companies have been attracted by abundant housing, the skilled labor force, shorter commute times, and available land. However, market conditions varied widely in 2002 among communities in the Tri-Valley, and between different types of office and flex space. To illustrate the spatial pattern of the Tri-Valley office market, data from Colliers International *Tri-Valley Area 2002 First Quarter Market Statistics* are shown in Table 4-29. The data clearly portray increasing office rent levels as one moves geographically westward from Livermore to the I-680/I-580 intersection, as well as occupancy weaknesses in Livermore's office market segments relative to other established Tri-Valley locations.

In contrast to the emerging office market in Livermore, its supply and occupancy data for more established warehouse and industrial space places Livermore as the leading supplier of this type of space within Tri-Valley. Data available to compare Livermore with other Tri-Valley submarkets are published by Colliers International in their *Tri-Valley Area First Quarter Market Statistics 2002*, as summarized below. As shown on Table 4-30, in 2002, Livermore had almost 12 million square feet

of warehouse/industrial space. Vacancy rates were relatively high in Livermore for warehouse space, despite historically better occupancy patterns shown on Table 4-31.

a. Existing and Planned Business Parks in Livermore. This section profiles Livermore's established business parks in detail in order to estimate available square footage, available acreage to-be-built, attracted users, and typical rent levels.

(1) Existing Business and Industrial Parks in 2002. Table 4-32 profiles numerous existing business parks located in Livermore in 2002. The following summarizes selected key parks.

The Tri-Valley Technology Park, located in northwest Livermore, opened in the mid-1980s. This 300-acre park has over 150,000 square feet of built space available and 60 acres still to buildout. Lease terms in 2002 ranged from $1.35 to $1.45 per square foot triple net[1] (NNN) per month, and land values are approximately $12.50 per square foot. Tenants in 2002 included Kraft Foods Inc., Bay Area Cellular, Costco, and CCI Triad Corporation.

Table 4-29: Comparative Office Space Rents in Tri-Valley, First Quarter 2002

Location	Class A	Class B	Office/ Flex	Total
LIVERMORE				
Avg. Asking Rent	$1.75	$1.28	$1.28	$1.38
Vacancy Rate	74.3%	13.7%	36.8%	36.5%
Total Sq. Ft.	203,248	356,657	1,296,154	1,856,059
SAN RAMON				
Avg. Asking Rent	$2.33	$2.22	$1.89	$2.28
Vacancy Rate	8.8%	9.1%	9.3%	8.8%
Total Sq. Ft.	7,120,862	1,026,025	706,515	8,853,402
DUBLIN				
Avg. Asking Rent	$2.63	$1.64	$1.65	$2.23
Vacancy Rate	11.8%	7.1%	2.2%	8.8%
Total Sq. Ft.	1,350,101	423,104	515,337	2,288,542
PLEASANTON				
Avg. Asking Rent	$2.64	$2.55	$1.72	$2.37
Vacancy Rate	8.4%	14.1%	18.5%	12.2%
Total Sq. Ft.	6,099,024	2,016,444	3,062,709	11,178,177
TRI-VALLEY TOTAL				
Avg. Asking Rent	$2.48	$2.24	$1.68	$2.26
Vacancy Rate	9.8%	11.9%	20.1%	12.5%
Total Sq. Ft.	14,773,235	3,822,230	5,580,715	24,176,180

Notes: All asking rents rates quoted as Full Service rates. City total average asking rents are estimated. A brief glossary of relevant real estate terms in provided at the end of Table 4-32.

Source: *Tri-Valley Area 2002 First Quarter Market Statistics,* Colliers International.

Livermore Airway Business Park, located south of I-580 at Airway Boulevard, opened in 1982 and was still developing as of May 2002. The 56-acre park is primarily light industrial, office, and research and development (R&D) space with 394,600 occupied square feet. Tenants included AAA and Arcade Planet, Inc. Monthly asking rates for leased space ranged from $1.00 per square foot NNN for office/flex/warehouse space to $2.25 per square foot for full service office space. In 2002, 285,600 square feet was available and 78,000 square feet had been permitted, but not built.

Shea Center, a 130-acre park with approximately 1.9 million square feet of planned built space, is located in northwest Livermore adjacent to the Tri-Valley Technology Park. KLA Tencor, the world's largest supplier of semiconductor inspection tools, will be the primary tenant, with original plans to occupy 720,000 square feet in this park. In 2002, 190,000 square feet were built and 50,000 square feet were available. Buildings at the Shea Center were renting for $1.25 to $1.50 per square foot NNN per month, with land "asking" prices of $10.00 to $13.00 per square foot.

[1] Triple Net (NNN): Rental type where the tenant pays rent to the landlord and additionally assumes all costs regarding the operation, taxes and maintenance of the premises and building.

Table 4-30: Warehouse and Industrial Rents – Tri-Valley, First Quarter 2002

Location	Average Warehouse NNN Rent	Warehouse Vacancy Rates	Average Industrial NNN Rent	Industrial Vacancy Rates
Livermore	5,777,579 sf $.42	19.7%	6,060,770 sf $.70	10.7%
Dublin	322,752 sf $.85	0%	1,446,299 sf $1.15	8.0%
Pleasanton	410,060 sf $.81	0%	2,685,162 sf $1.20	5.0%
Total	6,510,391 sf $.47	17.6%	10,192,231 sf $.90	8.8%

Note: Current inventory square footages for each city are shown at the top of rent columns. A brief glossary of relevant real estate terms in provided at the end of Table 3-32.

Source: *I-580/680 Corridor 1999 Year-End Market Report, Tri-Valley Area First Quarter 2002 Market Statistics,* Colliers International.

Table 4-31: Livermore Warehouse and Industrial Trends

Year	Average Warehouse NNN Rent	Warehouse Vacancy Rates	Average Industrial NNN Rent	Industrial Vacancy Rates
1998	$.41	20%	$.70	18.7%
1999	$.44	10.5%	$.75	10.8%
2000	$.55	8.9%	$.85	4.5%
2001	$.42	19.7%	$.70	9.6%

Note: A brief glossary of relevant real estate terms in provided at the end of Table 4-32.

Source: Colliers International.

Greenville Station, a smaller park, covers approximately 10.7 acres and contains 170,000 square feet of light industrial space along the I-580 corridor near Los Positas and Mountain Vista Drives.

Greenville Station's concrete tilt-ups were designed for light industrial users, with tenants in 2002 including Amerimade, Advantage Metals, and Balkin Manufacturing. In mid-2002, the park was fully leased with buildings priced at $80 per square foot for sale.

Greenville Business Center Park is a 22.44-acre park containing 375,573 square feet of distribution and office space located near the intersection of Los Positas and Mountain Vista Drives. In 2002, F. Rogers was the major tenant and 177,850 square feet of built space was available. The developer, Opus West Corporation, offered buildings priced at $55 per square foot and lease terms of $0.41 per square foot NNN.

Livermore Gateway Business Park West, a nine building park, had 205,789 square feet of light manufacturing/warehouse space located at Los Positas and Vasco Road. Tenants included two machine shops and small manufacturing. Approximately 324,600 square feet of space is available, including to-be-built approved square footage.

The Livermore National Corporate Center located at Greenville and National Road, recently completed in mid-2002, had total approvals for 186,000 of office/warehouse space, with 51,000 square feet available for sale offered at $112 to $115 per square foot.

In total, as shown on Table 4-32, business and industrial parks in Livermore had a total vacant space inventory of over 700,000 square feet in 2002. In addition, because some of these parks were still completing their buildout, existing parks could potentially add approximately 2.9 million square feet of new space from approved projects. The complete planned and proposed pipeline is discussed below.

Table 4-32: Existing and Developing Livermore Business Parks

Name and Location	Opening Date	Land Use	Total & Absorbed Acreage	Total Built & Approved Space (sf)	Available Space (sf)	Lease & Sale Terms[b]	Major Occupants & Amenities	Comments
Greenville Business Park Las Positas Rd./Greenville Rd.	N/A	Office & Industrial	200 N/A	2,500,000 N/A	N/A	$0.41-$1.35/sf NNN	Form Factor Inc.	20 completed buildings.
Tri-Valley Tech Park[a] Independence Dr.	1985	Class A & B Office R&D/Biotech	306 176	1,121,000 1,390,000	N/A	$1.35-$1.45/sf NNN $12.50/sf (sale) +$.30-$.35/sf CAM	Kraft Foods Inc., Bay Area Cellular, Costco, CCI Triad Corp., & Adept Technology	5,000 to 1 mil. sf sites available, 20 completed buildings.
Airway Business Park[a] Kitty Hawk Rd. & Armstrong St.	1982	Warehouse & Lt. Manufacturing	56 49	394,600 800,010	285,600	$1-$2.25/sf NNN	AAA, Arcade Planet Inc.	Bus stops on-site, Restaurant, Camelot Park, Extended Stay America Hotel.
Airway Business Center Kitty Hawk Rd. & Armstrong St.	2000	Lt. Industrial	N/A N/A	409,088 N/A	N/A	$1.90/sf FS $1.20/sf IG +$0.18/sf CAM +$8-$16 TIA	MCE Computer Tech, Contra Costa Times	
Airport Business Center Wright Bros. Ave. & Stealth St.	2000-01	Lt. Industrial	N/A N/A	500,000 550,000	114,395	$1.50/sf NNN $0.25/sf CAM +$25 TIA	Geyser Beverages, Fox Group, Axis Imex, Inc.	Fifteen small industrial buildings, ranging in size from 9,400 – 40,755 sf.
Lincoln Technical Park 477 N. Canyons Pkwy. @ Independence Dr.	1998	Industrial & R&D Flex	16.7 16.7	145,200 180,200 (est.)	109,800	$1.10-$1.15/sf NNN +$25 TIA	Kraft Foods, KLA-Tencor, Orco Construction, Cellular One, Realtime Access, Inc.	
Marathon Business Center Greenville Rd. & Patterson Pass	2002	R&D & Lt. Industrial	20.5 10.5	154,000 316,300	154,000	$0.85-$1.25/sf NNN $95-$125/sf (sale) +$15 CAM $10-$25 TIA (incl.)	Retail .5-1 mile away, hotels within .5 mile.	
Shea Center[a] (Including KLA Tencor Site)	2001	Office/R&D	253 60	190,000 1.9 mil.	50,000	$1.25-$1.50/sf NNN $10-$13/sf (sale) +$25-$40 TIA	KLA/Tencor, Flex Tex, Bus Stops, Some Retail & multi-family units considered.	KLA Tencor owns 44 acres, built about 30% - sf not included in total built sf.
National Corporate Center[a] National Rd. & Greenville Rd.	2000-01	Lt. Industrial & Warehouse/ Distribution	12.57 2.55	0 186,026	101,084 (incl. unbuilt)	$1.20-$2.05/sf $112-$115/sf (sale) +$15 TIA	Pasarow Foods, TriCad, Inc., Metropolitan Life.	No buildings completed, waiting for tenants.

Table 4-32 *continued*

Name and Location	Opening Date	Land Use	Total & Absorbed Acreage	Total Built & Approved Space (sf)	Available Space (sf)	Lease & Sale Terms[b]	Major Occupants & Amenities	Comments
Greenville Business Center Las Positas Rd. & Mountain Vista	2000	Distribution & Open Space	22.44 22.44	375,573 375,573	375,573	$0.41/sf IG $55/sf (sale) $3 TIA (incl.)	F. Rogers	
Pacific Corporate Center Longard Rd. near Greenville Rd. & Las Positas Rd.	2000-01	Office/Flex	24.5 N/A	279,420 377,088	193,768	N/A	Form F. Inc., Ingenus Inc.; near hotels.	Phase 1 of 3.
Copper Hill Business Park[a] 2800-2950 Collier Canyon Rd.	2001-02	Office & R&D	6.2 6.2	78,000 78,000	48,727	$1.60/sf NNN $170/sf (sale +$30 CAM +$25 TIA	McMullan & Assoc.; Festo Corp.; Close to Las Positas Junior College & a number of extended stay hotels.	Two buildings sold, two remaining.
Arroyo Business Center 4777 Bennet Dr. near Las Positas Rd.	2000	Distribution & Manufacturing	100 N/A	1,200,000 N/A	236,450	$1.17/sf NNN +$0.13/sf CAM +$12-$20 TIA	AT&T, TCI Cable, Alliant Food Services	14 completed buildings. Near bustop, mall and stores.
Las Positas Bus. Center Las Positas Rd. & Pullman Rd.	2001	Industrial & Warehouse	N/A N/A	78,379 78,379	20,804	$0.90/sf IG +$15-$20 TIA	Kenetech Corp/ Kenetech Windpower, Leon Kelly Plumbing	
Greenville Station Las Positas Rd. & Mountain Vista	2000	Industrial & Manufacturing	10.7 10.7	170,000 N/A	N/A	N/A $80/sf (sale)	Amerimade, Advantage Metal, Balkin Manufactur-ing.	Three single-story tilt-up for light industrial users.
Livermore Valley Bus. Park Independence Dr. & Constitution (near N. Canyon)	1983	R&D Flex &Warehouse	142 142	2,500,000 N/A	58,104 Total, 26,455 Office	$1.20-$1.35/sf NNN $0.30/sf IG (Ind.) +$0.35/sf CAM +$4-$10 TIA	Transwestern Polymers, Stanford Distributing & International Multifoods Corp.	15 completed buildings.
Gateway West[a] Las Positas Rd. & Vasco Rd.	2002	Warehouse & Lt. Manufacturing	29 N/A	298,000 N/A	N/A	N/A	Two retail buildings within park.	Nine buildings, incl. two machine shops & small manufacturing.
Amador Business Center 7650 Marathon Dr. at Greenville Rd.	1988-90	Warehouse/Dist.	58.8	1,100,000 N/A	66,000	$0.58/sf IG +$0.11/sf CAM +$1-$4 TIA	Best Buy Co. Inc.	Seven completed buildings.

[a] Portions of business parks under construction or going through City planning process listed in Table 4-33, Planned & Proposed Business Parks.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Table 4-32 *continued*

Glossary

Product Classifications:
Class "A" Office: Modern, steel-framed low, mid or high-rise structures used exclusively for office tenants.
Class "B" Office: Wood and steel mix framed low to mid-rise structures and older brick or concrete structures used predominantly for office.
Office/Flex or R&D Flex: One to three-story structures with extensive glass, heavy office buildout and 3.0/1,000 parking ratio. Buildings may occur high-end production facilities, laboratory space and grade level truck doors.
Warehouse/Distribution: Buildings with a minimum 20-foot clear height, dock-high truck loading and parking ratios of 2.0/1000 or less.
Industrial/Light Industrial: Buildings with drive-in and/or dock-high truck capabilities, clear heights of less than20 feet and parking ratios of 2.0/1000 or less.

Lease Terms:
Full Service (FS): Rental type generally used in office product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, maintenance, janitorial, and utilities.
Industrial Gross (IG): Rental type generally used in industrial product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, and maintenance.
Triple Net (NNN): Rental type where the tenant pays rent to the landlord and additionally assumes all costs regarding the operation, taxes and maintenance of the premises and building.
CAM: Common area maintenance charge. Generally used in Industrial Gross and NNN leases where the tenant pays a share of the costs associated with the maintenance of the common areas.
TIA: Tenant Improvement Allowance. Negotiable amount given to tenant to move into space, often used as incentives to attract tenants in a competitive market.

Source: BAE, 2002.

Table 4-33: Currently Developing, Planned & Proposed Business Parks in Livermore

Project Name, Address & Developer	Projected Opening Date	Land Uses	Total Acreage	Total SF Approved	Status	Comments
Tri-Valley Technology Park[a] 3099 Independence Dr.	2003	Office	5.6	80,000	Plan check due 6/5/02.	Project will not be built this year due to market conditions.
TKG Business Park[a] Sub-park: Independence Plaza 333 & 365 North Canyon Pkwy.	2002	Office	6.3	97,300	Near completion.	Two 2-story office buildings, part of Tri-Valley Technology Park.
Airport Business Center[a] 308 Stealth St.	2003	Office & Warehouse	1.6	57,255	Plan check out for corrections – 7/30/01.	Industrial shell with mezz. and spec. space. 15-20% office, 80-85% warehouse.
Airport Executive Center E. Airway Blvd. & Rutan Drive		R&D and Lt. Industrial	10.7	146,784	Design Review 7/18/02.	Four single-story buildings with parking, office 50%, warehouse 50%.
Airway Business Park[a] Kittyhawk Rd. & Armstrong St.	2003	Office & Warehouse	4.8	67,190	Planning Commission approved 8/7/01.	Two industrial buildings, 15-50% office, 50-85% warehouse.
7900 National Drive Jerry Willis/Valmark Industries	2002	Office & Warehouse	4.4	62,032	Project completed 4/1/02	38% office, 67% warehouse.
6500 National Dr. (at Exchange) BREMCO Construction	2003	Warehouse & Lt. Manufacturing	2.63	40,638	Plan check ready to issue 2/13/02	Tilt-up for warehouse/distribution, manufacturing & lumbar wholesales.
National Dr. & Exchange Ct. P.E.S. Enterprises	2003	Office & Warehouse	4.23	62,914	Planning Commission approved 9/18/01.	Five industrial buildings, 15-20% office and 80-85% warehouse.
Livermore National Industrial Park 501 Hawthorn Place 7400-7500 National Dr.	2002	Office & Warehouse	13.8	222,000	Project complete 3/12/02.	Three industrial buildings, 15-20% office, 80-85% warehousing.
6610-6670 Brisa St. Barry Swenson, Builder	2003	Office & Warehouse	10.02	189,519	Plan check permit, ready to issue.	15-20% office, 80-85% warehouse.
Livermore Gateway West[a] 5900 Las Positas Rd. BEP Livermore/Ellis Partners	2003	Office, Warehouse & Manufacturing	2.44	38,880	Permit issued 11/7/01.	Office 15-20%, warehouse 80-85%.
Shea Business Center[a] 2837 Collier Canyon Rd.	2003	Office	18.7	287,844	Planning Commission approved 6/5/01.	Five concrete tilt-up structures.

Table 4-33 *continued*

Project Name, Address & Developer	Projected Opening Date	Land Uses	Total Acreage	Total SF Approved	Status	Comments
Shea Center[a] 1, 101, 201, 301 Portola Ave. KLA Tencor, Phase II		Office, Industrial & Warehouse	14	497,056	1 & 101 complete, 201 & 301 plan check expired.	Two industrial buildings for KLA Tencor.
Bennet Dr. & Las Positas Rd. Ware & Malcomb Architects	2003	R&D	12.6	153,975	Planning Commission approved 8/21/01.	Seven, one-story R&D buildings.
N. Livermore Ave. & Las Positas Rd. Eighty-Eight & Associates	2003	Commercial		27,000	Planning Commission meeting 4/16/02.	
7275 National Drive T.C. Properties	2003	Office & Warehouse	3.1	65,796	Planning Staff approved 3/25/02.	Three tilt-up buildings for office, warehouse and heavy industrial use.
National Corporate Center National Drive & Hawthorne Pl. National Drive Developers	2003	Office & Warehouse	12.6	186,064	City Council approved 4/23/01.	Fifteen industrial buildings on separate parcels, office 25%, warehouse 75%.
Opus West Patterson Pass Rd. at Greenville Rd.	2002	Industrial	22	324,840	Project completed 4/19/02.	Six industrial buildings with office space, 15-20% office, 80-85% warehouse.
The Oaks 625 W. Jack London Blvd. Gale & Wentworth California	2004	Office, R&D & Warehouse	150	2,700,000	Planning Commission meeting 6/3/02.	60% office, 40% warehouse.
Greenville Corporate Center 7501 & 7551 Longard Rd. Greenville Investors	2002	Office & Manufacturing	7.5	122,317	Near completion.	Industrial uses with spec. space, 75% office, 25% manufacturing.
151 Greenville Rd. Panattoni Construction/Selway Tool	2003	Office & Warehouse	4.2	56,700	Plan check out for corrections.	42% office and 58% warehouse.

[a] Pending or recent entitlements for existing business parks.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Source: City of Livermore; BAE, 2002.

(2) Planned and Proposed Business Parks in 2002. In 2002, Livermore had a substantial pipeline of planned business parks, as shown on Table 4-33. Including pending approvals in existing business parks, developers had obtained or were seeking over 5.7 million square feet of building space in Livermore on 329 acres of industrial land. Approximately 10 percent of the building square footage for which approvals were sought was for industrial and R&D uses, with the balance split between office and warehouse/distribution. Because many of the developers required flexibility, particularly in building out warehouse buildings with a range between 15 to 50 percent office, the office component could have been larger.

Major projects in the approval pipeline included approximately 785,000 square feet of office and industrial space in the Shea Center, including two industrial buildings for KLA Tencor. However, the plan check on these building had expired as of September 2002. As in any of the projects seeking approval, it was not clear if this project will be built as it was approved. Changing market conditions could delay the construction of business park supply and its final land use and configuration could be altered.

The largest project in the approval process is The Oaks, a 150-acre park near the Livermore Airport. At buildout, this project would contain 2.7 million square feet. In the Fall of 2002, the developer was seeking Planning Commission and City Council approval for 60 percent office space and 40 percent warehouse. Other major projects seeking approvals included the Airport Executive Centre, for a single building with 146,784 square feet of 50 percent office and 50 percent warehouse, as well as a 186,519 square foot office/warehouse building at 6610 Brisa Street.

b. Competitive Supply: Business Parks in Tri-Valley in 2002. During the past several years, the Tri-Valley area has experienced a dramatic increase in development of business parks, including new parks in Dublin (Emerald Point, Dublin Transit Village, Koll Dublin Corporate Center, and Dublin Ranch). Selected existing parks leasing in the Tri-Valley, are profiled below and in Table 4-34.

(1) Dublin. The Alameda County Surplus Property Authority is developing Emerald Park in east Dublin. When complete, Emerald Park will encompass 700 acres and contain nearly five million square feet of built space. In addition to substantial office space, Emerald Park will include a school and possibly over 2,000 residential units. Sybase moved to its new corporate headquarters at Emerald Park, and will ultimately build a 400,000 square foot campus with two buildings containing six stories.

The Dublin Transit Village will be built on land owned by the Alameda County Surplus Property Authority and BART, and will include the development of the current Dublin-Pleasanton BART parking lots. This 75-acre development will encompass approximately two million square feet of built space, including 1,500 high-density housing units, 70,000 square feet of ground floor retail, and Class A office space. The intended primary occupant, CommerceOne, has dropped its option to build a major office campus due to changes in the economic outlook for this company's expansion. Instead, news articles reported the attraction of an IKEA furniture store, which would consume approximately 17 acres of this property.

Dublin Ranch, a 1,500-acre master planned community, was selling residential units and was planned to have Class A office space available for lease in 2003.

Table 4-34: Tri-Valley Selected Business Parks

Project Name, Address & Developer	Opening Date	Land Uses	Total Acreage & SF Approved	Total SF Available & Built	Lease/Sale Terms	Major Tenants/Comments
DUBLIN						
Emerald Park Hacienda Dr.		Office	250	N/A 1,600,000	$1.50-$3.50/sf NNN	Humphrey Instruments, Sybase, Inc., 11 completed buildings.
Amador Plaza 7567 Amador Valley Blvd.	1985	Office	N/A	5,182 36,666	$2.25/sf	
Enea Plaza 6665-6690 Amador Plaza Rd.	1981	Office	N/A	11,697 20,604	$1.80-$1.95/sf FS	
Heritage Park 11875-11876 Dublin Blvd.	1980	Office	N/A	19,501 137,291	$1.80-$1.90/sf FS	
Hites Plaza 5601 Arnold Rd.	2000	Office	N/A	22,480 125,000	$2.35/sf FS	
Sierra Trinity Industrial park 6711 & 6759 Sierra Court	1986	Office/R&D	N/A	4,050 20,920	$1.50/sf	
6515 Trinity Court	1996	Warehouse	N/A	1,647 12,400	$1.20/sf	
DANVILLE						
Blackhawk Plaza Circle	1999	Office	N/A	4,029 28,000	$2.50/sf FS	
Oak Court 50 Oak Court	1986	Office	N/A	3,000 14,000	$2.00/sf FS	
Danville Center	N/A	Mixed use	N/A	N/A 60,000	N/A	60,000 sf of office space in a mixed-use development.
PLEASANTON						
Bernal Corporate Park Koll Center Pkwy	1987	Office, R&D & Warehouse	88 N/A	N/A 1.2 mil.	N/A	Nissan Motor Corp., Documentum Inc., and Veritas Software.
Pleasanton Power Park 5165-75 Johnson Dr. 6601 Owens Dr.	1986	Office/R&D	19.1	38,682 76,725	$1.75-$2.00/sf NNN	

Table 4-34 *continued*

Project Name, Address & Developer	Opening Date	Land Uses	Total Acreage & SF Approved	Total SF Available & Built	Lease/Sale Terms	Major Tenants/Comments
Hacienda Business Park 4473 Willow Rd. 5725 Las Positas Blvd. 3875 Hopyard Rd.	1986	Office	865 9.5 mil.	43,463 7,680,000	$1.75-$2.55/sf FS	AT&T, Providian, Pac Bell SBCs, Sprint, Roche Molecular Systems and CommercialOne.
Chabot Center 4637 Chabot Dr.	1983	Office	N/A	33,980 74,594	$2.70-$2.95/sf FS	Part of Hacienda Business Park.
Stonebridge Corporate Plaza 6140-6150 Stonebridge Mall Rd.	1986	Office	N/A	45,918 262,447	$1.74-$1.85/sf FS	
Signature Center 5000 Hopyard Rd.	1985	Office	N/A	11,827 154,137	$2.75/sf FS	Part of Hacienda Business Park.
Stoneridge Business Center 5635-5673 W. Las Positas Blvd.	1986	Office/R&D	N/A	33,846 58,969	$1.35-$1.70/sf	Part of Hacienda Business Park.
Stanley Business Park 39 California Ave.	1985	Warehouse	N/A	1,200	$1.65/sf NNN	Part of Hacienda Business Park.
Arroyo Center 5794 W. Las Positas Blvd.	1984	Office	N/A	55,241	$0.90/sf NNN	Whole building sublease. Part of Hacienda Business Park.
Crossroads at Hacienda 5980 Stoneridge Dr.	1989	Class B Office	N/A	1,437 33,957	$2.00/sf FS	Part of Hacienda Business Park.
Britannia Business Center Stoneridge Dr. & Willow Rd.	1990	Office	N/A	16,221 114,259	$1.50/sf NNN	Part of Hacienda Business Park.
Las Positas Office Plaza 5976-5994 Las Positas Blvd.	1986	Office	N/A	16,047 105,380	$1.75-$2.25/sf FS	Part of Hacienda Business Park.
Valley Business Park	N/A	Office	60 N/A	N/A 885,000	N/A	Ford Motor Co., TUV Rheinland of North America, Inc.
Pleasanton Gateway Augustin Knolls		Class A Office	761,000	N/A	N/A	Eight buildings, office space inside mixed use development.
SAN RAMON						
Bishop Ranch 1 Annable Lane 3700 Executive Pkwy. 2400-2700 Camino Ramon 12657 Alcosta Blvd.	1986-1999	Office	585 9 mil.	187,534 8.5 mil.	$1.58-$1.92/sf NNN $2.00/sf FS	Bayer, Chevron, Fed Ex, IBM, Pitney Bowes, Toyota, and Proctor & Gamble

Table 4-34 *continued*

Project Name, Address & Developer	Opening Date	Land Uses	Total Acreage & SF Approved	Total SF Available & Built	Lease/Sale Terms	Major Tenants/Comments
Sunset Business Park 12939-12943 Alcosta Blvd. 3401 Crow Canyon Rd.	1978- 1981	Industrial Class B&D Office	N/A N/A	26,673 23,139 255,000	$1.00-$1.25/sf IG $1,05/sf NNN $2.05/sf FS	304,812 total space available.
Crow Canyon 2610 Crow Canyon Rd.	1984	Office	N/A	1,116	$2.15/sf NNN	
Deerwood Office Plaza 220 Porter Dr.	1998	Class A Office	N/A	6,086 9,900	$2.40/sf FS	
ADP Plaza II 2000 Crow Canyon Place		Class A Office	N/A	3,292 148,940	$2.25/sf FS	
125 Ryan Industrial Court	1979	Class C Office	N/A	4,307 21,000	$1.60/sf FS	

[a] Portions of business parks under construction or going through City planning process listed in Table 4-33, Planned & Proposed Business Parks.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Glossary

Product Classifications:
Class "A" Office: Modern, steel-framed low, mid or high-rise structures used exclusively for office tenants.
Class "B" Office: Wood and steel mix framed low to mid-rise structures and older brick or concrete structures used predominantly for office.
Office/Flex or R&D Flex: One to three-story structures with extensive glass, heavy office buildout and 3.0/1,000 parking ratio. Buildings may occur high-end production facilities, laboratory space and grade level truck doors.
Warehouse/Distribution: Buildings with a minimum 20-foot clear height, dock-high truck loading and parking ratios of 2.0/1000 or less.
Industrial/Light Industrial: Buildings with drive-in and/or dock-high truck capabilities, clear heights of less than20 feet and parking ratios of 2.0/1000 or less.

Lease Terms:
Full Service (FS): Rental type generally used in office product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, maintenance, janitorial, and utilities.
Industrial Gross (IG): Rental type generally used in industrial product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, and maintenance.
Triple Net (NNN): Rental type where the tenant pays rent to the landlord and additionally assumes all costs regarding the operation, taxes and maintenance of the premises and building.
CAM: Common area maintenance charge. Generally used in Industrial Gross and NNN leases where the tenant pays a share of the costs associated with the maintenance of the common areas.
TIA: Tenant Improvement Allowance. Negotiable amount given to tenant to move into space, often used as incentives to attract tenants in a competitive market.

Source: BAE, 2002.

In 2002, office rents in Dublin ranged from $1.80 to $2. 25. All parks in the Dublin area are approximately 10 miles from central Livermore.

(2) Pleasanton. One of the largest and most well-known business parks in the Tri-Valley area is Hacienda Business Park, located near the junction of I-580 and I-680. Having absorbed 815 of a total of 854 acres since it opened in 1983, Hacienda is still building out with 9.5 million square feet of existing built space and another 1.5 million to come. In 2002, major tenants included AT&T, Providian, Sprint, Pacific Bell SBC, PeopleSoft, and Roche Molecular Systems. Brokers report that recent leases range from $1.75-$2.55 per square foot full service per month. Bernal Corporate Park, which opened in 1987, has absorbed all of its 86 acres, but still is leasing 40,000 square feet of space. RMC Lonestar, Nissan, Documentum, and Veritas Software were tenants in 2002. Recent Pleasanton leases were offered in the range of $1.35 to 2.55 per square foot full service per month in 2002.

(3) San Ramon. Located approximately 15 miles from Livermore, Bishop Ranch, which first opened in 1981, is nearly built out with eight million of its nine million approved square feet of space developed. Leases have ranged from $1.58 to $2.00 per square foot full service per month including major sublease space available. Major tenants at Bishop Ranch included Bayer, Chevron, Fed Ex, IBM, Pitney Bowes, Toyota, and Proctor & Gamble. San Ramon leases were offered in the range of $1.00 to 2.40 per square foot full service per month in 2002.

c. Selected Regional Competitive Supply. In addition to the Tri-Valley area, future business parks in Livermore will compete with similar developments throughout Northern California. Selected examples of this competitive supply in the Commute Region are summarized below.

(1) Fremont/Alameda. Formerly considered on the edge of Silicon Valley, cities such as Fremont and Alameda are becoming more integrated into the core industrial base of the Valley, as companies seek developable land for new campuses and projects.

New development in the southern portion of Alameda County has attracted many Silicon Valley companies. For example, in addition to several older parks, Fremont's Pacific Commons, a 8.3 million square feet business park will be developed by Catellus. The 325-acre park will consist of two to 12-story buildings that will primarily house office/R&D space with some space reserved for light industrial uses

Further northward in Alameda County, reuse of the former Alameda Naval Air Station is also adding to potential competitive industrial supply. Named Alameda Point, this mixed-use, reuse development has attracted a number of companies, particularly in the software and film industries, since it became available for civilian leasing in 1996. Located on 1,100 acres of land close to the San Francisco Bay waterfront, Alameda Point will ultimately contain 4.2 million square feet of reused and newly constructed development including office, warehouse, R&D, industrial, and residential. Over 40 leases were signed as of mid-2002, including those by Manix Entertainment, Alameda Aerospace, ACET, and CALSTART.

(2) Morgan Hill/Gilroy. Located on the southern fringe of the Silicon Valley, the Gilroy/ Morgan Hill market has attracted technology companies seeking expansion space and inexpensive rents. For example, Morgan Hill Ranch is a 400-acre park that opened in 1981. Still in the build-out

phase, Morgan Hill Ranch has yet to absorb much of the five million square feet of built space. Abbot Labs, Erickson, Alien Technologies, and Enritsu are some of the park's tenants.

One of the new parks in Morgan Hill is Madrone Business Ranch, a 110-acre, 1.5 million square foot park. Media Arts Group has committed to occupy built-to-suit space in this park.

Wellington Business Park, a 110-acre business park, is also being planned for Gilroy. This park plans to market itself to chip manufactures and other tech firms priced out of Silicon Valley. When built out, there will be approximately 1.8 million square feet of space.

d. Livermore's Unique Industries. Livermore has two unique industries, the agriculture and wine industry and the national lab industry. These industries are described below.

(1) Agriculture/Wine Industry. For much of its history, Livermore has been an agricultural community. Vineyards and ranches continue within and around the City. Livermore has been a winegrowing region since the 1880s with a Livermore Valley Wine Appellation status granted in 1983. Acreage planted to vineyards continues to expand in the Livermore Valley despite pressure to develop the property for residential use. In 2002, there were over 20 vineyards in operation in the Livermore Valley with approximately 4,000 acres planted to wine grapes. The agricultural heritage of Livermore is an anchor of the tourism industry in the region. Events such as the Livermore Rodeo, Livermore Days of Wine and Honey, Harvest Wine Celebration, and the Farmer's Market attract visitors interested in Livermore's agricultural heritage and culture.

(2) Lawrence Livermore National Laboratory/Sandia Laboratory. The Lawrence Livermore National Laboratory (LLNL) and Sandia Laboratory provide unique economic anchors to the Livermore economy. It is important to note that both of these installations are located outside of Livermore's city boundaries.

LLNL, founded in 1952 by the U.S. Department of Energy and operated by the University of California, employs approximately 8,500 workers engaged in research in advanced defense technologies, energy, environment, biosciences, and basic sciences. The LLNL is dedicated to furthering U.S. national security capabilities. A key component of LLNL under development is the National Ignition Facility (NIF) Programs Directorate, which enables key programs and technologies that support the U.S. Department of Energy's National Nuclear Security Administration Defense Programs and LLNL missions of ensuring that the nation's nuclear weapons remain safe, secure, and reliable. The charter of the Directorate is to construct and operate the National Ignition Facility, to integrate the Inertial Confinement Fusion Program into the overall Stockpile Stewardship Program and to foster the development of associated laser technologies such as those developed in the Laser Science and Technology Program. The NIF Project, the largest laser in the world, is a collaborative scientific effort between LLNL and Sandia National Laboratories, Los Alamos National Laboratory, University of Rochester, Laboratory for Laser Energetics, General Atomics, and the Naval Research Laboratory.

The Sandia Laboratory is affiliated with the larger Sandia Laboratory located in New Mexico. The Livermore facility employs approximately 1,140 people.

5. TRANSPORTATION

This chapter describes key elements of the City's transportation system. It includes an overall description of the physical setting and environment, and an evaluation of operating conditions. Included are discussions of existing transportation systems in 2003 (roadways, transit services, bicycle facilities, pedestrian facilities, truck routes) and key transportation facilities and funding programs. As part of the existing conditions analysis, previous documents have been reviewed and summarized, and new traffic data has been collected and analyzed using City-approved methodologies.

A. STREETS AND HIGHWAYS

The following section describes the street classification system, major commute routes and connections to adjacent areas, and major roadway access to and within the City.

1. Street Classification System

The City of Livermore is served by an existing network of freeways, highways, arterial roadways plus collector, and local streets. Livermore has defined the highway/roadway system using the following classification system, as defined below:

- **Freeways.** Freeways are State-designated high-speed, high-capacity routes serving Statewide and interregional circulation needs. Direct access is limited to highways and major streets only, via freeway interchanges. No direct land use access function is provided from freeways. Major streets cross a different grade level than the freeways grade level. In urban areas, freeways are typically eight- to ten-lane divided facilities.
- **Highways.** Highways are State-designated, relatively high-speed, high-capacity routes serving needs for interregional through traffic movement and interconnection between Countywide road system components. Highways also connect local major streets with freeway interchanges. Local direct access is limited to major streets via signal-controlled intersections. Left turns are typically prohibited or highly restricted. Direct land service (i.e., driveways, etc.) and roadside parking are typically prohibited on highways. In urban areas, highways are typically four- to six-lane divided facilities.
- **Major Streets.** Major streets are local, medium-speed, high-capacity routes for intracity, crosstown travel and local access to freeways, highways, and the subregional road system via interchanges and signal-controlled intersections. Major streets also interconnect collector and local streets via signal and stop sign controlled intersections, respectively. The frequency of direct access to abutting properties is generally limited to avoid interference with the through traffic function of these routes. As such, direct access is limited to essential driveway locations away from intersections. New single-family homes are not permitted to front on major streets. Roadside parking is generally prohibited. Major streets are typically four- and six-lane divided facilities.
- **Collector.** Collector streets are relatively low-speed, medium-capacity streets that collect and distribute local traffic moving between local and major streets. Collector routes provide for

circulation between neighborhoods, and divert through traffic from local streets. Direct access to abutting properties (driveway spacing) is stringently limited. Prohibitions on curbside parking may vary with road widths and traffic conditions. Collector streets are typically two-lane facilities.

- **Local Streets.** Local streets are low-speed, low-capacity minor streets that provide for circulation within neighborhoods, with direct access to abutting land uses. Street design standards and layouts are typically used to discourage through traffic movements, avoid high travel speeds and volumes, and minimize neighborhood noise and safety impacts. Curbside parking is generally allowed. Local streets are typically two lanes.
- **Intracounty Routes.** Intracounty routes are medium-speed, medium-capacity rural roads on the City's urban fringe that are components of the subregional intercommunity road system. These routes are typically maintained at County two-lane rural standards (no curbs or gutters).
- **Special Rural Routes.** Special rural routes include highways, major streets, and intracounty routes that pass through or by areas designated as having special rural features that warrant incorporation of protection and enhancement measures in the roadway design. Special rural routes are designated through and entering vineyard lands. These routes incorporate special road design standards that serve to protect and complement the "wine county" character, including width restrictions, landscaping features, and special signs. Special rural routes are developed using two-lane rural standards (no curbs, gutters or sidewalks) but include combined bike, pedestrian, and equestrian trails.

  To protect the rural and agricultural character of the vineyard lands south of the City it is desirable that all roads in this area remain at two-lanes. This area is generally defined as the area south of Concannon Boulevard between Isabel Avenue and Arroyo Road, and the areas east of Arroyo Road and south of East Avenue. The roads in this area are designated to have two paved travel lanes with paved left turn lanes where required in developed portions of this area. Where future traffic volumes may exceed the capacity of a two-lane road, right-of-way for a four-lane road is required. The area not used for the two paved lanes shall be landscaped and/or used for appropriate hiking, biking, and equestrian trails.

Figure 5-1 illustrates the roadway system in the City. Figure 5-2 illustrates the existing functional classification of key roadways. A listing of highways and major streets is shown in Table 5-1.

2. Major Commute Routes and Connections to Adjacent Areas

The following describes major commute routes and connections to adjacent areas from Livermore.

- **I-580 Freeway** connects the Bay Area with San Joaquin County and is a major inter-regional route for commuting, truck commerce, and recreational travel. In 2002, I-580 experienced severe congestion during both the morning and evening peak hours. As a result, large numbers of commuters used surface streets in Livermore to bypass the freeway congestion. In 2002, environmental planning studies by Caltrans were underway to construct HOV lanes between Vasco Road and Santa Rita Road. A "gateway policy" for single-occupant vehicles was adopted by the Alameda County Congestion Management Agency (CMA) and the Tri-Valley Transportation Council to not increase lane capacity on I-580 over the Altamont Pass. I-580 carries an Average Daily Traffic (ADT) volume of 165,000 to 220,000 vehicles through the City (according to the I-580 High Occupancy Vehicle (HOV) Project Study Report).

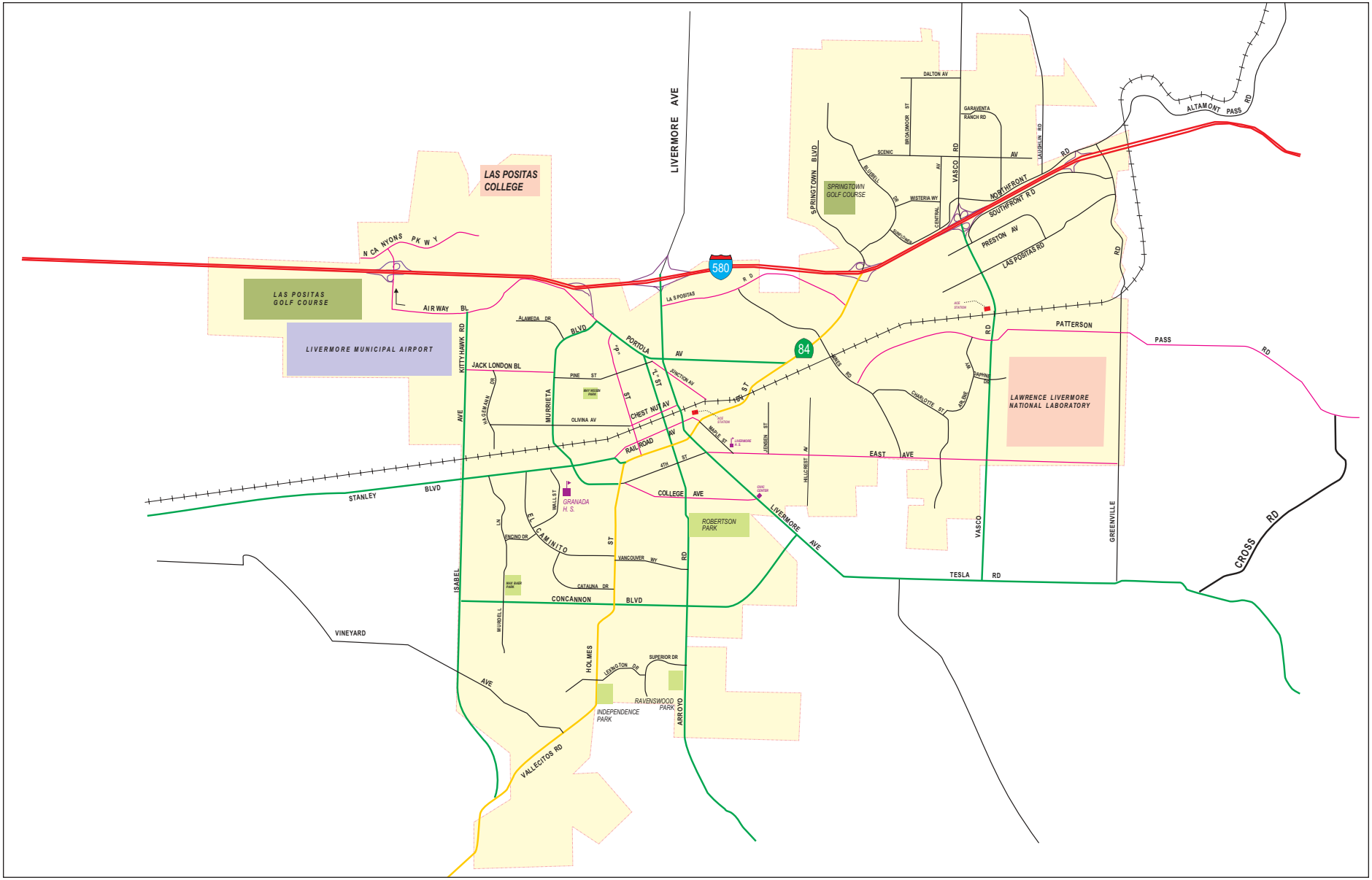


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FIGURE 5-1

Livermore General Plan Update
Master Environmental Assessment
Existing Roadway System

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-1.INDD (06/05/03)

Table 5-1: Major Streets

Roadway Segment	From	To
Highway		
Isabel Avenue	Jack London Boulevard	Vallecitos Road
Major Streets		
Concannon Boulevard	Isabel Avenue	S. Livermore Avenue
East Avenue	S. Livermore Avenue	Greenville Road
El Charro Road	I-580	Jack London Boulevard
First Street	Holmes Street	I-580
Fourth Street	Holmes Street	Livermore Avenue
Greenville Road	Altamont Pass Road	Tesla Road
Isabel Avenue	North Canyons Parkway	I-580
Jack London Boulevard	El Charro Road	Murrieta Boulevard
Las Positas Road	Livermore Avenue	Greenville Road
Livermore Avenue-Tesla Road	Northern City Limit	Southeastern City Limit
Mines Road	First Street	East Avenue
Murrieta Boulevard	Portola Avenue	Holmes Street
North Canyons Parkway	El Charro Road	Collier Canyon Road
Northfront Road	Vasco Road	East City Limit
Patterson Pass Road	Mines Road	Greenville Road
Portola Avenue	Collier Canyon Parkway	First Street
Railroad Avenue	Stanley Boulevard	First Street
Springtown Boulevard	Galloway Street	I-580
Stanley Boulevard	Western City Limits	First Street
Vallecitos Road-Holmes Street	First Street	Southern City Limit
Vasco Road	North City Limit	Tesla Road
Collector Streets		
Airway Boulevard	North Canyons Parkway	I-Portola Avenue
Alden Lane	Murdell Lane	Holmes Street
Arlene Way	Charlotte Way	Patterson Pass Road
Bluebell Drive	Hartford Avenue	Springtown Boulevard
Catalina Drive	El Caminito	Holmes Street
Charlotte Way	Mines Road	Carnegie Way
Chestnut Street	P Street	Junction Avenue
College Street	Fourth Street	Livermore Avenue
Daphne Drive	Arlene Way	Vasco Road
El Caminito	East Stanley Boulevard	Holmes Street
Encino Drive	Murdell Lane	El Caminito
Garaventa Ranch Road	Vasco Road	Scenic Avenue
Hagemann Drive	Daisyfield Drive	Jack London Boulevard
Herman Avenue	Scenic Avenue	Northfront Road
Hillcrest Avenue	Fordham Way	Devon Place
Jenson Street	Madeira Way	East Avenue
Joyce Street	Charlotte Way	Patterson Pass Road
Junction Avenue	Pine Street	Old First Street
L Street-Arroyo Road	Portola Avenue	Southern City Limits
Laughlin Road	Northern City Limits	Northfront Road
Lexington Way	Trinity Hills Lane	Superior Drive
Mines Road	Las Positas Road	First Street
Murdell Lane	Alden Lane	Stanley Boulevard

Table 5-1 *continued*

Roadway Segment	From	To
Olivina Street	Hagemann Drive	P Street
P Street	Portola Avenue	First Street
Pine Street	Murrieta Boulevard	Junction Avenue
Rincon Avenue	Portola Avenue	El Rancho Drive
Scenic Avenue	Bluebell Drive	Saddleview Court
Vancouver Way	Holmes Street	Arroyo Road
Wall Street	East Stanley Boulevard	El Caminito

Source: Meyer, Mohaddes Associates, 2003.

- **Isabel Avenue** connects Vallecitos Road to I-580 via Airway Boulevard. In 2003, environmental planning studies were underway to build a new Isabel Avenue/I-580 interchange and remove the existing partial interchange at I-580/Portola Avenue. The City was in negotiations with the State Department of Transportation (Caltrans) to adopt Isabel Avenue as State Route (SR) 84 and relinquish Holmes Street, First Street, and a portion of Vallecitos Road to the City. Isabel Avenue carries an ADT volume of 14,500 vehicles south of Stanley Boulevard.
- **Vallecitos Road (SR 84)** is a two-lane State Route connecting Livermore with I-680 in Sunol. SR 84 extends through Downtown Livermore along Holmes Street and First Street to its intersection with I-580. In 2002, a Project Study Report (PSR) was being prepared by Caltrans to identify SR 84 as a future six-lane expressway along the Isabel Avenue corridor between I-580 and Stanley Boulevard, and then a four-lane facility from Stanley Boulevard to I-680. Vallecitos Road carries an ADT volume of 27,500 vehicles.
- **North Canyons Parkway** provides access to Chabot – Las Positas College and the business and commercial park area in the northwest portion of the City. The 1989 Circulation Element, as amended, identifies a future arterial connection with Dublin Boulevard to the west. North Canyons Parkway carries an ADT volume of 27,000 vehicles.
- **Jack London Boulevard** is a major street between Murrieta Boulevard and Isabel Avenue continuing westerly to a dead end adjacent to the Livermore Municipal Airport. The 1989 Circulation Element shows a future extension of Jack London Boulevard to El Charro Road. Jack London Boulevard carries an ADT volume of 9,500 vehicles.
- **Vasco Road** is the primary access from I-580 south to Lawrence Livermore National Laboratory and Sandia National Laboratory. North of I-580, Vasco Road is a primary commute route connecting to Eastern Contra Costa County. A "gateway policy" was adopted by the Alameda County CMA and the Tri-Valley Transportation Council to not increase lane capacity on Vasco Road north of Livermore. Vasco Road carries an ADT volume of 6,000 vehicles north of Tesla Road to 23,000 vehicles at the north end of the City.
- **Stanley Boulevard** is a four-lane major street connecting Livermore and Pleasanton. This road is regularly used by commuters to avoid congestion on I-580. Stanley Boulevard carries an ADT volume ranging from 24,000 to 31,500 vehicles.
- **Vineyard Avenue** is a two-lane rural road connecting Livermore and Pleasanton. Vineyard Avenue carries an ADT volume of 8,500 vehicles.

- **Tesla Road, Patterson Pass Roads, and Altamont Pass Road** each provide a two-lane rural road connection to San Joaquin County. Their ADT volumes range from 2,200 (Patterson Pass Road) to 9,000 vehicles (Altamont Pass Road).

3. Major Roadway Access To and Within Downtown

There are a number of key roadways that provide access to and within Downtown Livermore. They include North and South Livermore Avenue, First Street (SR 84), Railroad Avenue, Fourth Street, L Street, and P Street. Key characteristics of those roadways are described below.

- **Livermore Avenue** is a four-lane major street north of First Street and two lanes south of First Street that provides north/south access through the City. At the southern end of the City, it connects to Tesla Road which runs eastward into San Joaquin County. To the north, it connects to Manning Road which provides access to Contra Costa County. Livermore Avenue is a key access route to Downtown and it provides direct access from Downtown to I-580 via a diamond-shaped interchange. The ADT volumes on Livermore Avenue range from 2,000 vehicles at the north end of the roadway, to 33,500 vehicles south of I-580, and 8,000 vehicles south of College Avenue.
- **First Street (SR 84)** is a four-lane State Route that is designated as a major street in the 1989 Circulation Element. To the east, it provides direct access to I-580 with a full interchange. To the west, just outside of Downtown, it connects to Holmes Street. First Street carries an ADT of 49,000 vehicles south of I-580, 40,000 vehicles at Portola Avenue, and 27,000 vehicles through Downtown.
- **Railroad Avenue** is a relatively short, four-lane major street with some two-lane sections that provides east/west access to and through Downtown. It connects to First Street east of Downtown and to Stanley Boulevard to the west of Downtown, thereby acting as a potential bypass route for First Street traffic. Railroad carries an ADT of 14,000 vehicles west of First Street.
- **Fourth Street** is a four-lane major street with a mix of commercial and residential frontage which provides east/west access to and through Downtown. It carries an ADT of 15,000 vehicles west of Livermore Avenue.
- **L Street** is a two-lane collector street south of First Street and four-lanes north of First Street, and provides access to Downtown from the north and south. North of Downtown, L Street intersects Portola Avenue, and to the south it becomes Arroyo Road. North L Street carries an ADT volume of 6,000 vehicles south of Portola Avenue, and 9,000 vehicles south of Chestnut Avenue.
- **P Street** is a four-lane major street between Pine Street and Second Avenue, and a two-lane street north of Pine Street and south of Second Street. It provides access from north of Downtown to College Avenue, south of Downtown. P Street is a collector street from Portola Avenue to 4th Street, and south of 4th Street it is designated as a local street.

Figure 5-3 illustrates the roadway cross-sections for major, collector, and local streets. These are typical design standards. In general, major streets will have four to six lanes for moving traffic and may have on-street parking or a bike lane. Collector streets will typically have one lane for moving traffic in each direction, plus a bike lane and possibly on-street parking.

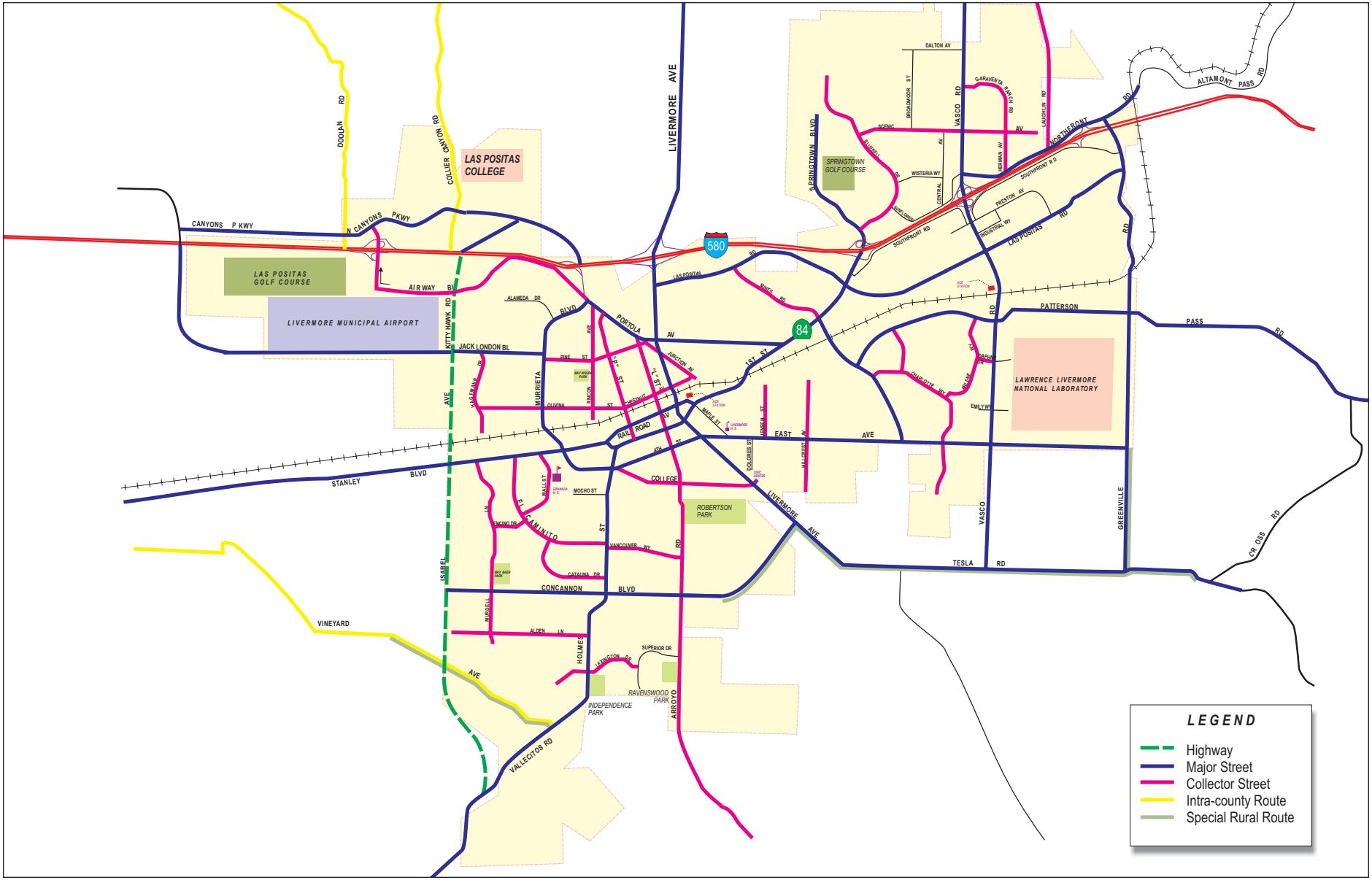

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FIGURE 5-2

Livermore General Plan Update
Master Environmental Assessment
Adopted Functional Classification System of Roadways

SOURCE: MEYER,MOHADDES ASSOC., 2003.

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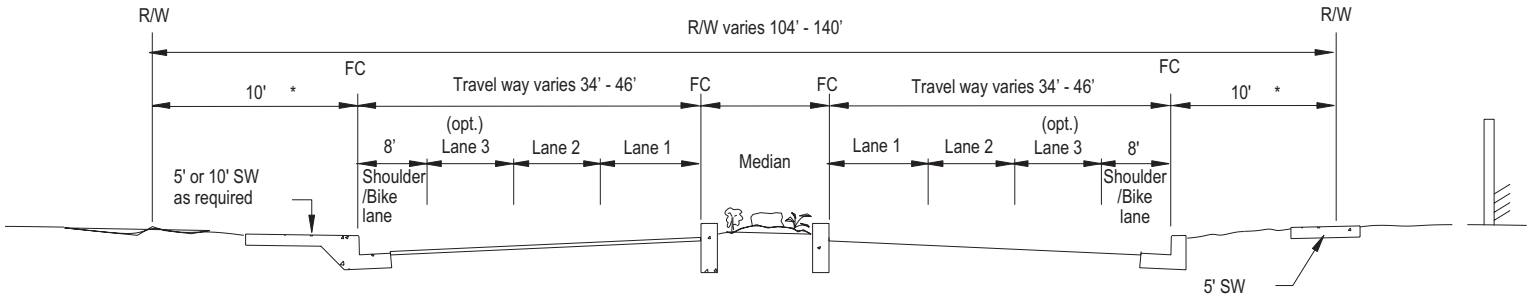
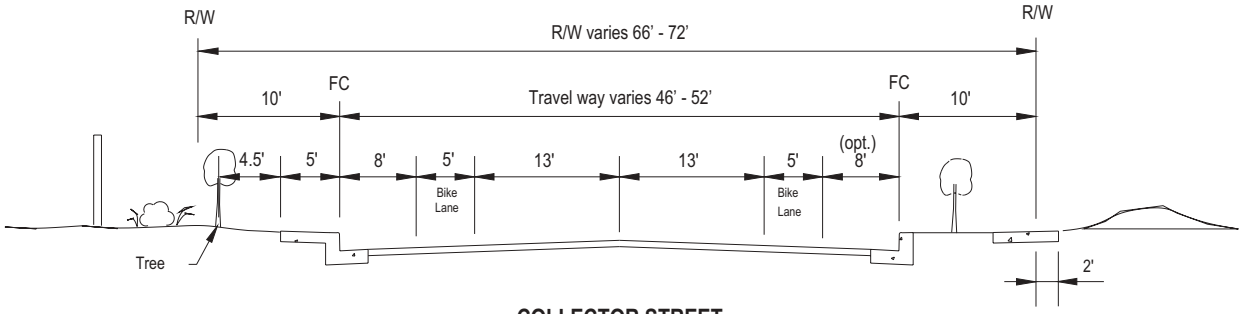
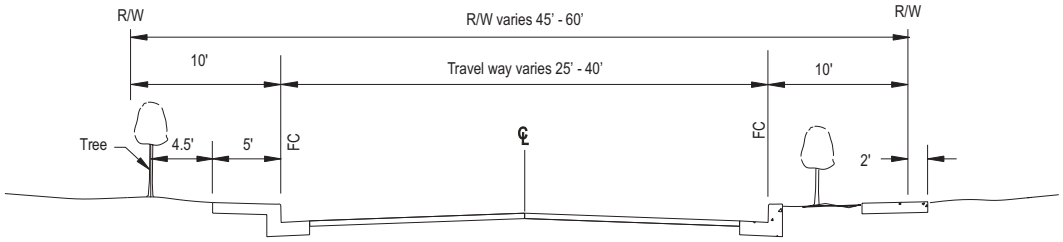


MAJOR STREET



COLLECTOR STREET



LOCAL STREET

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FIGURE 5-3

Livermore General Plan Update
Master Environmental Assessment
Typical Roadway Cross Sections

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-3.INDD (06/05/03)

Figure 5-4 illustrates the number of lanes, posted speed limit, and type of intersection traffic control at key intersections. As shown in Figures 5-3 and Figures 5-4a and 5-4b, traffic flow is controlled by a combination of stop signs (on minor streets), all-way stop control, and traffic signals.

B. TRAFFIC VOLUMES AND LEVEL OF SERVICE

Traffic flow is measured and analyzed both on a daily basis and during peak hours (commute peak hours). On a daily basis, traffic flow is measured on roadways at mid-block locations to determine the overall level of travel demand and level of service. Average Daily Traffic (ADT) values have been developed that represent the typical daily traffic flow on key roadways in the City. Figure 5-5 illustrates the Average Daily Traffic volumes for 2002, and Table 5-2 lists the ADT values by location. Figure 5-6 shows the intersections that were analyzed.

During peak hours, intersection traffic volume is counted to determine the operating conditions during the peak hours of travel demand. Typically, intersection traffic demand is measured for the peak morning and afternoon/evening commute peak periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.). The single highest hour in the morning and in the afternoon is then determined and used to develop intersection level of service estimates.

Level-of-service is a qualitative measure describing the efficiency of traffic flow. It also describes the way such conditions are perceived by persons traveling in a traffic stream. Levels-of-service measurements may also describe variables such as speed and travel time, freedom to maneuver, traffic interruptions, traveler comfort and convenience, and safety. Measurements are graduated ranging from level-of-service (LOS) A (representing free flow and excellent comfort for the motorist, passenger or pedestrian) to LOS F (reflecting highly congested or stop and go traffic conditions where traffic volumes approach or exceed the capacities of streets, sidewalks, etc.).

Levels-of-service can be determined for a number of transportation facilities including freeways, multi-lane highways, arterials, two-lane highways, signalized intersections, intersections that are not signalized, transit and pedestrian facilities. For the Circulation Element update, intersection level of service is measured to determine the peak period operating characteristics at all key intersections in the City. Intersections typically represent the most critical locations of bottlenecks and congestion since the right-of-way must be shared by opposing traffic. Currently, the City considers LOS D with a peak hour volume/capacity (V/C) ratio of 0.85 or average total stopped delay per vehicle of 45 seconds (mid-level LOS D) to be the upper limit of acceptable service at major intersections in Livermore. The maximum LOS D objective for the roadway system reflects the City's intent to maintain stable traffic flow throughout the City, recognizing that peak hour congestion may occur at locations near freeways or other locations with unusual traffic characteristics due to regional traffic flow. Table 5-3 outlines the level of service concept for signalized intersections.

Intersection traffic counts were obtained from previous studies and a series of new counts were conducted in 2002 to identify intersection traffic flow at 94 key intersections in the City. Each study intersection was then reviewed in the field to determine the geometric characteristics including number of lanes on each intersection approach by type (through lanes, left turn lanes, right turn lanes and shared lanes), type of traffic control and other relevant information. The roadway characteristics and traffic volume data were then used to estimate existing AM and PM peak hour operating conditions, using the Highway Capacity Manual 2000 methodology.

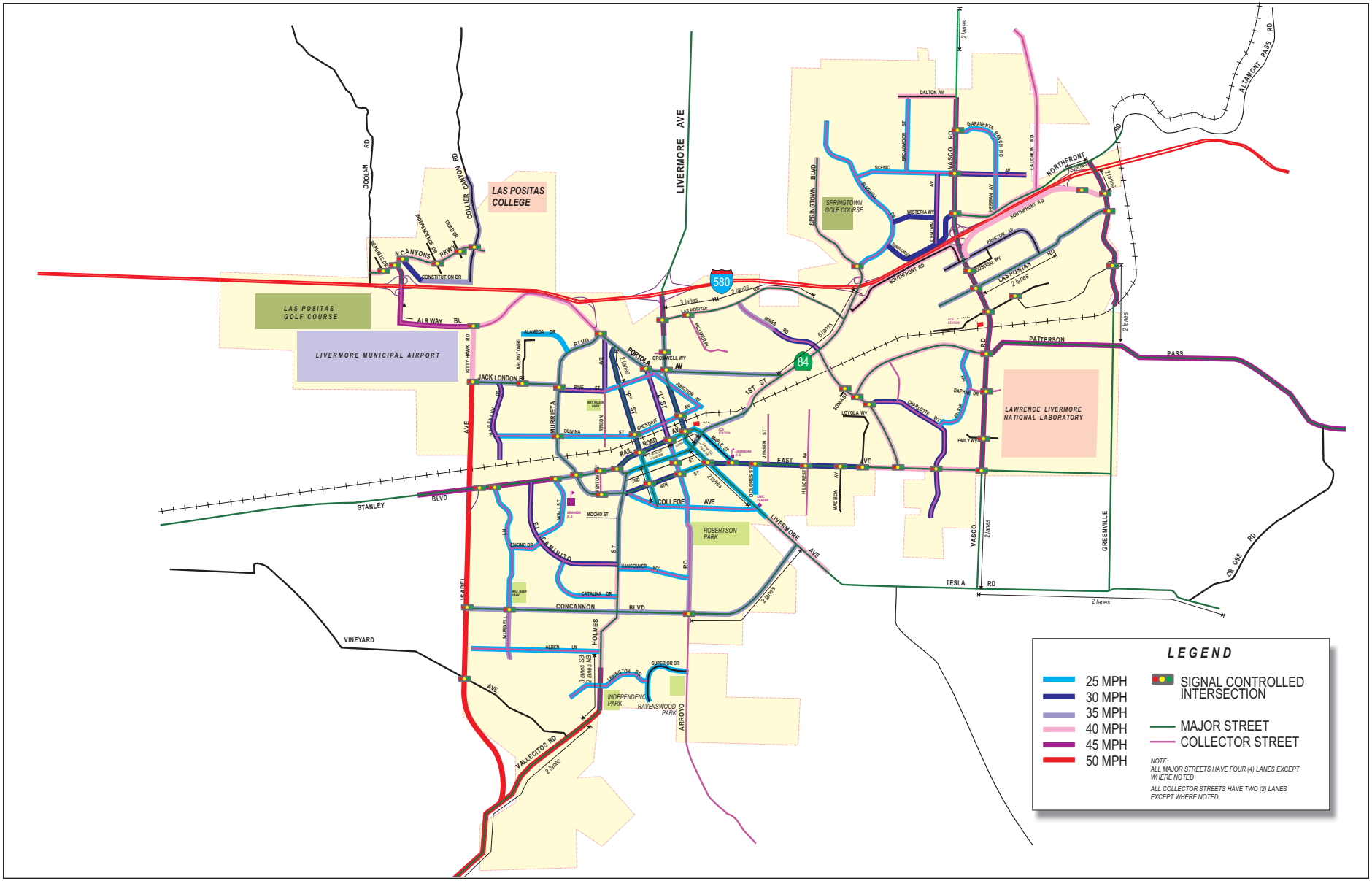

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FIGURE 5-4

Livermore General Plan Update
Master Environmental Assessment
Number of Lanes, Posted Speed Limit and Intersection Traffic Control

SOURCE: MEYER,MOHADDES ASSOC., 2003.

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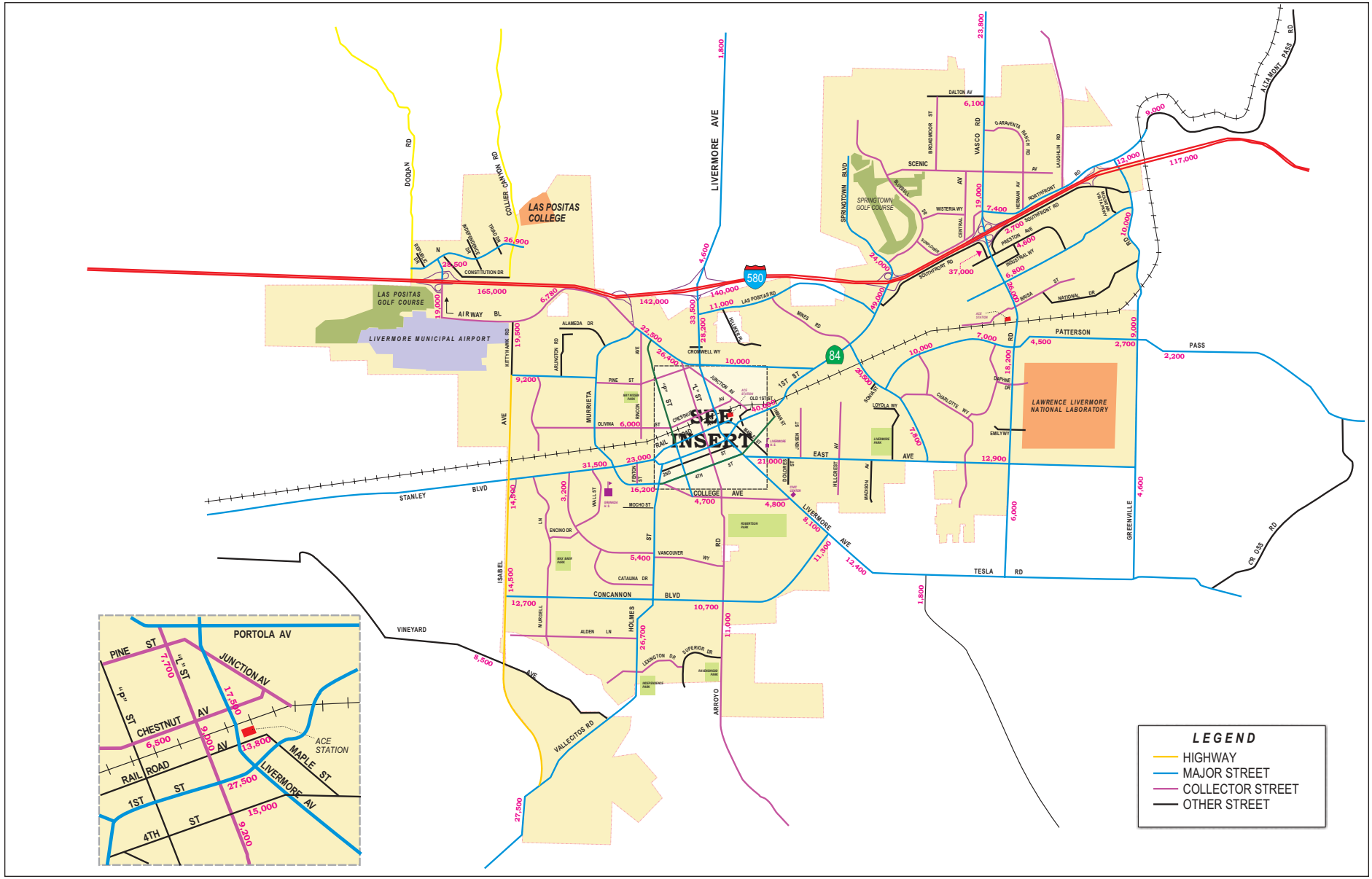

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FIGURE 5-5

Livermore General Plan Update
Master Environmental Assessment
Annual Daily Traffic Volumes (2002)

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-5.INDD (06/05/03)

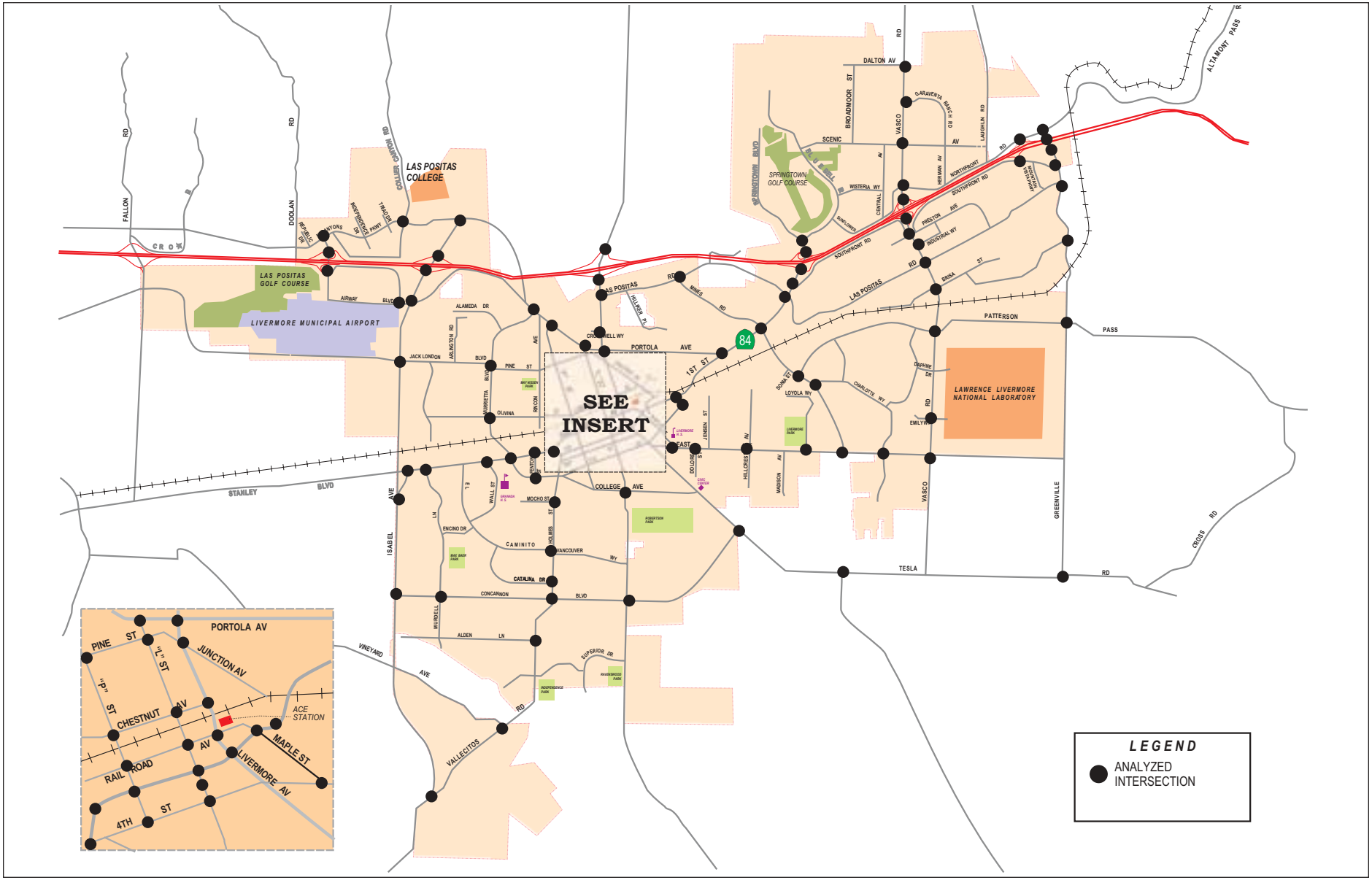

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FIGURE 5-6

Livermore General Plan Update
Master Environmental Assessment
Analyzed Intersections

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-6.INDD (06/05/03)

Table 5-2: 2002 Average Daily Traffic Volumes

Street	Location	Daily Traffic Volume	Street	Location	Daily Traffic Volume
1st St.	s/o Portola Ave.	40,000	Livermore Ave.	n/o Railroad Ave.	17,500
1st St.	n/o Las Positas Rd.	49,000	Livermore Ave.	n/o Portola Ave.	28,000
1st St.	n/o I-580 Ramps	24,000	Livermore Ave.	n/o Las Positas Rd.	33,500
Airway Blvd.	s/o Canyons Pkwy	28,500	Livermore Ave.	n/o I-580 Ramps	4,500
Airway Blvd.	e/o Kitty Hawk Rd.	7,000	Mines Rd.	n/o Patterson Pass Rd.	20,500
Airway Blvd.	e/o Murrieta Blvd.	22,500	Mines Rd.	s/o Patterson Pass Rd.	8,000
Airway Blvd.	e/o "P" St.	27,600	Mines Rd.	s/o Tesla Rd.	1,800
Arroyo Rd.	s/o College Ave.	11,000	Murrieta Blvd.	w/o Vallecitos Rd.	16,000
Canyons Pkwy	e/o Airway Blvd.	27,000	Northfront Rd.	e/o Vasco Rd.	7,500
Chestnut Ave.	e/o "P" St.	6,500	Northfront Rd.	e/o Greenville Rd.	12,000
College Ave.	w/o Arroyo Rd.	5,000	Northfront Rd.	e/o railroad tracks	9,000
Concannon Blvd.	w/o Holmes St.	12,500	Olivina Ave.	w/o Murrieta Blvd.	6,000
Concannon Blvd.	e/o Holmes St.	10,700	Patterson Pass Rd.	e/o Mines Rd.	10,000
Dalton Ave.	w/o Vasco Rd.	6,000	Patterson Pass Rd.	w/o Vasco Rd.	7,000
East Ave.	w/o Mines Rd.	21,000	Patterson Pass Rd.	e/o Vasco Rd.	4,500
East Ave.	e/o Mines Rd.	13,000	Patterson Pass Rd.	w/o Greenville Rd.	2,500
El Caminito	w/o Holmes St.	5,500	Patterson Pass Rd.	e/o Greenville Rd.	2,200
El Caminito	s/o Stanley Blvd.	3,200	Portola Ave.	e/o Livermore Ave.	11,000
Greenville Rd.	n/o Tesla Rd.	4,500	Railroad Ave.	e/o Livermore Ave.	14,000
Greenville Rd.	n/o Patterson Pass Rd.	9,000	Stanley Blvd.	w/o Isabel Ave.	28,000
Greenville Rd.	n/o Las Positas Rd.	10,000	Stanley Blvd.	w/o Murrieta Blvd.	31,500
Holmes St.	s/o Concannon Blvd.	26,700	Stanley Blvd.	e/o Murrieta Blvd.	24,000
Holmes St.	s/o Murrieta Blvd.	36,000	Tesla Rd.	e/o Greenville Rd.	6,000
Isabel Ave.	n/o Concannon Blvd.	14,500	Vallecitos Rd.	s/o Isabel Ave.	27,500
Isabel Ave.	s/o Stanley Blvd.	14,500	Vasco Rd.	s/o East Ave.	6,000
Jack London Blvd.	e/o Kitty Hawk Rd.	9,500	Vasco Rd.	s/o Patterson Pass Rd.	18,000
"L" St.	n/o Railroad Ave.	9,000	Vasco Rd.	s/o Las Positas Rd.	26,000
"L" St.	s/o Portola Ave.	8,000	Vasco Rd.	n/o Northfront Rd.	19,000
Las Positas Rd.	e/o Livermore Ave.	11,000	Vasco Rd.	n/o Dalton Ave.	23,000
Livermore Ave.	s/o College Ave.	8,000	Vineyard Ave.	w/o Isabel Ave.	8,500

Source: Meyer, Mohaddes Associates, Inc., 2002.

Table 5-3: Definition of Level of Service for Signalized Intersections

LOS	Description	Average Total Stopped Delay per Vehicle (Seconds)
A	Most vehicles do not stop.	Less than or equal to 10
B	Some vehicles stop.	Greater than 10 *and* less than or equal to 20
C	A significant number of vehicles stop. A few vehicles must wait more than one signal cycle.	Greater than 20 *and* less than or equal to 35
D	Most vehicles stop. A noticeable number of vehicles must wait more than one signal cycle.	Greater than 35 *and* less than or equal to 55 Mid-D = 45
E	Vehicles frequently wait more than one signal cycle.	Greater than 55 *and* less than or equal to 80
F	Extreme delays potentially affecting other traffic movements in the intersection.	Greater than 80

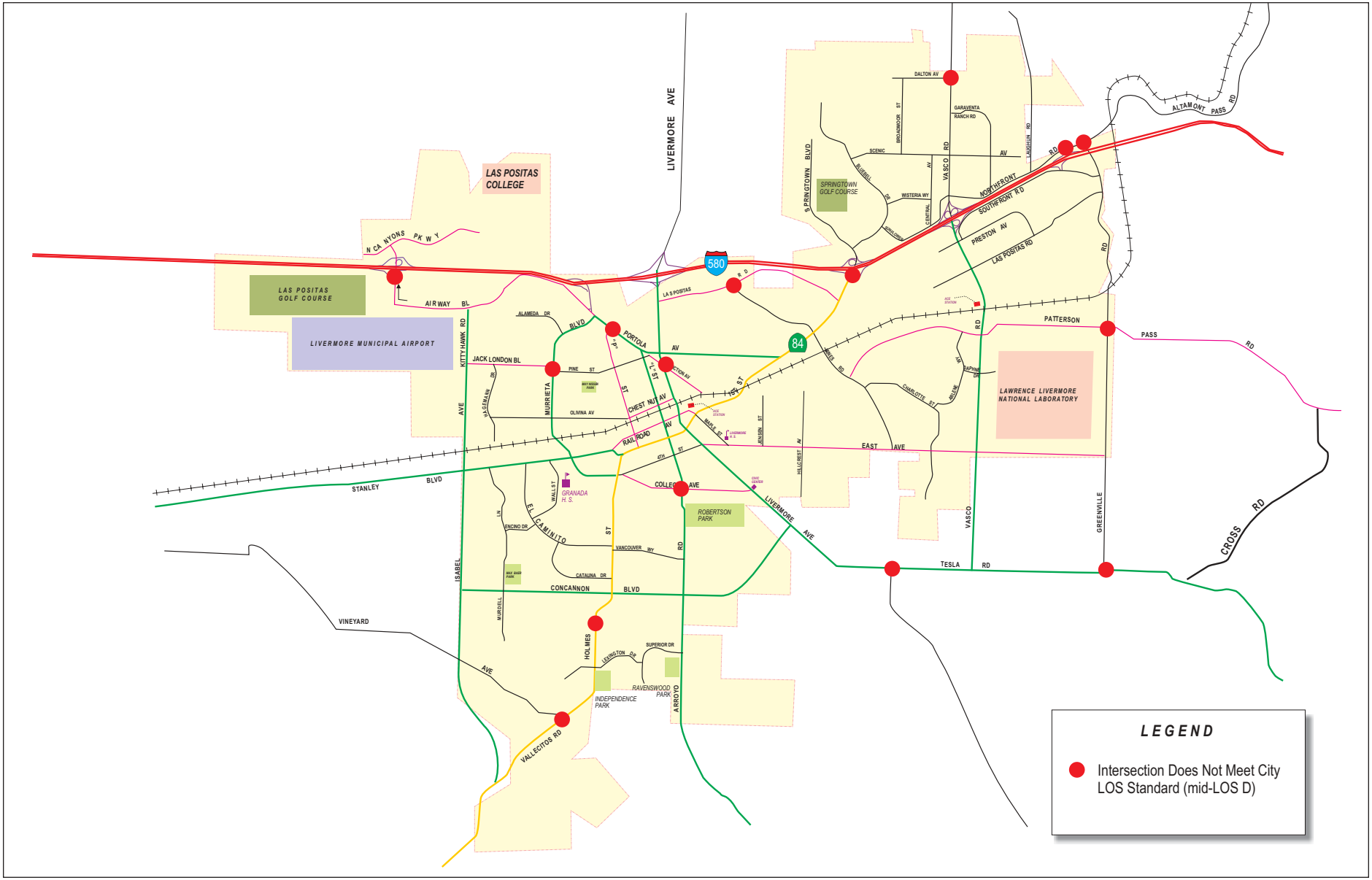
Source: *Highway Capacity Manual* 2000; and City of Livermore, 2002.

Unsignalized (stop-controlled) intersections are analyzed using vehicle delay-based methodologies as described in the Highway Capacity Manual. Level of service for stop-sign controlled intersections is assessed only for those movements that must yield the right of way (side street traffic movements with stop signs and left turns from the major street). Table C-1 in Appendix B illustrates the current intersection level of service at each key intersection. Figures 5-7 and 5-8 illustrate the results of the intersection level of service analysis for the AM and PM peak hours, respectively, and they highlight those signalized intersections operating at or worse than the City's upper limit of mid-LOS D (average control delay = 45 seconds).

As demonstrated by the data in Appendix B, the City had four signalized and 14 unsignalzed intersections that operate worse than the City's upper limit of mid-LOS D during the AM peak hour in 2002. During the PM peak hour, there were five signalized and ten unsignalized intersections that operated at the upper limit level of service threshold or worse. The remaining locations operate better than the City's upper limit. The signalized intersections that are estimated to operate over the City's designated upper limit level of service threshold are as follows (unsignalized intersections are listed in Table C-1 in Appendix B).

- Airway Boulevard/I-580 eastbound ramp (AM peak hour)
- First Street/Railroad Ave-Maple Street (PM peak hour)
- First Street/Southfront Street (AM and PM peak hours)
- Jack London Boulevard/Murrieta Boulevard (AM peak hour)

In addition to the intersections noted above, the City experienced congestion and back-up problems at several locations and routes that are at or near capacity during peak hours in 2002. These include I-580 and the resulting backup as traffic waits to access I-580 from southbound Vasco Road, southbound North Livermore Avenue, southbound Springtown Boulevard-Bluebell Drive and westbound Portola Avenue during the AM commute, and on eastbound First Street, northbound Vasco Road and at Southfront Street/ eastbound I-580 ramps during the PM commute, and SR 84 south of Livermore.



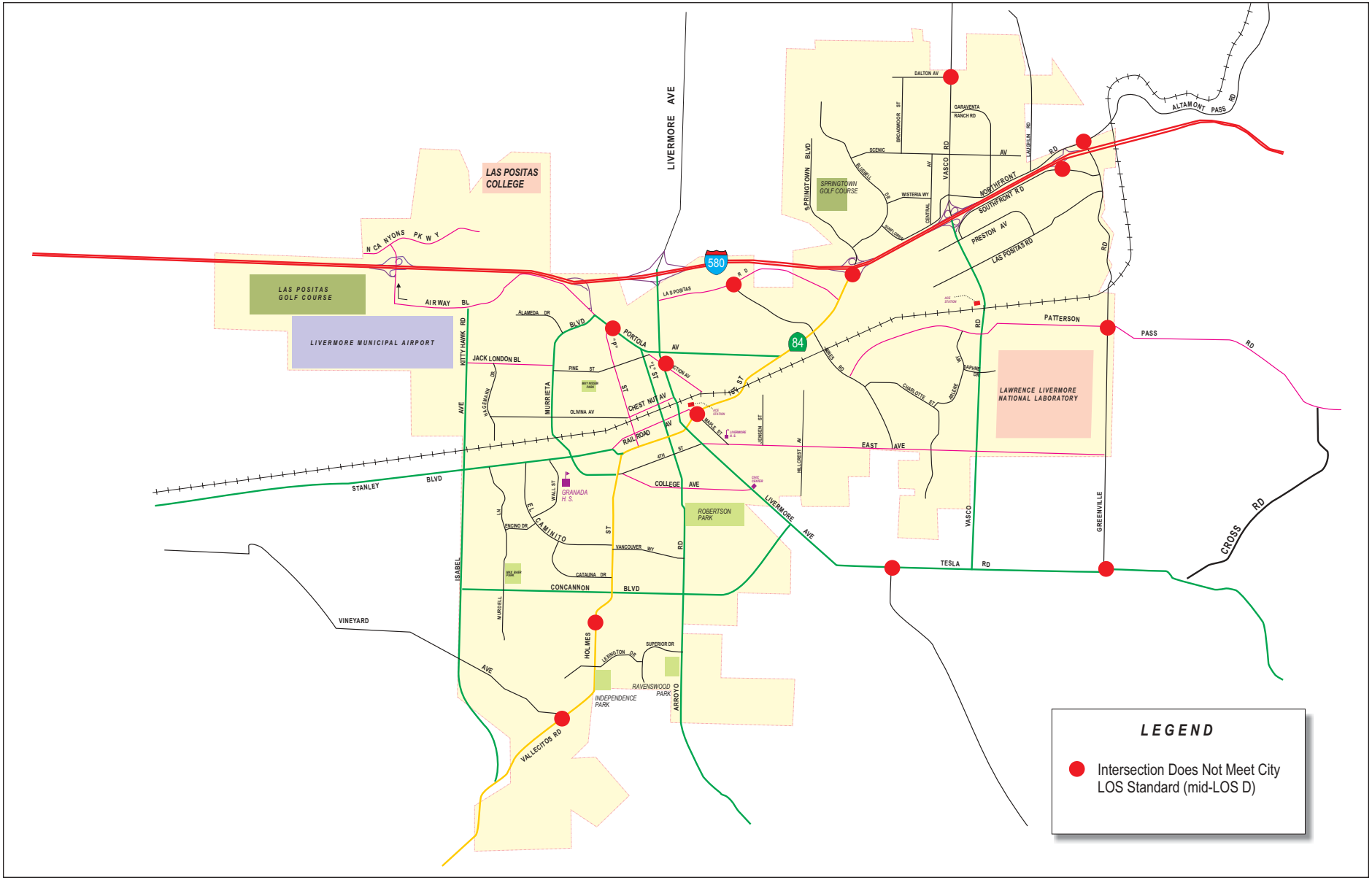
LSA

FIGURE 5-7

Livermore General Plan Update
Master Environmental Assessment
2002 Intersection Level-of-Service
AM Peak Hour

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-7.INDD (06/05/03)



LSA

FIGURE 5-8

Livermore General Plan Update
Master Environmental Assessment
2002 Intersection Level-of-Service
PM Peak Hour

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-8.INDD (06/05/03)

C. RESIDENTIAL TRAFFIC CALMING

Besides congestion on major streets, collectors, and intersections, traffic conditions on local streets is also a very important issue in the City. To address local street issues, the City adopted a Neighborhood Traffic Calming Program in March 2002. The purpose of the Neighborhood Traffic Calming Program is to improve livability and quality of life within residential neighborhoods through the deployment of traffic calming devices. The following program steps accomplish this:

- Definition of a process to evaluate neighborhood concerns.
- Identification of criteria to implement various methods to calm traffic.
- Establishing the means to pay for and maintain the devices.
- Prioritization of the deployment of traffic calming devices.
- Implementation of the program through the Capital Improvement Program.

The goal of the Neighborhood Traffic Calming Program is to implement measures identified by a consensus of the neighborhood to affect driver behavior in such a way that improves safety and the quality of life for residents, pedestrians, bicyclists, and motorists. This goal is to be balanced with the City's goal to provide quick emergency response times for emergency vehicles including fire trucks, police, and emergency response.

The objectives of the program are as follows:

- Reduce vehicle speeds on residential streets.
- Discourage cut-through traffic.
- Promote conditions that encourage bicycle and pedestrian travel.
- Create attractive streetscapes in neighborhoods.
- Provide clear guidelines of the process to evaluate traffic calming measures.
- Encourage citizen involvement in all phases of neighborhood traffic calming activities.
- Make efficient use of City resources by prioritizing traffic calming requests.

As outlined in the Program, the process begins once the City receives a request by a resident to initiate a traffic study in a residential neighborhood due to concerns about traffic. The process is divided into two distinct tiers; Tier 1 including the existing Traffic Education, Enforcement and Engineering Program, and Tier 2 including the Neighborhood Traffic Calming Program. At the beginning of each fiscal year, the top projects on the priority list will be selected for study during that year, depending upon availability of funding. Once funding measures are in place, the City Council will review the neighborhood approved plan, approve permanent installation of the devices, and allocate City funding. As needed, the California Environmental Quality Act (CEQA) process will be conducted for specific projects or plans.

D. GOODS MOVEMENT SYSTEM

The freeways and highways that traverse Livermore are major corridors for the movement of goods and services in and through the area. The corridors extend both east/west and north/south through the City from the East Bay to areas outside of Alameda County. According to Caltrans data, truck volumes on I-

580 range from approximately 12,000 to 17,000 trucks per day, which is approximately 10 to 11 percent of the traffic volume. Truck volumes on SR 84 range from 1,200 to 1,900 trucks per day, which is approximately 4.1 percent (near Stanley Boulevard) to 4.5 percent (near I-580) of the overall traffic volume.

The City has an adopted a truck route system that designates various facilities for "through" truck movements. In 2002, these routes were: Holmes Street, First Street, East Stanley Boulevard, North Livermore Avenue and South Livermore Avenue, as far south as First Street, within the corporate limits of the City. On those routes, trucks over 3.0 tons may legally travel even if they do not have a trip origin or destination along that route. On all other streets, trucks may only travel if they are on a direct route between a truck route and the truck's origin or destination. The truck route system is illustrated in Figure 5-9.

Rail freight through Livermore is served by the Union Pacific Railroad. The east-west route originates in Oakland and ties to two major north-south routes.

E. EXISTING TRANSIT SERVICES

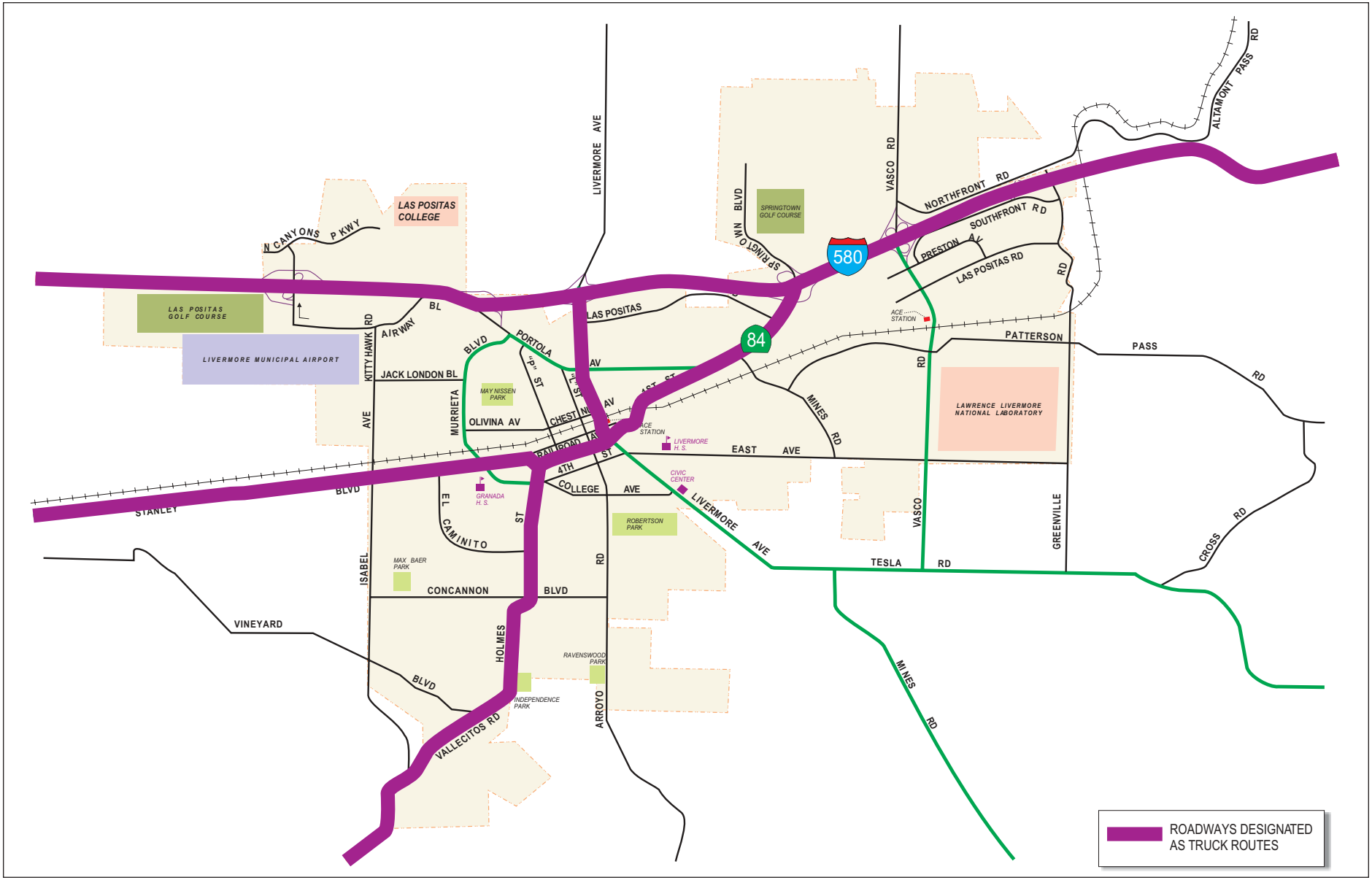
There are several transit services in the Livermore area. The Livermore Transit Center, located on Railroad Avenue near First Street, acts as a hub for many of the transit options. Opened in January 1998, the Transit Center serves as the major transfer point for local bus (WHEELS), Altamont Commuter Express (ACE) trains, Amtrak Motor Coaches, and Greyhound buses. Transit services that operate within the City are described below:

1. Livermore Amador Valley Transit Authority (LAVTA)

The Livermore Amador Valley Transit Authority (LAVTA) operates the WHEELS service, which provides local public transit to the cities of Dublin, Livermore, and Pleasanton, and to the adjacent unincorporated areas of Alameda County. The service area is approximately 40 square miles that is home to almost 160,000 residents.

LAVTA was created in 1986 under a Joint Powers Agreement between Livermore, Pleasanton, Dublin, and Alameda County. LAVTA provides a variety of transportation services including:

- **Fixed Route** provides local and intercity transit service for the Tri-Valley. The fixed route service originates from two primary locations; the Dublin/Pleasanton BART Station, and the Livermore Transit Center. The bus lines branch out from these locations and serve the local community. Service operates seven days per week from 4:30 a.m. to 12:30 a.m.
- **Direct Access Responsive Transit (DART)** provides service on Saturday in limited areas of Livermore and in all areas of Livermore on Sundays. Limited service is available on holidays. DART buses use "Flex Routing" to extend local passenger pickup and drop off to areas not served by WHEELS. In general, "Flex Routing" allows DART buses to follow routes that are more direct and make fewer stops than fixed route buses.
- **Dial-A-Ride** is an Americans with Disabilities Act (ADA) paratransit service for elderly riders and individuals with disabilities who are unable to use fixed route transportation systems. Service is available within ¾-mile of WHEELS fixed route service areas, and available weekdays, weekends and holidays. Weekday service is available from 5:00 a.m. to 1:00 a.m.



LSA

FIGURE 5-9

Livermore General Plan Update
Master Environmental Assessment
Truck Routes

SOURCE: MEYER,MOHADDES ASSOC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_5-9.INDD (06/05/03)

- **Prime Time** provides express bus service for commuters traveling to job sites in the Santa Clara Valley and a commuter express route to Walnut Creek only on weekdays.
- **Shuttles**. LAVTA provides shuttle service in its service area for various employers and special events. Shuttles typically serve the ACE Rail and BART stations, transporting employees directly to their job site. There are currently no shuttles that serve employers within Livermore. Special event shuttles operate from the ACE Rail and/or BART stations directly to the events.

Many transit connections can be made at the two main transit centers in the LAVTA system: the Livermore Transit Center and the Dublin/Pleasanton BART Station Transit Center. The Dublin/Pleasanton BART station is served on weekdays by nine of LAVTA's fixed routes and DART for Dublin and Pleasanton.

The LAVTA Vision 2010 report outlines several potential service changes for the mid- and long-term. Potential service improvements for the mid-term (2001 to 2005) include express service from South Livermore to BART via Jack London, and additional fixed bus routes in Pleasanton, Dublin, and Livermore. Long-term (2006 to 2010) projects include service from North Livermore, should development occur, to BART.

2. Altamont Commuter Express (ACE)

ACE provides passenger rail service from Stockton to San Jose via the Altamont Pass. Three morning and three evening trips provide connections to Livermore at two ACE stations, one located on Vasco Road near Brisa Street, the other is located Downtown on Railroad Avenue next to LAVTA's Livermore Transit Center. Shuttles at several of the ACE train stations provide connections to surrounding employment centers and other transit systems. Four shuttles provide connections to ACE train stations in Livermore and Pleasanton. Downtown is served by six of LAVTA's fixed routes.

3. Eastern Contra Costa Transit Authority (ECCTA) Tri Delta Transit

The ECCTA's Tri Delta Transit primarily serves the communities of Bay Point, Pittsburgh, Antioch, Oakley, and Brentwood. Twelve fixed routes provide local service, including connections to the BART system via the Pittsburgh/Bay Point BART station. Park-and-ride lots at Highway 4 and Hillcrest in Antioch, and at Walnut and Dainty in Brentwood serve regional commutes, including those to the LAVTA area.

Tri Delta Transit has one existing commuter route serving the Livermore area and one commuter route currently in the testing stage. The Delta Express provides service from East Contra Costa County to Lawrence Livermore National Labs and Sandia Lab. Two buses make two morning and two evening trips. Passengers are picked up in Antioch, Oakley, Brentwood, and Byron and connect non-stop to Livermore.

In response to requests for service to the ACE train stop and elsewhere in Livermore, Tri Delta Transit is testing a trial commute service. The current configuration connects passengers from East Contra Costa County to the ACE station and the Hacienda Business Park in Pleasanton. Depending on ridership and passenger comments, this service may become permanent or may be modified to serve other destinations.

4. San Joaquin Regional Transit District (SMART)

The San Joaquin Regional Transit District (SMART) provides public transit services in the Stockton Metropolitan Area, as well as intercity, interregional, and rural transit services Countywide. This includes connection to Sacramento, Dublin/Pleasanton BART Station Transit Center, and the Bay Area. Weekday subscription interregional commuter service serves passengers traveling to Livermore, Dublin, Pleasanton, San Ramon, Sunnyvale, San Jose, and Sacramento, including feeder service to BART for employees working in San Francisco and the East Bay.

The interregional specialized service is designed to meet the needs of commuters who travel distances greater than 50 miles one-way. Passengers subscribing to a SMART interregional commuter service meet the bus at park-and-ride lots throughout San Joaquin County. Lots are located in Stockton, Lodi, Manteca, Lathrop, Escalon, Ripon, and Tracy. Eight SMART interregional routes connect to Lawrence Livermore National Laboratory and the Sandia National Laboratory. Three connect to the Dublin/Pleasanton BART station.

5. The Bay Area Rapid Transit District (BART)

BART provides a system of grade-separated, electric, heavy rail trains operating as far east as Dublin/ Pleasanton. With the opening of the Dublin/Pleasanton station (located approximately eight miles west of Livermore), BART ceased operating its own shuttle connection service. The local transit provider (WHEELS) now operates connecting shuttle services to the BART station. BART operates trains to the Dublin/Pleasanton station on a regular BART schedule, with service seven days per week from 4:00 a.m. to midnight. As of 1999, BART provided 2,612 parking spaces at the Dublin/Pleasanton station and is applying for funding to construct a garage facility that would result in a net increase of 500 spaces. Eventually, BART service is anticipated to extend to Livermore, possibly providing service at a west Livermore and an east Livermore station. BART has acquired land south of 1-580 near the corner of Airway Boulevard and Kitty Hawk Road and has built an interim 200 space park-and-ride facility at this location. As of 2003, the City was working with BART to identify an appropriate BART station site in this vicinity, but nearer to the planned Isabel Avenue/I-580 interchange. In addition, BART has purchased land near the Greenville/1-580 interchange, where a potential East Livermore terminal yard/station that could serve as a multi-modal transit facility may be located.

Due to the growth of traffic volumes on I-580, a study has been undertaken to examine the feasibility of various transportation alternatives including the extension of BART to Livermore. The I-580 Corridor/ BART to Livermore Study (I-580 Corridor Study) was initiated to determine the most feasible and effective transit solutions for communities in the eastern Tri-Valley, identify both interim and long-term transit improvements to relieve congestion, and provide alternatives to driving alone. The I-580 Corridor/BART to Livermore Study was funded by the Governor's Traffic Congestion Relief Program to identify and evaluate transit alternatives to relieve congestion in the I-580 corridor in the Tri-Valley. The study will include an analysis of both short and long term transit solutions and is being co-managed by the Alameda County CMA and BART.

The study will analyze alternative transit alignments and modes in the I-580 corridor, and provide estimates of transit ridership and project capital and operating costs. In addition to traditional BART service, the analysis will consider alternative transit modes for the corridor, such as Express Bus and tBART (a diesel rail system similar to light rail except with diesel engines that provide power for electrical motors). The draft final report from the Policy Advisory Committee working on this project

recommended that an I-580 median alignment be studied. However, due to low transit ridership forecasts in the first-phase study, a second phase was undertaken to account for reverse commute trips into the Tri-Valley, and intra-Tri-Valley trips. The Phase 2 study compared a BART extension in the I-580 median to Greenville Road plus express bus service to Tracy and up the I-680 corridor to San Ramon and Walnut Creek against tBART (also referred to as diesel multiple units or DMU) in existing rail corridors. Preliminary results of this study were unveiled in May 2003, and showed increased ridership for each of the study options, particularly for the DMU concept. The Policy Advisory Committee will consider the results of the Phase 2 study in the Summer of 2003.

6. Park-and-Ride Lots

In addition to the BART parking located on Airway Boulevard as described above, a Caltrans park-and-ride lot is available at Portola Avenue at Alviso Place. The lot has approximately 100 spaces and is well-lit for early arriving and late departing commuters.

F. NON-MOTORIZED TRANSPORTATION (BIKEWAYS AND TRAILS)

The City of Livermore adopted the Bikeways and Trails Master Plan in December 2001. This plan updated the 1996 Bicycle/Pedestrian Plan Update and Equestrian Trails Study Policy Document and Background Report. A series of lanes, trails, and routes were recommended as a network to serve the entire City, from the Downtown area to the more rural fringes. Components of the Plan include pedestrian and bicycle facilities, and multiple-use trails with equestrian components. The goals and policies in the Plan include six main topics: 1) network connectivity and design, 2) planning and inter-agency coordination, 3) support facilities, 4) safety, education and promotion, 5) maintenance, and 6) implementation. A series of action steps are listed for each topic, along with general timeframes to guide implementation. The plan also discusses equestrian demand, equestrian centers and trails.

As of the 2001 Plan, there were 21.6 miles of mixed-use Class I trails in the City (Class I are completely separated right-of-way for exclusive use of bicycles and pedestrians), 45.9 miles of Class II bike lanes (striped lane of one-way bike travel on a street or highway), and no Class III facilities (shared use facilities indicated via signs). The proposed Plan calls for an additional 85.5 miles of Class I facilities, an additional 41 miles of Class II facilities, and 3.6 miles of Class III facilities.

G. AIR TRANSPORTATION

The Livermore Municipal Airport is the only municipal airport in the Livermore-Amador Valley. Airport improvements are undertaken in accordance with the City's 1975 Airport Master Plan. In 2003, the Airport Master Plan was in the process of being updated, and adoption is anticipated to occur later in the year.

Two major projects have been completed under the 1975 Airport Master Plan. In 1985, a 2,699-foot long secondary runway was constructed to ease congestion on the primary runway. Also in 1989, the primary runway was extended to a length of 5,255 feet. In addition, the City's General Plan, in response to the *Alameda County Airport Land Use Policy Plan*, reserves acreage for an airport runway approach protection zone. The protection approach zone is necessary for aviation operations safety. In July 2000, the City Council voted to continue disallowing commercial flights at the Airport.

H. REGIONAL TRANSPORTATION PLANNING AND PROGRAMMING

Transportation planning, policies, and goals for Livermore are affected by land use growth and related policies in the surrounding cities and counties. Transportation planning and programming is conducted by numerous regional, subregional and local agencies. The key agencies involved in transportation planning and programming that affect the City are described in the following section.

1. Metropolitan Transportation Commission (MTC)

The MTC is the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. Created by the State Legislature in 1970 (California Government Code § 66500 et seq.), MTC functions as both the regional transportation planning agency – a State designation – and for federal purposes, the region's metropolitan planning organization (MPO). As such, it is responsible for the Regional Transportation Plan, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle and pedestrian facilities. The MTC also screens requests from local agencies for State and federal grants for transportation projects to determine their compatibility with the Plan.

To foster consensus in the implementation of the Intermodal Surface Transportation Efficiency Act (ISTEA) and develop agreed-upon spending priorities, MTC created The Bay Area Partnership – a consortium of local, State, and federal agencies. With the cooperation of these partners, MTC administers federal funds including Surface Transportation Program, Congestion Mitigation, and Air Quality Improvement funds. MTC also administers State moneys, including those provided by the Transportation Development Act. Legislation passed in 1997 that gave MTC and other regional transportation planning agencies increased decision-making authority over the selection of projects and allocation of funds for the State Transportation Improvement Program (STIP).

The MTC has the duty to oversee the efficiency and effectiveness of the region's transportation system. MTC monitors transit operators' budgets, conducts performance audits and adopts a yearly productivity/transit coordination improvement program.

A 19-member panel gives MTC policy direction. Fourteen members are appointed directly by local elected officials. Two members represent regional agencies – the Association of Bay Area Governments and the Bay Conservation and Development Commission. In addition, three non-voting members have been appointed to represent federal and State transportation agencies and the federal housing department.

Some key projects in the 2001 Regional Transportation Plan (RTP) that affect Livermore include:

- Isabel Avenue/I-580 Interchange.
- LAVTA – transit operating and capital improvement program (federal, State, and local funds).
- Transit operations – LAVTA (Measure B sales tax funds).
- ACE station/track improvements, including parking improvements at Vasco Road and Downtown Livermore stations (State ITIP funds).
- Transit Use Incentives for LAVTA.
- BART to Livermore (partial funding).

2. Alameda County Congestion Management Agency

In 1990, Proposition 111 added $0.09 per gallon to the State fuel tax to fund local, regional, and State transportation projects and services. It also required urban counties to designate a congestion management agency, whose primary responsibility is to coordinate transportation planning, funding, and other activities in a congestion management program. The Alameda County CMA was created in 1991 by a joint-powers agreement between Alameda County and all its cities.

The CMA is Alameda County's transportation information and funding conduit (as contrasted with MTC's regional scope). The CMA coordinates planning and development that crosses jurisdictional lines. The CMA Board includes representatives from Alameda County, its cities, AC Transit, and BART. Technical expertise is provided by the staff-level Alameda County Technical Advisory Committee with representatives from each of the above organizations, plus LAVTA, Union City Transit, the Alameda County Transportation Authority (ACTA), MTC, Caltrans, the Port of Oakland, and the Bay Area Air Quality Management District (BAAQMD).

The CMA develops and periodically updates the Alameda Countywide Transportation Plan. This long-range policy document includes future population and employment patterns. It guides transportation funding and service decisions over the next 20 years, addressing freeways, buses, rail, ferries and other options like telecommuting, bicycling and pedestrian facilities. Transportation projects competing for State or federal funds must be consistent with this plan, as well as with the long-range plan of MTC. Projects competing for State funds must be included in the Congestion Management Program (CMP).

The CMP is a short-range document mandated by Proposition 111. It ensures that gas-tax funds produce the greatest benefit by coordinating planning, funding and other activities that affect the transportation system. The CMP sets level-of-service standards for roadways, analyzes the impact of land development on transportation, explores ways to manage travel demand and develops the seven-year capital improvement program.

Both the State and federal governments provide discretionary funding for capital projects. The CMA, in cooperation with MTC, determines how roads should be used in Alameda County. Since 1991, these funds have included $50 million for local street projects, as well as funds for rehabilitating BART vehicles and building the Port of Oakland's Joint Intermodal Terminal, carpool lanes on I-880 and I-80, and the BART Warm Springs Extension.

The CMA also distributes 40 percent of the money raised from a $4 air quality surcharge on vehicle registration fees. This "Transportation Fund for Clean Air" generates $1.6 million annually for Alameda County transportation projects that improve air quality.

3. Alameda County Transportation Improvement Authority (ACTIA)

The Alameda County Transportation Improvement Authority (ACTIA) is a special government agency authorized by State law and created by the voters of Alameda County to collect a half-cent sales tax and use the money for a specific list of transportation projects and programs in Alameda County. ACTIA is governed by an independent board composed of five members of the Alameda County Board of Supervisors, three representatives appointed by the Alameda County Mayors' Conference, and one representative designated by the Mayor of Oakland. ACTIA invites public participation and review of all its activities. The governing board has created the Citizens Advisory Committee in an extra effort to provide

information about ACTIA and an understanding of its role and its activities to the community, and to bring citizen input to the Authority.

The one-half cent sales tax was authorized by voters in 1986 under passage of the Measure B ballot initiative, and was reauthorized by voters. The tax will be in effect until 2022 and is expected to generate approximately $1 billion. In addition, ACTIA has used the local tax effort to leverage a number of State and local grants for ACTIA projects. Measure B projects in Livermore include: Isabel Avenue/I-580 Interchange, the I-580 Corridor/BART to Livermore Studies, Isabel Avenue widening to four lanes, various local street and road projects, and various bike and pedestrian improvement projects.

4. Tri-Valley Transportation Council (TVTC)

The Tri-Valley Transportation Council (TVTC) is the interagency council formed by a joint powers agreement by and among the County of Alameda, County of Contra Costa, Town of Danville, and Cities of Dublin, Livermore, Pleasanton, and San Ramon on March 1, 1991. The seven Tri-Valley jurisdictions have adopted the joint exercise of powers agreement pertaining to Tri-Valley transportation development fees for traffic mitigation ("Tri-Valley JEPA") providing for collection of fees on certain development to be used to mitigate traffic congestion in the Tri-Valley area. The impact fees are discussed in additional detail within this document.

The cities and counties in the Tri-Valley area have identified, through the Tri-Valley Transportation Plan and Action Plan routes of regional significance, the impact of new development, and certain regional transportation improvement projects that will reduce these traffic impacts. The TVTC acts as the treasurer for the transportation development fees collected by member agencies used to reduce the traffic impacts of new development in the Tri-Valley area.

I. FUNDED AND PLANNED MAJOR TRANSPORTATION SYSTEM PROJECTS

There are several major transportation improvement projects in Livermore that are either fully funded or planned and partially funded. Those projects will provide important congestion relief. Major projects are described below.

1. Isabel Avenue/I-580 Interchange

The final connection to I-580 for the realigned SR 84 will be made at the new Isabel Avenue/I-580 interchange, located between Airway Boulevard and Portola Avenue. This partial-cloverleaf facility will also improve access to Las Positas Community College, Costco, and other developments north of I-580. As part of the project, the westbound-on and eastbound-off ramps at Portola Avenue will be removed, and Portola Avenue will cross I-580 on a new bridge and connect to extended Isabel Avenue.

2. Isabel Avenue Widening

As the future SR 84, Isabel Avenue is ultimately planned to be a six-lane facility from I-580 to Stanley Boulevard, and a four-lane facility from Stanley Boulevard to I-680 on Vallecitos Road. The 2002 Measure B expenditure program identifies $70 million for the SR 84 (Isabel) Expressway to widen Isabel Avenue to four lanes within Livermore plus safety improvements to Vallecitos Road south of Livermore. In 2002, the City was working with Caltrans and ACTIA to prioritize the scope and scheduling of this work. In addition, the City and the Tri-Valley Transportation Council are sponsoring the preparation of a

Caltrans Project Study Report, which will evaluate alternatives and identify phased components for the improvement of SR 84 to a four-lane expressway from I-580 to I-680.

3. I-580 Widening Project

The adopted Regional Transportation Plan (RTP) includes a Track 1 project to widen I-580 from west of Tassajara Road in Pleasanton to east of Vasco Road in Livermore (this is an initial segment). This widening would accommodate an added high occupancy vehicle (HOV) lane in each direction and would include ramp metering at all of the interchanges.

4. City Traffic Control Projects

Various traffic control projects were funded in the City's Capital Improvement Program for fiscal years 2002-2004. These included traffic signals, intersection modifications, emergency vehicle preemption equipment, signal interconnection, traffic calming, and trail and pedestrian crossings for streets included in the program. The Traffic Calming Program is funded at $200,000 in the first year of the budget and $100,000 in the second year of the budget. These projects are funded primarily from gas taxes, the General Fund, Measure B local funding, and the City's Traffic Impact Fee. Including traffic calming, the funding for fiscal year (FY) 2002-2003 was $2.22 million and for 2003-2004 was $1.35 million.

5. Transportation Infrastructure Projects

Transportation infrastructure projects identified in the FY 2002-2003 and 2003-2004 Capital Improvement Program included a variety of projects to address safety, capacity, access and mobility needs for various modes of travel. Capacity projects ranged from street widening to providing additional lanes to construction of new roadway segments, to expansion and construction of new freeway interchanges. Planning, design or feasibility studies, separate vehicular, pedestrian and bicycle traffic flows, and landscaping to enhance streetscapes will be provided, as appropriate, for projects.

Priority projects included the Isabel Avenue/I-580 interchange, the Portola Avenue Reconstruction Project, the Vasco/I-580 Interchange Modification Project, the Greenville Railroad Undercrossing Project, and the Las Positas Road Connection Project. The total budgeted amount for Transportation Infrastructure Projects for FY 2002-2003 was $39.47 million, and $43.69 million for FY 2003-2004.

J. LOCAL AND REGIONAL TRANSPORTATION FINANCING

The General Fund contributes funding to various transportation projects in the City, as do traffic impact fees, and other local revenue sources. In addition to funds raised locally, there are a number of federal and State funding sources available to the City, Alameda County, and regional agencies for transportation system improvements. This funding is generally available for highway construction, improvements and maintenance, local street and road improvements and maintenance, transit capital projects and operating subsidies, carpool and bicycle projects, bridge replacement and rehabilitation, paratransit, congestion pricing and operational improvements using new technologies. Funds for freeway, local street and transit capital projects have generally been easier to obtain than funds for transit operation subsidies or other uses described above. The funding sources available for both ongoing and new projects and programs include:

- State gas tax subventions to the City.
- Transportation Development Act (TDA)/State Transit Assistance (STA) revenues.

- Measure B half-cent sales tax Program.
- State Transportation Improvement Program (STIP) Funds, potentially including such sources as the Transportation System Management Program (TSM), the Inter-regional Road System Program (IRR), Soundwall Retrofit Funds, the Flexible Congestion Relief Program (FCR).
- AB 1107 half-cent sales tax revenues for transit (BART).
- Federal Transportation Efficiency Act for the 21st Century (TEA-21).
- Vehicle registration fees for clean air programs.
- State Environmental Enhancements and Mitigation Program (EEM).
- State Transportation Development Act (TDA) Article 3 – Bicycle and Pedestrian.
- State Traffic Congestion Relief Program (TCRP) for specifically identified projects.
- State PUC Grade Separation Fund.
- Highway Bridge Rehabilitation and Replacement (HBRR) Program.
- Transportation Enhancement Activities.

1. City of Livermore Traffic Impact Fee

The Citywide traffic impact fee is the funding method used by Livermore and many other jurisdictions to secure a "fair-share" funding contribution from development to improve the transportation system. This means that new development is required to pay for the roadway improvements needed to accommodate the traffic generated by that growth. As a result of increasing regional growth, significant residential, commercial, and industrial development is expected to occur within the City. This anticipated development, including development currently approved or submitted for approval, cumulatively will generate a substantial increase over existing levels of traffic within the City. This increase in traffic will result in traffic volumes which exceed the capacity of the existing Citywide circulation system to provide acceptable levels of service. In 1988, the City Council adopted a traffic impact fee as a fair and equitable method of securing some of the revenues necessary to fund the construction and implementation of improvements to the Citywide circulation system sufficient to accommodate the traffic volumes generated by new development and preserve acceptable levels of service throughout the City. The traffic impact fees can only be spent on projects in the traffic impact fee program via the City's Capital Improvement Program.

The fee is based upon total peak hour trips expected to be generated by new development. It applies to all new development unless specifically exempted. The TIF program has raised approximately $6 million a year for the past few years. Overall, it is targeted to fund approximately $240 million worth of projects. Important roadway projects in Livermore that have been or are being funded fully or partially by TIF include: the Isabel Avenue/I-580 interchange project; the Isabel extension project; the Vasco Road/I-580 interchange project; widening of Portola Avenue between North Livermore Avenue and Murrieta Boulevard; the Mines Road overpass; widening of First Street near I-580; and the installation of traffic signals.

2. Tri-Valley Transportation Development Fee for Traffic Mitigation

The Tri-Valley area is forecasted to receive 157,000 new residents and 121,000 new jobs by the year 2020. The impact from these new residential units, commercial uses, and other uses, as well as additional

development beyond the year 2020, will be increased congestion on all major routes in the area. The seven Tri-Valley jurisdictions have adopted the joint exercise of powers agreement pertaining to Tri-Valley transportation development fees (TVTDF) for traffic mitigation. This agreement provides for collection of fees on certain development to be used to mitigate traffic congestion in the Tri-Valley Area. The current TVTDF was expected to raise approximately $70 million during the 15-year period between 1998 and 2013. This funding source is expected to fund approximately 15 percent of the cost of 11 specific projects identified by the Tri-Valley Transportation Council. The TVTDF fees are assessed by each member agency. The priorities for spending the revenue are identified in the TVTC's Strategic Expenditure Plan which is currently undergoing revision.

3. Measure B

Another funding source for Livermore transportation projects is Measure B, the one-half cent sales tax in Alameda County. The original 1986 Measure B program funded a portion of the Isabel Avenue extension from Vallecitos Road to I-580. The new Measure B program, passed by voters in 2000, includes funding for widening Isabel to four lanes between I-580 and Vallecitos Road, some improvements to the Pigeon Pass stretch of SR 84, partial funding of the Isabel Avenue/I-580 interchange, a study of a future BART extension to Livermore, and annual funding for local street improvements and maintenance.

6. INFRASTRUCTURE AND UTILITIES

This section describes Livermore's infrastructure in 2002, including the water supply and distribution system; wastewater collection, treatment, and disposal system; the stormwater collection system; and utilities, namely solid waste, energy, and telecommunications.

A. WATER SUPPLY AND DISTRIBUTION

The following describes the agencies that supply water to the City of Livermore, as well as the distribution infrastructure.

1. City of Livermore Water Supply Sources

Potable water and raw water for agricultural irrigation is provided to the City of Livermore from a variety of sources. Zone 7 Water Agency (Zone 7) is the water wholesaler. California Water Service Company (Cal Water) and the City of Livermore's Water Resources Division provide retail service, and the City and County of San Francisco's Hetch Hetchy supply system provides water directly to Lawrence Livermore National Laboratory and Sandia National Laboratory. Cal Water supplies the Downtown area and southern portion of the City, while the City of Livermore's Water Resources Division serves the northwest, northeast, and east portions of the City. These water sources are briefly described below.

a. Zone 7 Water Agency. Zone 7 of the Alameda County Flood Control and Water Conservation District supplies treated water to retail water agencies, such as the City of Livermore, Pleasanton, Cal Water and the Dublin San Ramon Services District, for municipal and industrial use. Zone 7 also supplies untreated, or non-potable water, to non-municipal users such as agricultural operators. Zone 7 serves a population of about 180,000 in a service area comprising approximately 425 square miles in eastern Alameda County.

Figure 6-1 shows the Zone 7 region and water supply. Currently, approximately 70 percent of the water supplied to Zone 7 comes from the State Water Project, a Statewide system of reservoirs, canals, pipelines, and pump stations that transport surface water drawn from rivers, lakes, and reservoirs, such as the Del Valle Reservoir. In the Livermore area, this system is comprised primarily of the South Bay Aqueduct, which began deliveries in 1962. This aqueduct also conveys water to the Alameda County Water District and the Santa Clara Valley Water District. The balance of the Zone 7 service area supply is from local runoff conserved in Lake Del Valle, local groundwater, and supplemental surface water sources, such as the Byron Bethany Irrigation District (BBID). In 2001, Zone 7 received 30,400 acre-feet[1] of State Water Project water, 8,100 acre-feet of locally conserved surface water, and 4,000 acre-feet of BBID water. In addition, Zone 7 pumped 9,700 acre-feet of local groundwater.

[1] One acre-foot is approximately 326,000 gallons, or the amount of water needed to supply the average indoor/outdoor needs of two single-family homes for a year.

In the Zone 7 Water Supply Forecast Summary (April 2002), Zone 7 had identified a long-term average sustainable water supply[2] of 84,100 acre-feet/year. Demand for the entire Livermore Amador Valley was 59,000 acre-feet in 2001, and is estimated to grow to 69,000 acre-feet/year by 2006, and 81,000 acre-feet/year by 2020. The 2020 demand estimate is comprised of the water demands anticipated to serve the amount of growth projected in the current general plans for each of the local jurisdictions within Zone 7's service area. In Livermore, this long-term water demand is estimated to be approximately 25,000 acre-feet, based on the City's current General Plan, which includes assumptions for new urban development in North Livermore and the Vasco Laughlin area. Table 6-1 shows Zone 7's estimated supplies and demands for 2002.

Table 6-1: Livermore-Amador Valley Water Supplies and Demand, 2002

Sustainable Water Supplies	Acre-Feet/ Year
SWP	58,900
Lake Del Valle	9,300
Byron Bethany Irrigation District	2,000
Safe Yield for Groundwater Basin	13,400
Recycled water	500
Total	**84,100**
Water Demand	
Zone 7 Untreated	7,500
Zone 7 Treated Surface Water	31,000
Zone 7 Groundwater Pumping	9,000
Purveyor Groundwater Pumping	7,200
Mining Groundwater Use	3,200
Other M&I and Domestic Groundwater	1,200
Agriculture Groundwater	1,200
Recycled Water – Irrigation	500
Total	**60,800**

Source: Zone 7 Water Supply Forecast Summary, April 1, 2002.

In 1999 and 2000, Zone 7 purchased an additional 32,000 acre-feet per year of State Water Project entitlement water to increase its total State Water Project entitlements to 78,000 acre-feet. This additional supply was the amount needed to meet the projected long-term water demands of the Valley. In addition, Zone 7 has acquired a total of 65,000 acre-feet of storage capacity in the Semitropic Water Storage District (Semitropic) in Kern County for storage of surplus water for later use. During dry years, Zone 7 can receive water from Semitropic by way of entitlement exchanges with Southern California State Water Project contractors, such as the Metropolitan Water District of Southern California.

If an extended drought were to force cutbacks in State Water Project deliveries, Zone 7 would utilize its local and Semitropic groundwater resources to meet its reliability policy of providing for 100 percent of its expected treated water demands under all hydrologic conditions. The local groundwater basin holds approximately 200,000 acre-feet, and Semitropic holds about 50,000 acre-feet. The Livermore Amador Valley groundwater basin is considered full at about 240,000 acre-feet, and Zone 7 estimates that about half of this amount could be made available during times of drought through well-pumping.

Zone 7 operates two water treatment plants, the Del Valle and Patterson Pass Water Treatment Plants (WTP), which treat water from the State Water Project before distribution throughout the Valley. The Del Valle WTP, located in the southern portion of Livermore, has a capacity of 36 million gallons per day (MGD). The Patterson Pass Water Treatment Plant, located in the eastern portion of Livermore, has a capacity of 12 MGD. In addition, in 2002 Zone 7 was working on an ultra-filtration project to

[2] Long-term average sustainable water supply is the average expected yield of a given water supply source over a long period of time.

LSA

FIGURE 6-1

Livermore General Plan Update
Master Environmental Assessment
Zone 7 - Regional Water Map

SOURCE: ZONE 7 WATER AGENCY

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_6-1.AI (04/22/03)

increase the capacity of the Patterson Pass WTP to 20 MGD. Zone 7 also has roughly 32 MGD of groundwater production capacity from seven municipal wells located in Pleasanton.

Zone 7 is planning a third water treatment facility to address the increasing local water demand. The proposed Altamont Water Treatment Plant is expected to be constructed within the next six to ten years and is projected to provide an initial capacity of 12 to 24 MGD and up to 42 MGD, ultimately. Zone 7 recently completed its Treated Water Master Plan (February 2000) and its Water Conveyance Study (June 2001), which recommends projects to meet Zone 7's long-term raw water conveyance and treated water transmission needs. These projects include a South Bay Aqueduct Enlargement Project (additional 130 cubic feet per second increase in capacity for Zone 7), a treated water pipeline north of Livermore to link the new Altamont Water Treatment Plant with the existing Zone 7 water transmission system, and up to ten new production wells. These projects are currently programmed into Zone 7's Capital Improvement Program.

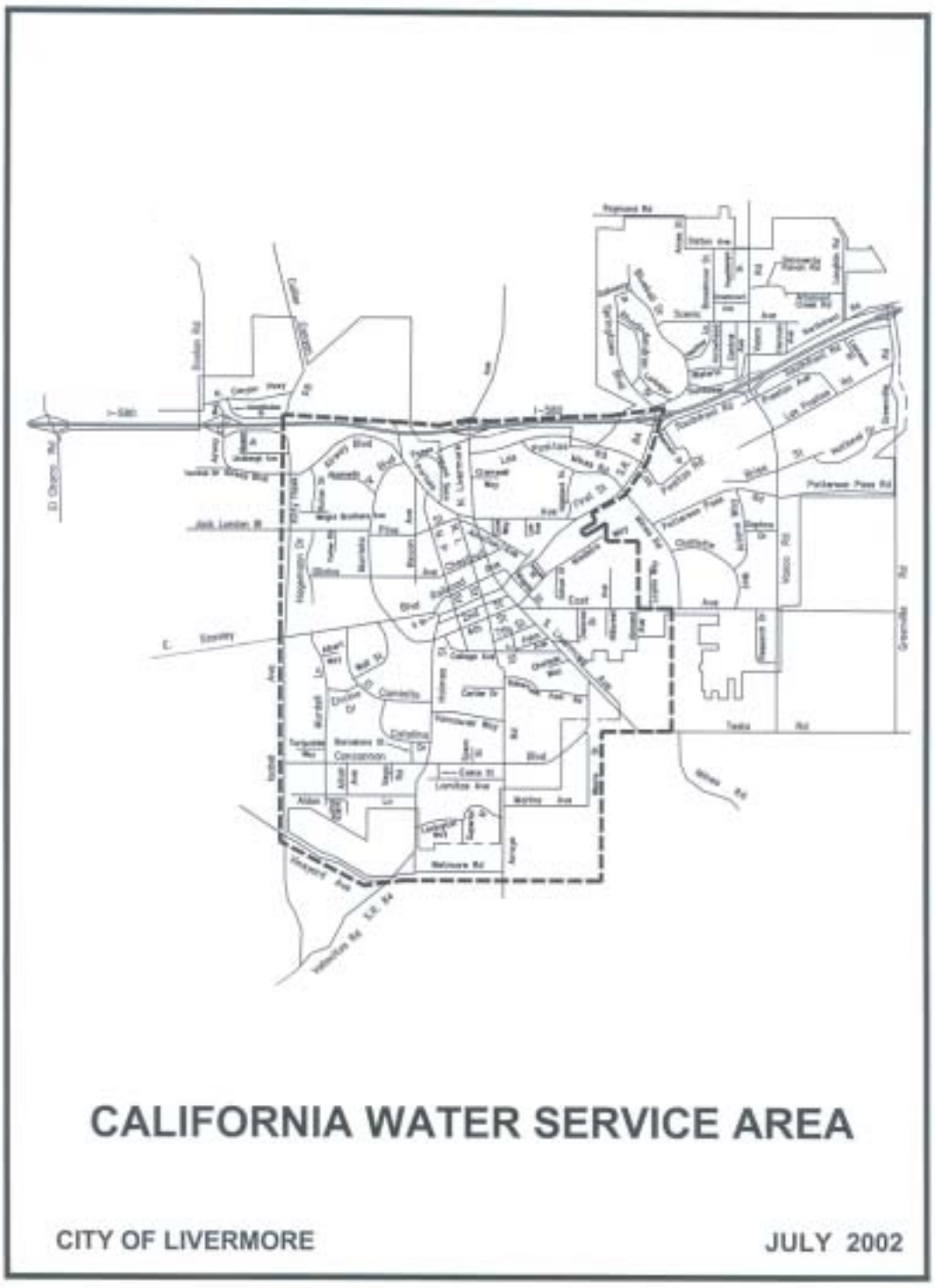
Once the water is treated at the Water Treatment Plants, it is then conveyed via transmission mains (typically 24 to 48 inches in diameter) to the City of Livermore and other retailer turnouts.

Zone 7 also supplies untreated water to agricultural users and golf courses in Livermore. In 2002, the demand for these uses was expected to be approximately 7,500 acre-feet per year. The City of Livermore anticipates the potential for a large increase in agricultural production in the South Livermore Valley over the next 20 years. Zone 7's Water Conveyance Study, completed in June 2001, evaluated various demand alternatives for untreated water within the Livermore Amador Valley up to a maximum of 27,000 acre-feet per year by the year 2020. Zone 7 meets untreated water demand through deliveries from the South Bay Aqueduct, which is part of the State Water Project, and, as mentioned above, is currently planning up to a 130 cubic feet per second (cfs) enlargement of the South Bay Aqueduct to meet its anticipated future raw water conveyance needs for both future treated and untreated water demands.

b. California Water Service Company. Cal Water's Livermore District was established in 1927. Cal Water provides water to an area that generally includes the older Downtown and central and southern portions of the City. Its service area is generally south of I-580, east of Kitty Hawk Road (Isabel Avenue) and west of First Street to Trevarno Road, Barber Street to Colgate Way, Jackson Avenue to East Avenue, North Mines to Tesla Road and Wente Road (see Figure 6-2).

Cal Water's distribution system includes over 200 miles of transmission and distribution mains sized-up to 16 inches in diameter. Supply sources include 13 wells and eight Zone 7 turnouts. Twenty-five water tanks, totaling 12,090 million gallons, provide peak demand and fire flow storage. This system is divided into five pressure zones.

In 2001, average water supply to the Cal Water service area was 12 MGD. Approximately 80 percent of the water supplied by Cal Water to the Downtown came from the Zone 7 Water District, while the remaining 20 percent comes from wells that Cal Water owned and operated. Fire flow availability and system design are based on consumer demand, as well as the Livermore Pleasanton Fire Department's requirements. Any future changes in uses allowed or intensity of development in Downtown will more than likely require upgrades to portions of the water system in order to meet Fire Department requirements.



LSA

FIGURE 6-2

Livermore General Plan Update
Master Environmental Assessment
California Water Service Area
City of Livermore

N

NOT TO SCALE

SOURCE: CALIFORNIA WATER SERVICE COMPANY, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_6-2.AI (04/22/03)

Cal Water maintains and upgrades its distribution system by replacing water mains and facilities on a regular basis. As of 2002, Cal Water representatives considered their system to be in very good condition which is accomplished by maintaining routine inspections to identify leaks, and subsequently repairing leaks quickly so that water supply to customers is uninterrupted.[3]

c. City and County of San Francisco Hetch Hetchy Supply System. The Lawrence Livermore National Laboratory and Sandia Laboratory are served directly from the City and County of San Francisco's Hetch Hetchy supply system. It is anticipated that the Lawrence Livermore National Laboratory and the Sandia Laboratory will continue to be served directly from the Hetch Hetchy supply system.

2. City of Livermore Water Distribution System

The City of Livermore is the water retailer in the northwest, northeast, and east portions of the City. Improvement projects for the distribution system are funded by the Water Enterprise Fund and the Water Connection fee charged on new development. Maintenance of the water lines in some cases is funded from the General Fund. Other sources of funding include the Water Enterprise Fund and the Water Connection Fee.

a. Pressure Zones. The City receives its water from Zone 7 through seven permanent turn-outs. The turn-outs are located off Zone 7's Cross Valley Pipeline, which traverses the City from east to west. The City of Livermore's existing water distribution system is divided into three pressure zones (as shown on Figure 6-3), which are described below. The City's planned improvement projects for each zone are also discussed below.

(1) Zone 1. Zone 1 (West Side) consists of the primarily industrial area on the west side of the City and is generally located east of Kitty Hawk Road on the south side of I-580 and west of the eastern boundary of Las Positas College on the north side of I-580. Water is supplied to this zone from Zone 7's Cross Valley Pipeline at Turnout No. 5 on Kitty Hawk Road, south of I-580, and turnout No. 9 which is located on Airway Boulevard near the intersection with Kitty Hawk. There was no existing reservoir or pump station serving Zone 1 in 2002. However, a new 3 million gallon (MG) reservoir and pump station to service the Zone 1 area is included in the Capital Improvement Plan and programmed over three fiscal years, beginning in FY 2002-2003.

(2) Zone 2. Zone 2 (Dalton) consists of the primarily residential Springtown development north of I-580, as well as a strip of commercial/industrial development along the south side of I-580 in the vicinity of Vasco Road. Water is supplied to Zone 2 from Zone 7's Cross Valley Pipeline at Turnouts No. 1, 6, and 8. Zone 2 is served by the Dalton Reservoir (2.0 MG) and the Dalton Pump Station (also called the Trevarno Pump Station) located in the vicinity of Mines Road and the Union Pacific Railroad tracks, and the Springtown Pump Station, located near Turnout No. 6.

(3) Zone 3. Zone 3 comprises the eastern portion of the City and consists of mixed development located both north and south of I-580 and east of the Cal Water service boundary to the south and Vasco Road to the north. Water is supplied primarily from Zone 7's Turnout No. 7 at the Patterson Pass Water Treatment Plant, south of I-580, and from Turnout No. 6 at Vasco Road, north

[3] Personal communication with Henry Wind and John Freeman, Jr., California Water Service Company.

of I-580. Zone 3 is served by the Altamont Reservoir (3.0 MG) and Altamont Pump Station, which are located near the Patterson Pass WTP, and by the Springtown Pump Station, located near Turnout No. 6.

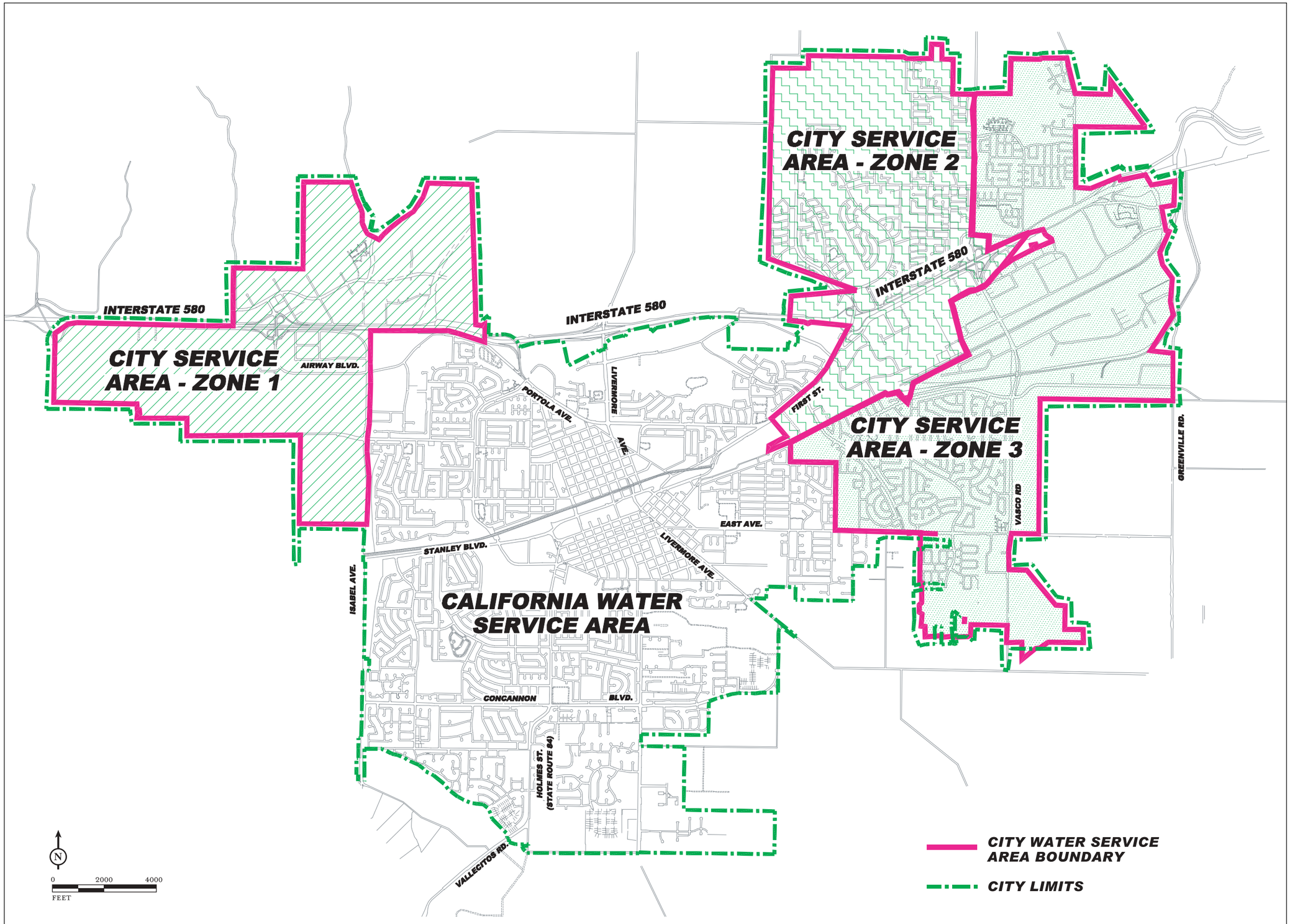
The City of Livermore's Capital Improvement Program for fiscal years 2002-2004 includes: 1) a project to construct a new five million gallon (MG) potable water reservoir next to the existing three MG Altamont Reservoir; 2) expanding the Altamont Pump Station; 3) installing an emergency generator at the Altamont Pump Station; and, 4) installing various required transmission mains. These projects are expected to greatly enhance system reliability in the Pressure Zone 3 water system.

b. Distribution Pipelines. The City's existing transmission and distribution pipelines include 113 miles of pipeline, which vary in diameter from six to 22 inches. The water distribution system was evaluated in the 1995 Water Master Plan. The existing distribution system was found to be adequate for existing demands. However, this report identified only two lines, both located in the vicinity of I-580 and Vasco Road, that needed replacing with larger size pipes to meet both existing and buildout water supply demands. The City has completed replacement of one of these lines, the water transmission main along Vasco Road from Northfront Road to I-580. The second line, the Southfront Road and Central/I-580 Water Transmission Main Crossing, is included in the City's Capital Improvement Plan for fiscal years 2003-2005.

c. Water Recycling Facilities. Water recycling has been practiced at the Livermore Water Reclamation Plant for approximately 28 years. Effluent filters and chlorination tanks used to provide disinfected reclaimed water were constructed in 1975 during a major plant expansion and upgrading. An effluent pumping station was installed. Additionally, the Doolan Canyon Reservoir, a 1.85 MG steel storage tank, was constructed above the treatment plant. The purpose of the reservoir is to balance daily production of recycled water with its use (primarily at night). A portion of the tank volume, approximately 600,000 gallons (30 percent), must be reserved for fire protection for customers connected to the system specifically for fire protection.

In the past, the Las Positas Golf Course was the principal initial user of recycled water from the Livermore plant. More customers have been connected to the system and more users will be added in the next few years.

The difficulty in using recycled water is the difference between the timing of the wastewater flow and irrigation demand in Livermore. In order for Livermore to increase the use of recycled water, the City would need to expand its long-term (seasonal) and short-term (daily) storage capacity and integrate it into its overall water recycling system. Seasonal storage is required only when there is no other alternative disposal option available during the winter months. Short-term (daily storage) is required because most recycled water is used during the night for irrigation, while reclaimed production occurs substantially during the day current with larger server demands.



SOURCE: CITY OF LIVERMORE, 2003.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_6-3.AI (05/21/03)

FIGURE 6-3

Livermore General Plan Update
Master Environmental Assessment
Water Service Areas

B. WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

The following discussion provides information on the wastewater collection, treatment, and disposal system in Livermore.

1. Wastewater Collection

Within the City, sewer service is provided by the City's Public Service Department. There are over 250 miles of existing sewer lines within the City of Livermore, of which approximately 50 miles are major trunk sewer lines (18 inches or larger). The northern part of the City is served by a sewer trunk, which begins north of I-580 and runs west towards the treatment plant. It crosses I-580 between Livermore Avenue and First Street and serves the Springtown area. The central part of the City is served by a network of trunk sewers that pass through Downtown and branch at the intersections of First Street and East Avenue. A third network of sewer trunk lines serves the area south of Arroyo Mocho.

With the exception of two pump stations, all of the wastewater flow in Livermore is conveyed to the wastewater treatment plant by gravity. The Airport Pump Station has a capacity of 0.72 MGD and conveys flows from the Airport and golf course to the treatment plant via an eight-inch-diameter force main. The City has included a capital project, expected to be completed in late-2003, that will expand the capacity of this pump station to 1.65 MGD. The Jack London Lift Station (located on the north end of the treatment plant) has a capacity of 1.0 MGD. This pump station lifts flow from the trunk sewer serving Collier Canyon through a short reach of 12-inch diameter force main to the treatment plant.

As of 2002, approximately eight miles of sewer lines were estimated to need slip lining rehabilitation or replacement. Several major maintenance and repair projects were included in the City's current Capital Improvement Program FY 2002-2004, which totaled nearly $13 million, including the North Trunkline Protection Project and the East Jack London Trunkline Project. Upon completion of these projects, the system will be in generally good condition. Primary funding sources for wastewater collection and treatment systems are operating revenues from the Sewer Enterprise Fund and the City's sanitary sewer connection fees paid by new development.

2. Wastewater Treatment

The Water Resources Division of the City's Public Services Department operates the City's Water Reclamation Plant. It was originally constructed in 1958 with a capacity of 2.5 MGD average dry weather flow. Four major plant expansions and/or modifications have occurred since 1958 to match influent flow increases and changing discharge regulations. The 1991 Phase V project, the last major expansion, increased the rated plant capacity to 8.5 MGD on an average dry weather flow.[4]

In 2000, the average daily inflow to the treatment plant was 6.5 MGD, while the average daily inflow in 2001 was 6.23 MGD. These are annual flows averaged over a daily basis, and therefore, fluctuate from year-to-year. There are no apparent episodes or events to properly identify the fluctuation for these past two years. Development already approved by the City as of 2002, was estimated to generate an additional sewage flow of approximately 0.6 MGD.

[4] The average dry weather flow (ADWF) is the flow contributed during the dry weather season (typically defined as the month of August).

The Livermore Water Reclamation Plant Master Plan identifies treatment and effluent disposal needs to treat an ultimate average dry weather influent flow of 11.1 MGD. This ultimate flow (or Phase VI flows), also represents the flows agreed upon by the Livermore and Amador Valley Management Agency (LAVWMA). However, additional facilities at the plant would be needed to handle ultimate flows. The majority of the recommended facilities are needed to process additional solids. The estimated total project cost for these facilities is approximately $14.7 million.

The Water Reclamation Plant has a 0.75 MGD reverse osmosis system to reduce the total dissolved solids (TDS) content of a portion of the plant effluent. An upstream micro filtration system minimizes the pollutant loading to the reverse osmosis unit, reducing operation and maintenance requirements. Demineralized water can be sent to the reclaimed water system along with filtered secondary effluent. Brine is conveyed to LAVWMA for disposal via the Livermore Export interceptor.

The reverse osmosis system produces high quality recycled water and was originally planned to be used to recharge the groundwater basin. However, the cost to produce this high-quality recycled water is very expensive. In addition, the City has been unable to obtain the necessary permits in order to use this recycled water to recharge the groundwater. Therefore, as of mid-2003, the reverse osmosis system was not currently in operation.

If it were economically feasible to produce recycled water, options for disposal could include irrigation for commercial, municipal, or educational landscaped property. However, a new distribution system, including seasonal storage facilities, would be required prior for distribution of this water.

According to the City's Water Reclamation Plant Master Plan, the overall condition of the existing major mechanical and structural equipment at the plant is good, with the exception of some structural repairs. The recommended repairs were included in the City's Capital Improvement Program for fiscal year 2002-2003. Operating revenues from the Sewer Enterprise Fund are used to fund maintenance and repair projects at the Water Reclamation Plant.

3. Wastewater Disposal

Wastewater treated at the Livermore Water Reclamation Plant is conveyed to the LAVWMA export pipeline via a gravity-flow pipeline (known as the Livermore interceptor) that conveys the effluent to a LAVWMA metering structure. The rated capacity of the Livermore gravity interceptor is 9.2 MGD for both dry weather and wet weather flows. At the metering structure, effluent from the Livermore Water Reclamation Plant combines with wastewater treatment plant effluent from the Dublin San Ramon Service District and the City of Pleasanton. The combined effluent then flows through two flow equalization basins, receives additional chlorination, and is pumped through the LAVWMA export pipeline to the East Bay Dischargers Authority, which is responsible for dechlorination and final flow discharge into the Bay.

The peak wet weather flow capacity of the existing LAVWMA export pipeline is 21 MGD. The City shares this overall capacity with Dublin San Ramon Service District and the City of Pleasanton. Livermore's portion of the existing LAVWMA pipeline capacity in 2002 was 8.5 MGD for average dry weather flows and 8.73 MGD during peak wet weather flow conditions.

a. Peaking Factor. The peak-to-average sanitary sewer wastewater flows can fluctuate for a number of reasons. On a daily basis, wastewater flows typically reach minimum values at night, and peak in the morning and evening as people prepare for and return home from work. Wastewater flows also typically increase on the weekends when most people are home. The City of Livermore Sewer Master Plan estimates a peak-to-average peaking factor of 2.0. This factor represents a conservative assumption for infrastructure planning purposes.

The projected peak wet weather flows are arrived at by multiplying the average daily flows by the peaking factor of 2.0, resulting in the peak flow. Added to this is the estimated wet weather inflow and infiltration, producing a peak wet weather flow. Rainwater inflow enters the system during rainfall events and groundwater infiltration enters the system through pipe joints, separations, and sewer structures.[5]

b. LAVWMA Export Pipeline Facilities Improvement Project. LAVWMA has initiated a project to increase its wastewater disposal capacity by expanding wastewater export facilities. This project began construction in May 2001 and is expected to be completed in 2004. This project was taken to the voters of the cities of Pleasanton and Livermore in November of 1998. Neither Pleasanton nor Livermore has any responsibility to participate in the expansion portion of the project unless their respective voters approve their participation, although both cities will participate in the rehabilitation of the existing pipeline. The City of Pleasanton did vote to participate in the project, but the advisory ballot measure in Livermore (Measure Q) failed, therefore Livermore will not participate in the project.

Completion of the project will expand LAVWMA's average dry weather flow disposal capacity from 21 MGD to 41.2 MGD through a combination of replacement pipelines, parallel pipelines, rehabilitation of the existing export pipeline, and construction of new pumping stations. Under the LAVWMA expansion project, the City's Water Reclamation Plant discharge capacity to the LAVWMA pipeline would be increased to 11.1 MGD average dry weather flow, and its share of capacity in the export pipeline would be increased to 12.4 MGD during peak wet weather conditions.

Under the terms of the LAVWMA Joint Powers Agreement, the Water Reclamation Plant will be authorized to increase its influent limitations to 11.1 MGD. However, the City will not increase its existing share of the export pipeline capacity beyond the 2003 limits of 8.5 MGD under average dry weather flow and 8.73 MGD under wet weather flow conditions, which only meet Phase V flows. Since the plant has minimal short-term storage and no long-term storage facilities, average daily inflows cannot exceed the limit of the effluent pipeline capacity of 8.5 MGD. Livermore's Water Reclamation Plant Master Plan indicates there will be a shortfall of approximately 2.6 MGD average dry weather flow between existing capacity and ultimate (Phase VI) flows.

The LAVWMA Joint Powers Agreement limits the City to a maximum LAVWMA allocation of 11.1 MGD, but this capacity can only be reached if the discharge line is upgraded. One option to increase effluent disposal capacity is to reconsider participation in the LAVWMA expansion project. This

[5] Sources included: City of Livermore Sewer Master Plan, Camp Dresser & McKee, March 1995; Technical Memorandums Nos. 6 and 8, West Yost and Associates, July 2, 1998, and October 16, 1998, respectively.

option, which is available through 2005, would increase Livermore's capacity to a peak wet weather flow of 12.4 MGD.

The unit cost for the City of Livermore to buy the additional LAVWMA effluent disposal capacity is estimated to cost approximately $700/acre-foot, with capital costs amortized over 20 years. However, a public vote would be necessary prior to the 2005 deadline to modify this decision and increase the City's discharge allocation beyond 8.5 MGD. After 2005, Livermore's capacity increase allocation will be distributed between the Dublin San Ramon Services District and the City of Pleasanton.

c. Water Reclamation or Recycling. Water reclamation or recycling is a potential alternative means for providing additional effluent disposal capacity at the Livermore Water Reclamation Plant. Water recycling has been used as an alternative water source for landscape irrigation and other uses in the vicinity of the Livermore Water Reclamation Plant since 1974. The City maintains approximately 10 miles of reclaimed water pipelines. Water recycling could be used as an alternative to participation in the LAVWMA expansion project. However, significant modifications to the system would be needed to provide reliable year-round additional disposal capacity. Additional demands would need to be developed to increase recycled water use, such as at golf courses, parks, and commercial landscaping. Recycled water use must be increased nearly four times, to an annual use of approximately 2,900 acre-feet, to provide sufficient disposal capacity. Also, additional storage and pumping facilities must be provided to store and distribute recycled water over the year to match demand, as the majority of recycled water demands would occur during the irrigation season between May and October.

It was concluded in the Livermore Water Reclamation Plant Master Plan, that additional recycled water use sites would not provide enough effluent disposal capacity to make up the anticipated future 2.6 MGD disposal shortfall. In addition, a recycled water system expansion of 500 acre-feet/year would cost approximately $1,500 per acre-foot. This is more than twice as expensive as a buy-in to the LAVWMA expansion project. In addition, a significant number of regulatory permits would be required in order to construct a storage reservoir of this size. The amount of time necessary to obtain these permits is unknown, however it can be assumed by the number of regulatory agencies involved, that at a minimum, it would take several years.

C. STORMWATER SYSTEM

The following provides a discussion of Livermore's stormwater system, describing the creeks and arroyos, the storm drain collection system, and stormwater pollution control.

1. Creeks and Arroyos

The Livermore Valley drains in a westerly direction to the Arroyo de la Laguna, thence to Alameda Creek, near Sunol. The Alameda Creek basin drains an area primarily east of the Coast Range to San Francisco Bay through Niles Canyon. The Livermore Valley watershed has three major drainage watersheds, each drained by a major channel: Arroyo del Valle, Arroyo Mocho, and Arroyo Las Positas.

Arroyo del Valle flows through the southwestern-most corner of the City. Peak flows in Arroyo del Valle through the City are controlled by releases from Lake del Valle, located south of the City.

Arroyo Mocho flows through the southern portion of the City and drains much of Livermore's Downtown area. Arroyo Las Positas drains all of the North Livermore area (north of I-580), as well as a small area south of I-580. Major tributaries to Arroyo Las Positas include: Arroyo Seco south of I-580, Altamont Creek, Cayetano Creek, Collier Canyon Creek, and Cottonwood Creek north of I-580.

The Zone 7 Water Agency is responsible for flood control and or stream management of some portions of Arroyo Las Positas, relocated Arroyo Las Positas, Altamont Creek, a portion of Arroyo Mocho, Arroyo Seco, and Collier Canyon Creek, within the City of Livermore.

Special Drainage Area agreements provide for improvement of channels and arroyos to Zone 7 standards. Zone 7 assumes ownership of these facilities upon completion of improvements. Responsibility for maintaining unimproved arroyos to the centerline of the arroyo falls to the underlying property owner. The City of Livermore also owns and maintains some channels within the City boundaries.

The channels range from trapezoidal-shaped concrete channels to natural creeks. Zone 7 implements a Special Drainage Area (SDA) 7-1 Program, funded by developer fees which provide the revenue for improvements to the existing system. Zone 7 flood control maintenance activities include both routine maintenance and emergency repairs. Funding for flood control maintenance comes from local property taxes.

Areas where flood control improvements are still required are along three sections of Arroyo Las Positas and one section along Arroyo Mocho. The sections along Arroyo Las Positas include Altamont Creek to Heather Lane, Kitty Hawk Road to Airway Boulevard, and east of Airway Boulevard to El Charro Road. The section along Arroyo Mocho is between Concannon Boulevard (formally Wente Street) and Stanley Boulevard. Recommended management measures for these sections were identified in the Arroyo Mocho and Los Positas Management Plan completed for the City in December 2000 by Philip Williams & Associates. These measures are expected to address flooding concerns though stabilization measures and enhanced sediment transport and deposition. Implementation of the measures recommended for Arroyo Los Positas would alleviate recurring flooding at the Los Positas Golf Course. Although these projects are included in the City's 20-year Capital Improvement Plan, no funding sources have yet been identified.

The City has appropriated major capital expenditures in the Capital Improvement Plan over the fiscal years 2002-2004 to resolve flooding along Stanley Boulevard and Fourth Street, and to address bank erosion on Arroyo Mocho, adjacent to the Maintenance Service Center.

2. Storm Drain Collection System

The City's storm drain system consists of more than 200 miles of pipeline, ranging in size from 8 to 66 inches in diameter. The storm drain pipes are generally concrete, with some corrugated metal pipes. There are a few ditches or open channels within the existing developed areas, such as the Granada Channel, which flow through a residential development and drain to Arroyo Mocho. Most of the drainage reaches are relatively short due to the proximity of the many major channels. A few new detention basins constructed with the development of new subdivisions within Livermore were established to maintain runoff levels to predevelopment levels and protect habitat for sensitive species.

The City's 1995 Storm Drain Master Plan identified a large number of capacity-related deficiencies in the existing storm drainage system. However, many of the deficiencies were attributable to the adoption of more demanding design criteria since the time the storm drains were originally built. Most needed improvements were scattered throughout the older neighborhoods south of I-580, with just a handful north of I-580 in the Springtown area. The recommended improvements would provide protection against extreme and infrequent rainfall events. However, in most cases, the system handles typical rainfall events well. The later-stage projects were more evenly distributed throughout the City, with the single largest one consisting of a long system installed along the railroad from Vasco Road to Arroyo Seco.

The City's Capital Improvement Program includes the first-priority projects identified in the 1995 Storm Drain Master Plan. The major, four-phase project is located along Stanley Boulevard from Railroad Avenue to Arroyo Mocho, and Fourth Street, from South "M" Street to South "S" Street. Phases 1 and 2 are anticipated to be completed in early 2004, while Phases 3 and 4 are programmed in later years. New projects are primarily paid for through connection fees and by new development.

The City of Livermore also has an ongoing maintenance program, which includes catch basin cleaning, street/sidewalk sweeping, site inspection testing and monitoring, run-off control from new development, and public information**.** The maintenance program is funded by the General Fund. City staff report that, overall, the system is generally in good condition. The City is able to maintain this system in good condition by routinely cleaning catch basins and street gutters, keeping them free of debris, and subsequently allowing stormwater to flow unobstructed along the intended pathway.

3. Stormwater Pollution Control

The City protects the surface water from pollution by ensuring that stormwater discharges comply with San Francisco Bay Area Regional Water Quality Control Board (RWQCB) limits, establishing non-point source pollution control measures as required by federal and State law. Stormwater pollution control prevention measures, such as retention ponds, erosion, and sedimentation control, are incorporated in the planning, design, construction, and operation of all projects with the potential to create pollutants in stormwater runoff.

In the near future, the City will be required to abide by stricter requirements for stormwater runoff created by new and redevelopment projects than those required in 2002. New, more stringent requirements are reflected in the Alameda Countywide Clean Water Program (ACCWP) permit with the RWQCB. The City, as a member of the Alameda Countywide Clean Water Program, will share responsibility for implementing these requirements in Livermore.

The new requirements are imposed on commercial, industrial, and residential developments that create or replace one acre or more of impervious surfaces. Roadway projects and redevelopment projects, which create or replace one acre or more of impervious surface, may also be subject to these new requirements. The economic impact of these new requirements will be significant in areas where land is unavailable to provide on-site stormwater treatment.

D. SOLID WASTE COLLECTION AND DISPOSAL

A description of the City's solid waste collection and disposal system is provided below. A discussion of the public and private responsibilities for solid waste, as well as the regulatory context, is included.

1. Public and Private Responsibilities for Solid Waste

In Alameda County, responsibility for the collection and disposal of solid waste is held jointly by the Alameda County Waste Management Authority and local jurisdictions. The City has entered into a seven-year franchise agreement with Waste Management of Alameda County, with three one-year options to extend, for the exclusive right to collect, transport, or process and dispose of solid waste, recyclable materials, and compostable materials, effective August 1, 2002. Programs included in this agreement include the following:

- Waste Management provides all single-family residents with a refuse cart, a recycling cart, and a green waste cart.
- Waste Management provides weekly service for refuse, recycling, and green waste.
- Components of the recycling programs provided by Waste Management include:
    1. Three on-call clean up events for residents per year.
    2. Bulky items will be collected for an additional fee.
    3. Weekly curbside collection of used motor oil for residential customers.
    4. An electronic-waste collection event will be held annually for residents.
    5. Collection of abandoned waste and unmarked shopping carts in the public right-of-way.
    6. An annual community garage sale event.
    7. A six-month pilot food waste program for 500 residential customers and 60 commercial businesses will start November 2002.

Waste Management transports solid waste from Livermore to the Vasco Road Sanitary Landfill for disposal. The Vasco Road Sanitary Landfill is designated as a Class III disposal site that permits the disposal of municipal solid waste, with separate disposal areas required for asbestos and auto-shredder waste.[6] In 2002, Waste Management hauled approximately 81,000 tons of solid waste to the Vasco Landfill.[7]

2. Regulatory Context

A discussion of the regulatory context pertaining to solid waste is provided below.

a. California Integrated Waste Management Act (AB 939). In 1989, the California Legislature enacted the California Integrated Waste Management Act (AB 939), which requires the diversion of waste materials from landfills in order to preserve the decreasing capacity of landfills and natural resources. Cities and counties in California were required to divert 25 percent of solid waste by 1995, and 50 percent of solid waste by the year 2000. AB 939 further requires every city and county to

[6] Livermore, City of, with Lamphier & Associates and SWA Group, 2000. *North Livermore Specific Plan Draft Environmental Impact Report.* April.

[7] Jacque Delgadillo, City of Livermore Public Services Department: Vasco Landfill Solid Waste Data from Eric Hortin, Vasco Landfill Manager. April 2003.

prepare two documents demonstrating how the mandated rates of diversion will be achieved. The Source Reduction and Recycling Element describes the chief source of the jurisdiction's waste, the existing diversion programs, and current rates of waste diversion and new or expanded diversion programs. The Household Hazardous Waste Element describes each jurisdiction's responsibility in ensuring that household hazardous wastes are not mixed with non-hazardous solid wastes and subsequently deposited at a landfill. Livermore's Source Reduction and Recycling Element was approved in June 1998 and its Household Hazardous Waste Element was approved in August 1995 by the California Integrated Waste Management Board.[8]

Waste Management provided the services of Dr. Eugene Tseng to assist the City of Livermore with research and documentation for the City's Base Year Generation Modification Request and 2000 annual report. Dr. Tseng's work indicates that, based on approval of the new base year, Livermore's waste diversion rate for 2000 was 53 percent. A hearing with the California Integrated Waste Management Board to approve the new base year 2000 diversion rate, and thereby approving the 53 percent diversion, is expected in late 2003.

b. Alameda County Waste Reduction and Recycling Initiative. In 1989, Alameda County voters approved the Alameda County Waste Reduction and Recycling Initiative (Measure D) with the goal of diverting 75 percent of solid waste from landfills. Measure D applies a surcharge at Alameda County landfills, of which 50 percent is earmarked and disbursed to jurisdictions for source reduction and recycling programs. The Measure D fee is usually increased annually. The Alameda County Measure D fee effective January 1, 2002 was $6.59/ton.

c. City of Livermore Programs. The City implements the following programs to ensure waste diversion. The diversion provided by Waste Management for 2000 was as follows:

- Single-Family Residential Curbside Recycling
  - 7,276 tons of curbside recycling
  - 10,259 tons of green waste
  - 477 tons of wood waste
- Multi-Family Residential curbside Recycling
  - 500 tons of curbside recycling
- Commercial Recycling
  - 2,421 tons of commercial recycling
  - 1,411 tons of green waste commercial recycling

d. Construction and Demolition Materials Recycling Program. In July 1997, the Vasco Road Sanitary Landfill began accepting construction and demolition materials for diversion. In 2002, 143,209 tons (including greenwaste) of construction and demolition materials had been diverted from the landfill; 39,811 tons, or 28 percent of these diversions were from Livermore.[9] The City adopted a Construction and Demolition Debris Ordinance in June 2002 (effective August 1, 2002), which is expected to increase landfill diversion.

[8] California Integrated Waste Management Board, 2002. *Waste Stream Information Profiles.* Website: www.ciwmb.ca.gov/profiles/.

[9] Jacque Delgadillo, City of Livermore Public Services Department: Vasco Landfill Solid Waste Data from Eric Cortin, Vasco Landfill Manager. April 2003.

e. Progress Toward Diversion Goals. As of July 2002, the year 2000 diversion rate for the City has not been approved by the California Integrated Waste Management Board. However, with the assistance of Dr. Tseng and his staff, approval from the California Integrated Waste Management Board is expected in late 2002 for a 53 percent diversion rate.

Table 6-2 presents the waste diversion rates for the City from 1995 to 2000. If approved, then the City will have met the requirement of the California Integrated Waste Management Act to divert 50 percent of solid waste by the year 2000. More significant reductions in the waste stream are expected with the adoption of a new Construction and Demolition Debris Ordinance as construction and demolition debris constituted 21 percent of the waste transported to Alameda County landfills in 2000.[10]

Table 6-2: City of Livermore Waste Diversion Rates, 1995-2000

Year	Diversion Rate (%)
1995	26
1996	25
1997	45
1998	37
1999[a]	38
2000[a]	53

[a] Preliminary Data.

Source: California Integrated Waste Management Board, 2002.

In parallel with the new franchise agreement with Waste Management of Alameda County, in June of 2002, the City of Livermore adopted two ordinances:

- A Construction and Demolition Debris ordinance, effective August 1, 2002. This requires all construction and renovation projects (each has a monetary value that triggers the ordinance) to reuse or recycle at least 50 percent of the construction and demolition waste.
- A Solid Waste Management ordinance, effective August 1, 2002. This ordinance reflects changes in the franchise agreement with Waste Management, as well as information related to the new Construction and Demolition Debris ordinance. The ordinance allows contractors the option to choose a provider, as the collection of construction and demolition debris will no longer be an exclusive right of the franchisee.

A Solid Waste and Recycling Container Enclosure Ordinance was moved to the Livermore Planning and Zoning Code from the Health and Safety Title of the Livermore Municipal Code, effective August 1, 2002. This ordinance implements state requirements for reduction, diversion and recycling by providing safe areas and facilities for solid waste, recyclable materials and compostable materials enclosures.

E. ENERGY

This subsection presents a discussion of electricity, natural gas, and alternative forms of energy.

1. Electricity

The Pacific Gas and Electric Company (PG&E) provides electricity within the Livermore area. Most of Livermore's electric power is delivered via a 230-kilovolt (kV) transmission line running between the Contra Costa Power Plant near Antioch and the Newark Substation; the power is then distributed to local substations, which reduce the power to a lower voltage so it can be passed on to consumers. PG&E operates several 69-kV electrical substations within and in the vicinity of Livermore, including

[10] English, Taunya, 2002. "Construction Waste Hurts Recycling Goal" in *Contra Costa Times*. April 22.

the Livermore Substation near Stanley Boulevard/First Street, the Las Positas Substation near First Street/I-580, and the Vasco Substation south of I-580/east of Vasco Road.[11] The Livermore Substation supplies electricity to customers in the Central Livermore area. The Las Positas Substation serves customers in the City of Livermore and surrounding unincorporated areas of Alameda County. The Vasco Substation serves customers in the area east of Vasco Road.[12]

Like much of the Bay Area, the Tri-Valley region has experienced a rapid increase in demand for electricity over the past few years, as a result of both population growth and a boom in local high-tech industry uses. The City faces the same peak demand power shortfalls as the rest of the State. Currently, electrical demand throughout the Tri-Valley region is more than 98 percent of the area's existing electrical system capacity on an average daily basis. The total capacity of the Tri-Valley distribution system is 552.6 megawatts (mW), while demand is 544.4 mW; thus, only 1.4 percent of capacity is left available on an average day. In 2002, the actual average daily load in the Livermore-Las Positas Distribution Planning Area (DPA) was 130.6 mW. The DPA has a capacity of 144.4 mW in 2003 and is expected to exceed capacity in 2004 if no additional facilities or expansion to existing facilities occurs.[13]

In November 1999, PG&E submitted an application to the California Public Utilities Commission to construct the Tri-Valley 2002 Capacity Increase Project to address the increasing demand for electricity in the cities of Dublin, Livermore, Pleasanton, and San Ramon, and in portions of unincorporated Alameda and Contra Costa counties adjacent to these cities. PG&E proposed the following actions as part of the project:

- Construction of two new distribution substations—one in Dublin, and another in North Livermore at the intersection of May School Road and North Livermore Avenue.
- Installation of 7.9 miles of 230-kV overhead double-circuit transmission line in PG&E's existing vacant easement to serve the Dublin and North Livermore Substations.
- Construction of approximately 10 miles of new 230-kV double-circuit transmission line in PG&E's existing vacant easement from the Contra Costa-Newark 230-kV line southeast to the Tesla Substation connecting the Dublin and North Livermore substations directly to the Tesla Substation.
- Upgrading the Vineyard Substation in Pleasanton.[14]

On July 24, 2001, the California Public Utilities Commission issued a Proposed Decision approving 8.8 miles of the transmission lines and the Dublin Substation, but denied permission for the North Livermore Substation due to the implementation of slow-growth measures in the area and the significant environmental impacts of constructing the substation.[15] However, on October 10, 2001,

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[11] Livermore, City of (with Lamphier & Associates and SWA Group), 2000. *North Livermore Specific Plan Draft Environmental Impact Report.* April.

[12] California Public Utilities Commission. *Project Description: Tri-Valley 2002 Capacity Increase Project.* Website: www.cpuc.ca.gov/Environment/info/tri-valley.htm.

[13] Design, Community & Environment, 2001. *Livermore Vision Project Briefing Book.* April.

[14] California Public Utilities Commission. *Project Description: Tri-Valley 2002 Capacity Increase Project.* Website: www.cpuc.ca.gov/Environment/info/tri-valley.htm.

[15] Design, Community and Environment, 2001. *Livermore Vision Project Briefing Book.* April.

the California Public Utilities Commission approved PG&E's Tri-Valley 2002 Capacity Increase Project, overturning the previous decision and reaffirming much of what PG&E had originally planned. Included in the Certificate of Public Convenience and Necessity was the authorization for new electrical substations in North Livermore and Dublin, along with associated transmission lines.[16]

The timing of the development of the North Livermore substation, as of March 2003, is not well defined. PG&E monitors loads and conducts peak load studies to determine approximately when electricity demand in the Tri-Valley region will exceed capacity. Based on current peak load, PG&E anticipates that the construction of the North Livermore substation will be completed 2003 or 2004, when it predicts that electricity capacity in the Tri-Valley region will be exceeded.[17]

2. Natural Gas

PG&E has several natural gas pipelines that traverse the East County area, and five oil pipelines that traverse the northeastern portion of Alameda County. The City of Livermore is supplied natural gas via three main pipelines. A 24-inch natural gas pipeline main traverses the City of Livermore from southwest to northeast. A 36-inch and a 22-inch natural gas pipeline main enter the Planning Area north of Vasco Road and extend south till approximately Telsa Road before heading west through the City. PG&E also maintains six natural gas regulator stations within the City that reduced gas pressure prior to urban use distribution.[18]

3. Alternative Forms of Energy

Because of the 2000-2001 energy crisis in the State, it is important to note the existence of other energy sources within the vicinity of the Planning Area that provide energy to Livermore. The Altamont Landfill, operated by Waste Management and located just outside Livermore, captures landfill gases to generate 6,600 kW of energy for all on-site operations, as well as approximately 6,000 homes in the area.[19]

The Altamont Pass, which includes a number of separate wind energy projects developed, owned, and managed by various companies, is the site of one of California's major wind energy resource areas. The Altamont Pass Wind Farm has an installed capacity of approximately 550 mW.[20] The annual energy output for year 1998 was estimated at 637 million kilowatt hours.[21] PG&E is the primary

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[16] Pacific Gas & Electric Company, 2001. "California PUC Approves Pacific Gas and Electric Company Plan to Upgrade Power System in Tri-Valley: Project Crucial to Meet Area's Growing Electricity Needs," PG&E News Release. October 10. Website: www.pge.com.

[17] Jordan, Roger, 2002. Planning Engineer, PG&E. Personal communication with LSA Associates, Inc., July 12.

[18] Sumeet Singh, 2003. Senior Gas Distributor Engineer, PG&E. Personal communication with LSA Associates, Inc., April 17.

[19] National Renewable Energy Laboratory. *Renewable Plan Information System: Operating Facilities by Technology in the State of California*. Website: erendev.nrel.gov/state_energy/opfacbytech.cfm?state=CA.

Waste Management, Inc., 2001. "Four Waste Management Facilities Recognized by EPA for Environmental Programs," Press Release. January 22. Website: www.wm.com/docs/press0108.asp.

[20] American Wind Energy Association, 2002. Wind Project Data Bases, California. January 9. Website: www.awea.org/projects/california.html.

[21] A kilowatt hour is a unit of energy equivalent to one kilowatt (1 kW) of power expended for one hour of time.

purchaser/user of the energy generated from the Altamont Pass Wind Farm. Two new projects with a total capacity of 136.6 mW are anticipated to go online in 2004 or later.[22]

F. TELECOMMUNICATIONS

SBC provides residential and commercial telephone service within the Livermore area. SBC also provides or hosts a variety of other telecommunications services, such as Digital Subscriber Lines (DSL), Internet Service Provider (ISP), web hosting, virtual private networking, and wireless/cellular and paging services.

The California Public Utilities Commission requires that SBC anticipate and serve new growth. To meet this requirement, SBC continually upgrades its facilities and infrastructure, adding new facilities and technology to remain in conformance with California Public Utilities Commission tariffs and regulations and to serve customer demand in the City. SBC has indicated to the City of Livermore that it is nearing capacity for additional phone service. As of July 2002, the City was reviewing a project for the expansion of SBC utilities.

Additions to City infrastructure and proposals for development would result in a need for expansion or changes in SBC's infrastructure, which would involve suitable siting for equipment placement. Suitable sites must meet requirements for the physical transmission of telecommunication services and conform to the City's guidelines. SBC also works with the City to ensure that construction of new facilities does not interfere with any new or newly-paved streets.

Cable services within the City of Livermore are provided by Comcast Corporation. In November of 2002, Comcast merged with AT&T Cable Services. Comcast has a franchise agreement with the City for cable communication services, including television. During the past 3-5 years, the Planning Area has undergone cable infrastructure upgrades associated with the installation and use of fiber optics.[23] Some of the cable communication services offered by Comcast include digital cable, high-speed internet connection, and digital phone lines.

[22] American Wind Energy Association, 2003. Wind Project Data Bases, California. January 9. Website: www.awea.org/projects/california.html.

[23] James Dameron, 2003. Comcast Repair Tech and Service Lead. Personal communication with LSA Associates, Inc., April 21.

7. PUBLIC SERVICES

This chapter describes the existing conditions of Livermore's public services in 2002, including police, fire and emergency medical, schools, parks and community facilities, libraries, healthcare, and child care. Figure 7-1 shows the locations of these public services.

A. POLICE

This section describes police services in the City of Livermore in 2002. It includes a brief discussion of existing police facilities, staff, and programs, as well as the most commonly-reported crimes in Livermore and Livermore Police Department response times.[1]

1. Existing Facilities and Staff

Police protection services within the City of Livermore are provided by the Livermore Police Department (LPD). The LPD operates one station, located at 1110 S. Livermore Avenue.

LPD does not respond to calls outside of the City limits unless requested to do so by another agency. The area surrounding Livermore is in the jurisdiction of the Alameda County Sheriff's Department and the California Highway Patrol. LPD assists these agencies occasionally with their requests. LPD has a holding facility at the police station, but does not house prisoners overnight. Persons requiring overnight incarceration are booked at Santa Rita Jail in Dublin.

In 2002, LPD had a total paid staff of 164 persons, as well as three volunteer reserve officers. Table 7-1 provides a breakdown of LPD's 2002 staffing numbers. As of October 2002, staff numbers included 95 sworn officers, along with 69 administrative and support staff. This number of officers served a 2002 population of approximately 74,300, at a ratio of 1.29 officers per thousand residents. The minimum ratio the department would like to maintain is 1.25 officers per thousand. Livermore is divided into five areas, or beats, that are regularly patrolled by LPD officers.

Table 7-1: LPD Staff in 2002

Title	Number of Staff
Chief	1
Captains	3
Lieutenants	4
Sergeants	14
Officers	73
Civilian Managers	3
Civilian Supervisors	1
Dispatchers	16
Records Clerks	6
Animal Control Officers	2
Evidence/Property Technicians	2
Community Service Officers	5.5
Crime Analyst	2
Computer Technician	1
Police Cadets	2
Clerks	6
Counselors	6
Crossing Guards	16
Reserve Officers	3

Source: Livermore Police Department, 2002.

2. LPD Programs

LPD's mission statement reflects the Department's goal of being "leaders in law enforcement through community partnerships." LPD seeks to form both formal and informal relationships with commun-

[1] Information in this section is based on personal communication with Captain Steve Sweeney, Administrative Services Division, Livermore Police Department, and reflects conditions as of June 2002.

ity members in order to learn about their specific public safety concerns. In 2002, LPD operated a number of community programs designed to prevent and intervene in criminal activity in the community. Many of the programs focused on children and were implemented through Livermore schools. These programs included:

- **Drug Abuse Resistance Education (D.A.R.E.) –** Aimed at 5th graders and teaches children decision-making skills and information on the consequences of drug and alcohol abuse.
- **Police Activities League (PAL) –** An after-school activities program for 6th to 8th graders run in conjunction with the Livermore Area Recreation and Parks District and the Livermore Valley Joint Unified School District.
- **Every 15 Minutes –** A program created by a nationwide nonprofit organization in which local law enforcement agencies, including the police and fire departments, participate in a detailed re-enactment of a fatal drunk driving accident.
- **School Resource Officers (SROs)** – Persons assigned to both high schools and all four middle schools in Livermore. These officers perform all necessary law enforcement duties on the campus and act as a resource for students, teachers, and administrators.

In 2002, LPD also coordinated other community programs, including the Neighborhood Watch Program, bicycle and car seat safety courses, and the Citizen's Police Academy. They also provided consultation to residents and business owners in an attempt to minimize and ultimately prevent crime.

3. 2001 Crime Statistics

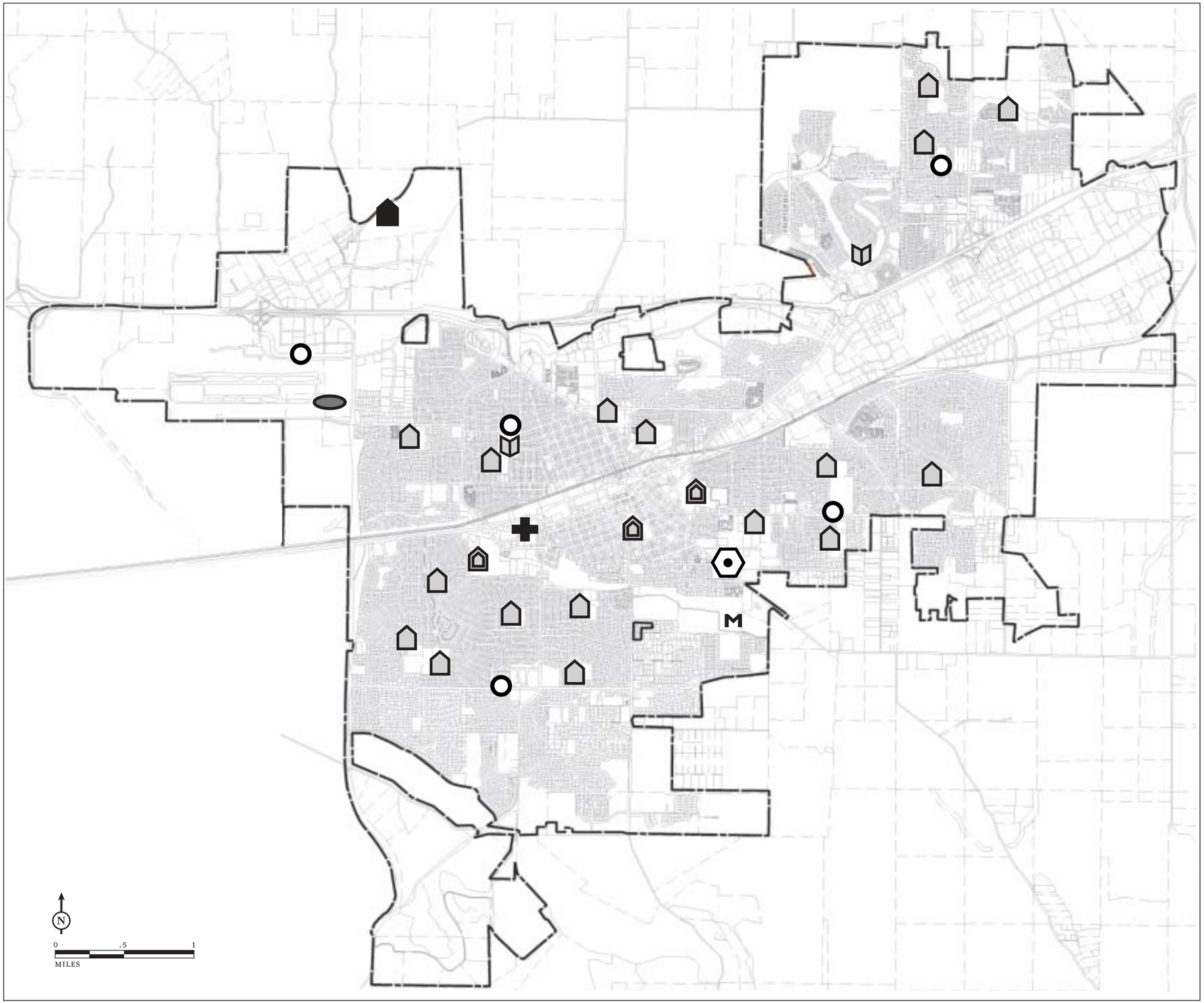
Crimes are placed into one of three categories (Part I, II, or III) depending upon the severity of the crime. The categories utilized by LPD are consistent with those established by the Federal Bureau of Investigation (FBI). The following describes each category, as well as category statistics for 2001.

Part I crimes include serious threats to health or property, such as homicide, rape, robbery, aggravated assault, auto theft, and arson. In 2001, 2,218 Part I crimes were reported in Livermore. The majority of these (66 percent or 1,459 incidents) were cases of larceny.

Part II crimes include but are not limited to threats to health or property, such as simple assault, child abuse, drunk driving, narcotics violations, and vandalism. In 2001, Part II crimes accounted for 3,456 of the crimes reported to LPD. The most common Part II crimes reported were vandalism, simple assault, drunk driving, and narcotic violations.

Part III crimes include less urgent offenses, such as domestic disturbances, juvenile runaways, and missing persons. In addition, Part III activities include routine police business, such as responding to false alarms, investigation of suspicious activity, or conduction of field interviews. In 2001, 35,329 Part III calls were reported; 12 percent (4,108) were false alarms, ten percent (3,363) were field interviews, and nine percent (3,132) were reports of suspicious activity.

Between 2000 and 2001, the number of calls reported in the Part I and Part II categories increased. Reported Part I crimes increased by 29 percent. Part II crimes increased by 19 percent. Part III crimes, however, decreased by 13 percent. In general, increases and decreases in crime in Livermore



LEGEND

- City Limit Line
- Civic Center:
  - City Hall
  - Police Station
  - Main Library
- Fire Station
- Elementary/Middle School
- High School
- Las Positas Community College
- Valley Memorial Hospital
- Library
- Water Reclamation Plant
- City Maintenance Facility

FIGURE 7-1

Livermore General Plan Update
Master Environmental Assessment
Public Services

SOURCE: BASELINE ENVIRONMENTAL CONSULTING, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\FIG_7-1.AI (04/22/03)

over the past decade have tended to follow national trends. LPD does not attribute the 2001 increase in Part I and II crimes to any specific local cause. [2]

4. Response Times

Police response times to reports of crime are dependent upon call priority, with Priority One calls being the most urgent and Priority Three calls being least urgent.

Priority One calls include Officer needs assistance, any serious crime in-progress, any serious crime which has just occurred, any reported serious injury accident, or any crime that has resulted in a citizen detaining a suspect with violence potential. For Priority One calls, the LPD had a 2002 target response time of three minutes.

Priority Two calls include any non-serious crime in progress, any non-serious crime that has just occurred, or a notice for officers to Be On the Look Out (BOLOs). For Priority Two calls, the target response time in 2002 was ten minutes.

Priority Three calls include incidents that generally do not require immediate police presence to prevent potential citizen injury, loss of property, or escape of violators. The target response time for Priority Three calls in 2002 was 30 minutes.

B. FIRE AND EMERGENCY MEDICAL SERVICES

This section describes fire protection and emergency medical services in Livermore in 2001 and 2002. It includes a brief discussion of Fire Department staffing levels, facilities and programs, as well as Fire Department response times, and the most common types of emergencies reported in Livermore. Information in this section is based largely on the *Livermore-Pleasanton Fire Department 2001 Annual Report*.

1. Existing Staff

Fire protection and emergency medical services in Livermore is provided by the Livermore-Pleasanton Fire Department (LPFD). The Livermore and Pleasanton Fire Departments consolidated through a joint powers authority in 1996 in order to provide more efficient and effective service to the two communities. The LPFD budget is shared by the cities of Livermore and Pleasanton through a cost-sharing plan that enables each city to pay its fair share of the Fire Department's operating expenses. Each city builds and maintains its own fire stations and purchases and maintains its own light-duty vehicles and fire apparatus. In fiscal year 2001-2002, the total LPFD budget was $18,782,665, of which Livermore contributed $9,101,117.

In addition, the Lawrence Livermore National Laboratory (LLNL) has its own fire department on-site. LPFD has mutual aid agreements with both the LLNL Fire Department and the Alameda County Fire Department.

[2] Personal communication with Lieutenant Scott Trudeau, Watch Commander, Livermore Police Department, June 7, 2002.

During 2001, the LPFD had a total staff of 129 persons, including one fire chief, one fire deputy chief, four division chiefs, including one training chief officer, one fire administration manager, one emergency medical services disaster preparedness manager, one information systems manager, one fire marshal, one assistant fire marshal, one hazardous materials coordinator, two hazardous materials inspectors, four fire prevention inspectors, six office support staff (five full-time equivalent), 30 fire captains, 30 fire engineers, and 45 firefighters.

2. Existing Facilities in 2001

In 2001, LPFD operated a total of 51 vehicles, including:

- Nine staff and command vehicles;
- Ten fire prevention vehicles;
- Eleven Type I fire engines (the "classic" fire engine, with a minimum 1,000-gallon per minute (gpm) pump, 400-gallon water tank, and 20-foot ladder);
- Four Type III vehicles (a large four-wheel drive engine for wildland fires, with a minimum 120-gpm pump and 300-gallon water tank);
- Eight Type IV vehicles (similar to a large pickup truck, also for use in wildland fires, with a minimum 50 gpm pump and 200-gallon water tank);
- Two ladder engines; and
- Seven utility vehicles, such as rescue vehicles and a volunteer van.

In 2001, LPFD also maintained ten stations and one training center. The training center, five stations, as well as the headquarters were located in Pleasanton. Five additional stations were located in Livermore. Their locations are listed in Table 7-2.

Table 7-2: Fire Stations in Livermore

Facility	Location
Headquarters	3560 Nevada Street, Pleasanton
Station No.6	4550 East Ave.
Station No.7	951 Rincon
Station No.8	5756 Scenic Ave.
Station No.9	1919 Cordoba St.
Station No.10	330 Airway Blvd.

Source: Livermore-Pleasanton Fire Department, 2002.

As of August 2001, Livermore had a total of 3,373 fire hydrants. The Cal Water District served 1,842 hydrants, while 1,469 hydrants were served by the City of Livermore. In addition, the City operated 62 recycled water hydrants, most of which were north of I-580 between Collier Canyon Road and Doolan Canyon Road. The minimum fire flow of most hydrants was 1,500 gallons per minute (gpm). Maximum flows varied in different service areas, but flows from recycled hydrants were the highest. The recycled water fire flow was greater than 5,000 gpm. The lowest flows were found in approximately twenty outdated wharf hydrants located in older parts of the community in the Cal Water service area. Wharf fire hydrants are single, 2½-inch outlets on four-inch piped connections to the public water main. The 2002 City standard was two, 2½-inch outlets, plus one, 4½-inch outlet on a six-inch connection to the public water main. In 2002, it was not possible to meet the 1,500-gpm minimum fire flow from the wharf fire hydrants.

3. Divisions and Programs

In 2002, LPFD was organized in three divisions: 1) Fire Operation and Suppression Division, 2) Fire Prevention Bureau, and 3) Administrative Services Division. Each of these divisions and their areas of expertise, as they existed in 2002, are discussed below.

a. Fire Operations and Suppression Division. As of 2002, the Fire Operations and Suppression Division of the LPFD provided several different types of services, including:

- *Fire Suppression*: Suppression of fires in buildings of all types, car fires, grass, rubbish or other fires.
- *Emergency Medical Response*: Dispatching of personnel trained as Firefighter/Paramedics and Emergency Medical Technicians who can provide Advanced Life Support (ALS) as well as Basic Life Support (BLS) services.
- *Rescue Emergencies*: Rescue of people trapped in wrecked cars, collapsed buildings, machinery, or other situations.
- *Public Assistance*: Response to situations involving children locked in cars or homes, disabled persons needing help, or others needing assistance.
- *Company Fire Inspection Program*: Inspection of businesses, apartments, etc., by fire companies to ensure that they are fire safe.
- *Hazardous Materials Incidents*: Response to incidents where a hazardous materials release represents a threat to life, property, or the environment, including natural gas leaks or potential biological or chemical terrorist attacks.

In 2002, the Operations and Suppression Division also oversaw a variety of other programs, such as:

- Training and fitness-wellness programs for all firefighters;
- Disaster preparedness;
- Fleet services to maintain equipment and purchase new equipment;
- Public education, such as public service announcements, presentations at local public schools, and senior assistance programs.

In 2001, the LPFD hosted or participated in 166 public events, offered 27 CPR classes, and provided 13 first aid classes to the community.

b. Fire Prevention Bureau. In 2002, the Fire Prevention Bureau oversaw code adoption, inspection, and enforcement; conducted fire and hazardous materials inspections; managed weed abatement programs for land uses in urban-wildland interface areas; and conducted building plan checks for fire code conformance and hazardous materials storage and usage. During 2001, the Fire Prevention Bureau conducted 2,964 construction inspections and 1,082 plan checks. The Bureau also investigates all major fires and hazardous materials incidents, often in conjunction with the Livermore and Pleasanton Police Departments.

As of 2002, the Fire Prevention Bureau also coordinated the City's Hazardous Materials Program, which inspected businesses that handle hazardous materials, conducted plan checks of regulated businesses for the Permit Center, and assisted larger companies with design, upgrades, or closures of hazardous materials storage and use facilities. As of 2002, both Livermore and Pleasanton were certified by the State of California under the Certified Unified Program Agencies for the management of hazardous materials and hazardous waste. In 2002, the Fire Prevention Bureau also managed this program for both cities.

c. Administrative Services Division. In 2002, the Administrative Services Division oversaw human resource management, budget preparation and administration, fiscal management, information systems oversight and support, new facility construction management, and interagency coordination. Administrative Services was also responsible for compiling Department-wide statistics and for the preparation of a variety of routine reports.

The Department completed a number of improvement programs in all areas, including implementing the new computer-aided dispatch/records management system, updating the hazardous materials and fire prevention filing system, conducting four outside recruitments, managing the on-going construction of the Department's new headquarters facility in Pleasanton, and negotiating a new six-year labor contract with the Firefighters Local 1974.

4. Types of Calls and Response Times

In 2001, the LPFD responded to a total of 8,862 emergency calls. Of these, 4,733 responses (53 percent) were to locations within Livermore. The highest number of calls in Livermore was in District No. 7, which includes the area around Rincon Avenue. Station No. 7, which covers District No. 7, responded to 1,750 calls. This number of calls received at Station No. 7 was high compared to other stations because of two primary factors, including: 1) the district covered by this station includes the Downtown which has a larger number of older buildings and higher density of people and buildings per acre than the rest of the City; and 2) it also serves a segment of I-580 that experiences an above-average number of calls, further increasing the stations total call statistics.[3] Station No. 8, located in Springtown, responded to 939 calls, and Station No. 6 on East Avenue responded to 926 calls. The fewest number of calls were received by Station No. 10, in northwest Livermore, which responded to 391 calls. Station No. 10 experiences fewer calls because it covers an area of northwest Livermore that is dominated by business, institutional, and industrial uses, as well as a large amount of undeveloped land, which typically generate fewer calls than the residential uses served by other stations.

In 2001, the majority of calls received by LPFD were for emergency medical services. Of the 4,733 responses to calls in Livermore in 2001, 3,295 responses (69 percent) were for medical aid. LPFD also responded to 567 calls for general services, such as assisting children locked in cars or helping disabled people in need, 454 calls from automatic alarms, and 380 calls to vehicle, structural, or wildland fires. During 2001, the LPFD responded to 1,606 calls to single-family residences, 374 calls to multi-family residences, and 145 calls to "other" types of residences such as businesses including mobile home parks, senior living centers, and transient living facilities.

The LPFD seeks to respond to fire incidents and medical emergencies within seven minutes from receipt of the 911 call by the dispatch center at least 90 percent of the time. This seven-minute total response time includes a five-minute travel time, one minute for dispatch processing, and one minute for the crew to get dressed in protective clothing and get the engine rolling. In 2001, LPFD met its response time goal for structure fires 93 percent of the time.[4]

[3] Personal communication with Eric Carlson, Fire Marshal, Livermore-Pleasanton Fire Department, June 26, 2002.

[4] Eric Carlson, Fire Marshal, Livermore-Pleasanton Fire Department, January 7, 2003.

C. SCHOOLS

This section describes school services in Livermore in 2001 and 2002. Information in this section is based largely on the *Ten-Year Facilities Master Plan* of the Livermore Valley Joint Unified School District, published in October 2001.

1. Existing Conditions in 2002

As of 2002, Livermore was served by the Livermore Valley Joint Unified School District. The District's area encompasses a 240-square-mile area, including the City and the surrounding area. At this time in 2002, the District included 12 elementary schools serving students from kindergarten through 5th grade, four middle schools serving students from 6th to 8th grade, two comprehensive high schools, and three alternative high schools serving students from 9th to 12th grade. These schools, their locations, and 2001-2002 capacity and enrollment are listed in Table 7-3. District enrollment records indicated that a total of 13,909 students were enrolled during the 2001-2002 school year. Total capacity in District schools was 15,436. The District does not calculate capacity for alternative programs, such as continuing education and the alternative high schools.

2. Future Projections and Projects

While the District was not overcrowded in 2002, the remaining capacity of existing facilities in 2002 was likely to be filled in the near-term as enrollment continued to grow, and was likely to be exceeded within 3 to 10 years. From the 1997-1998 school year to the 2000-2001 school year, elementary enrollment in the District increased by 8.6 percent, an average annual growth rate of 2.8 percent. Middle school enrollment grew by 9.93 percent, an annual average rate of 3.2 percent. High school enrollment increased by 9.03 percent over the three school years, for an average annual growth rate of 2.9 percent. Projections for future growth, based on this historical enrollment data, indicated that total enrollment in the District would increase from the 2000-2001 enrollment of 13,925 students to 17,452 students in the 2010-2011 school year, a 25.3 percent increase. In addition to historical enrollment data, the District has used student generation rates for single- and multi-family housing to determine future enrollment, as shown in Table 7-4.

According to these projections, 2002 elementary school capacities were anticipated to be exceeded by 2006, middle school capacity by 2010, and high school capacity by 2003. As of 2001-2002, East Avenue Middle school was already over capacity and Mendenhall Middle School was anticipated to reach capacity in 2004. Livermore High School was anticipated to reach capacity in the 2002-2003 school year. Granada High School was projected to serve enrollment needs through 2005-2006.

In order to provide additional capacity, the District was planning several modernization and expansion projects to add capacity for 2,750 students. A new elementary school in South Livermore was scheduled to open in 2004-2005. The District was also planning to open an additional new elementary school at an undetermined location in 2009-2010. While capacity will not be added to any existing middle schools, a new middle school could open in 2010-2011. At the high school level, the District was planning to add capacity for 570 students at Granada High School within the next 10 years. In addition, a new high school, with a minimum capacity of 1,650 students, may be needed to serve long-term enrollment needs.

Table 7-3: School Locations, Capacity, and Enrollment in 2002

School	Location	2001/2002 Capacity	2001/2002 Enrollment
Elementary			
Almond Elementary	1401 Almond Avenue	610	596
Altamont Creek Elementary	6500 Garaventa Ranch Road	724	569
Arroyo Mocho Elementary	1040 Florence Road	664	609
Arroyo Seco Elementary	5280 Irene Way	680	595
Croce Elementary	5650 Scenic Avenue	794	711
Jackson Elementary	554 Jackson Avenue	616	482
Marylin Elementary	800 Marylin Avenue	580	460
Michell Elementary	1001 Elaine Avenue	536	413
Portola Elementary	2451 Portola Avenue	582	527
Rancho Las Positas Elementary	401 East Jack London Boulevard	660	599
Smith Elementary	391 Ontario Drive	544	460
Sunset Elementary	1671 Frankfurt Drive	610	600
Middle Schools			
Christensen Middle School	5757 Haggin Oaks Avenue	965	637
East Middle School	3951 East Avenue	827	871
Junction Middle School	298 Junction Avenue	1,043	823
Mendenhall Middle School	1701 El Pedro Drive	1,001	833
High Schools[a]			
Granada High School	400 Wall Street	2,000	1,820
Livermore High School	600 Maple Street	2,000	1,956
Alternative Programs			
Vineyard School, grades 1-12	543 Sonoma Avenue	--*	172
Del Valle Continuation High School	2253 Fifth Street	--*	104
Phoenix Continuation High School	555 Sonoma Avenue	--*	72

[a] LVJUSD does not calculate capacity for its alternative programs (continuing education and alternative high schools).

Source: Livermore Valley Joint Unified School District, 2002.

If new schools are not built, alternatives such as using only relocatable units (e.g., portables) and instituting year-round school may need to be explored. In fact, as of 2002, several schools in Livermore were already operating principally out of relocatable units. These schools consisted of classrooms in modular units arranged around a permanent core building that housed administrative offices and multi-purpose space.

Table 7-4: Student Generation Rates

Grade Level	Single-Family Housing Unit Generation Rate	Multi-Family Housing Unit Generation Rate
K-5	0.30	0.30
6-8	0.15	0.10
9-12	0.17	0.11
Total Estimated per Unit	*0.62*	*0.51*

Source: Livermore Valley Joint Unified School District, 2002.

3. Sources of Funding

As of 2002, the only source of funding for capital improvements to serve new students in the District was Measure L. In March 1999, voters in the District approved Measure L, which will provide the District with a total of $110 million. The District planned to use this money to modernize existing schools. Funds were also available from the

State through the School Facility Program, which funds new construction and modernization of existing school facilities. As of 2002, the District had been awarded six modernization grants from the State, however, at that time, funding for the grants was not yet secured.

There are limited sources of funding available to provide needed new school facilities. A primary source available, however, is fees paid for new development. Fees levied on new development are intended to fund the facilities needed to provide schooling for the children that will be living in that development. While new children residing in new housing constituted the majority of the increased enrollment in the District in 2002, the number of new children in older housing had also increased due to young families moving into the City's older housing stock that is typically less costly than new housing. In early 2002, the District completed a justification study for an adjustment to the fees and held a public hearing for the fee adjustment in June 2002. At this meeting, the fee adjustment was approved by the School Board and became effective in late August 2002.

For the 2001-2002 school year, the District projected that it would receive over $19.8 million in funds from Measure L. Over the 10 school years from 2001 to 2010, the District also estimated that there will be a funding shortfall. Approximately 2,480 of the new students in the District were projected to come from new development and approximately 1,050 of the new students will be children who move into existing housing units in the City. New children in old homes present a challenge to the District because there are no funding mechanisms in place to support these students. As a result, the District has estimated that it will experience a shortfall of $3.2 million between 2001 and 2005. Sixty-four percent of its total revenue during this period will come from Measure L bond proceeds, 31 percent will come from developer fees, four percent will come from commercial and industrial development fees, and slightly less than one percent will come from State grants.

D. PARKS AND COMMUNITY FACILITIES IN 2002

Livermore is served by an extensive network of parks ranging from large regional parks covering several hundred acres to small neighborhood parks with tot lots. Existing parks within the City in 2002 are shown in Figure 7-2. Residents can experience a wide variety of open space and recreational opportunities, including formal sports fields, tennis courts and aquatic facilities, open play fields, hiking and bicycle trails, tot lots, picnic areas and space for public events. In addition to public open space, Livermore has a number of community facilities, including three public library branches, a senior center, and several spaces available for public events and community group activities.

In 2002, the City owned and operated several of the smaller parks in the community. The East Bay Regional Park District (EBRPD) and the Livermore Area Recreation and Park District (LARPD), two separate agencies, were responsible for the development and maintenance of the non-city-owned parks and public open space in the Livermore area. In 2002, LARPD was responsible for the operation of most of Livermore's parks and community facilities, as well as many miles of scenic multi-use trails.

Funding for the LARPD comes from a variety of sources, including property taxes, a special tax, fees, charges, and grants. Provisions of the Quimby Act, which requires developers to dedicate parkland or in-lieu fees as a condition for approval of a final subdivision tract or parcel map, have provided capital development funds for many of Livermore's neighborhood parks. Under the Act, residential developments must either dedicate 1.37 acres per 100 units or pay a fee of $5,916 per unit. Other

funding comes from developer agreements, government bonds and leases, and capital grants. Since 1993, approximately half of Livermore's property tax revenue has been diverted to the Education Revenue Allocation Fund, resulting in a funding shortfall of almost $3.5 million annually for LARPD.

In 2002, LARPD was in the process of developing several new parks and recreation facilities in the Livermore Area, including:

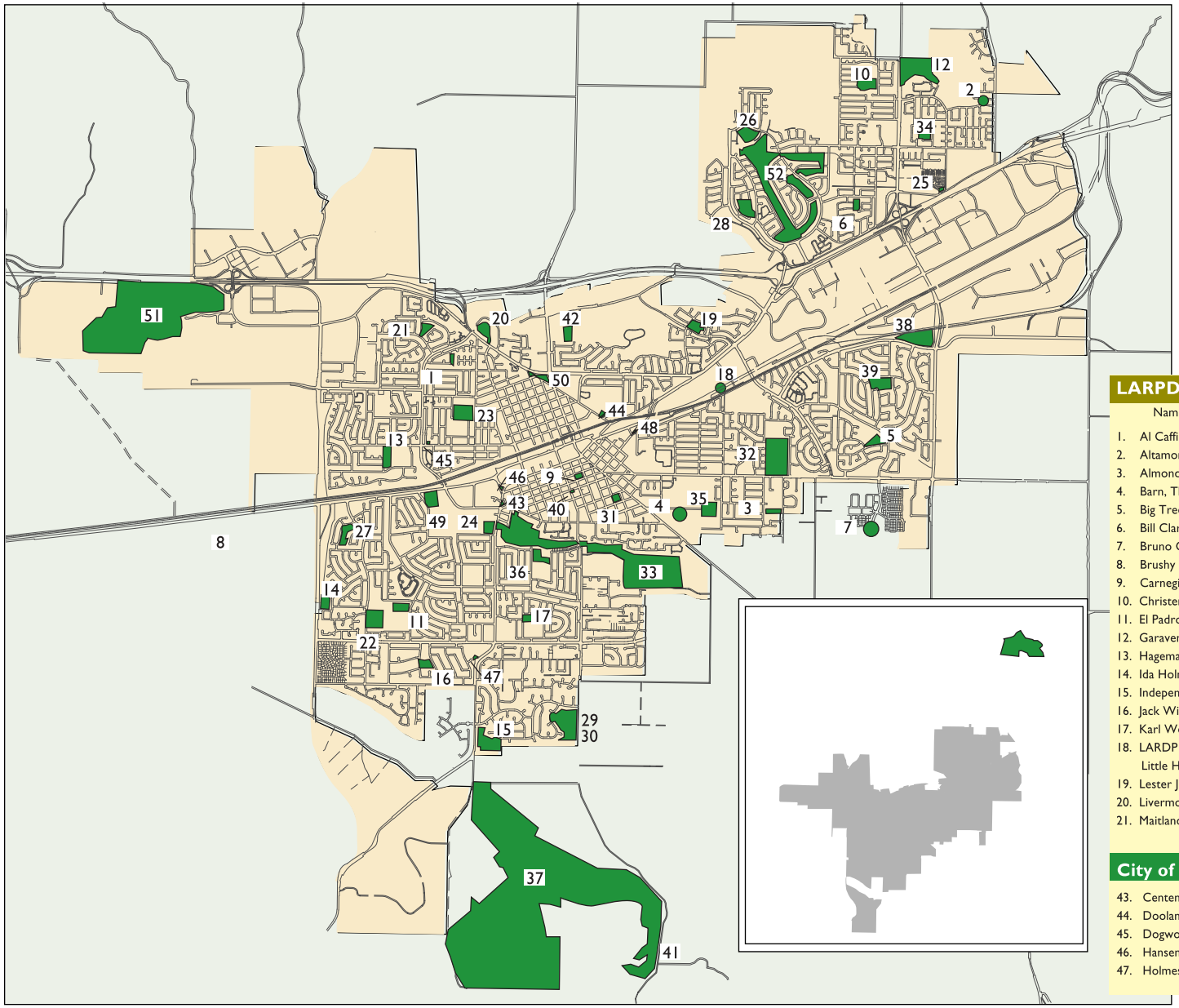
- The William J. Payne Sports Park, which opened in 2002 and includes two ballfields, a soccer field and a BMX bike track, and two new neighborhood parks. This park is located at the northwest corner of Patterson Pass Road and Vasco Road.
- A new community center at Robert Livermore Community Park, which will house a new Senior Center, a Youth Center, meeting spaces, a gymnasium and two swimming pools. Excavation at this site had begun in 2002, construction was scheduled to be completed in late-2003, and the Center was scheduled to open in mid-2004. This park is located at the northwest corner of East Avenue and Loyola Way.
- More than 2,000 acres have been added to Brushy Peak Regional Preserve. LARPD and EBRPD were negotiating the joint operation of the Preserve in 2002, as well as developing a land use plan to guide recreational and non-recreational uses at the Preserve. Brushy Peak Regional Preserve is located northeast of the City limits.
- Renovations and improvements at several of Livermore's existing neighborhood parks were being undertaken in mid-2002.

LARPD's park standards are listed in Table 7-5. These standards are used to determine the various amounts and types of parkland needed to serve Livermore residents. According to these standards, the amount of Regional, Neighborhood, and Special Use parks provided in 2002 was adequate. There was a shortfall, however, of approximately 110 acres of Community Parks in the City in 2002, equal to 3 or 4 parks of 30 to 40 acres each.

In 2002, LARPD had begun an update of its 1995 Master Plan. The updated Master Plan will re-evaluate the park, bicycle, and trail facilities, and recreational programs covered in the 1995 document, and will expand its analysis to include a broader range of goals, objectives, and policies of the agency, along with timelines for their implementation. Community outreach efforts for the Master Plan process had been completed at this time by an outside consultant hired by LARPD to conduct phone, mail, and internet surveys. Although a schedule for the Master Plan Update has not yet been determined, in mid-2002 LARPD officials estimated that the update would be completed within the following 12- to 18-month period.

E. LIBRARIES

The Livermore Public Library was established in 1878, and has been a full department of the City government since 1979. In 2002, Livermore was served by three libraries; the Main Library located in the Civic Center complex, and two branch libraries (one in Springtown, the other in the Rincon area). Each library contributes to the Library Department's mission – "The Livermore Public Library encourages the development of lifelong interest in reading and learning by providing materials and



LARPD Operated Facilities

	Name	Type	Acres
1.	Al Caffidio	N	2
2.	Altamont Creek	N	6
3.	Almond	N	6
4.	Barn, The	S	
5.	Big Trees	N	4.2
6.	Bill Clark	N	2.4
7.	Bruno Canziani	N	12
8.	Brushy Peak	R	507
9.	Carnegie S		1
10.	Christensen	N	8.2
11.	El Padro N		5.5
12.	Garaventa Wetlands	R	24
13.	Hagemann	N	7.2
14.	Ida Holm	N	6
15.	Independence	S	17
16.	Jack Williams	N	4.5
17.	Karl Wente	N	3.4
18.	LARDP Office/ Little House	S	1.7
19.	Lester J. Knott	N	5.2
20.	Livermore Downs	N	6
21.	Maitland R. Henry	N	5
22.	Max Baer	S	12
23.	May Nissen Pk/ Swim Center	C	12
24.	Mocho	N	3.3
25.	Northfront	N	2
26.	North Livermore	N	9
27.	Pleasure Island	N	7.5
28.	Ralph Wattenburger	N	5
29.	Ravenswood Historic Site	S	29.7
30.	Ravenswood Park	N	3.3
31.	Recreation Center	N	2.1
32.	Robert Livermore	C	29.8
33.	Robertson	S	133
34.	Summit	N	4.2
35.	Sunken Gardens	N	8.5
36.	Sunset	N	6
37.	Sycamore Grove	R	742
38.	William J. Payne	S	17
39.	Tex Spruiell	N	9.8
40.	Veterans Mem. Bldg.	S	
41.	Veterans Park	R	32
42.	Vista Meadows	N	5.7

City of Livermore Operated Facilities

43. Centennial Park
44. Doolan Park
45. Dogwood Park
46. Hansen Park
47. Holmes Park
48. Madeira Park
49. Oaknoll Pioneer Park
50. Portola Park
51. Las Positas Golf Course
52. Springtown Golf Course

LSA

FIGURE 7-2

Livermore General Plan Update
Master Environmental Assessment
Parks

SOURCE: ESRI/FEMA, 2002.

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Table 7-5: Park Types and Standards

Park Type	Description	LARPD Standard	Required Acreage	Existing Acreage	Difference From Standard
Neighborhood (N)	6 – 10 Acres. Service Area: ¾- to 1-mile. No permanent restrooms, no sports lighting, open play fields, small picnic areas, tot lot.	2 acres/1,000 residents or 1 park/3,000-5,000 residents	149 acres	151 acres	Exceeds standard by 2 acres
Community (C)	30+ Acres. Service Area: 2-miles. Sports fields with lighting where possible, permanent restrooms, on-site parking, tennis courts, aquatic facilities, large group picnic areas	2 acres/1,000 residents	149 acres	42 acres	Below standard by 107 acres
Regional (R)	250-Acre Minimum. Service Area: within 1 hour drive. Minimal improvements, site must provide habitat for plants and animals, permanent restrooms only when feasible.	15 acres/1,000 residents	1,115 acres	1,305 acres	Exceeds standard by 190 acres
Special Use (S)	No Minimum Size. Service Area: may include the whole community. Activities may include rodeos, soccer, softball and concerts.	3 acres/1,000 residents	223 acres	211 acres	Below standard by 12 acres

Source: Livermore Area Recreation and Parks District, 2002.

services of popular interest, emphasizing and encouraging reading by children, supplementing the educational needs of the community and furnishing timely, accurate information."

In 2002, the Main Library, located at 1000 S. Livermore Avenue, was open seven days a week for a total of 63 available public operating hours. The Rincon Branch Library, located at 725 Rincon Avenue, was open six days a week for a total of 43 available public operating hours. The Springtown Branch Library, located at 998 Bluebell Drive, was also open six days a week for a total of 43 available public operating hours.

In 2002, materials available through the library included books, magazines, videos, audio books, music CD's, CD-ROM's, e-books, DVD's, and electronic information through free, unrestricted internet access. These materials were available to all patrons on an equal basis. Materials could also be procured from other libraries through an interlibrary loan. At this time, library programs were particularly focused on introducing and interesting children in the library's materials. One of the largest programs the library offered was its summer reading program, in which 2,000 to 2,300 children participated annually.

In addition to making physical and electronic media available, the library provided a variety of other services to the community, including free computers with internet access, internet classes, lecture series, art exhibitions, and a passport application service. The library also provided space for free tax assistance, legal advice services, meeting rooms, and a community bulletin board.

Use of the library has been steadily increasing over the past ten years, growing by approximately 6 to 7 percent each year. Between 60 and 70 percent of Livermore residents are registered borrowers at the library, meaning they have used the library at least once over the previous two years. Moreover, the average circulation rate of ten items per capita annually was well above the national median rate for libraries of its size, which generally circulate about seven items per capita annually.[5]

As of mid-2002, a new Main Library was under construction at 1188 S. Livermore Avenue, as part of the Civic Center complex. This facility will consist of 52,000 square feet and will house an adult library, children's library, periodical reading room, storytime/craft room, teen center, computer training lab, a community meeting room, three quiet study rooms, a public-use computer lab, and a small café and bookstore, in addition to storage space and administrative offices. Twenty-million dollars in funding for the construction of this facility was approved by Livermore voters as part of Measure L, passed in March 1999. Groundbreaking on the site took place in February 2002, and the library is expected to open in late 2003 or early 2004.

In 2002, the Library Department had 3.5 full-time equivalent (FTE)[6] positions at the Springtown Branch Library, 3.5 FTE positions at the Rincon Branch Library, and 13.61 FTE positions at the Civic Center Library, as well as eight technical services positions. The majority of library positions are part-time. During fiscal year 2003-2004, when the new library is scheduled to open, the total number of positions in the Department will increase to 40.61 FTE. The opening of the new Civic

[5] Public Library Data Service Statistical Report, 2002.

[6] Full-time equivalent (FTE) employment is a computed statistic representing the number of full-time employees that could be employed if the number of hours worked by part-time employees is worked by full-time employees.

Center Library will necessitate an increase in staffing level from the 2002 level of 30.75 full-time equivalent employees to 41.63 full-time equivalent employees.

The library's budget is allocated from the City's General Fund. Fines and fees collected by the library are paid into the General Fund and are included as part of the library's budget allocations.

F. HEALTH CARE

In 2001, Livermore was served by two private, for-profit hospitals, both operated by ValleyCare: ValleyCare Medical Center in Pleasanton and Valley Memorial Hospital in Livermore. ValleyCare Medical Center provided a 24-hour emergency room, an intensive care unit (ICU), and a critical care unit (CCU), and offered surgery rooms, a maternity ward, a neo-natal intensive care unit, pediatric medicine, outpatient surgery, physical therapy and radiation therapy facilities, occupational health services, a geriatric psychiatric unit, a skilled nursing facility, and preventative health and wellness programs.

The Valley Memorial Hospital, located on East Stanley Boulevard in Livermore, is a private, for-profit hospital operated by ValleyCare. Valley Memorial offered a complete nursing care unit along with outpatient services such as urgent care, a laboratory, radiology facilities, physical therapy facilities, electrocardiogram (EKG), and electroencephalogram (EEG) equipment. Valley Memorial Hospital also provides home care services, health and wellness programs, cardiac and pulmonary rehabilitation programs, diabetes education, and weight reduction assistance.

In addition to these facilities, both ValleyCare and Kaiser Permanente had new facilities underway in the City in 2002. ValleyCare had proposed to return the hospital's administrative offices from Pleasanton to a site in Downtown, adding 65,000 plus square feet of medical office space, a 66,500 square foot wellness center and a 278-unit senior housing project on a 10-acre site adjacent to Valley Memorial. Kaiser Permanente was scheduled to begin construction of a 70,000 square foot medical facility on Las Positas Road that would house adult and pediatric medicine, women's health, optometry and optical sales, a pharmacy, dermatology, an allergy lab, and imaging services. The facility was scheduled to open by late 2003.

In 2002, low-income and uninsured populations in Livermore were served by the Valley Community Health Centers. The Valley Community Health Center in Livermore provided routine medical care for all age groups, including immunizations. This facility was funded largely by Alameda County, which had primary responsibility for the provision of public health care in Livermore. Additional funding for Valley Community Health Centers comes from City governments, State and federal agencies, and grants from foundations. The Valley Care Community Health Center in Livermore has experienced decreases in service. During the Fall of 2001, the Center was opened sporadically, and then closed completely for a three-month period from December 2001 through February 2002. As of June 2002, the Center had increased its operating hours from one half-day per week to five half-days per week (open Monday through Friday).

In addition to routine care, specialized services for low-income individuals were offered in Pleasanton. Valley Community Health Centers for Women, Infants, and Children offered family planning education, gynecology and obstetrics for teens and adult women, and pregnancy testing. Another ValleyCare Health Center provides mental health services, including drug and alcohol abuse

recovery services, smoking cessation education, as well as counseling for individuals and families. The Valley Mental Health Center, a non-profit facility in Pleasanton not affiliated with the Valley Community Health Centers, provided psychiatric care for adults and children, including psychotherapy, medication, education, and behavior management.

G. CHILDCARE

In 2002, childcare in Livermore was provided by professional day care centers, as well as by home-based day care providers. A total of 4,192 spaces were available in childcare facilities in Livermore. Two-thirds (2,763) of these spaces were in private childcare centers, and the remaining one-third (1,429) of these spaces were provided in home-based facilities. During 2001, overall need for childcare in the Tri-Valley area decreased slightly.

In addition to private center- or home-based care providers, the School District operated childcare programs for pre-school, elementary, and middle school students through cooperative arrangements between the District and the City. The District offered parent-participation preschool for children six months to six years of age at several park facilities and elementary schools in the City. Elementary school students were eligible to participate in the Extended Student Services (ESS) and Kid's Zone programs, which were open five days per week, year-round. These programs offered learning activities in areas such as art, music, science, language, crafts, and outdoor play. Over 800 students participated in the ESS and Kid's Zone programs during 2001, including 134 children from low-income homes. For middle school students, LARPD has implemented the TeenNRG PAL program. This program was held from 2:30 p.m. to 6:00 p.m. five days per week at all four middle schools. The program offered a healthy snack, recreational activities, and one hour of mandatory homework time. Over 150 students participated in the program in 2001.

The highest demand for childcare in Livermore, and the Tri-Valley area as a whole, was for spaces for children 5 to 10 years old. There were approximately 2,150 spaces needed for children 5 to 10 years of age. Actual supply was slightly less than this demand. For 2 to 5 years of age, the only age group in Livermore in which the supply of childcare spaces exceeded the demand, there were approximately 1,550 spaces available with 1,450 filled. For children under two years old, 500 spaces were available to meet a demand for over 700 spaces.

Almost 20 percent of parents interviewed by Child Care Links, the resource and referral service for parents seeking childcare in the eastern part of Alameda County, reported that they were unable to find childcare due to prohibitive costs. Other reasons parents were unable to find care included a lack of vacancies (17 percent), inability to find a care provider with a suitable schedule (14 percent), and unacceptable facilities (13 percent).

Average weekly costs for childcare in Livermore in 2002 varied by the neighborhood the facility was located in, as well as by the age of the child. For home-based facilities, the average weekly cost for care for a child under two years of age was $160.00. For children ages 2 to 5, the weekly cost averaged $143.00. For children ages 5 to 10, the cost averaged $102.00 per week. In childcare centers, costs were higher for infant care, with weekly costs averaging $220.00. Childcare center costs, however, were roughly the same as home-based facilities for children two to five years of age averaging $151.00, and were less expensive for children ages 5 to 10, averaging $78.00 per week. Average weekly costs for home-based childcare in Livermore were slightly higher than the Tri-Valley

averages in 2002, while center-based costs in Livermore were below the cost of care in Dublin and Pleasanton.

8. PALEONTOLOGICAL AND CULTURAL RESOURCES

The City of Livermore is home to a range of cultural and paleontological resources, including fossiliferous Pleistocene deposits, archaeological sites associated with the Livermore-Amador Valley's prehistoric inhabitants, historic buildings, structures, objects, and sites. This chapter addresses both paleontological and cultural resources of the City and its vicinity.

A. PALEONTOLOGICAL RESOURCES

The Livermore Valley is located in the Diablo Range of the northern Coast Ranges physiographic province. The Livermore Valley separates the Diablo Range into a northern range, the Altamont Hills and Mt. Diablo, and a southern range, dominated by Mt. Hamilton.

The Planning Area is predominantly composed of sedimentary and weakly metamorphosed rocks that range in age from 159 million years old to 10,000 years old. The Livermore Valley is filled with Miocene and younger gravel-bearing formations and is bounded on the west by the Calaveras Fault and on the east by the Greenville Fault. The Diablo Range hills surrounding the Livermore Valley consist of Jurassic and Cretaceous sedimentary rocks with Cenozoic sedimentary rocks flanking the sides.[1]

1. Methodology for Paleontological Research

A fossil locality search was conducted at the Museum of Paleontology at the University of California, Berkeley in May 2002 to identify fossil localities within and adjacent to the Planning Area (see Table 8-1). Several Pleistocene vertebrate fossil localities were identified within the Planning Area boundaries. The most recently discovered fossil locality is within the Lawrence Livermore National Laboratory, where a fossil mammoth was found during excavations in 1997 and 1998.[2]

2. Geological and Paleontological Setting

A number of fossiliferous deposits exist within the Planning Area. Figure 8-1 shows the locations of University of California Museum of Paleontology fossil localities in the Planning Area. This subsection describes these formations and indicates the types of resources they are likely to contain. Table 8-2 links the various ages with time periods.

a. Franciscan Complex. The Franciscan Complex, found in the extreme southeastern portion of the Planning Area, is a group of high pressure/low temperature metamorphic rocks formed during the

[1] Barlock, Vincent Emery, 1988. *Sedimentology of the Livermore Gravels (Miocene-Pleistocene), Southern Livermore Valley, California.* Masters Thesis, Department of Geology, San Jose State University.

[2] Photonics Spectra, 1998. "No Bones About it: Lawrence Livermore National Lab Has a Mammoth Problem." Website: www.photonics.com/Content/Feb98/busBones.html.

Table 8-1: Late Pliocene, Irvingtonian, and Rancholabrean Fossil Localities on Record with the University of California Museum of Paleontology

Locality Description	Locality Number[a]	Order	Family	Genus	Species	North American Land Mammal Age[b]
Foothills north of Livermore	1077	Perissodactyla	Equidae	Equus		Pleistocene-Rancholabrean[c]
Foothills north of Livermore	1077	Artiodactyla	Bovidae	Bison	bison	Pleistocene-Rancholabrean
Pits west of Livermore	70151	Proboscidea	Elephantidae	Mammuthus		Pleistocene-Rancholabrean
Pits west of Livermore	6111	Proboscidea	Elephantidae	Mammuthus		Pleistocene-Rancholabrean
Pits west of Livermore	75112	Proboscidea	Elephantidae	Mammuthus		Pleistocene-Rancholabrean
Foothills northeast of Livermore	69167	Proboscidea	Elephantidae	Mammuthus		Pleistocene-Rancholabrean
Foothills northeast of Livermore	5201	Proboscidea	Elephantidae	Mammuthus		Irvingtonian[d]
Foothills northeast of Livermore	4901	Proboscidea		Mammuthus & Equus		Irvingtonian
Foothills northeast of Livermore	7, 86011	Xenarthra	Mylodontidae	Glossotherium	harlani	Rancholabrean

[a] Locality number established by Museum of Paleontology, University of California, Berkeley.
[b] Time zones that divide time and climate changes into eras based on how mammals evolved, migrated, or became extinct.
[c] Rancholabrean Stage (0.5 to 0 million years ago)
[d] Irvingtonian Stage (1.8 to 0.5 million years ago)

Source: LSA Associates, Inc., 2002.

Jurassic and Cretaceous periods.[3] Fossils found in the Franciscan Complex within and adjacent to the Livermore Valley date to the Tithonian and Turonian ages, between 151 million and 89 million years ago. The Franciscan Complex is composed of abundant metamorphosed and unmetamorphosed graywacke; greenstone; conglomerate; serpentinite; blueschist and related schists; and varicolored red and green chert. Most of these rock types occur as blocks with sizes up to thousands of feet in length and width, encased within a sheared melange.

Table 8-2: Geologic Time Definitions

CENOZOIC ERA – 65 million years ago to present	
Quarternary Period 1.8 mya to present	Holocene Epoch (11,000 years ago to present)
	Pleistocene Epoch (1.8 mya 11,000 years ago)
Tertiary Period 65 mya to 1.8 mya	Pliocene Epoch (5 mya to 1.8 mya)
	Miocene Epoch (23 mya to 5 mya)
	Oligocene Epoch (38 mya to 23 mya)
	Eocene Epoch (54 mya to 38 mya)
	Paleocene Epoch (65 mya to 54 mya)
MESOZOIC ERA – 245 to 65 million years ago	
Cretaceous Period 146 mya to 65 mya	Turonian Epoch (94 mya to 89 mya)
Jurassic Period 208 mya to 146 mya	Tithonian Epoch (151 mya to 144 mya)

Note: mya = million years ago.
Source: University of California, Museum of Paleontology, 1998. *Geologic Time Machine*. Website: www.ucmp.berkeley.edu.

[3] Wakabayashi, John, 1999. Distribution of Displacement on and Evolution of a Young Transform Fault System: The Northern San Andreas Fault System, California. *Tectonics* 18(6).

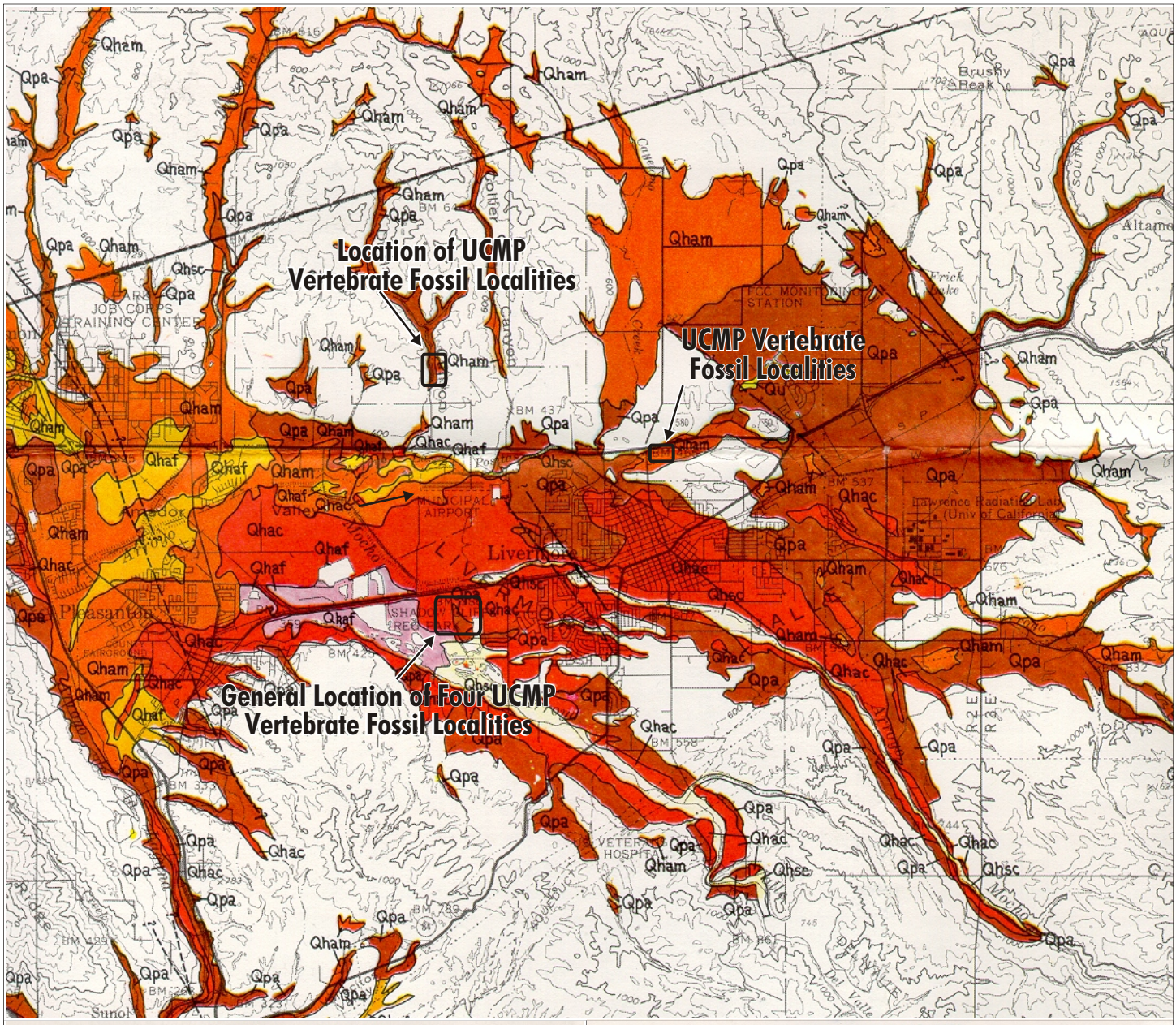

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FIGURE 8-1

Livermore General Plan Update
Master Environmental Assessment
UCMP Fossil Localities in the Planning Area

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MILES

SOURCE: HELLEY, E.J., K.R. LAJOIE, W.E. SPANGLE, AND M.L. BLAIR, 1979.

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Marine fossils, including icthysaurus (a marine vertebrate), and belemnite, buchia, and inoceramus (all marine invertebrates), occur in the least-metamorphosed rocks of the Franciscan Complex.

b. Great Valley Complex. The Great Valley Complex is situated in the southern and eastern portions of the Planning Area.[4] The Great Valley Complex is composed of lithic sandstone, graywacke, grayish black carbonaceous shale, and marine invertebrate fossils.[5] Fossils from these rocks date to the Tithononian through the Turonian ages, between 151 million and 89 million years ago. The Great Valley Complex can contain Jurassic and Cretaceous marine fossils, including ammonoids (marine invertebrates) and foraminifera (marine microfossils).[6]

c. Late Miocene Marine and Non-Marine Rocks. Miocene marine and non-marine rocks, roughly 13 million to 10 million years old, occur in the eastern and southwestern portions of the Planning Area. These rocks contain both marine and non-marine continental sedimentation patterns,[7] and include coarse, pebbly, fossiliferous beds; fine-grained, light gray sandstone; massive siltstone and claystone; arkosic sandstone; and andesitic-pebble conglomerate.[8]

The late Miocene Neroly Formation of the San Pablo Group, 23 million to 5 million years old, is present in the foothills east of Livermore Valley, where the San Pablo Group overlies the Great Valley Complex. The San Pablo Group also crops out in the northern and southern portions of the Planning Area.

The Briones Formation of the San Pablo Group may occur within the southern portion of the Planning Area. This Miocene marine formation contains vertebrate and invertebrate fossils.

d. Late Miocene and Pliocene Non-Marine Formations. Late Miocene to Pleistocene non-marine formations, approximately 9 million to 2.5 million years old, are present in the middle, northern, and southern portions of the Planning Area. These include the Lower and Upper Livermore Formation and the Sycamore Formation.[9]

(1) Lower Livermore Formation. The late Miocene to Pliocene Lower Livermore Formation formed about 5.2 to 2.5 million years ago. These loosely consolidated rocks crop out within the

[4] Wagner, D.L., E.J. Bortugno, and R. D. McJunkin, 1990. *Geologic Map of the San Francisco-San Jose Quadrangle, California.* California Division of Mines and Geology, Sacramento.

[5] Blake, M.C., R. W. Graymer, and D. L. Jones, 2000. *Geologic Map and Database of Parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California.* United States Geological Survey Miscellaneous Field Studies MF-2337, Version 1.0.

[6] Payne, M.B. Type Panoche Group (Upper Cretaceous) and Overlying Moreno and Tertiary Strata on the West Side of the San Joaquin Valley. In *Geologic Guide to the Gas and Oil Fields of Northern California*. Bulleting 181, California Division of Mines and Geology, pp. 165-175.

[7] California Department of Water Resources, 1966. *Livermore and Sunol Valleys, Evaluation of Ground Water Resources, Appendix A., Geology.* California Department of Water Resources Bulletin 118-2.

[8] Barlock, op. cit.

[9] Barlock, op. cit.

Isaacson, Kathleen A., 1990. *Late Tertiary Synorogenic Sedimentation in the Northern Livermore Basin, California.* Masters Thesis, Department of Geology, San Jose State University.

Livermore Valley plain and to the south and north of Livermore, and consist of sandstone and conglomerate deposited in a fluvial (river or stream) environment. This formation may interfinger with the Sycamore Formation. Several invertebrate and vertebrate non-marine fossil localities occur in the Lower Livermore Formation. The dominant classes of the conglomerate are sandstone and lithic sandstone, Franciscan Complex graywacke, and fine-grained veined quartz.[10]

(2) Upper Livermore Formation. The Pliocene to Pleistocene Upper Livermore Formation, formed between 3 and 1 million years ago, is composed of sandstone and conglomerate deposited in a fluvial environment.[11] Several vertebrate fossil localities occur in the Upper Livermore Formation within the Planning Area.

(3) Sycamore Formation. The Sycamore Formation dates from the late Miocene to the Pliocene, approximately 8.5 to 2 million years ago, and is composed of silt, clay, sandstone, and conglomerate.[12] This formation overlies the San Pablo Group and is exposed in the northern portion of the Planning Area. This formation contains extensive vertebrate and invertebrate terrestrial and lacustrine (lake) fossils. Among these fossils are:

- Hypolagus – rabbits
- Citellus – ground squirrels
- Eucastor cf. lecontei – beavers
- Vulpes cf. vafer – foxes
- Aelrodon cf. aphobus – hyenid dogs
- Osteoborus diabloensi – hyenid dogs
- Bassariscus parvus – cacomistles (small carnivorous racoon-like mammal)
- Procyoninae – racoon
- Mustelinae – weasels
- Pseudaelarus – giant true cat
- Machairodontinae – giant saber cats
- Gomphotherium – long-jawed mastodons
- Rhinocerotidae – rhinoceros
- Hipparion forcei – three-toed grazing horse
- Pliohippus leardi – three-toed grazing horse

[10] Barlock, op. cit.

[11] Barlock, op. cit.

[12] Isaacson, op. cit.

- Prosthennops – peccaries
- Ustatochoerus – large oreodonts (sheep-sized hoofed mammals)
- Procamelus – camels
- Pliauchenia – camels
- Paracamelus – large camels
- Capromeryx – hornless prongbacks

e. Quaternary Deposits. Unnamed Quaternary deposits of Pleistocene (1.9 million to 10,000 years ago) to Holocene (present) age occur in the central portion of the Livermore Valley. These deposits are composed of loosely consolidated sand and gravel deposited in fluvial systems.[13] Older Pleistocene deposits typically occur as terraces incised by Holocene fluvial drainages. The Pleistocene deposits contain boulders and Rancholabrean (10,000 years and older) fossils.[14] Typical Rancholabrean fossils include the remains of camels, mammoths, bison, horses, and ground sloths.

3. Paleontological Sensitivity

Four deposits within the Planning Area are likely to contain significant paleontological resources:

- The *Livermore Formation*, located in the foothills within and adjacent to the Planning Area, and unnamed Pleistocene deposits throughout the Livermore Valley plain are composed of interbedded lithologies including silt, fine- to coarse-grained sandstone, and conglomerate. They are the product of a network of fluvial and lacustrine systems that dominated this area from the Late Miocene (approximately seven million years ago) to the Pleistocene (10,000 years ago).
- The *Sycamore Formation*, mapped in the northern portion of the Planning Area, has the potential to contain late Miocene and Pliocene fossils.
- The *San Pablo Group*, exposed in various places within the Planning Area, has the potential to contain late Miocene fossils.
- The *Great Valley Complex* and *Franciscan Complex* exposed within the Planning Area have the potential to contain Jurassic and Cretaceous fossils.

B. CULTURAL RESOURCES

Cultural resources in the Planning Area are associated with the Livermore-Amador Valley's prehistoric past, the Spanish and Mexican periods, and the civic and agricultural development of Livermore. This discussion of cultural resources, along with the Cultural Resources Sensitivity Map (Figure 8-2) and Cultural Resources within the Planning Area table (Table 8-4) are intended to accomplish three objectives: 1) provide an overview of Livermore's prehistoric, ethnographic, and

[13] Helley, E. J., K.R. LaJoie, W. E. Spangle, and M.L. Blair, 1979. *Flatland Deposits of the San Francisco Bay Region: Their Geology and Engineering Properties and their Importance to Comprehensive Planning.* Geological Survey Professional Paper 943. United States Geological Survey and Department of Housing and Urban Development.

[14] Blake, M.C, et al., op. cit.

historic past; 2) indicate areas which are particularly sensitive for cultural resources; and 3) list all cultural resources identified in the Planning Area prior to June 2002.

1. Methodology for Cultural Resources Research

To prepare the following overview of known resources, as well as Figure 8-2 and Table 8-4, LSA conducted a review of historical, archaeological, and ethnographic source materials, including a records search (#01-1626) at the Northwest Information Center of the California Historical Resources Information System, Sonoma State University, on May 28, 2002. The Northwest Information Center is an affiliate of the California Office of Historic Preservation and is the official state repository of cultural resources reports and records for 16 northern California counties, including Alameda County.

The background research included a review of the *California Inventory of Historic Resources*[15] and the Office of Historic Preservation's *Five Views: An Ethnic Historic Site Survey for California* (1988), *California Historical Landmarks* (1996), *California Points of Historical Interest* (1992), and the *Directory of Properties in the Historic Property Data File* (April 25, 2002).[16] The *Directory of Properties* includes the listings of the National Register of Historic Places and the California Register of Historical Resources, and the most recent listings of the California Historical Landmarks and California Points of Historical Interest.

City of Livermore documents which list or discuss cultural resources were also reviewed. These included the *Community General Plan, 1976-2000*,[17] the *Livermore Cultural Resources Inventory*,[18] the *Draft Environmental Impact Report: East County Area Plan*,[19] the *North Livermore Specific Plan*,[20] the *Downtown Historical Assessment, City of Livermore*,[21] and cultural resource studies

[15] California Department of Parks and Recreation, 1976. California Department of Parks and Recreation, Sacramento.

[16] California Office of Historic Preservation, 1988. *Five Views: An Ethnic Historic Sites Survey for California.* California Department of Parks and Recreation, Sacramento.

California Office of Historic Preservation, 1990. *California Historical Landmarks.* California Department of Parks and Recreation, Sacramento.

California Office of Historic Preservation, 1992. *Points of Historical Interest.* California Department of Parks and Recreation, Sacramento.

California Office of Historic Preservation, 2002. *Directory of Properties in the Historic Properties Data File.* April 25, 2002. California Department of Parks and Recreation, Sacramento.

[17] Ibid.

[18] Bamburg, Bonnie L., 1988. *City of Livermore Historical Resources Inventory.* Urban Programmers, San Jose, California.

[19] Alameda County Planning Department, 1993. *Draft Environmental Impact Report: East County Area Plan.*

[20] Alameda County, City of Livermore, SWA Group, and Lamphier and Associates, 2000. *North Livermore Specific Plan.* Three volumes.

[21] Carey & Co., Inc., 1999. *Downtown Historical Assessment, City of Livermore*.

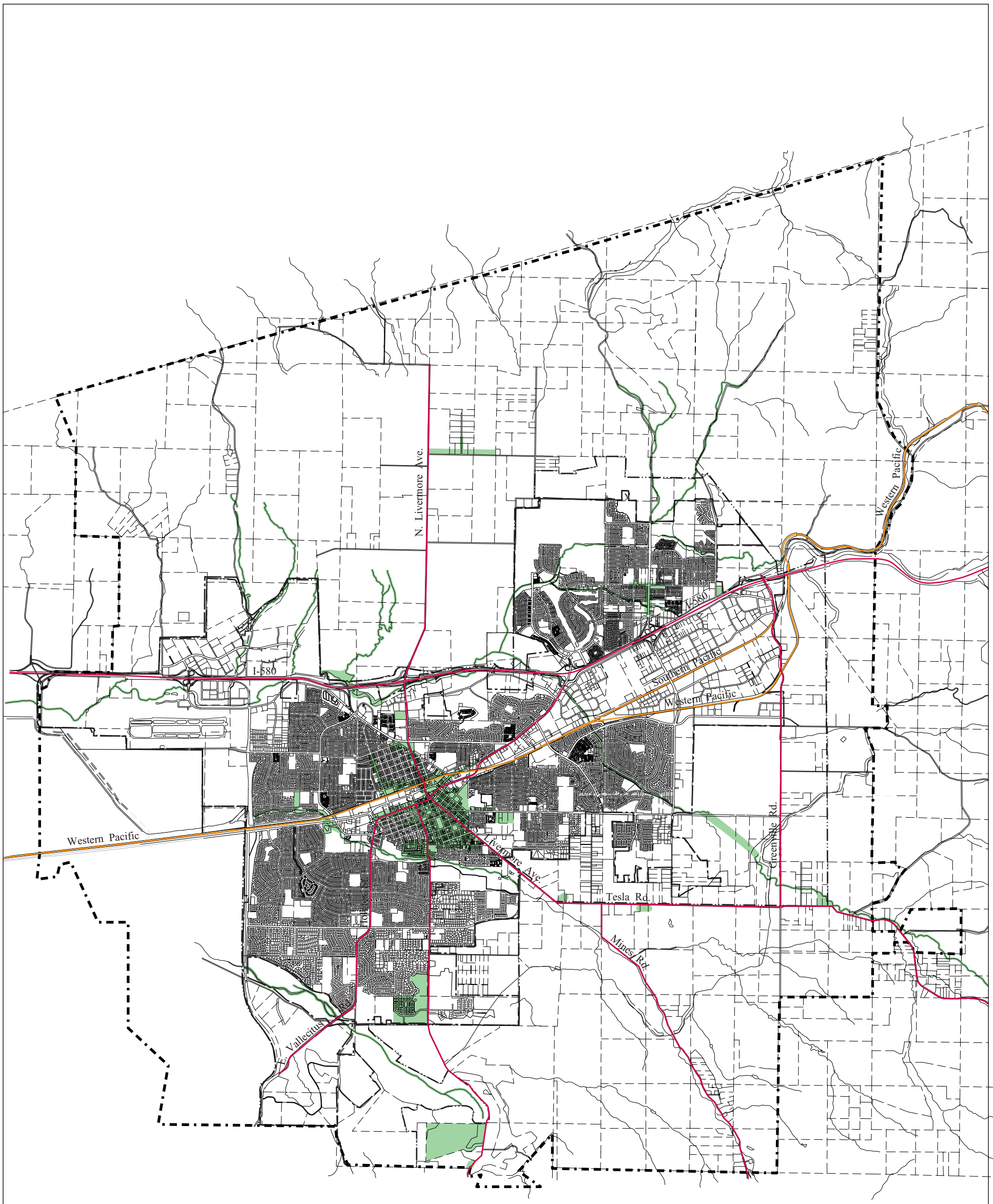

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FIGURE 8-2

Livermore General Plan Update
Master Environmental Assessment
Culturally Sensitive Areas

LEGEND

- PLANNING AREA BOUNDARY
- CITY LIMIT LINE
- SPHERE OF influence
- URBAN GROWTH BOUNDARY
- CULTURALLY SENSITIVE AREAS
- RAILROADS
- ROADS

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Note:
This map is for general planning purposes only. Culturally sensitive areas shown on this map include areas where cultural resources are known to be present (as of June 2002) and areas which are considered sensitive because of their physical and environmental characteristics. Because not all of the study area has been surveyed for cultural resources, there may be resources outside the marked culurally sensitive areas. No area should be excluded from further study because it is not marked as culturally sensitive on this map.

SOURCE: LSA ASSOCIATES, INC., 2002.

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prepared for the North Livermore Master Plan/Specific Plan and the Vasco-Laughlin Specific Plan and Open Space/Resource Conservation Program.[22]

The Native American Heritage Commission and the Livermore Heritage Guild were contacted to determine if these groups had information or concerns about cultural resources within the Planning Area. The Native American Heritage Commission indicated that their Sacred Lands File includes a Native American resource within the Planning Area and recommended that Don Hankins be contacted for information about the resource and appropriate mitigation measures for potential project impacts. In July 2002, the Livermore Heritage Guild reviewed the compiled list of cultural resources for accuracy and provided comment and input.

2. Livermore History

The following subsection provides an overview of the historical aspects of Livermore—Native Californians, European explorers, missions and ranchos, and civic development—that contribute to the City's cultural resources.

a. Native Californians. The Livermore-Amador Valley was initially occupied by native Californians between 6,000 and 12,000 years ago. The area's earliest inhabitants are referred to by archaeologists as "Paleoindians." Paleoindian groups were the first humans to enter California, and subsisted mainly on big game and minimally processed plant foods. The Paleo period lasted roughly from 10,000 to 6,000 B.C., and was followed by the Archaic period, which is broken down into three stages: the Lower Archaic (6,000 to 3,000 B.C.); the Middle Archaic (3,000 to 1,000 B.C.); and the Upper Archaic (1,000 B.C. to A.D. 500). Archaic cultures developed complex trade networks, an increasing variety of plant foods, and elaborate burial and grave goods. The final prehistoric period, the Emergent, lasted from A.D. 500 to the establishment of permanent non-native settlements in the area, circa A.D. 1800.[23] The Emergent period is marked by the introduction of the bow and arrow, the development of wealth-linked social status, and the elaboration and expansion of trade networks, demonstrated in part by the appearance of clam disk bead money.[24]

The descendants of the native groups who lived in the Livermore area prefer to be called Ohlone, although they are often referred to by the name of their linguistic group, Costanoan. The Planning Area is within the former territories of the *Ssoam*, *Luecha*, and *Pelnen* tribelets,[25] three of approximately 40 Ohlone tribes which existed in the Bay Area prior to European settlement in the region.

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[22] Wiberg, Randy S., Randall Dean, and Miley P. Holman, 1998. *A Cultural Resource Study for the North Livermore Master Plan/Specific Plan Environmental Impact Report, Alameda County, California.*

Wiberg, Randy S. and Randall Dean, 2000. *Cultural Resources Study for the Vasco-Laughlin Specific Plan and Open Space/Resource Conservation Program, City of Livermore and Alameda County, California.*

[23] Mission San Jose, in Fremont, was established in 1797, but European settlers did not build homes in the Livermore-Amador Valley until about 1835.

[24] Fredrickson, David A., 1974. Cultural Diversity in Early Central California: A View From the North Coast Ranges. *Journal of California Anthropology* 1(1):41-53.

Moratto, Michael J., 1984. *California Archaeology.* Academic Press, Orlando, Florida.

[25] Milliken, Randall, 1995. *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769-1810*. Ballena Press Anthropological Papers No. 43. Ballena Press, Menlo Park, California.

b. European Explorers, Missions, and Ranchos. In the late 18th century, the Bay Area was the northern frontier of Spanish colonial expansion. Explorers, traders, and privateers had been traveling up and down the Pacific Coast for two centuries before any serious plans to establish permanent settlements were made. In 1769, the first mission in Alta California was established at San Diego; a chain of missions, running north along the Pacific coast, reached San Francisco in 1776. Additional Bay Area missions were established at Santa Clara, in 1777; San Jose de Guadalupe (in present-day Fremont) in 1797; San Rafael, in 1817; and San Francisco Solano de Sonoma, in 1823.[26]

The missionaries' goal was to transform the native people of California into farmers and loyal subjects of the Spanish Crown. This goal was difficult to achieve for a variety of reasons, chief among them the native Californians' low resistance to European diseases. The establishment of Mission San Jose had a devastating effect on the Livermore-Amador Valley's native peoples. Archaeologist Randall Milliken writes, "Newly opened Mission San Jose immediately surpassed the two older Bay Area missions in its death rate."[27]

A number of native Californians resisted incorporation into the mission system. The Luechas of the eastern Livermore-Amador Valley were known for finding and attacking foreigners who entered their territory. In 1805, a group of Luechas attacked and killed Mission San Jose steward Ygnacio Higuera and three Mission San Jose Indians, and wounded a Franciscan priest. This incident may have given Arroyo Mocho (which translates as "Mutilated Creek") its name.[28]

Many Luechas were baptized at missions Santa Clara and San Jose during 1805 and 1806. The Pelnen of the western Livermore-Amador Valley moved to Mission San Jose between 1798 and 1805. The Ssoam, who had lived near Brushy Peak and the Altamont Pass, and their subsidiary group, the Yuliens, began moving into Mission San Jose in 1802 and were apparently largely incorporated into the mission by 1808.[29] Baptismal records indicate that there were no Ohlone tribelets living an "aboriginal existence" by 1810.[30]

In 1821, California became a Mexican territory when Mexico won its independence from Spain. During the Mexican period, the missions' influence on life in California waned. The missions were officially disbanded in 1834 and their land holdings given away by the government. This secularization program was intended to benefit former Mission neophytes, but in practice most of the beneficiaries were government administrators and their friends. Many of the former Mission Indians became laborers on the ranchos.[31]

During the Mexican period, much of California was administered as privately-held ranchos, large tracts of land typically used for cattle ranching and owned by an individual, family, or group of

[26] Rolle, Andrew, 1987. *California: A History.* 4th Edition. Harlan Davidson, Inc., Arlington Heights, Illinois.

[27] Milliken, op. cit., p. 172.

[28] Milliken, op. cit., p. 185-186, 247.

[29] Milliken, op. cit., p. 247, 251, 255.

[30] Levy, Richard, 1978. Costanoan. In *Handbook of North American Indians, Volume 8: California*, p. 485-495. Robert F. Heizer, Editor. Smithsonian Institution.

[31] Rolle, op. cit., p. 121.

investors. These lands were granted to their owners by the government, often as a reward for service. The modern City of Livermore includes lands which were part of three ranchos: Rancho Santa Rita, to the west; Rancho Las Positas, which included most of today's urban Livermore; and Rancho El Valle de San Jose, southwest of today's Downtown Livermore. Nearby ranchos included Rancho San Ramon, to the northwest of today's Livermore, and Rancho Canada de los Vaqueros, to the northeast.

Northern California's ranchos primarily produced hides and tallow, which supplied leather and soap factories of the eastern United States and Britain. "Thus during the Mexican period, California became like a typical 'third world' developing country," writes historian Charles Wollenberg, "exporting unprocessed primary goods to the economically developed parts of the world, and receiving manufactured goods in return."[32] Rancho San Ramon and Rancho Las Positas both diverged somewhat from this economic model: Jose Maria Amador, the first owner of Rancho San Ramon, produced leather goods, soap, and wagons in adobe "factories" on the rancho, while Robert Livermore, owner of Rancho Las Positas, planted a vineyard and pear and olive orchards.[33]

c. Civic Development. The first municipality in the Planning Area had its roots in a hotel built by Louisiana native Alphonso S. Ladd and his wife on the road to Stockton. Dates vary as to when this building was constructed. Hoover et al. state that Ladd and his wife built the hotel in 1855.[34] The Livermore Heritage Guild, however, states that they did not begin work on the hotel until 1864.[35] The small settlement that grew up around the hotel became known as Laddsville, and officially came into being in 1864.[36] Laddsville did well economically, growing to include a general store, drug store, bakery, harness-maker and smithy, saloons, and a brewery.

The town of Livermore, established along the Central Pacific Railroad line in 1869 by overland pioneer and cattle rancher William Mendenhall, was Laddsville's closest neighbor until fire figured prominently in Laddsville's demise. According to the Livermore Heritage Guild, an 1871 fire in Laddsville's business district quickly spread throughout town, leaving many residents homeless; the town was never rebuilt and most residents moved to Livermore.[37] Hoover et al., however, state that an 1876 fire destroyed the prosperous Ladd Hotel, after which Laddsville could not recover and keep pace with the town of Livermore in terms of local importance.[38] Mendenhall's town, named for earlier settler Robert Livermore, consisted of approximately 35 city blocks that paralleled the railroad tracks. The rancher donated lots for a college, a church, and a Central Pacific depot.[39]

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[32] Wollenberg, Charles, 1985. *Golden Gate Metropolis: Perspectives on Bay Area History.* Institute of Governmental Studies, University of California, Berkeley, p.62.

[33] Hoover, Mildred Brooke, Hero Eugene Rensch, Ethel Grace Rensch, and William N. Abeloe, 1990. *Historic Spots in California.* 4th Edition, Revised by Douglas E. Kyle. Stanford University Press.

[34] Hoover *et al*., op. cit., p. 12.

[35] Livermore Heritage Guild, 1999. "Laddsville." Website: www.lhg.org/history%20folder/4laddsville.html.

[36] Gudde, Erwin G., 1998. *California Place Names.* 4th Edition, Revised and enlarged by William Bright. University of California Press, Berkeley, p. 212.

[37] Livermore Heritage Guild, op. cit., "Laddsville."

[38] Hoover *et al*., op. cit., p. 12-13.

[39] Drummond, op. cit., p. 7-9.

The depot proved critical to the new town's success, as Livermore became an important shipping point for the Livermore-Amador Valley's agricultural produce. Local farmers and ranchers grew wheat, planted vineyards and orchards, and raised sheep, horses, cattle, and even angora goats.[40] In the late nineteenth century, the viticultural industry experienced particular growth, with vineyard acreage increasing from 40 acres in the 1870s to over 4,000 acres by 1884. Viticultural statistics vary, however; the Livermore Heritage Guild states that vineyard acreage increased from less than 100 in 1880 to more than 4,000 in 1885.[41] "The most highly regarded of the new regions exploited for vines around this time was the Livermore Valley in Alameda County . . . it has from the outset made good dry white wine, for many, many years a thing that the rest of California had trouble in producing."[42]

The City of Livermore continued to experience moderate growth through the mid-20th century, serving as both a regional shipping point and small commercial town. Livermore's dominance as a transportation center increased when the Western Pacific Railroad was laid through Downtown in 1908, and again in the early 1920s when the Lincoln Highway—the nation's first transcontinental paved highway—was routed through the community. The Livermore Heritage Guild, however, cites 1915 as the date for the entry of the Lincoln Highway into Livermore.[43] The Lincoln Highway, which was broken up into five U.S. highways in 1928, was advertised as the "shortest and most direct route between New York and San Francisco."[44]

Other notable civic facilities included a free public library, established with a grant from Andrew Carnegie in 1911, the Arroyo del Valle Sanitarium, and a large federal hospital for veterans with tuberculosis, on Arroyo Road.[45] In 1952, Livermore was dramatically transformed when the Lawrence Livermore National Laboratory opened at the former naval air station east of town. By 1960, the lab employed almost 4,000 workers; by 2000, that number had grown to approximately 7,000. In the half century since its founding, the lab's mission has grown from nuclear weapons development to include medical, computer science, and chemistry research.[46] In 1956, Sandia National Laboratory was established to assist Lawrence Livermore National Laboratory in weapons development, and has since diversified to include research related to combustion studies and micro-electronics; Sandia National Laboratory, Livermore, currently employs about 850 people.[47] The City of Livermore has grown from an agricultural community to an economically-diverse Bay Area city,

[40] Wood, M.W., 1883. *History of Alameda County, California.* M.W. Wood, Publisher.

[41] Drummond, Gary. Personal Communication, 2003.

[42] Pinney, Thomas, 1989. *A History of Wine in America: From the Beginnings to Prohibition.* University of California Press, Berkeley and Los Angeles, p. 320-321.

[43] Lincoln Highway Association-California Chapter, 2000. "Lincoln Highway Garage, Livermore, California." Website: www.lincolnhighwayassoc.org/ca/meetings/2000-01.html.

[44] Ahlgren, Carol, 1998. "Nebraska: The Lincoln Highway," in *Saving Historic Reads: Design and Policy Guidelines,* Paul Daniel Marriott, Editor. The National Trust for Historic Preservation and John Wiley and Sons, Inc.

[45] Hoover *et al.*, op. cit., p. 13.

[46] Lawrence Livermore National Laboratory, 2002. "About the Lab: Laboratory History." Website: www.llnl.gov/llnl/02about-llnl/history.html.

[47] Sandia Corporation, 2002. "About Sandia." Website: www.sandia.gov/about/history/index.html.

complete with technology firms, retail stores, and residential housing. Today, the City's population is approximately 75,000 per California Department of Finance 2002 population estimates.[48]

3. Cultural Resources Sensitivity Map

Figure 8-2 indicates areas of sensitivity for cultural resources; these areas were determined based on a review of historical records, accounts, and maps described previously.[49] The Cultural Resources Sensitivity Map also indicates the locations of relatively unaltered riparian corridors within the Planning Area, which are likely to be sensitive for prehistoric resources because native peoples often located where fresh water was available.

The Cultural Resources Sensitivity Map is intended only as a general planning tool. The shaded areas on the map indicate areas which are known to be culturally sensitive. An area which is not shaded may still contain significant cultural resources. The Cultural Resources Sensitivity Map should not be used to exclude any area from project-specific studies.

4. Cultural Resources Within the Planning Area

There are a total of 405 cultural resources within the Planning Area, of which five have been determined eligible for listing on the National Register of Historic Places. An additional 160 are listed in the City of Livermore's Historic Resources Inventory and Heritage Sites and Buildings, and/or are ranked as potentially locally significant in the *Directory of Properties in the Historic Property Data File*. The remaining 240 either have not been formally evaluated, may become eligible for listing on local, State, or national registers, or have been determined ineligible for listing on local, State, or national registers. Listed properties include:

- Bank of Italy Building, 1922
- Christopher Buckley Estate, 1885
- DJ Murphy Home, 1890

Cultural resources within Livermore fall into three broad categories: 1) prehistoric resources; 2) historic urban resources; and 3) historic rural/agricultural resources. Prehistoric resources tend to cluster near water sources such as creeks or springs. Historic urban resources are concentrated in Livermore's historic Downtown, an area roughly bounded by Railroad Avenue to the north, Livermore Avenue to the east, College Avenue to the south, and Holmes and First streets to the west. Historic rural/agricultural resources, typically associated with viticulture, dry farming, or stock raising, are present in the northern parts of the Planning Area and, to a lesser degree, in southern and eastern Livermore. The Trevarno Road area is particularly noted for its contribution to Livermore's industrial and residential history. Trevarno, meaning "Head of the Valley" in Welsh, was the name given this area in tribute to the hometown of the inventor of the safety fuse. The Trevarno Road industrial and residential district is the site where Coast Manufacturing Company established manufacturing facilities to produce safety fuses in 1913. The industrial complex, along with the

[48] California Department of Finance, 2002. Website: www.dof.ca.gov.

[49] United States Geological Survey, 1916. *Pleasanton, Calif.* 15-minute topographic quadrangle. United States Geological Survey, 1940. *Pleasanton, Calif.* 15-minute topographic quadrangle. United States Geological Survey, 1942. *Altamont, Calif.* 15-minute topographic quadrangle. United States Geological Survey, 1953. *Altamont, Calif.* 7.5-minute topographic quadrangle. United States Geological Survey, 1953. *Livermore, Calif.* 7.5-minute topographic quadrangle.

company-provided housing, were important in the early 20th century industrial and economic development of Livermore. The Hexcel Company merged with Coast Manufacturing in 1968, and later sold the remaining company homes to private developers.[50]

Table 8-3 presents the keys that explain the codes used in Table 8-4, as well as Appendices C-2 and C-3. The general status code is the first number that appears in the code column. The subsequent numbers give more detailed information about the resource. A more detailed description of these codes is available in Appendix 2 of the California Office of Historic Preservation publication Instructions for Recording Historical Resources.[51] Please note that Table 8-4 contains a mix of properties identified as meeting the minimum standards to be recorded as historical resources;[52] some have and some have not been formally evaluated for historical significance. This document does not include historical evaluations of cultural resources; Table 8-4 only presents cultural resources identified in applicable resource inventories or previous studies. The Livermore Heritage Guild provided additional information about some of the cultural resources in Table 8-4.

Table 8-3: Keys to Codes and Sources for the Cultural Resource Table, National Register of Historic Places, and Eligibility

Table or General Status Code	Source
CULTURAL RESOURCE TABLE	
NWIC	Files of the Northwest Information Center, Sonoma State University, Rohnert Park, California
H	*Directory of Properties in the Historic Property Data File*, California Office of Historic Preservation, April 25, 2002
L	Livermore Historic Resources Inventory, 1988
LH	City of Livermore Heritage Sites and Buildings, Livermore General Plan, 1976
C	Caltrans Bridge Inventory, 2001
HRI	*California Inventory of Historic Resources*, California Department of Parks and Recreation, 1976
CHL	*California Historical Landmarks*, Office of Historic Preservation, 1990
D	*Downtown Historical Assessment, City of Livermore*, 1999
LHG	Livermore Heritage Guild letter 2002
P	California Points of Historical Interest
NATIONAL REGISTER OF HISTORIC PLACES	
1	Listed in the National Register
2	Determined eligible for the National Register in a formal process involving federal agencies
3	Appears eligible for listing in the National Register in the judgement of the person(s) completing or reviewing the form
4	Might become eligible for listing
5	Ineligible for the National Register but still of local interest
6	None of the above
7	Undetermined
ELIGIBILITY	
Y	Resource is eligible for listing on California or National registers.
N	Resource is not eligible for listing on California or National registers.
M	Resource may become eligible for listing on California or National Registers.
L	Resource has local importance.

Source: California Office of Historic Preservation, *Instructions for Recording Historical Resources*.

Table 8-4 is based on the California Office of Historic Preservation's *Directory of Properties in the Historic Property Data File* (April 25, 2002 revision), the files of the Northwest Information Center, the 1988 City of Livermore Historic Resources Inventory, and the City of Livermore Heritage Sites and Buildings list from the 1976 General Plan. Table 8-4 lists the resources within the Planning Area, giving the resource's street address or location, its primary number, its trinomial (where applicable), the date when it was built, its National Register of Historic Places Status Code, its eligibility for local and State or national listing, the source in which it is listed, and a brief description.

Text continues on page 185

[50] ACE, 2002. "Along the ACE Route, Livermore" by Ken Meeker. Website: www.acetrail.com/info-13.html; Bamburg, Bonnie L., 1988. op. cit.

[51] Office of Historic Preservation, 1995. *Instructions for Recording Historical Resources.* Office of Historic Preservation, Sacramento.

[52] Office of Historic Preservation, 1995. op. cit.

Table 8-4: Cultural Resources within the Planning Area

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
487	E Airway Blvd	01-002203					NWIC	Gandolfo Ranch
487	E Airway Blvd	01-002204		1874			NWIC	Gandolfo Ranch
487	E Airway Blvd	01-002205		1874			NWIC	Gandolfo Ranch
	SW of 487 E. Airway Blvd	01-002196					NWIC,LH	Ramke Ranch remains
	Airway & Kitty Hawk	01-002198					NWIC	Sandstone mano
	Altamont Pass Rd	01-005915		1922	2S2	Y	H	Bridge #33C-6, Carroll Overhead
	Arroyo Las Positas & Cayetano Creek	01-002200					NWIC	Hammerstone fragment
	Arroyo Las Positas & Cayetano Creek	01-002201					NWIC	Artifact scatter
	Arroyo Las Positas & Cayetano Creek	01-002202					NWIC	Bifacial sandstone fragment
	Arroyo Las Positas N of Arroyo Mocho	C-737					NWIC	Trash dump
2647	Arroyo Rd	01-003349		1885	3	Y	H,L,LH	Christopher Buckley Estate
2647	Arroyo Rd	01-006790		1893	1S	Y	H,L,P	Ravenswood Carriage House
2647	Arroyo Rd	01-006787		1893	1S	Y	H,L,HRI,P	Ravenswood Main House
2647	Arroyo Rd	01-006788		1893	1S	Y	H,L,P	Ravenswood Bedroom House
2647	Arroyo Rd	01-006789		1893	1S	Y	H,L,P	Ravenswood Tank House
5050	Arroyo Rd	01-003602		1882	4D	M	H,LH,HRI,CHL	Cresta Blanca Winery; SHL #586
	Arroyo Rd	01-003600		1890	4S	M	H	Olivina Gateway Arch
	Btwn Arroyo Las Positas & Cayetano Creek	01-000067	ALA-047				NWIC	
	Building 962	01-005904		1940	6Y1	N	H	Sandia National Laboratory
	Cayetano Rd & I-580	01-002197					NWIC	Ranch remains
1816	Chestnut St	01-003351		1890	6	N	H,L	McBride Property Site
2083	Chestnut St	01-003352		0	5S	L	H,L	Circa 1886[1]
	Chestnut St	01-003350		1890	4S	M	H	Row of Olive Trees
242	Church St	01-003353		1893	3S	Y	H,L	Wagoner Winery
	College Ave and South L Street						LH	Livermore Sanatorium & Mendenhall Home Site
1531	College Avenue					L	L	Clary House; 1875[1] Listed as Chestnut St in Source L
1617	College Ave	01-003354		1950	4S	M	H,L	Livermore College Site
1909	College Ave	01-003355		1888	5S	L	H,L	Dr. WS Taylor Home, moved 1976[1]
2101	College Ave	01-003356		1915	5S	L	H	Livermore Sanatorium Staff Residence[1]
2102	College Ave					L	L	
2211	College Ave	01-003357		1876	3S	Y	H,L	Jesse Bowles Home[1]
2489	College Ave	01-003358		1910	6	N	H,L	
2551	College Ave	01-003359		1925	3S	Y	H,L	
	East Ave						LH	St. Michael's Cemetery[1]
	East Ave						LHG	IOOF Cemetery Memory Gardens

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
2785	East Ave			1933		L	LHG	Built by Cerruti[1]
3057	East Ave	01-003360		1880	3S	Y	H,L,LH	H Callaghan House
3138	East Ave	01-003361		1920	6	N	H,L	
2516	Eighth St	01-003596		1906	5S	L	H,L	
2519	Eighth St	01-003597		1915	5S	L	H,L	Henry House
2548	Eighth St	01-003598		1875	5S	L	H,L	
2785	Eighth St	01-003599		1870	6	N	H,L	
	El Charro Rd. near I-580	C-1283					NWIC	
1790	Elm St	01-003362		1909	5S	L	H,L	
1713	Fifth St	01-003572		1901	6	N	H,L	1920[1]
1813	Fifth St	01-003573		1924	5S	L	H,L	
1827	Fifth St	01-003574		1907	5S	L	H,L	
1858	Fifth St	01-003575		1926	5S	L	H,L	
1885	Fifth St	01-003576		1885	5S	L	H,L	
1886	Fifth St	01-003577		1887	3S	Y	H,L	
1917	Fifth St	01-003578		1917	5S	L	H,L	
1945	Fifth St	01-003579		1920	5S	L	H,L	
2145	Fifth St	01-003580		0	3S	Y	H,L	1920[1]
2173	Fifth St	01-003581		1870	4S	M	H,L	1889[1]
2253	Fifth St	01-003582		1922/1923	3S	Y	H,L,LHG	Livermore Grammar School; (Fifth Street School)
2391	Fifth St	01-003583		1888	5S	L	H,L	Wilder House
2532	Fifth St	01-003584		1935	5S	L	H,L	
2533	Fifth St					L	L	1935[1]
2534	Fifth St					L	L	1935[1]
	First St and Livermore Avenue	01-003473		1905	3S	Y	H,LH,HRI	Flagpole
1571	First St	01-003474		1960	6	N	H,L	Demolished[1]
1814	First St	01-003475		1945	5S	L	H,L	
1987	First St	01-003476		1908	4S	M	H,L	Valley Hotel Annex
2008	First St			1920/62		M	D	Valley Gas Station; LHG wants this removed[1]
2017	First St	01-003477		1941	5S	L	H,L,D	Purity Store, (Donut Wheel)
2020	First St	01-003478		1904	5S	L	H,L,D	Mack Building; heavy modification[1]
2026	First St					L	H,L,D	Mack Building; heavy modification[1]
2029	First St			1909		L	D,LHG	J.C. Stafford Furniture Store
2041	First St					M	D	(Cleo's Memory Lane Antique)
2032	First St					L	L,D	Mack Building; heavy modification[1]
2044/2048	First St	01-003479		1890	5S	L	H,D,LHG	(Normandy Beauty Salon)

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
2047	First St	01-003480		1900	4S	M	H,L,D	Demolished[1]
2053	First St	01-003481		1935	4S	M	H,L,D	(Blue Goose Gifts)
2059	First St	01-003482		1931	4S	M	H,L,D	(Great Szechwan Restaurant)
2062	First St	01-003483		1887	5S	L	H,L,D	Marx Building, Rosenthal Building
2062	First St	01-005895			7K	N	H,L,D	Travel Agency; LHG wants this removed[1]
2071	First St	01-003484		1912	4S	M	H,L,D	C P Rapoli Building, VE Club
2074	First St	01-003485		1895	5S	L	H,L,D	
2080	First St					L	L,D	
2083	First St	01-003486		1877	4S	M	H,L,D,LHG	Whitmore Building (Schoenstedt Saloon; built in 1869/70)[1]
2086	First St	01-003487		1884	4S	M	H,L,D	(Livermore Party Time)
2086	First St	01-005733			6Y	N	H,L,D	Residence
2106	First St	01-003488		1930	4S	M	H,L,D	Hagstroms Market, (Livermore Beauty)
2118	First St	01-003489		1925	4S	M	H,L,D,LHG	Central Meat Market
2120	First St	01-005896			7K	N	H,L,D	(Prospector's Claim)
2121	First St	01-003490		1909	6	N	H,D	Bernal and Bonetti Building
2124	First St	01-003605		1895	4S	M	H,L,D	(Prospector's Claim, Good Book Store)
2127	First St	01-003491		1908	4S	M	H,L,D	Jordan's Brewery Site
2130	First St	01-003492		1878	4S	M	H,L,D	Livermore Library Reading Room
2133	First St	01-003493		1936	4S	M	H,L,D	Purity Stores, Cycle Center
2133	First St	01-005899			7K	N	H,L,D	Livermore Schwinn
2136	First St					L	L,D	Livermore Library Reading Room
2145	First St			1900		M	D,LHG	1999 renovation removed historical significance[1]
2148	First St	01-003494		1937	4S	M	H,L,D	(Vans Health Foods)
2156/ 2184	First St	01-005900 01-003495		1873	3S	Y	H,L,D,HRI, LH,LHG	IOOF Oddfellows Hall; enlarged in 1874[1]
2157	First St			1960		M	D	(Chamber of Commerce)
2175	First St	01-003496		1945	4S	M	H,L,D	
2181	First St					L	L,D	
2187	First St	01-005903			7K	N	H,L,D	(Fun Factory)[1]
2190	First St	01-003497		1915	4S	M	H,L,D	1915 Building
2193	First St	01-005893			7K	N	H,D	(Valley Furniture)[1]
2196	First St					L	L,D	1915 Building
2200	First St					L	L,D	1915 Building
2205	First St	01-003498		1946	5S	L	H,L,D,LHG	Has been modified so as to lose its historical significance[1]
2206	First St	01-003499		1921	4S	M	H,L,D	(Print Shop)

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
2211	First St	01-003500		1940	4S	M	H,L,D	(Tri Valley Cobbler)
2212	First St	01-003501		1889	4S	M	H,L,D	America Outdoor Sports Supply
2216	First St					L	L,D	(Gun and Ammo Shop)
2219/ 2223/2235	First St	01-003502		1914	3S	Y	H,L,D,LHG	L Schenone Building
2220	First St	01-003503		1932	4S	M	H,L,D	(Barter/Rather Ripped Records)
2226	First St	01-005898			7K	N	H,L,D	(Ruth's Flowers and Gifts)
2241	First St	01-003504		1931	4S	M	H,L,D	(Elite Soda and Candy Store)
2247	First St	01-003505		1909	3S	Y	H,L,D,LH	Masonic Building
2250	First St	01-003506		1922	1S	Y	H,L,D,LH	Bank of Italy, Livermore City Hall
2262	First St	01-003507		1886	4S	M	H,L,D	Portion of McLeod Building
2288	First St			1886		M	D	(Livermore Cyclery)
2290	First St	01-003508		1886	4S	M	H,L,D	ND Dutcher & Son Hardware
2293	First St			1980		M	D	(McKay's Bar & Grill)
2310	First St	01-003509		1883	4S	M	H,L,D	LHG questions the date[1]
2321	First St			1940		M	D	(Jim's Glass)
2326	First St	01-003510		1912	4S	M	H,D	(Valley Garage)
2332	First St	01-003511		1926	4S	M	H,L,D	(Anderson Motors Garage)
2338	First St			1926		M	D	(Mixed Retail)
2339	First St			1950		M	D	(Bill's Antiques, Offices)
2350	First St			1926		M	D	(Mixed Retail)
2364	First St	01-005901			7K	N	H	(Natalie's Deli)
2365	First St	01-003512		1875	3S	Y	H,L,D,LHG	FH Hawley Building (Old City Hall); circa 1885[1]
2366	First St			1960		M	D	(Howard Floor Co, Inc)
2369	First St			1906		L	L,D,LHG	(Fire Dept)
2389	First St			1950		M	D	(Jimmy's Sports Bar & Grill)
4260	First St	01-006836		1927	3S	Y	H,LH	Robert Schenone House
	Fourth & K Streets						LH	Old Sanctuary, Presbyterian Church, 1874[1]
1342	Fourth St.						LH	Winegar Home, 1900[1]
1609	Fourth St	01-003557		1928	6	N	H,L	
1679	Fourth St	01-003558		1905	5S	L	H,L	
2157	Fourth St	01-003559		1905	5S	L	H,L	
2205	Fourth St	01-003560		1915	5S	L	H,L	Nissen Home
2210	Fourth St	01-003561		1910	3S	Y	H,L	Beck Home
2255	Fourth St	01-003562		1870	5S	L	H,L	
2273	Fourth St	01-003563		1909	5S	L	H,L	Emminger Home

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
2317	Fourth St	01-003564		1880	4S	M	H,L	
2417	Fourth St	01-003565		1920	5D	L	H,L	
2439	Fourth St	01-003566		1920	5D	L	H,L	
2445	Fourth St	01-003567		1920	5D	L	H,L	
2493	Fourth St	01-003569		1880	5S	L	H,L,LHG	ca. 1910 build date[1]
2510	Fourth St	01-003570		1915	6	N	H,L	Christensen Residence
2593	Fourth St	01-003571		1908	6	N	H,L	
	Fourth St	01-003568		1920	5S	L	H	
3068	Gardella Plaza	01-003369		1867	5S	L	H,L	Horton House
	Isabel Ave near E Stanley	01-002123	ALA-517H				NWIC	Burned house site
925	Junction Ave	01-003465		1910	3	Y	H,LHG	Highway House, Durant Garage; see 2016 Pine St.[1]
	E of Junction Ave; N of S Pacific tracks			1864			LH,HRI	Laddsville Site
	Las Positas Creek & I-580	01-002194					NWIC	Historical ranch remains
	Las Positas Creek & I-580	01-002195	ALA-584H				NWIC	Jim Anderson historical ranch remains
211	Maple St	01-003443		1922	6	N	H,L,LHG	Has been removed by development
212	Maple St	01-003444		1892	6	N	H,L,LHG	Has been removed by development
372	Maple St	01-003445		1912	3S	Y	H,L,LH	Saint Michael's School
458	Maple St	01-003446		1918	3S	Y	H,L,LH	Saint Michael's Church
	May School Rd	01-003601		1890	3S	Y	H,HRI,LH,LHG	May School Site; LHG wants date removed[1]
156	McLeod St	01-003447		1922	3S	Y	H,L,D	Jail, Delinquent Dog
209	McLeod St			1920		M	D	Residence
253	McLeod St	01-003448		1887	6	N	H,L	
256	McLeod St	01-003449		1931	3S	Y	H,L	Wallace Meyers Medical Office
286	McLeod St					L	L	1910[1], LM MacDonald House (Meyers)[1]
289	McLeod St	01-003450		1910	5S	L	H	MacDonald House
291	McLeod St	01-003451		1890	1S	Y	H,L	DJ Murphy[1]
408	McLeod St	01-003452		1913	5S	L	H,L	
448	McLeod St	01-003453		1913	5S	L	H,L	
476	McLeod St	01-003454		1955	6	N	H,L	Historic?[1]
490	McLeod St	01-003455		1910	5S	L	H,L	
508	McLeod St	01-003456		1908	6	N	H,L	Nissen House[1]
612	McLeod St			1927		L	LHG	Cerruti Home
618	McLeod St			1925		L	LHG	Peter Cerruti home
658	McLeod St			1917		L	LHG	Neils Jensen, local carpenter/builder
674	McLeod St			1917		L	LHG	Neils Jensen, local carpenter/builder
675	McLeod St			1950		L	LHG	Bettencourt home

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
691	McLeod St					L	LHG	Moved from Tesla Road in 1941
692	McLeod St			1917		L	LHG	Neils Jensen, local carpenter/builder
47405	Mines Rd	01-009288		1943	5N	L	H	Sweetwater Forest Fire Station Bar
47405	Mines Rd	01-009296		1943			H	Sweetwater Forest Fire Station Kitchen
	N bank of Mocho Creek	C-1282					NWIC	Trash dump
	N Canyon Pkwy at Collier Canyon	01-002122	ALA-516H				NWIC	Ranch standing structures
228	N K St	01-003384		1880	4S	M	H,L	
309	N K St	01-003385		1890	5S	L	H,L	Old Weymouth House, Lassen House
410	N K St	01-003386		1870	5S	L	H,L	
292	N L St	01-003393		1925	5S	L	H,L	Dutro House[1]
309	N L St	01-003394		1917	4S	M	H,L	
321	N L St	01-003395		1917	5S	L	H,L	(Livermore Junk Yard, Blue Door Antiques)
509	N L St	01-003396		1889	6	N	H,L	1900[1]
738	N L St	01-003397		1946	5S	L	H,L	Demolished[1]
	N Livermore to Junction	01-010431					NWIC	Western Pacific Railroad
418	N M St	01-003440		1880	5S	L	H,L	
	N of E Stanley and Isabel Ave.		ALA-519H				NWIC	Rail bed remains
141	N. Livermore Ave	01-003422		1876	5S	L	H,L	Gardemeyer Building[1]
309	N. Livermore Ave	01-003423		1879	3S	Y	H,L	Gardemeyer House[1]
394	N. Livermore Ave	01-003424		1875	4S	M	H,L	Water Tower
415	N. Livermore Ave	01-003425		1880	5S	L	H,L	
487	N. Livermore Ave	01-003426		1905	5S	L	H,L	Frank Gomes Home[1]
527	N. Livermore Ave	01-003427		1935	4S	M	H,L	Eagles Aerie, Eagles Hall
577	N. Livermore Ave	01-003428		1870	3S	Y	H,L	IDES Hall, Eglesia Apostolica; circa 1900[1]
609	N. Livermore Ave	01-003429		1915	5S	L	H,L	
699	N. Livermore Ave	01-003430		1929	3S	Y	H,L	California Water Service Co Pump House
2580	Old First St	01-003513		1870	5S	L	H,L,LHG	Antonio Gardella house; built ca. 1900[1]
1861	Old Tower Rd	01-003458		1875	6	N	H,L	UM Mendenhall Tank House, 1878[1]
455	Olivina Ave	01-003459		1852	3S	Y	H,L,HRI	Martin Mendenhall Ranch
2515	Palm Ave	01-003460		1925	6	N	H,L	
2539	Palm Ave	01-003461		1925	6	N	H,L	
1887	Park St	01-003462		1880	5S	L	H,L	
1894	Park St	01-003463		1920	5S	L	H,L	
1319	Pine St	01-003464		0	6	N	H,L	circa 1915[1]
2016	Pine St			1915		L	H,L,LHG	F.H. Duarte Highway Garage, enlarged 1924
1412	Portola Ave	01-003466		1930	4S	M	H,L	(Jerry's Auto Service)

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
1842	Portola Ave	01-003467		1925	6	N	H,L	Joesville
2542	Portola Ave	01-003468		1880	6	N	H,L	
	Portola Ave	01-003604		1935	5S	L	H,LH,HRI,CHL	Livermore Memorial Monument, SHL#241
	Portola Ave at I-580	C-1396					NWIC	Midden soil
1882	Railroad Ave	01-003469		1945	6	N	H,L,LHG	(Tubbsville; now vacant)
2080	Railroad Ave			1910		M	D	(Valley Pool Service)
2121	Railroad Ave			1960		M	D	(Carol Jean Dance Studio)
2124	Railroad Ave			1960		M	D	(Anita's Taqueria)
2136	Railroad Ave			1960		M	D	(Livermore Glass)
2139	Railroad Ave			1980		M	D	(Circuit Test)
2160	Railroad Ave	01-003470		1880	6	N	H,D	True Building, (Alpha Tile Building)
2266	Railroad Ave	01-010432		1947		M	NWIC,D	Ising's Culligan building
2271	Railroad Ave	01-010430				M	NWIC,D	
2330	Railroad Ave			1950		M	D,LHG,NWIC	Vacant lot; hay barn burned[1] NWIC indicates 1940 date
2330	Railroad Ave	01-010433		1940		M	NWIC	Repeat Entry[1]
2456	Railroad Ave			1970		M	D	Don's Auto Repair
2494	Railroad Ave			1970		M	D	Livermore Veterinary
2957	Rodeo Lane	01-003471		1875	4S	M	H,L	
817	S G St	01-003363		1908	5S	L	H,L	
857	S G St	01-003367		1905	5S	L	H,L	
857	S G St	01-003364		1905	5D	L	H,L	
873	S G St	01-003365		1905	5D	L	H	
875	S G St					L	L	
890	S G St	01-003366		1905	5D	L	H,L	
950	S G St	01-003368		1900	6	N	H,L	Pepper Tree in front of 950 S G St
485	S H St	01-003370		1913	6	N	H,L	
559	S H St	01-003371		1880	6	N	H,L	Langan Home[1]
587	S H St	01-003372		0	5S	L	H,L	
713	S I St	01-003373		1910	4S	M	H,L	Fred Schrader Home[1]
791	S I St	01-003374		1917	4S	M	H,L	Emmett Moren Home[1]
812	S I St	01-003378		1906	5S	L	H,L	Varney Cottage[1]
824	S I St	01-003375		1906	5D	L	H,L	Varney Cottage[1]
838	S I St	01-003376		1906	5D	L	H,L	Varney Cottage[1]
854	S I St	01-003377		1906	5D	L	H,L	Varney Cottage[1]
157	S J St	01-003379		1914	3S	Y	H,L	Foresters Hall
171	S J St					L	L	Foresters Hall; Repeat Entry[1]

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
187	S J St					L	L	Foresters Hall; Repeat Entry[1]
254	S J St			1885		L	LHG	S. Levy cottage; heavily modified, built with 2224 Third St.
282	S J St	01-003380		1935	5S	L	H,L	
559	S J St	01-003381		1880	5S	L	H,L	1897[1]
627	S J St	01-003382		1883	4S	M	H,L	
659	S J St							George Kruger Home, 1908[1]
813	S J St	01-003383		1927	3S	Y	H,L	St Paul's Hospital, C&J Livermore
505	S K St	01-003387		1930	5S	L	H,L,LHG	H.W. Anderson, first owner
578	S K St	01-003388		1942	4S	M	H,L	
582	S K St	01-003389		1925	5S	L	H,L	
585	S K St			1937			LHG	H.P. Anderson home
615	S K St	01-003390		1885	3S	Y	H,L	1898[1]
690	S K St	01-003391		1870	5S	L	H,L	1886[1]
758	S K St			1895		L	LHG	Ed Snapp, carpenter/builder
828	S K St	01-003392		1915	4S	M	H,L	
	S L St	01-003413		1870	5S	L	H	
20	S L St	01-003398		1905	4S	M	H,L,D,LH,LHG	Railroad Depot, SPRR: 1892[1]
20	S L St	01-005902			7K	N	H,L	Livermore Train Station
50	S L St			1980		M	D	Kentucky Fried Chicken
57	S L St			1960		M	D	Groth Bros Auto
59	S L St	01-003399		1914	6	N	H,L,D	
522	S L St	01-003400		1931	3S	Y	H,L	Veterans Memorial Building
529	S L St	01-003401		1885	5S	L	H,L	Dr. Meyer's House; 1904[1]
543	S L St	01-003402		1925	5S	L	H,L	Bernhardt House; 1923[1]
556	S L St	01-003403		1910	6	N	H,L	Bistorius Home[1]
567	S L St	01-003404		1895	5S	L	H,L,LHG	Tom Knox House; built1898[1]
580	S L St	01-003405		1894	3S	Y	H,L,LHG	Oscar Meyers House; built 1895[1]
585	S L St	01-003406		1898	3S	Y	H,L,LHG	Wm H Taylor House; built 1897[1]
610	S L St	01-003407		1908	5S	L	H,L	WA Mitchell House; JH Wilson House[1]
626	S L St	01-003408		1908	5S	L	H,L	JH Wilson House; WA Mitchell House[1]
641	S L St	01-003409		1915	5S	L	H,L	
661	S L St	01-003410		1915	5D	L	H,L	
679	S L St	01-003414		1885	5S	L	H,L	WA Thomas Home[1]
691	S L St	01-003411		1870	5D	L	H,L	
701	S L St	01-003412		1905	5D	L	H,L	

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
755	S L St	01-003415		1911	5S	L	H,L	Dennis Bernal Home[1]
799	S L St	01-003416		1880	5S	L	H,L	Hart House; circa 1880[1]
879	S L St	01-003417		1888	4S	M	H,L,LH	Anspacher House
947	S L St	01-003418		1935	5S	L	H,L	OB Jensen Home
955	S L St	01-003419		1912	4S	M	H,L	
975	S L St	01-003420		1925	5S	L	H,L	
989	S L St	01-003421		1944	5S	L	H,L	
12	S Livermore Ave	01-003431		1930	6	N	H,L	Demolished[1]
21	S Livermore Ave	01-003432		1914	5S	L	H,L,D	FA Schrader CM Montgomery Blacksmith
25	S Livermore Ave			1920		M	D	(V & G Mufflers)
30	S Livermore Ave			1950		M	D	(Shooter's)
37	S Livermore Ave			1970		M	D,LHG	Building demolished[1]
43	S Livermore Ave			1960		M	D,LHG	Building demolished[1]
56	S Livermore Ave			1920		M	D	(Main Street Designs)
152	S Livermore Ave			1960		M	D	(Livermore Bakery/Tequila's)
160	S Livermore Ave			1960		M	D	(Livermore Bakery/Tequila's)
167	S Livermore Ave			1940		M	D	(Livermore Auto & Tire)
220	S Livermore Ave	01-003433		1939	3S	Y	H,L,D	Livermore Post Office
392	S Livermore Ave	01-003434		1910	3S	Y	H,L,LHG	McGill Home,(Stockin)[1]
508	S Livermore Ave	01-003435		1875	3S	Y	H,L	
515	S Livermore Ave	01-003436		1935	5S	L	H,L	
524	S Livermore Ave	01-003437		1920	5S	L	H,L	
543	S Livermore Ave	01-003438		1915	5S	L	H,L	
609	S Livermore Ave	01-003439		1909	5S	L	H,L	
1356	South Livermore Avenue							Peter Connelly Farm, 1900 (Retzlaff Vineyard)[1]
6	S M St	01-003441		1875	4S	M	H,LHG	No such address;[1] possible typo
590	S M St	01-003457		1878	4S	M	H	
657	S M St					L	L	
766	S M St	01-003442		1902	5S	L	H,L	Elizabeth Gallagher Home[1]
	Second St	01-003519		1880			H	No Significance[1]
1587	Second St	01-003514		1925	5S	L	H,L	
1633	Second St	01-003515		1880	5S	L	H,L	
1651	Second St	01-003516		1890	5D	L	H,L	
1667	Second St	01-003517		1880	5D	L	H,L	
1683	Second St	01-003518		1880	5D	L	H,L	
1716	Second St	01-003520		1910	5D	L	H,L	

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
1730	Second St	01-003521		1920	6	N	H,L	
1783	Second St	01-003522		1911	5S	L	H,L, LH	Dania Hall
1814	Second St	01-003537		1925	6	N	H	Demolished[1]
1828	Second St	01-003538		1925	6	N	H	Demolished[1]
1842	Second St	01-003539		1925	6	N	H	Demolished[1]
1860	Second St	01-003523		1929	6	N	H,L	Plaza Building
1911	Second St	01-003524		1960	6	N	H,L	JC Penney & Company
2011	Second St	01-003525		1935	6	N	H,L,LHG	Club Rodeo; built 1880, Catanich's Restaurant/Ferrario's Saloon[1]
2046	Second St	01-003526		1917	3S	Y	H,L,LH	Raboli residence
2060	Second St	01-003527		1884	5S	L	H,L	Wolfmeyer Home
2074	Second St	01-003528		1910	5S	L	H,L	Raboli Winery, (Knodts Flowers); 1913[1]
2152	Second St	01-003529		1908	5S	L	H,L	Bernal Building
2222	Second St	01-003530		1910	6	N	H,L	Old Theatre Mall
2233	Second St	01-003531		1921	6	N	H,L	
2247	Second St					L	L	Significance?[1]
2324	Second St	01-003532		1929	4S	M	H,L,D	PT & T Co Repeater Station
2379	Second St			1980		M	D	Residence
2388	Second St			1950		M	D	PT&T Station[1]
2410	Second St	01-003533		1894	5S	L	H,L,D	John Berry Home[1]
2426	Second St	01-003534		1904	5S	L	H,L,D	
2456	Second St			1980		M	D	Residence
2471	Second St	01-003535		1875	5S	L	H,L	
2551	Second St	01-003536		1930	5S	L	H,L	(International Auto Car)
	Seventh and I Street					L	LH,LHG	Original Livermore High School Site
2058	Seventh St	01-003594		1884	3S	Y	H,L	Morrill Wagoner House
2175	Seventh St	01-003595		1875	4S	M	H,L	1910[1]
1881	Sixth St	01-003585		1888	3S	Y	H,L,LH	Frank Fasset House
2317	Sixth St	01-003586		1891	6	N	H,L	Heavily Modified[1]
2417	Sixth St	01-003587		1908	5S	L	H,L	Dr. Frank Savage Home[1]
2433	Sixth St	01-003588		1909	5S	L	H,L	Carl Wood Home[1]
2449	Sixth St	01-003589		1909	5S	L	H,L	CC Wand Home[1]
2452	Sixth St	01-003590		1888	5S	L	H,L	Dr. Silas Savage Home[1]
2463	Sixth St	01-003591		1909	5S	L	H,L	Chester Beck Home[1]
2520	Sixth St	01-003592		1880	5S	L	H,L	John Boding Home[1]

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
2536	Sixth St	01-003593		1880	5S	L	H,L	Modified Tank House[1]
4520	Tesla Rd						LHG	Modified Tank House[1]
4590	Tesla Rd	01-003603		1883	3D	Y	H,LH,HRI,CHL	Concannon Vineyard, SHL#641
5565	Tesla Rd	01-008102			7L	N	H,CHL,LH	Wente Bros Winery, SHL#957[1]
	Third St	01-003555		1901	5S	L	H,LHG	Third St Bungalow District; 1700,1800 blocks[1]
1814	Third St					L	L	1925[1]
1828	Third St					L	L	1925[1]
1842	Third St					L	L	1925[1]
1856	Third St	01-003540		1925	6	N	H,L	5 rating[1]
1919	Third St	01-003541		1924	5S	L	H,L	Jack Gardella Home
2155	Third St	01-003542		1910	3S	Y	H,L,LH	Carnegie Library
2207	Third St	01-003543		1925	5S	L	H,L	Guderson House
2221	Third St	01-003544		1887	5S	L	H,L	Frank Fennon House[1]
2224	Third St	01-003545		1885	5S	L	H,L, LHG	Kennedy House; built by S. Levy
2235	Third St	01-003546		1917	5S	L	H,L	James Gallegher House
2409	Third St	01-003547		1901	5D	L	H,L	
2427	Third St	01-003548		1925	5D	L	H,L	
2441	Third St	01-003549		1887	5D	L	H,L	
2456	Third St	01-003550		1915	5D	L	H,L	
2463	Third St	01-003551		1913	5D	L	H,L	
2470	Third St	01-003552		1916	5D	L	H,L	
2475	Third St	01-003553		1927	5D	L	H,L	
2493	Third St	01-003554		1926	5D	L	H,L	
2558	Third St	01-003556		1945	6	N	H,L	
153	Trevarno Rd	01-003472		1914	4S	M	H,L	Coast Manufacturing Co Headquarters
	Trevarno Rd					L	L	Historical district
51	Vallecitos Road						LH,LHG	Chateau Bellevue Winery Site, (Thos. Coyne Winery); 1884[1]
83	Vallecitos Road						LH,LHG	True Winery Site; (Fenestra Winery, 1881)[1]
1100	Vallecitos Rd	01-006749			2D3	Y	H	Jos. Altschul Home (Kalthoff Vineyards)
1188	Vineyard Avenue						LH	Ruby Hill Winery
	Wetmore Road						LH	Olivina Winery Site
		C-669					NWIC	See NWIC Study #S-8893
		01-000167	ALA-445H				NWIC	Narrow gauge railroad fragment
		01-002108	ALA-430H				NWIC	Adobe house site

[1] Livermore Heritage Guild information 2003.

Table 8-4 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Comments (Re-Use Name Or Business)
		01-002124	ALA-518H				NWIC	Farm remains
		01-002157					NWIC	
		01-002158					NWIC	
		01-002159					NWIC	
		01-002199					NWIC	Metate & modified cobble
							LH,LHG	August Schween Farm Site
							LH,LHG	Del Valle Sanatorium, Taylor Foundation; 1881[1]
							LH,LHG	Dr. Gordon Home Site; Could be archaeological
							LH	George Stanley Farm and Home
							LH	Masonic Cemetery (Roselawn)
							LH	Pioneer Memorial Park (Oak Knoll)
							LH,LHG	Rancho Del Valle de San Jose; Included from LHG comments 2002
							LH	Reimer Stoven Farm and Home
							LH,LHG	Summit School; demolished[1]
							LH,LHG	Teresa Bernal Home Site; location?

Source: LSA Associates, Inc., 2002.

[1] Livermore Heritage Guild information 2003.

Appendix C-1 presents the explanation of National Register of Historic Places codes. Appendix C-2 lists all properties in Livermore that appear eligible for listing in the National Register for Historic Places. Appendix C-3 presents all the bridges within the Planning Area listed in the Caltrans Bridge Inventory.

Carey & Co. is preparing a historic resources management plan for Livermore's Downtown. The historic resources management plan will update the inventory of historic resources, assign National Register Places ratings to the resources, and recommend guidelines for treatment of historic resources. The Draft of the historic resources management plan is anticipated to be completed in September 2003 and will be incorporated into the Downtown Specific Plan currently under development. Once the Historic Preservation Commission and Planning Commission have reviewed the Draft Management Plan, it is expected to be adopted by the City Council at the end of 2003, as part of the Downtown Specific Plan.

C. REGULATORY SETTING

A variety of regulations apply to cultural resources within the Planning Area. Major regulations are described below.

1. National Historic Preservation Act

The National Register of Historic Places, established by the National Historic Preservation Act of 1966, as amended, recognizes historical properties that are significant at local, State, and national levels. According to the National Historic Preservation Act, significance is determined by four criteria as follows.

Properties are significant if they:

- Are associated with events that have made a significant contribution to the broad patterns of our history;
- Are associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the criteria listed above, a property must possess integrity: the ability to convey its significance.[53] Properties that are *eligible* for inclusion on the National Register are afforded the same protection as *listed* properties. If a property is listed or eligible for listing, Section 106 of the National Historic Preservation Act requires that if the property will be affected by a proposed project, the effect must be considered by the agencies permitting the proposed project before the project is initiated. The National Historic Preservation Act specifies, "The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and

[53] National Park Service, 1998. *National Register Bulletin: Guidelines for Evaluating and Documenting Traditional Cultural Properties*.

seek ways to avoid, minimize or mitigate any adverse effects on historic properties."[54] The National Historic Preservation Act applies only to projects which are federally funded, regulated, or permitted.

2. California Environmental Quality Act

The California Environmental Quality Act applies to all discretionary projects undertaken or approved by the State's public agencies, and mandates public involvement in the planning of any project which may have a significant effect on the environment. Under the provisions of the act, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment."[55] The California Environmental Quality Act defines a "historical resource" as a resource that is eligible for listing on the California Register of Historical Resources (California Register), listed in a local register of historical resources (as defined in Public Resources Code Section 5020.1(k)), identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, or determined to be a historical resource by a project's lead agency.[56] A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California . . . Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources."[57]

3. California Register Criteria

Per the California Register, a cultural resource is evaluated under four criteria to determine its historical significance. These criteria require that the resource be significant at the local, State, or national level under one or more of the following:

- It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
- It is associated with the lives of persons important to local, California, or national history;
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
- It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, California Register regulations require that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resource." The time needed to develop this perspective and permit a legitimate understanding of the resource's significance is estimated at 50 years.[58]

[54] 36 CFR 800.1(a)

[55] CCR §15064.5(b).

[56] CCR §15064.5(a).

[57] CCR §15064.5(a)(3).

[58] CCR 4852 (d)(2).

Finally, the California Register requires that a resource possess integrity, which is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance."[59] To retain integrity, the original location, design, setting, materials, workmanship, feeling, and association of the resource should be intact. Which of these factors are most important will depend on the particular criteria under which the resource is considered eligible for listing.[60]

Resources which are significant, meet the age guidelines, and possess integrity will generally be considered eligible for listing on the California Register.

4. California Public Resources Code, Section 5024

Section 5024 of the Public Resources Code mandates that State agencies preserve and maintain, when prudent and feasible, all State-owned resources under their jurisdiction. The California Office of Historic Preservation maintains a master list of state-owned historic resources, and agencies may not "alter the original or significant historical features or fabric, or transfer, relocate, or demolish historical resources on the master list maintained pursuant to subdivision (d) of Section 5024 without, early in the planning processes, first giving notice and a summary of the proposed action to the [state historic preservation] officer who shall have 30 days after receipt of the notice and summary for review and comment. . . ." Section 5024.5 also states that "until such time as a structure is evaluated for possible inclusion in the inventory pursuant to subdivisions (b) and (c) of Section 5024, State agencies shall assure that any structure which might qualify for listing is not inadvertently transferred or unnecessarily altered."

5. Local Regulations

Livermore has addressed the preservation of historical properties as a vital component in maintaining community character in both the Municipal and the Planning and Zoning Codes. The City of Livermore Planning and Zoning codes requires the "…identification, protection, and economic integration of historic resources… to further the community property, social and cultural welfare, and economic advancement." It encourages the adoption of historic districts which meet 10 specific criteria listed in Livermore Municipal Code 15.68.030 C. For Landmark Districts, as described in the Livermore Planning and Zoning Code (LPZC) §2-73-040, all demolitions, additions, alterations, or moving of any historic features will be subject to review and approval of the Historic Preservation Commission. For Historic Districts, as described in LPZC §2-73-040, demolitions or additions shall be subject to review and approval of the Historic Preservation Commission if visible from the public right-of-way, a private street, or a parking lot for public use. In addition, the demolition of structures over 50 years old not designated as a historic resource is subject to review and approval by the historic preservation commission Ordinance 1374, Section 2.1992.

[59] California Office of Historic Preservation, 1999. *California Register and National Register: A Comparison.* Technical Assistance Series 6. Office of Historic Preservation, Sacramento.

[60] Ibid.

9. AIR QUALITY

The following discussion provides an overview of existing air quality conditions in the region and the Livermore area as of 2002, or as noted. Ambient standards and the regulatory framework relating to air quality are summarized. Climate, air quality conditions, and typical air pollutant types and sources are described. Lastly, air quality issues relevant to the General Plan Update are discussed.

A. AIR QUALITY STANDARDS, REGULATORY FRAMEWORK, AND ATTAINMENT STATUS

Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

1. Air Quality Standards

Both the State and federal governments have established health-based Ambient Air Quality Standards for six air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to primary and secondary Ambient Air Quality Standards, the State of California has established a set of episode criteria for O_3, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

California Ambient Air Quality Standards and National Ambient Air Quality Standards for the criteria air pollutants are listed in Table 9-1. Health effects of these criteria pollutants are described in Table 9-2.

2. Regulatory Framework

The Bay Area Air Quality Management District (BAAQMD) is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. Indirect sources are facilities that do not have equipment that directly emits substantial amounts of pollution, but that attract large numbers of mobile sources of pollution, such as freeways. The California Air Resources Board and the U.S. Environmental Protection Agency regulate direct emissions from motor vehicles.

Table 9-1: Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards
Carbon Monoxide (CO)	8-hour	9 ppm	9 ppm
	1-hour	20 ppm	35 ppm
Nitrogen Dioxide (NO_2)	Annual Mean	—	0.053 ppm
	1-hour	0.25 ppm	—
Ozone (O_3)	1-hour	0.09 ppm	0.12 ppm
	8-hour	—	0.08 ppm
Lead (Pb)	Quarterly	—	1.5 $\mu g/m^3$
	30-day	1.5 $\mu g/m^3$	—
Particulate Matter (PM_{10})	Annual Geometric Mean	30 $\mu g/m^3$	—
	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Arithmetic Mean	—	50 $\mu g/m^3$
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	—	15 $\mu g/m^3$
	24-hour	—	65 $\mu g/m^3$
Sulfur Dioxide (SO_2)	Annual Mean	—	0.03 ppm
	24-hour	0.04 ppm	0.14 ppm
	3-hour	—	0.50 ppm
	1-hour	0.25 ppm	—

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

Source: U.S. Environmental Protection Agency and California Air Resources Board, 2003.

a. Federal Clean Air Act. The Federal 1970 Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining National Ambient Air Quality Standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the National Ambient Air Quality Standards are required to develop State Implementation Plans to show how they will achieve the National Ambient Air Quality Standards for O_3 by specific dates.

The Clean Air Act requires that projects receiving federal funds demonstrate conformity to the approved State Implementation Plan and local air quality attainment plan for the region. Conformity with the State Implementation Plan requirements would satisfy the Clean Air Act requirements.

b. California Clean Air Act. In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards for O_3, CO, SO_2 and NO_2 by the earliest practical date. Plans for attaining California Ambient Air Quality Standards were submitted to the California Air Resource Board by June 30, 1991, 1994, 1997 and 2000. The California Clean Air Act provided districts with new authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from

Table 9-2: Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM_{10})	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

transportation and area-wide emission sources. Each district plan is to achieve a five percent annual reduction, averaged over consecutive three-year periods, in district-wide emissions of each nonattainment pollutant or its precursors.

3. Attainment Status Designations

The California Air Resources Board is required to designate areas of the State as attainment, nonattainment or unclassified for any State standard. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The California Clear Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. Environmental Protection Agency designates areas for O_3, CO, and NO_2 as either "does not meet the primary standards," or "cannot be classified" or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified" or "better than national standards." In 1991, new nonattainment designations were assigned to areas that had previously been classified as Group I, II, or III for PM_{10} based on the likelihood that they would violate national PM_{10} standards. All other areas are designated "unclassified."

Table 9-3 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

B. EXISTING CLIMATE AND AIR QUALITY

The following provides a discussion of the regional air quality, local climate and air quality in the Livermore Valley, and air pollution climatology.

1. Regional Air Quality

The City of Livermore is located in the San Francisco Bay Area, a large shallow air basin ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

The City of Livermore is within the jurisdiction of the BAAQMD, which regulates air quality in the San Francisco Bay Area. Air quality conditions in the San Francisco Bay Area have improved significantly since the District was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. In June 1995, the Bay Area was designated as being in attainment for the federal O_3 standard. However, the U.S. Environmental Protection Agency changed the Bay Area back to nonattainment status in August 1998 due to new exceedances of the standard in 1995 and 1996. The BAAQMD submitted an

Table 9-3: Bay Area Attainment Status as of January 2003

Pollutant	Averaging Time	California Standards[a]		National Standards[b]	
		Concentration	Attainment Status	Concentration	Attainment Status
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment[c]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	Not Applicable	Not Applicable	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.25 ppm (470 µg/m^3)	Attainment	Not Applicable	Not Applicable
Ozone (O_3)	8-Hour	Not Applicable	Not Applicable	0.08 ppm	Unclassified
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	0.12 ppm (235 µg/m^3)	Nonattainment[d]
Suspended Particulate Matter (PM_{10})	Annual Mean	30 µg/m^3	Not Applicable	50 µg/m^3	Attainment
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Sulfur Dioxide (SO_2)	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	Not Applicable	Not Applicable

[a] California standards for 0_3, CO (except Lake Tahoe), SO_2 (one-hour and 24-hour), NO_2 and PM_{10} are values that are not to be exceeded. If the standard is for a one-hour, eight-hour, or 24-hour average, then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average.

[b] National standards other than for 0_3 and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. For example, the 0_3 standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one.

[c] In April 1998, the Bay Area was redesignated to Attainment for the national eight-hour CO standard.

[d] In June 1995, the Bay Area was redesignated to Attainment for the national 0_3 standard. However, the Environmental Protection Agency changed the Bay Area back to Nonattainment in August 1998, due to new exceedances in 1995 and 1996.

Notes: Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

Source: Bay Area Air Quality Management District, Bay Area Attainment Status as of January 2003, and Henry Hilken of the District.

Ozone Attainment Plan (1999 Plan) to the U.S. Environmental Protection Agency in August of 1999 to set policies and guidelines aimed at reducing O_3 in the Bay area by November 15, 2000. The U.S. Environmental Protection Agency approved parts and disapproved parts of the 1999 Ozone Plan for failing to ensure attainment status for O_3. As a result, the U.S. Environmental Protection Agency recommended to the federal government that it withhold transportation funding for specific projects

within the Bay Area. The BAAQMD has developed and adopted a new plan (2001 Ozone Plan) to correct the deficiencies of the 1999 Ozone Plan and respond to the finding of failure to achieve attainment status for O_3. The new plan was adopted in October 2001 by the BAAQMD's Governing Board and was approved by the California Air Resources Board in November 2001. As of January 2003, the plan is still under review by the Environmental Protection Agency

Levels of PM_{10} in the Bay Area currently exceed California Clean Air Act standards and, therefore, the area is considered a nonattainment area for this pollutant relative to the State standards. However, PM_{10} levels monitored at the Livermore station were below the State's standard in 2002. The Bay Area is an unclassified area for the federal PM_{10} standard.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

The BAAQMD's Bay Area 1991, 1994, 1997 and 2000 Clean Air Plans contain districtwide control measures to reduce CO and O_3 precursor emissions. Generally, the State standards for these pollutants are more stringent than the national standards.

Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

2. Local Climate and Air Quality

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. The City is located in the Livermore Valley. The Livermore Valley is a sheltered inland valley near the eastern border of the Bay Area. The western side of the valley is bordered by hills of 1,000 to 1,500 feet in elevation with two gaps connecting the valley to the central Bay Area, the Hayward Pass and Niles Canyon. The eastern side of the valley also is bordered by hills of 1,000 to 1,500 feet in elevation with one major passage to the San Joaquin Valley at the Altamont Pass and several secondary passages. To the north lie the Black Hills and Mt. Diablo. A northwest to southeast channel connects the Diablo Valley to the Livermore Valley. The south side of the Livermore Valley is bordered by mountains approximately 3,000 to 3,500 feet high. During the summer months, when there is a strong inversion with a low ceiling, air movement is weak and pollutants become trapped and concentrated. Maximum summer temperatures in the Livermore Valley range from the high-80s to the low-90s, with extremes in the 100s. At other times in the summer, a strong Pacific high-pressure cell from the west, coupled with hot inland temperatures causes a strong onshore pressure gradient, which produces a strong, afternoon wind. With a weak temperature inversion, air moves over the hills with ease, dispersing pollutants. This pattern deposits pollutants into the San Joaquin Valley.[1] In the winter, with the exception of an occasional storm moving through the area, air movement is often dictated by local conditions. At night and early morning, especially under clear, calm and cold conditions, gravity drives cold air downward. The cold air drains off the hills and moves into the gaps and passes. On the eastern side of the valley the prevailing winds blow from north, northeast and east out of the Altamont Pass. Winds are light

[1] The San Francisco Bay Area, especially the Livermore Valley region, contributes to air quality in San Joaquin Valley.

during the late night and early morning hours. Winter daytime winds sometimes flow from the south through the Altamont Pass to the San Joaquin Valley. Average winter maximum temperatures range from the high-50s to the low-60s, while minimum temperatures are from the mid-to-high-30s, with extremes in the high teens and low-20s.

Air pollution potential is high in the Livermore Valley, especially for photochemical pollutants in the summer and fall. High temperatures increase the potential for O_3 to build up. The Valley not only traps locally generated pollutants but also can be the receptor of O_3 and O_3 precursors from San Francisco, Alameda, Contra Costa and Santa Clara counties. On days with northeasterly winds, most common in the early fall, O_3 may be carried west from the San Joaquin Valley to the Livermore Valley.

During the winter, the sheltering effect of the Valley, its distance from moderating water bodies and the presence of a strong high-pressure system contribute to the development of strong, surface-based temperature inversions. Pollutants such as CO and PM_{10}, generated by motor vehicles, fireplaces and agricultural burning, can become concentrated.

Pollutant monitoring results for the years 1993 to 2002 (see Table 9-4) at the Livermore ambient air quality monitoring station indicate that air quality in the project area has generally been good. As indicated in the monitoring results, 18 or fewer violations per year of State PM_{10} standard during the 10-year period were recorded and no violation of federal PM_{10} standard was recorded. Federal and State O_3 standards have been exceeded every year, except in 1997 and 2001 when the federal O_3 standard was not exceeded. CO and NO_2 standards were not exceeded in Livermore during the 10-year period.

3. Air Pollution Climatology

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

C. AIR QUALITY ISSUES

Five key air quality issues—CO hotspots, construction equipment exhaust, vehicle emissions, fugitive dust, and odors—are described below.

1. Local Carbon Monoxide Hotspots

Local air quality is most affected by CO emissions from motor vehicles. CO is typically the pollutant of greatest concern because it is created in abundance by motor vehicles and it does not readily disperse into the air. Because CO does not readily disperse, areas of vehicle congestion can create "pockets" of high CO concentration called "hot spots." These pockets have the potential to exceed the State one-hour standard of 20 ppm and/or the eight-hour standard of 9.0 ppm.

Table 9-4: Results from the Livermore Ambient Air Quality Monitoring Station Exceeded Standards, 1993 to 2002

	Ozone			Carbon Monoxide		Nitrogen Dioxide		PM_{10}		
YEAR	Max. 1-Hour (pphm)	National D-O-S	California D-O-S	Max. 8-Hour (ppm)	National D-O-S	Max. 1-Hour (pphm)	California D-O-S	Annual Geometric Mean (mg/m^3)	National D-O-S	California D-O-S
1993	13	1	7	3.9	0	11	0	20.9	0	3
1994	13	2	5	3.4	0	8	0	22.1	0	4
1995	16	7	20	2.3	0	8	0	19.4	0	6
1996	14	8	22	2.5	0	9	0	19.9	0	6
1997	11	0	3	2.5	0	8	0	22.0	0	12
1998	15	6	21	2.4	0	7	0	19.4	0	12
1999	15	2	14	2.9	0	9	0	22.7	0	18
2000	15	2	7	2.7	0	7	0	19.4	0	12
2001[b]	11	0	9	3.2	0	7	0	21.0	0	3
2002[b]	16	2	7	2.5	0	6	0	21.0	0	0

[a] PM_{10} was sampled every sixth day from 1995 to 2000. Thus, the number shown in the table is 6 times the data/information posted in the *Annual Bay Area Air Pollution Summaries* for 1995 to 2002.

Notes: D-O-S = Days Over Standard
pphm = parts per hundred million
ppm = parts per million
ppb = parts per billion
mg/m^3 = milligrams per cubic meter

Source: Bay Area Air Quality Management District, 2003. *Annual Bay Area Air Pollution Summaries*. Website: www.baaqmd.gov/pie/apsums.htm.

While CO transport is limited, it does disperse with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels affecting local sensitive

receptors (e.g., residents, schoolchildren, the elderly, hospital patients, etc). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentration, modeling is recommended to determine a project's effect on local CO levels.

2. Construction Equipment Exhaust

Construction activities cause combustion emissions from utility engines, heavy-duty construction vehicles, equipment hauling materials to and from construction sites and motor vehicles transporting construction crews. Exhaust emissions from construction activities vary daily as construction activity levels change. The use of construction equipment results in localized exhaust emissions.

3. Vehicle Emissions

Long-term air emission impacts are those associated with changes in automobile travel within the City. Mobile source emissions would result from vehicle trips associated with increased vehicular travel. As is true throughout much of the U.S., motor vehicle use is projected to increase substantially in the region. The BAAQMD, local jurisdictions, and other parties responsible for protecting public health and welfare will continue to seek ways of minimizing the air quality impacts of growth and development in order to avoid further exceedances of the standards.

4. Fugitive Dust

Fugitive dust emissions are generally associated with demolition, land clearing, exposure of soils to the air, and cut and fill operations. Dust generated during construction varies substantially on a project by project basis, depending on the level of activity, the specific operations and weather conditions. Surrounded by a variety of agricultural operations and subject to moderate levels of winds, Livermore will continue to face the issue of fugitive dust in coming years.

The U.S. Environmental Protection Agency has developed an approximate emission factor for construction-related emissions of total suspended particulate of 1.2 tons per acre per month of activity. This factor assumes a moderate activity level, moderate silt content in soils being disturbed and a semi-arid climate. The California Air Resources Board estimates that 64 percent of construction-related total suspended particulate emissions is PM_{10}. Therefore, the emission factors for uncontrolled construction-related PM_{10} emissions are:

- 0.77 tons per acre per month of PM_{10}; or
- 51 pounds per acre per day of PM_{10}.

However, construction emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. There are a number of feasible control measures that can be reasonably implemented to significantly reduce PM_{10} emissions from construction. Rather than attempting to provide detailed quantification of anticipated construction emissions from projects, the BAAQMD suggests the following:

> "The determination of significance with respect to construction emissions should be based on a consideration of the control measures to be implemented. From the Districts' [BAAQMD] perspective, quantification of emissions is not necessary, although a lead agency may elect to do so. If all of the control measures indicated as appropriate, depending on the size of the project are implemented, then air pollution from emissions from construction activities would be considered a less-than-significant impact."[2]

5. Odors

Odors are also an important element of local air quality conditions. Specific activities allowed within each of the major general plan land use categories can raise concerns on the part of nearby neighbors. Major sources of odors include restaurants, manufacturing plants, and agricultural operations. Other

[2] Bay Area Air quality Management District, 1966. *BAAQMD CEQA Guidelines Assessing the Air Quality Impacts of Projects and Plans*. April. (Amended in December 1999.)

odor producers include the Livermore Water Reclamation Plant and the Vasco Road Sanitary Landfill. While sources that generate objectionable odors must comply with air quality regulations, the public's sensitivity to locally produced odors often exceeds regulatory thresholds.

10. NOISE

The following discussion describes the general characteristics of sound and the categories of audible noise. The regulatory framework related to noise issues at the City, County, State and federal levels is then described. Lastly, potential sources of noise are summarized.[1]

A. CHARACTERISTICS OF SOUND

To the human ear, sound has two significant characteristics: pitch and loudness. A specific pitch can be an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations or cycles per second of a wave that results in the range of tone from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment, and it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments.

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation and sleep.

Several noise measurement scales exist which are used to describe noise in a particular location. A *decibel* (dB) is a unit of measurement which indicates the relative intensity of a sound. The zero point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3.0 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3.0 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, 30 dB is 1,000 times more intense. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness. Sound intensity is normally measured through the *A-weighted sound level* (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Table 10-1 shows representative outdoor and indoor noise levels in units of dBA.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a six-dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern.

[1] This general discussion of noise will be supplemented with substantially more data on existing noise conditions in the Planning Area, once measurements have been taken, traffic noise estimated, and the resulting noise contours mapped.

Table 10-1: Typical A-Weighted Sound Levels

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a few feet away	110	Very Loud	16 time as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	
Average Office	60	Moderate	1/2 as loud
Suburban Street	55	Moderate	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	1/4 as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	1/8 as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing

Source: LSA Associates, Inc., 2002.

B. NOISE REGULATORY FRAMEWORK

The following section provides brief discussions of the regulatory framework related to noise.

1. City Noise Ordinance

A Noise Ordinance (Chapter 9.36 of the City's Municipal Code) was established to reduce and restrict certain noise producing activities. No quantitative noise standards are established in the Noise Ordinance; however, the City provides several methods for addressing noise problems, such as regulating hours of machinery/equipment operation or distance of noise sources to adjacent uses, etc

2. City General Plan Noise Element

The Noise Element of the City's General Plan was prepared in 1977 to conform to State law, and is intended to identify local noise problems, establish goals to be achieved in noise abatement, and provide a framework that will be the basis for implementing a noise control program. The Noise Element of the City's General Plan describes accepted noise levels, based on State guidelines, for certain land uses and defines noise sensitive areas of the City (see Table 10-2). These standards are established to help reduce noise associated with development, and goals aim to guide future mitigation of noise issues. Through these methods, the City can help reduce adverse impacts of urban development.

Table 10-2: Land Use Compatibility For Community Noise Environments in Terms of Day Night Average Sound Level (DNL) (dB)

Land Use	Normally Acceptable		Conditionally Acceptable		Normally Unacceptable		Clearly Unacceptable	
	City	County	City	County	City	County	City	County
Residential – Low Density	<60	50-60	55-70	55-70	70-75	70-75	>75	75
Residential – Multi-family	<65	50-65	60-70	60-70	70-75	70-75	>75	75
Transient Lodging	<65	50-65	60-70	60-70	70-80	70-80	>80	80
School, Library, Church	<70	50-70	60-70	60-70	70-80	70-80	>80	80
Auditorium, Concert Hall	—	—	<70	—	—	—	>65	—
Sports Arena, Outdoor Sports	—	—	<75	—	—	—	>70	—
Playground, Park	<70	50-70	—	—	70-75	68-75	>75	72.5
Golf Course, Water Recreation	<75	50-75	—	—	70-80	70-80	>80	80
Office Building	<70	—	70-75	—	>75	—	—	—
Industrial, Manufacturing, Agricultural	<75	—	70-80	50-75	>75	70-80	—	75-85

Source: City of Livermore General Plan, Noise Element, 1977, and County of Alameda General Plan, Noise Element.

3. County Noise Element

The Alameda County General Plan Noise Element is similar to the City's. Noise criteria are also included within the East County Area Plan (ECAP). The goals contained within these two plans are generally more strict than those set in the City's Noise Ordinance. In addition, the ECAP addresses potential impacts based on changes in the noise setting. Impacts are characterized by the net increase (in dBA) of proposed projects. The County's Noise Element also restricts the amount of noise that can be heard from one property to another. These standards are set to protect certain noise-sensitive land uses.

4. State of California

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design or building materials that would offset any noise source in the vicinity of the receptor.

5. Noise Regulations

a. U.S. Environmental Protection Agency (EPA). In 1972 Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) as shown in Table 10-3. The EPA cautions that their identified levels are not standards because they do not take into account the cost or feasibility of the levels. For protection against hearing loss, 96 percent of the

population would be protected if sound levels are less than or equal to an Leq (24) of 70 dB. The "(24)" signifies an Leq duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about five feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels do not exceed 55 dBA and 45 dBA, respectively.

The noise effects associated with an outdoor Ldn of 55 dB are summarized in Table 10-4. At 55 dB Ldn, 95 percent sentence clarity (intelligibility) may be expected at 3.5 meters, and no community reaction. However, one percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

Table 10-3: Summary of EPA Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing Loss	Leq(24) $\leq$ 70 dB	All areas.
Outdoor activity interference and annoyance	Ldn $\leq$ 55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use
	Leq(24) $\leq$ 55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc
Indoor activity interference and annoyance	Leq(24) $\leq$ 45 dB	Indoor residential areas.
	Leq(24) $\leq$ 45 dB	Other indoor areas with human activities such as schools, etc.

Sources: U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March 1974.

C. EXISTING NOISE SOURCES IN 2002

Noise levels in Livermore and their effect on the City's quality of life will revolve around at least five key sources as described below.

1. Construction Activity

Short-term noise impacts would be associated with demolition, excavation, grading, and building construction. Construction-period noise levels are higher than existing noise levels, but eventually cease once construction is complete.

Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by

Table 10-4: Summary of Human Effects in Areas Exposed to 55 dB CNEL

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 0.35 meters. 99 percent sentence intelligibility (average) at 1.0 meters. 95 percent sentence intelligibility (average) at 3.5 meters.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below "vigorous action" (attitudes and other non-level related factors may affect this result).
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Sources: U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March 1974.

work phase. Table 10-5 lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor.

Typical noise levels range up to 91 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels because the noisiest construction equipment is earth-moving equipment. Earth moving equipment includes excavating machinery such as backhoes, bulldozers, draglines and front loaders, and earth moving and compacting equipment, which includes compactors, scrapers and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings.

Table 10-5: Typical Construction Equipment Noise Level

Type of Equipment	Range of Sound Levels Measured (dBA at 50 feet)
Pile Drivers	81 to 96
Rock Drills	83 to 99
Jack Hammers	75 to 85
Pneumatic Tools	78 to 88
Pumps	68 to 80
Dozers	85 to 90
Tractors	77 to 82
Front-End Loaders	86 to 90
Hydraulic Backhoe	81 to 90
Hydraulic Excavators	81 to 90
Graders	79 to 89
Air Compressors	76 to 86
Trucks	81 to 87

Source: Bolt, Beranek & Newman, 1987. Noise Control for Buildings and Manufacturing Plants.

The City of Livermore requires that all construction vehicles or equipment, fixed or mobile, be equipped with properly operating and maintained mufflers. All operations must comply with the noise ordinance standards, and stockpiling and/or vehicle staging areas are located as far as practicable from dwellings.

The City of Livermore also restricts the hours of operation for noise-producing construction equipment. The operation of pile drivers, steam shovels, and pneumatic hammers used in construction, demolition, or other repair work, is prohibited between the hours of 6:00 p.m. Saturday to 7:00 a.m. Monday, 8:00 p.m. to 7:00 a.m. Monday through Thursday, and 8:00 p.m. Friday to 9:00 a.m. Saturdays (and all City-observed holidays).[2]

2. Stationary Sources

A wide variety of stationary sources also contribute to noise throughout the City. These sources include machinery or equipment that emit noise during operation (e.g., air conditioners, generators, restaurant loudspeakers). Noise associated with certain land uses (industrial, and commercial) could be considered stationary sources if the point for noise generation was stationary and not mobile (e.g., a forklift).

3. Vehicular Traffic

Present in growing numbers in Livermore are motor vehicles with their distinctive noise characteristics. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Major contributing roadway noise sources include Interstate 580 (I-580), SR 84, Livermore Avenue, First Street, and other arterial and collector roadways throughout the City.

[2] Livermore Municipal Code, Section 9.36.080.

The Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions along roadway links within the City Planning Area. A typical vehicle mix for urban/suburban areas in California was used in this modeling effort. The modeled 24-hour CNEL levels for the existing (year 2003) baseline conditions are shown in Table 10-6.

Table 10-6 shows that traffic noise along the majority of the roadway links in the City was moderate (i.e., the 70 dBA CNEL contour is confined within the roadway right-of-way). However, along some City streets (e.g., East Avenue, Holmes Street, Kitty Hawk Road, Murrieta Boulevard, North Canyons Parkway, Springtown Boulevard, Livermore Avenue, Mines Road, Vasco Road, Stanley Boulevard, and First Street) the 70 dBA CNEL extends up to 87 feet from the roadway centerline and toward existing development on fronting parcels. The 65 dBA CNEL extends up to 181 feet from the roadway centerline followed by the 60 dBA CNEL which extends up to 386 feet from the roadway centerline. Figure 10-1 provides a diagram of the noise contours on the roadway segments associated with this analysis.

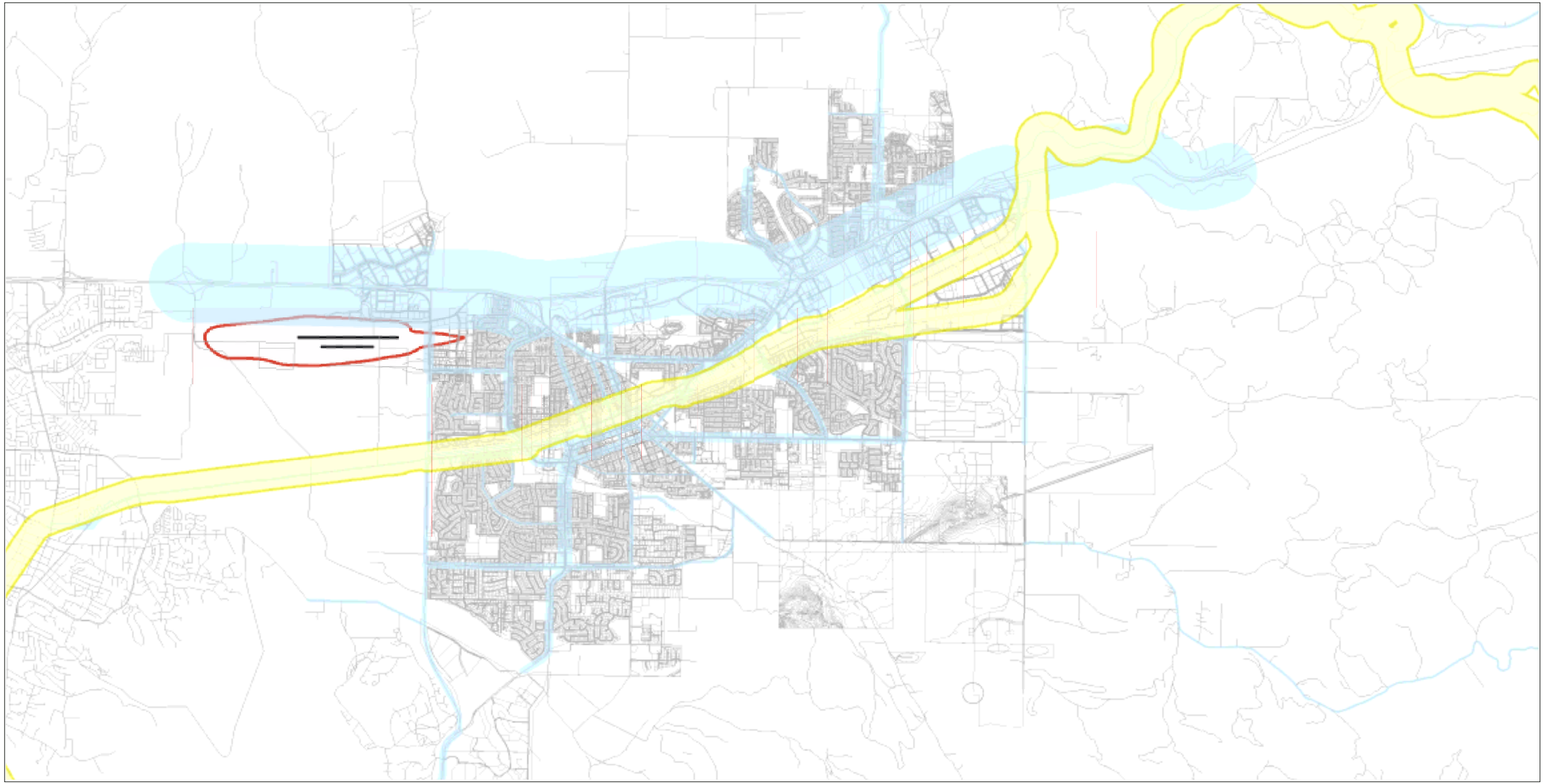
4. Rail Operations

Rail operations are a source for noise within cities with existing rail networks. The City of Livermore contains a functioning rail line that produces noise and groundborne vibration. Activity on the Union Pacific rail lines represents a significant source of noise and groundborne vibration in the City. Freight trains generally emit higher noise levels than passenger or commuter trains. Therefore, in areas where the tracks are used more frequently by freight trains, the single event noise exposure levels and total train noise would be higher than in areas with less frequent freight train use. In Livermore an estimated five freight trains per day with an average of 60 to 80 cars per train traveling at 40 to 60 miles per hour use the Union Pacific rail lines.[3] According to Figure 10-2, 2003 Noise Contour Map, noise levels of 60 dBA exist along the length of rail lines ranging from approximately 650 feet from the rail line up to 1,250 feet in areas where the rail line splits. Residential neighborhoods are located north and south of the railroad tracks within Livermore's central core.

Factors that influence the overall impact of railroad noise on adjacent uses include the distance of the uses from the tracks, surrounding land topography, the intermittent nature of train events, and the lack of sound walls or other barriers between the tracks and adjacent uses.

It has been assumed for the purposes of this Noise Element that BART will extend service to Livermore via the I-580 centerline right-of-way. BART has established maximum pass-by exterior noise levels for its transit operations. These noise levels are higher than typical standards for noise sensitive uses because they are based on individual noise events rather than average noise levels over a period of time. The impact of BART pass-by noise on ambient CNEL levels would depend on the location, frequency and duration of the train pass-bys which will be determined during the planning process and environmental review for the BART extension.

[3] Furtney, Mike, 2003. Director of Public Relations, Western Region of Union Pacific Railroad. Personal communication with LSA Associates, Inc. March.



LSA

N

0 2,500 5,000
Feet

Legend

- Airport 60dBA CNEL (2000)
- Existing Traffic Noise 60dBA CNEL (2003)
- Railroad Train Noise 60dBA CNEL (2003)

FIGURE 10-1

Livermore Draft General Plan
Master Environmental Assessment
2003 Noise Contour Map

SOURCE: CITY OF LIVERMORE, USGS, LSA ASSOCIATES, INC., 2003.

I:IMAGES/GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_10-1.INDD (06/04/03)

Table 10-6: 2003 Traffic Noise Levels[a]

Roadway Segment	Average Daily Traffic	Centerline to 70 CNEL[b] (Feet)	Centerline to 65 CNEL[b] (Feet)	Centerline to 60 CNEL[b] (Feet)	CNEL (dBA) 50 Feet from Outermost Lane
Airway Boulevard					
Between North Canyons Pkwy. and I-580	28,500	< 50	99	213	68.7
Between I-580 and Kitty Hawk Rd.	19,200	< 50	76	164	67.0
E. Airway Boulevard					
Between Kitty Hawk Rd. and Portola Ave.	6,700	< 50	< 50	81	62.5
Altamont Pass Road					
East of Greenville Rd.	9,000	< 50	< 50	99	63.7
Arroyo Road					
Between College Ave. and Robertson Park Rd.	11,200	< 50	53	114	64.7
Between Robertson Park Rd. and Vancouver Wy.	10,000	< 50	< 50	106	64.2
Between Vancouver Wy. and Concannon Blvd.	9,200	< 50	< 50	100	63.8
Bluebell Road					
Between Springtown Blvd. and Heather Ln.	8,000	< 50	< 50	92	63.2
Chestnut Street					
Between P St. and N. Livermore Ave.	6,600	< 50	< 50	81	62.4
Collier Canyon Road					
Between Las Positas College and North Canyons Pkwy.	6,000	< 50	< 50	76	62.0
Concannon Boulevard					
Between Isabel Ave. and Murdell Ln.	12,700	< 50	90	189	66.4
Between Murdell Ln. and Holmes St.	12,100	<50	88	183	66.2
Between Holmes St. and Arroyo Rd.	10,700	<50	81	169	65.7
Between Arroyo Rd. and Robertson Park Rd.	8,300	< 50	< 50	94	63.4
Between Robertson Park Rd. and S. Livermore Ave.	10,300	< 50	51	108	64.3
Dalton Avenue					
Between Ames St. and Vasco Rd.	6,100	< 50	< 50	76	62.1
Dolores Avenue					
Between East Ave. and Pacific Ave.	6,200	<50	59	119	63.3
East Avenue					
Between S. Livermore Ave. and Hillcrest Ave.	21,000	61	124	263	68.6
Between Hillcrest Ave. and Mines Rd.	19,400	59	118	250	68.3
Between Mines Rd. and Vasco Rd.	12,900	< 50	91	191	66.5
First Street					
Between Holmes St. and P St.	20,000	60	120	255	68.4
Between P St. and L St.	21,000	61	124	263	68.6
Between L St. and S. Livermore Ave.	27,500	72	148	315	70.0
Between S. Livermore Ave. and Inman St.	37,000	86	179	383	71.1
Between Inman St. and Mines Rd.	40,000	90	188	403	71.4
Between Mines Rd. and I-580	49,000	106	217	462	71.6
Fourth Street					
Between Holmes St. and P St.	13,300	< 50	93	195	66.6
Between P St. and S. Livermore Ave.	15,000	< 50	100	211	67.1
Between S. Livermore Ave. and Inman St.	7,200	< 50	64	131	64.0
Greenville Road					
Between Northfront Rd. and Southfront Rd.	11,800	< 50	86	180	66.1
Between Southfront Rd. and National Dr.	10,000	< 50	78	162	65.4
Between National Dr. and East Ave.	8,900	< 50	73	150	64.9

Table 10-6 *continued*

Roadway Segment	Average Daily Traffic	Centerline to 70 CNEL[b] (Feet)	Centerline to 65 CNEL[b] (Feet)	Centerline to 60 CNEL[b] (Feet)	CNEL (dBA) 50 Feet from Outermost Lane
Holmes Street					
Between Fourth St. and Concannon Blvd.	35,900	84	176	375	70.9
Between Concannon Blvd. and Wetmore Rd.	26,700	< 50	95	204	68.5
Isabel Avenue					
Between Jack London Blvd. and Stanley Blvd.	14,500	< 50	63	136	65.8
Between Stanley Blvd. and Vallecitos Rd.	14,500	< 50	63	136	65.8
Jack London Boulevard					
Between Isabel Ave. and Murrieta Blvd.	9,200	< 50	74	153	65.0
Kitty Hawk Road					
Between Airway Blvd. and E. Airway Blvd.	10,100	< 50	< 50	107	64.2
Between E. Airway Blvd. and Jack London Blvd.	19,600	59	119	251	68.3
N. L Street					
Between Portola Ave. and Chestnut St.	7,700	< 50	67	136	64.3
L Street					
Between Chestnut St. and First St.	9,000	< 50	< 50	99	63.7
Between First St. and College Ave.	9,200	< 50	< 50	100	63.8
Los Positas Road					
Between N. Livermore Ave. and First St.	11,100	< 50	53	114	64.7
Between First St. and Vasco Rd.	10,800	< 50	52	112	64.5
Between Vasco Rd. and Greenville Rd.	6,800	< 50	< 50	82	62.5
N. Livermore Avenue					
Between I-580 and Las Positas Rd.	33,600	81	168	359	70.6
Between Las Positas Rd. and Portola Ave.	28,200	73	150	320	69.9
Between Portola Ave. and First St.	17,500	56	110	233	67.8
S. Livermore Road					
Between First St. and East Ave.	12,000	< 50	56	120	65.0
Between East Ave. and Concannon Blvd.	8,100	< 50	< 50	92	63.3
Between Concannon Blvd. and Tesla Rd.	12,400	< 50	57	122	65.1
Maple Street					
Between First St. and East Ave.	5,500	< 50	< 50	71	61.6
Mines Road					
Between First St. and Patterson Pass Rd.	20,500	61	122	259	68.5
Between Patterson Pass Rd. and East Ave.	7,800	< 50	67	138	64.3
Murrieta Boulevard					
Between Portola Ave. and Jack London Blvd.	15,000	< 50	100	211	67.1
Between Jack London Blvd. and Stanley Blvd.	19,300	59	118	249	68.2
Between Stanley Blvd. and Holmes St.	16,200	< 50	105	222	67.5
North Canyons Parkway					
Between Airway Blvd. and Collier Canyon Rd.	26,900	71	146	310	69.7
Northfront Road					
Between Vasco Rd. and Greenville Rd.	7,400	< 50	< 50	87	62.9
Olivina Avenue					
Between Hagemann Dr. and Murrieta Blvd.	6,000	< 50	< 50	76	62.0
N. P Street					
Between Portola Ave. and First St.	12,200	< 50	88	184	66.2
Patterson Pass Road					
Between Mines Rd. and Joyce St.	10,000	< 50	78	162	65.4
Between Joyce St. and Vasco Rd.	6,700	< 50	62	125	63.6

Table 10-6 *continued*

Roadway Segment	Average Daily Traffic	Centerline to 70 CNEL[b] (Feet)	Centerline to 65 CNEL[b] (Feet)	Centerline to 60 CNEL[b] (Feet)	CNEL (dBA) 50 Feet from Outermost Lane
Portola Avenue					
Between I-580 and Murrieta Blvd.	22,700	< 50	85	183	67.8
Between Murrieta Blvd. and N. Livermore Ave.	26,400	< 50	94	202	68.4
Between N. Livermore Ave. and First St.	11,300	< 50	84	175	65.9
Railroad Avenue					
Between Stanley Blvd. and N. Livermore Ave.	17,400	< 50	110	232	67.8
Between N. Livermore Ave. and First St.	13,800	< 50	61	131	65.6
Robertson Park Road					
Between Arroyo Rd. and Concannon Blvd.	10,600	< 50	52	110	64.5
Springtown Boulevard					
Between Bluebell Dr. and I-580	24,100	66	136	288	69.2
Stanley Boulevard					
West of Isabel Ave.	28,000	73	149	318	69.9
Between Isabel Ave. and Murrieta Blvd.	31,600	78	162	345	70.4
Between Murrieta Blvd. and Railroad Ave.	23,600	66	134	284	69.1
Southfront Road					
Between First St. and Vasco Rd.	7,200	< 50	< 50	85	62.8
Tesla Road					
East of Greenville Rd.	6,000	< 50	< 50	76	62.0
Vallecitos Road					
South of Isabel Ave.	27,400	< 50	97	208	68.6
Vasco Road					
North of Dalton Ave.	23,100	< 50	86	185	67.8
Between Dalton Ave. and Scenic Ave.	28,000	73	149	318	69.9
Between Scenic Ave. and I-580	37,500	87	181	386	71.1
Between I-580 and Las Positas Rd.	36,900	86	179	382	71.1
Between Las Positas Rd. and Daphine Dr.	18,200	57	113	239	68.0
Between Daphine Dr. and East Ave.	12,000	< 50	87	182	66.2
Between East Ave. and Tesla Rd.	6,100	< 50	< 50	76	62.1
Vineyard Avenue					
West of Isabel Ave.	8,400	< 50	< 50	95	63.4
Wall Street					
Between Stanley Blvd. and El Caminito	6,100	< 50	< 50	76	62.1
I-580					
Between N. Flynn Rd. and Greenville Rd.	117,000	334	714	1,534	78.8
Between Greenville Rd. to Vasco Rd.	142,000	379	812	1,746	79.7
Between Vasco Rd. and First St.	174,000	433	929	1,999	80.5
Between First St. and N. Livermore Ave.	164,000	417	893	1,921	80.3
Between N. Livermore Ave. and Portola Ave.	164,000	417	893	1,921	80.3
Between Portola Ave. and Airway Blvd.	183,000	448	961	2,067	80.8
Between Airway Blvd. And El Charro Rd.	184,000	450	964	2,074	80.8

[a] This noise contour analysis is based on the average daily traffic projected to occur along individual roadway segments. Projects in the vicinity of a given roadway segment could also be affected by other noise sources (e.g., I-580 and train operations). Project specific noise analysis may be required for any given specific location to meet noise compatibility guidelines.

[b] The noise analysis model was programmed to provide noise levels beyond 50 feet of the roadway centerline, as it is assumed that areas within 50 feet of the centerline are usually within the roadway right-of-way for major roadway segments. Traffic noise within 50 feet of the roadway centerline can be provided with site specific analysis, as necessary.

Source: LSA Associates, Inc., March 2003.

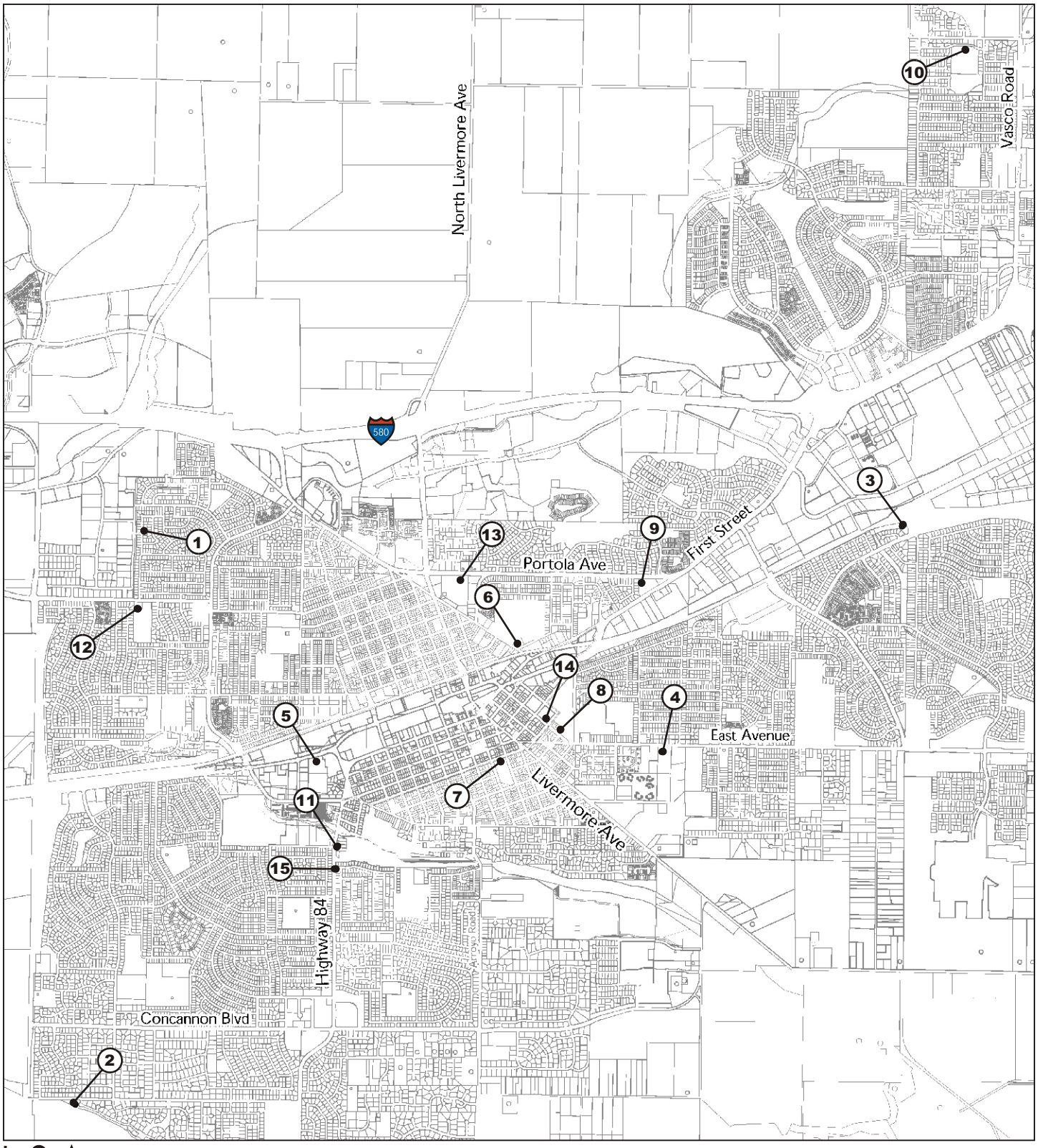


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FIGURE 10-2

N

1 NOISE MONITORING LOCATIONS

NOTE: THE LOCATIONS ARE DESCRIBED ON TABLE 10-7.

0 1,320 2,640
FEET

Livermore General Plan Update
Master Environmental Assessment
Ambient Noise Monitoring Locations

SOURCE: LSA ASSOCIATES, INC., 2003.

I:\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\NEW MEA FIGURES\FIG_10-2.CDR (06/09/03)

5. Aircraft Operations

Aircraft overflights contribute little to the ambient noise levels in Livermore. However, the Livermore Airport does provide a variety of services to small and large non-commercial aircraft. Increased airport operations envisioned under the Airport Master Plan Update (in preparation as of June 2002) would be expected to increase the zone within which noise from aircraft would be noticeable.

D. NOISE MEASUREMENTS

LSA conducted an ambient noise survey on March 18, 2003. A Larson-Davis Model 824 sound level meter was used to conduct the ambient noise survey. Ambient noise level at 15 representative locations within the City was measured for a period of 15 to 30 minutes. Figure 10-2 provides a noise monitoring location map identifying the 15 monitoring locations within the City. Ambient noise levels at five residences, six elementary/middle/high schools, one church, one hospital, and one Assisted Care Center for Seniors were recorded. Table 10-7 lists the 15 locations and the noise levels measured. Table 10-7 shows that noise levels in 2003 in communities within the City ranged from 52.5 to 65.2 dBA Leq. This range of noise levels is typical of an urban/suburban setting that is not near a busy street. In addition to vehicular traffic, aircraft overflight, leaf blower, construction activity, loading/unloading operation, dog barking, bird chirping, children playing, and church bell ringing contributed to the ambient noise measured.

Table 10-7: Livermore Ambient Noise Levels

Location #	Date	Time	Duration	L_{eq}
1. 1390 Arlington Rd. Residential neighborhood at the intersection of York Way and Arlington Rd.	3/18/2003	3:01-3:31 p.m.	30 minutes	62.4 dBA
2. 249 Alden Lane Residential neighborhood at the intersection of Old Oak Road and Alden Lane.	3/18/2003	2:02-2:17 p.m.	15 minutes	52.5 dBA
3. 4947 Candy Court Residential neighborhood. In the front yard near the intersection of Patterson Pass Road and Candy Court.	3/18/2003	8:41-8:56 a.m.	15 minutes	53.6 dBA
4. 3951 East Avenue East Avenue Middle School on East Avenue between Hill Crest and Estate Street. Next to St. Michaels Cemetery.	3/18/2003	9:22-9:37 a.m.	15 minutes	62.2 dBA
5. 1111 East Stanley Blvd. Valley Memorial Hospital/Hacienda Convalescent Hospital.	3/18/2003	1:26-1:41 p.m.	15 minutes	60.7 dBA
6. 298 Junction Avenue Junction Avenue Middle School and Park near the intersection of Junction Avenue and Ladd Avenue.	3/18/2003	10:14-10:29 a.m.	15 minutes	55.4 dBA
7. 2253 Fifth Street Del Valle High School. Near the intersection of I Street and Fifth Street.	3/18/2003	4:56-5:11 p.m.	15 minutes	53.8 dBA
8. 600 Maple St. Livermore High School near intersection of Maple Street and East Avenue.	3/18/2003	9:47-10:02 a.m.	15 minutes	61.3 dBA
9. 3594 Ridgecrest Center Near the intersection of First Street and Portola Avenue.	3/18/2003	11:14-11:34 a.m.	20 minutes	58.7 dBA
10. 5757 Haggin Oaks Avenue Christensen School parking lot on Haggin Oak Avenue between Pasatiempo Street and Briadmoor Street.	3/18/2003	8:02-8:17 a.m.	15 minutes	57.3 dBA
11. 790 Holmes Street Tiffany Gardens (Assisted Care Center for Seniors) at the intersection of Holmes Street and Mocho Street.	3/18/2003	4:30-4:45 p.m.	15 minutes	65.2 dBA
12. 401 E. Jack London Blvd. Rancho Las Positas Elementary School and Nursery School. At the intersection of Jack London Blvd. and Arlington Road.	3/18/2003	2:38-2:53 p.m.	15 minutes	63.5 dBA
13. 2451 Portola Avenue Don Gasper De Portola Elementary School near the intersection of N. Livermore Avenue and Portola Avenue.	3/18/2003	10:49-11:04 a.m.	15 minutes	59.3 dBA
14. 458 Maple Street St. Michaels Church next to Livermore High School. Near the intersection of Maple Street and Fifth Street.	3/18/2003	12:04-12:19 p.m.	15 minutes	64.4 dBA
15. 927 Aberdeen Avenue In the front yard near the intersection of Holmes Street and Anza Way. Down the street from Tiffany Gardens.	3/18/2003	1:13-2:13 p.m.	15 minutes	60.2 dBA

Source: LSA Associates, Inc., March 2003.

11. BIOLOGICAL RESOURCES

This chapter provides a general description of the biological resources in and around the City of Livermore. The general vegetation, habitat types, associated wildlife, and the special-status species potentially present as of 2002 are all briefly described in this paper, followed by a discussion of the regulatory setting.

A. VEGETATION AND HABITAT TYPES

The following vegetation and habitat types can be found within the Livermore Planning Area. Several of these habitats are considered rare by the California Department of Fish and Game (CDFG) as noted in the following descriptions. Figure 11-1 shows existing habitat types.

1. Urban Developed Areas

Urban, developed areas do not generally provide habitat for native plants. However, there are many wildlife species that utilize urban areas for foraging, roosting, and/or nesting. Some of these species are non-native, such as house sparrows (*Passer domesticus*) and European starlings (*Sturnus vulgaris*). There are also a number of common native species that have adapted well to living in close proximity to humans and human activity. These include Pacific treefrogs (*Hyla regilla*), western fence lizards (*Sceleroporus occidentalis*), alligator lizards (*Elegaria* sp.), mallards (*Anas platyrhynchos*), cliff swallows (*Petrochelidon pyrrhonota*), barn swallows (*Hirundo rustica*), Brewer's blackbirds (*Euphagus cyanocephalus*), and western scrub-jays (*Aphelocoma californica*). In addition, there are a few special-status species that also live in close proximity to humans in urban areas and/or use man-made structures such as western burrowing owls (*Athene cunicularia*) and some bat species.

2. Agricultural

Agriculture remains a key land use in the Livermore Planning Area. Agricultural land uses include hayfields, vineyards, almond orchards, walnut orchards, and cattle grazing. These various forms of agriculture are found within and surrounding the City of Livermore and make up the majority of land use in the Planning Area north of I-580.

Depending on the type and intensity of agriculture, agricultural lands vary in the degree to which they support native plant and animal species. Grazing lands probably support the greatest diversity of species since the land is not as intensively-managed and altered. However, the intensity of grazing can greatly affect the composition of native and non-native plant communities and, consequently, the diversity of wildlife species. Wildlife that may use grazing land in the Livermore region include black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), deer mice (*Peromyscus maniculatus*), California ground squirrels (*Spermophilus beecheyi*), Botta's pocket gophers (*Thomomys bottae*), San Joaquin kit fox (*Vulpes macrotis mutica*), and many bird species, including birds of prey, such as red-tailed hawks (*Buteo jamaicensis*) and golden eagles (*Aquila chrysaetos*).

Intensively-farmed lands do not typically support native plant communities. However, certain wildlife species use these fields for foraging and/or roosting, particularly migrating waterfowl. Birds may find suitable foraging habitat in newly-tilled soil or in certain crops. Mammals, such as mice, rabbits, hares, and their predators, may find food and cover in some crops, such as grains. As in grazing land, soaring, open country birds of prey are often found hunting over agricultural fields for rodents and other small mammals. The edges of agricultural fields, where disturbance is minimized, may provide opportunities for burrowing animals, such as California ground squirrels and burrowing owls. In addition, agricultural areas are often some of the few sites with readily available water, irrigation ditches, and stock ponds that are not heavily disturbed, and often support various species of reptiles and amphibians, such as western pond turtles (*Clemmys marmorata*), California red-legged frogs (*Rana aurora draytonii*), certain salamanders (including California tiger salamanders [*Ambystoma californiense*]), and some bird species.

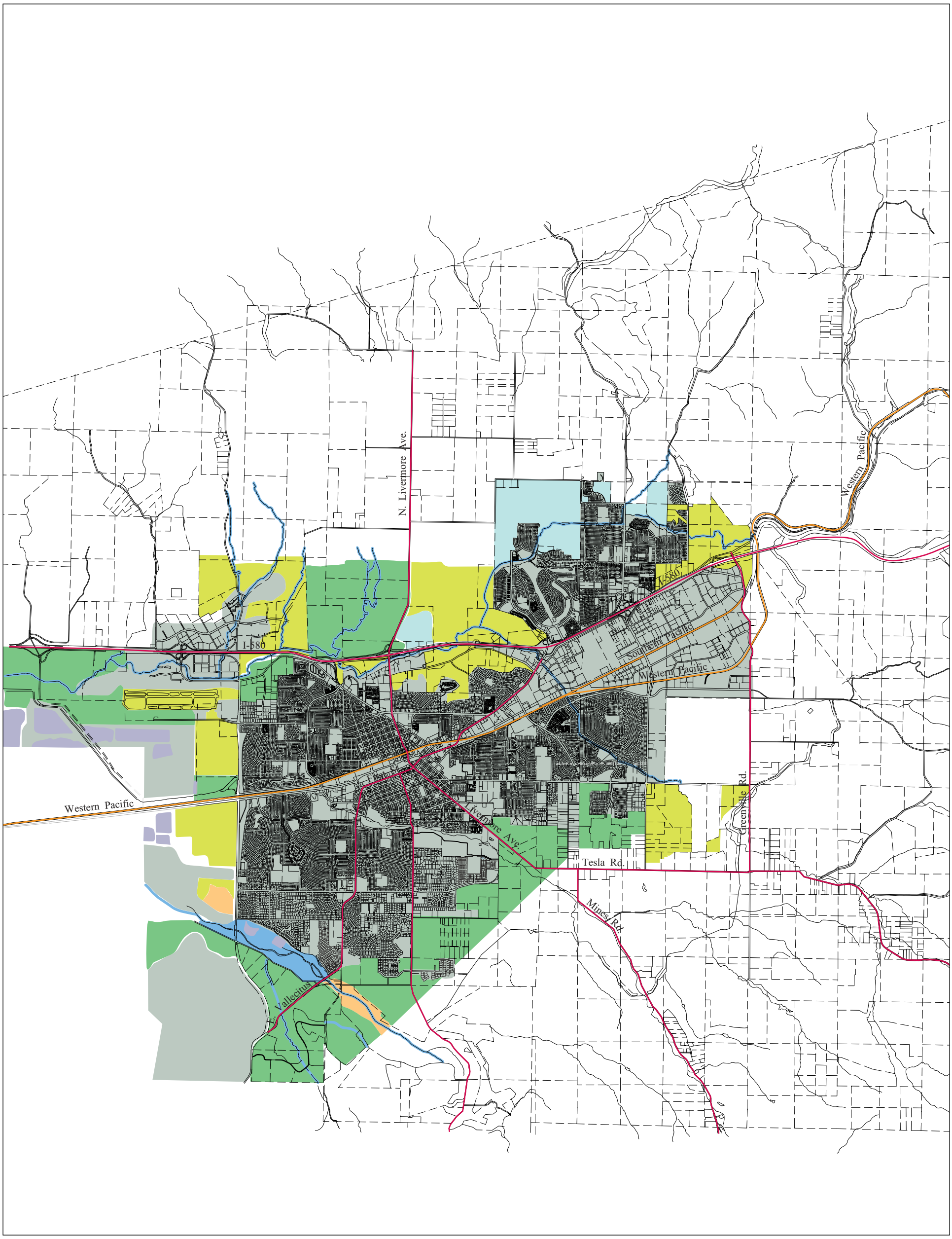
3. Grassland

The following discussion about grassland areas in the Livermore Planning Area includes descriptions of non-native annual grassland, valley needlegrass grassland, and alkali meadows.

a. Non-Native Annual Grassland. Non-native annual grassland is the most common vegetation type in the Livermore Planning Area. It is abundant on the valley floor, as well as in the surrounding hillsides where it often makes up the understory of oak woodland. Non-native grassland is generally found in areas that have been grazed or in abandoned agricultural fields and is usually dominated by annual, introduced grasses, mustards, and filaree. Depending on the degree of disturbance or grazing, it may also be dominated by a number of thistle species, especially in seeps or slumps.

The most common species in non-native grassland in the Livermore area are: wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), yellow star thistle (*Centaurea solstitialis*), soft chess (*Bromus hordeaceous*), hare barley (*Hordeum marinum* ssp. *leporinum*), fescue (*Vulpia myuros*), filaree (*Erodium* sp.), and mustards (*Brassica and Hirschfeldia* sp.). Many native wildflowers can be found in these annual grasslands, particularly those that are good competitors, such as fiddleneck (*Amsinkia* sps.), bluedicks (*Dichelostemma capitatum*), lupine (*Lupinus* sps.), popcorn flower (*Plagiobothrys nothofulvus*), California poppy (*Eschscholzia californica*), clarkia (*Clarkia* sp.), and owl's clover (*Castilleja exserta* and *C. densiflora*). Where the vegetation is thin due to poor or shallow soils, other native species and possibly special-status species can be found.

b. Valley Needlegrass Grassland. Found in small remnants in the Livermore Planning Area, Valley needlegrass grassland is a perennial native grassland community that is typically dominated by purple needlegrass (*Nassella pulchra*). A variety of native and non-native spring wildflowers are also found in native Valley grassland. As a result of grazing, intensive agriculture, reduction in fire frequency, and the introduction of exotic species, native grassland has been reduced to 10 percent of its former area in California. Because of the rarity of this once abundant vegetation type, the California Department of Fish and Game considers it a Significant Natural Community and monitors its status and distribution via the California Natural Diversity Database. The State may request mitigation for projects that impact native grassland. Additionally, special-status plants are more likely to be found in undisturbed native vegetation.



LSA

FIGURE 11-1

Livermore General Plan Update
Master Environmental Assessment
Existing Habitat Map

SOURCE: LSA ASSOCIATES, INC., 2003.

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c. Alkali Meadows. Alkali meadows can be found within some grassland areas in the Livermore Planning Area, and favor a unique set of species. They are formed in shallow basins where the soil is particularly alkaline relative to surrounding grasslands. Alkali Meadows typically contain hare barley (*Hordeum marinum)*, saltgrass (*Distichilis spicata)*, alkaki heath (*Frankenia salina)*, California goldfields (*Lasthenia californica)*, toad rush (*Juncus bufonius)*, and sand spurrey *(Spergularia* sp.*)*. Basins with a visible salt crust may support such species as Italian rye grass, alkaliweed (*Cressa truxillensis*), Douglas's dandelion (*Microseris douglasii*), dwarf carrot (*Daucus pusilla*), alkali mallow (*Malvella leprosa*), Mayweed (*Anthemis cotula*), blow wives (*Achyrachaena mollis)*, alkali heath, and special-status plants like brittlescale (*Atriplex depressa)*, and San Joaquin saltbush (*A. joaquiniana)*. However, a visible salt crust is not necessary for any of these species to exist.

d. Wildlife Species in Grasslands. Many wildlife species use both non-native and native grassland during part or all of their life. Reptiles commonly found in grassland include western fence lizard, common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus viridis*). Birds that breed in grassland include northern harrier (*Circus cyaneus*), burrowing owl (which are generally dependent on presence of burrowing mammals), horned lark (*Eremophila alpestris*), grasshopper sparrow (*Ammodramus savannarum*), and western meadowlark (*Sturnella neglecta*). Other birds that commonly forage in grasslands include turkey vulture (*Cathartes aura*), red-tailed hawk, American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and prairie falcon (*Falco mexicanus*). Several mammal species use grasslands including coyote, black-tailed deer, California ground squirrel, black-tailed jackrabbit (*Lepus californicus*), San Joaquin kit fox and many different rodents.

4. Wetlands

The Livermore Planning Area supports several different types of wetlands. All wetlands are characterized by plant and wildlife species that depend on year-round or seasonally-dependable sources of water. Such water sources are typically natural drainages, groundwater seeps, or seasonally inundated areas. Beyond the dependence on water, the different wetlands can vary considerably in their floral and faunal characteristics. Many of these wetland types can also be closely associated with one or more of the different habitat types described in this section.

a. Riparian Areas. Riparian vegetation refers to the native scrub or forest occurring along streams and riverbanks. In riparian areas, the roots of trees and other vegetation can easily reach the water table. Surface flow may be year-round or seasonal and such areas are often prone to frequent flooding. Riparian vegetation used to be found along most perennial and intermittent streams in the Livermore area, however, this vegetation type has become rare due to disturbance by agriculture, development, and the filling or channelizing of small streams in urban areas.

There are several arroyos in the Livermore area that still support riparian habitat. Arroyo Mocho is relatively undisturbed and, as a result, supports some mature riparian woodland with cottonwood, sycamore, and alder. Arroyo del Valle, particularly within the Sycamore Grove Regional Park, also supports mature riparian woodland. Other arroyos, such as Arroyo Las Positas and Arroyo Seco, have been largely modified for flood control purposes and impacted by grazing. As a result, the riparian vegetation is sparse and has been replaced in some areas with aquatic vegetation like cattails and rushes as well as exotic species from the surrounding grasslands.

Two kinds of riparian vegetation are found in the Livermore area. Riparian scrub is dense, brushy, and dominated by willows (*Salix* sps.). Other tree species that are occasionally found in riparian

scrub include coast live oak (*Quercus agrifolia*), northern California black walnut *(Juglans californica var. hindsii*), blue elderberry (*Sambucus mexicana*), and white alder (*Alnus rhombifolia*). The dense understory may include coyote bush, mulefat (*Baccharis salicifolia*), and California blackberry (*Rubus ursinus*). Exotic invasive species in the riparian scrub often include black locust (*Robinia psuedo-acacia*), wattle (*Acacia* sps.), and Himalayan blackberry (*Rubus discolor*). In riparian areas with less frequent flooding or other disturbance, riparian scrub may develop into a riparian woodland.

Riparian woodland has more large trees, less willow, and a slightly more open understory than riparian scrub. The character of riparian woodland varies depending on flow and topography. Along small creeks and in mountainous terrain, the floodplain will be restricted to a narrow zone along the creek and the tree species will be those more tolerant of dry soils, such as coast live oak, California bay (*Umbellularia californica*), and California buckeye (*Aesculus californica*). Where streams are broader and have regular flows such as along the valley floor, more moisture-dependent tree species dominate the canopy. Typical riparian woodland species in major drainages include Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), and alder (*Rhamnus* sp.). Scrub species, such as various willows and mulefat, are often found in these woodlands as well. In addition, there are several exotic tree species that do well in riparian areas, such as eucalyptus (*Eucalyptus* sp.), tobacco tree (*Nicotiana glauca*), and naturalized tree of heaven (*Ailanthus altissima*).

Riparian areas provide important breeding and foraging habitat for many amphibians, reptiles, birds, and mammals; in fact, they are usually one of the most biologically diverse habitats in any region. In addition to the reliable presence of water, another reason for the diversity and their importance is that they serve as movement corridors and migratory stopovers for many species. Riparian communities have declined significantly due to agriculture and development throughout California. This is reflected in the many species of special concern, which frequently use or are dependent on this habitat. These species include the California red-legged frog, foothill yellow-legged frog (*Rana boylii*), western pond turtle, and Swainson's hawk (*Buteo swaisoni*), which nests in large trees such as cottonwoods.

(1) Movement Corridors. Riparian areas and creek corridors in the Planning Area (e.g., Arroyo Mocho, Arroyo Las Positas, and others) provide important habitat for a variety of wildlife species, both terrestrial and aquatic. Aquatic species exploit the creek channels that allow them to move through the developed portions of the Planning Area. Depending on the species, the aquatic habitat provided by a creek may provide foraging, breeding, and sheltering habitat or it may serve as a movement corridor between other habitat areas. The Pacific treefrog is a species that may use the creeks in the Planning Area for foraging, breeding, and larval development. Alternatively, steelhead may use the creeks to move from the bay to spawning areas, but do not likely find suitable spawning habitat in the Planning Area.

Riparian corridors may also function as simple movement corridors or may provide suitable habitat for foraging, breeding, sheltering, and other essential functions. Many bird species find well-developed riparian communities suitable for breeding even though the surrounding area may be developed. Riparian corridors allow terrestrial wildlife to pass through inhospitable urban areas, which may separate suitable habitat areas outside the Planning Area. In addition to connecting open spaces outside the Planning Area, the creeks and riparian corridors may also provide a connection

between open spaces and parks within the urban landscape. Connection of the parks and open spaces in the urban area with each other and with larger undeveloped open spaces outside the Planning Area increases the likelihood that parks and open spaces in the urban area will be able to support native species and sustain viable populations over time.

b. Freshwater Marsh. Valley freshwater marshes occur in areas that are wet year-round and are typically associated with ponds (natural or man-made), the shallow edges of lakes, and large pools in riparian areas. Plant species found in freshwater marshes are very characteristic since there are few species capable of withstanding continuous inundation of their roots. Typical species include cattails, sedges, rushes, willows, bulrushes (*Scirpus* sps.), and common tule (*Scirpus acutus*).

Freshwater marsh is usually closely associated with other habitats, such as surrounding grassland or riparian vegetation, and the wildlife from these habitats will use the marsh frequently, especially when it is the primary source of water in the area. There are also many species that use marshes exclusively or preferentially. Aquatic species, such as Pacific tree frogs, California red-legged frogs, California tiger salamanders, and western pond turtles, use marshes depending on their condition. Common bird species include marsh wrens, common yellowthroats, and red-winged blackbirds. Many mammals will come to marshes for water or forage. The aquatic muskrat (*Ondatra zibethica*) lives in marshes, as well as riparian habitats.

c. Freshwater Seep. Freshwater seeps may be found in grasslands or meadows or associated with freshwater marshes. They have permanently wet or moist soil as a result of the water table being near the surface and typically contain sedges (*Carex* spp.) and rushes (*Juncus* spp.). If water pools sufficiently, they may contain watercress (*Rorripa nasturtium-aquaticum*). Many plant and animal species from the surrounding grasslands use seeps. In addition, seeps can provide habitat for plants and animals dependent on seasonal wetlands, including many special-status species such as those found in vernal pools.

d. Northern Claypan Vernal Pools. Vernal pools are seasonal wetlands that occur in grasslands. In order to form, they require slight depressions over bedrock or hardpan soils that allow water to pool during the winter and spring rains. Northern claypan vernal pools found in the Livermore area typically have an impervious layer of silicate-based claypan underlying them that prevents water from percolating down into the soil. As the ponds dry in the spring, a succession of different plant species bloom around the edges of the pool creating a wave of colorful wildflowers. Since vernal pools are a unique habitat and tend to be isolated from each other, they often support species that are endemic (i.e., restricted) to vernal pools or even to pools in that particular region. As a result of this endemism and the dramatic decline of vernal pools due to agriculture and development, vernal pools are listed as a Significant Natural Community by the California Department of Fish and Game and many vernal pool dependent plants and animals are special-status species protected by the State or federal government. Plant species common to vernal pools include the federally-endangered Contra Costa goldfields (*Lasthenia conjugens*), coyote thistles (*Eryngium* spp.), dwarf blennosperma (*Blennosperma nanum*), spreading alkali-weed (*Cressa truxillensis*), and Douglas' mesamint (*Pogogyne douglasii*). Vernal pools are also habitat for special-status animals like the California tiger salamander and fairy shrimp (*Branchinecta* sp.). Also, more common species from surrounding grasslands will also occur in vernal pools.

e. Alkali Meadow/Alkali Sink Scrub. This habitat is typically found in the valley bottoms where the highly alkaline Rincon Solano, Clear Lake, and Pescadero soil series are present. The soils are seasonally saturated and slow to drain, supporting vegetation that is distinct from the surrounding grasslands or woodland. Similar to vernal pools and native grasslands, the extent of this habitat has diminished greatly with only small pockets left in the Livermore Planning Area, mainly in the Springtown area and east of the Altamont Hills. The California Department of Fish and Game considers these alkali habitats a Significant Natural Community because they support plant and animal species not found elsewhere and because they are declining sharply in California. Plants growing in these alkaline habitats, depending on specific conditions, can include iodine bush (*Allenfolfea occidentalis*), alkali weed (*Cressa truxillensis*), alkali heath (*Frankenia grandifolia*), salt grass (*Distichlis spicata*), seepweed (*Suaeda fruticosa*), and pickleweed (*Salicornia subterminalis*). They may also support the federally-endangered palmate-bracted bird's beak (*Cordylanthus palmatus*), and the federal candidates for listing, hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*) and San Joaquin saltbush (*Atriplex joaquiniana*).

Hispid bird=s beak is restricted to saltmarsh and alkali meadow habitats at the northwest end of the San Joaquin Valley. A population is known to occur in the Springtown Wetlands. The species flowers between May and July. Hispid bird=s-beak is a summer-blooming species. Potentially suitable habitat is present in the Planning Area in alkaline areas, especially in the hilly areas. Palmate-bracted bird=s-beak is restricted to the west side of the Central Valley, and extant populations are known from only two locations. It occurs on highly alkaline soils in habitats such as alkali meadow or alkali scrub. A population is known to occur in the Springtown Wetlands.

Similar to vernal pools, ponding occurs in the winter and early spring and supports a specialized fauna that have adapted to this water regime. Wildlife that can be found in these habitats include California tiger salamander, a species of special concern and candidate for listing, and two listed invertebrates, vernal pool fairy shrimp (*Branchinecta lynchi*) and longhorn fairy shrimp (*Branchinecta longiantenna*). Many species that are common to the surrounding grasslands also use these habitats such as northern harriers, burrowing owls, killdeer (*Charadrius vociferus*), and ground squirrels.

5. Open Water

Within the Livermore Planning Area, permanent open waterbodies are mostly restricted to the former sand and gravel pits west of the City, such as the lake within the Shadow Cliffs Regional Recreation Area. Other open water habitats may exist as small natural or man-made ponds and reservoirs.

Although open water does not provide habitat for many plant species, it is important for wildlife and fish. Waterbirds and waterfowl use the lakes and rivers for foraging and breeding, as well as stopovers during migration.

Creeks in the Livermore Planning Area support a variety of aquatic fish and amphibians, many of which are non-native predators, such as bullfrogs (*Rana catesbeiana*), bluegill (*Lepomis macrochirus*), and bass (*Micropterus* sp.). Native species, such as steelhead (*Oncorhynchus mykiss*) and California red-legged frogs, also occur in the aquatic habitats in the region.

6. Woodland/Forest

Woodland and forested habitats are largely restricted to the north and east-facing slopes or higher elevations in the southern and western sections of the Livermore Planning Area. The moist micro-climate produced by the altitude, steepness and/or aspect of these areas allows the development of dense stands of trees. Two woodland/forest communities are present in the Livermore Planning Area depending on the microclimate of the site: oak woodland and evergreen forest. Additionally, these woodland types may overlap considerably and share many common plant and animal species.

a. Coast Live Oak Woodland. This community is typically found higher on slopes and on ridgetops where there is a drier microclimate and well-drained soils. The dominant tree species is coast live oak (*Quercus agrifolia*). Other tree species commonly interspersed with the oaks are blue oak (*Quercus douglasii*), California bay (*Umbellularia californica*) and California buckeye (*Aesculus californica*). The canopy in this community is usually moderately dense and the understory is mostly grassland with scattered shrubs, such as poison oak (*Toxicodendron diversiloba*).

Oak trees provide food, cover, and nesting sites for many wildlife species. A number of amphibian and reptile species live in the cool understory and leaf litter. Acorns provide an important fall and winter food source for acorn woodpeckers (*Melanerpes formicivorus*), dusky-footed woodrat (*Neotoma fuscipes*), and black-tailed deer. Many cavity-nesting birds and birds of prey rely on oak woodlands for nesting sites.

b. Mixed Evergreen Forest. This forest type occurs in the cooler, moister canyons and the east or north facing slopes. The mixed evergreen forest varies from the coast live oak woodland by having a more closed canopy, greater vegetation diversity, and greater density of understory vegetation. The common tree species include coast live oak, California bay, big leaf maple (*Acer macrophyllum*), and madrone (*Arbutus menziesii*). The understory vegetation typically includes poison oak, hazelnut (*Corylus cornuta*), creambush (*Holodiscus discolor*), and coffeeberry (*Rhamnus californica*).

The mixed evergreen forest also supports a diverse fauna. Because it is generally moister than oak woodland, several species of amphibian, such as the California newt (*Taricha tarosa*), rely on it for a summer retreat. Others, like the slender salamander (*Batrachoseps attenuatus*) and yellow-eyed salamander (*Ensatina eschscholtzi xanthipotica*), spend their entire life in the leaf litter of the forest floor. The many bird and mammal species that use this forest are similar to those that are common to oak woodlands.

7. Scrub

Scrub communities in the Livermore Planning Area generally occur on arid, south-facing slopes and above woodlands on the ridges and provide a transition between woodland and grassland. Three types of scrub community have been identified in the Planning Area: diablan sage scrub, coastal sage scrub, and baccharis brushland. The vegetation composition of these habitats is similar but chamise (*Adenostoma fasciculatum*) dominates the diablan sage scrub; California sage (*Artemesia californica*) dominates the coastal sage scrub; and coyote bush (*Baccharis pilularis*) dominates the baccharis brushland. Other common plant species in these habitats include bush monkey-flower (*Mimulus aurantiacus*), interior goldenbush *(Ericarmeria linearifolia),*woolly paintbrush (*Castilleja foliolosa),*valley tassels (*C. attenuata),* deerweed (*Lotus scoparius),* and goldback fern (*Pentagramma*

triangularis). Since these scrub communities are often adjacent to grasslands, the various native and non-native grassland species may also be present in the understory.

Because they are generally warm, the scrub communities are home to a number of reptile species, including the federal and State-listed Alameda whipsnake (*Masticophis lateralis euryxanthus*), western rattlesnake, common kingsnake (*Lampropeltis getulus*), western fence lizard, and northern alligator lizard (*Elgaria coerulea*). Many bird species common to these habitats include California thrasher (*Toxostoma redivivum*), wrentit (*Chamaea fasciata*), spotted towhee (*Pipilo maculatus*) and California quail (*Callipepla californica*). Mammals that are likely to use this habitat for cover and forage include black-tailed deer, coyote, gray fox (*Urocyon cinereoargenteus*), black-tailed jackrabbit, and various rodents.

B. SPECIAL-STATUS SPECIES AND SIGNIFICANT NATURAL COMMUNITIES

The following special-status species and sensitive community types are considered in this evaluation:

- Species that are listed, or designated as candidates for listing, as threatened or endangered under the federal Endangered Species Act;
- Species that are listed, or designated as candidates for listing as rare (plants), threatened, or endangered under the California Endangered Species Act;
- Wildlife species listed by the California Department of Fish and Game as species of special concern or fully protected species;
- Communities designated by the California Department of Fish and Game to be "significant natural communities;
- Plant species on List 1A, List 1B, List 2, and List 3 in the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants* of California;
- Species that meet the definition of rare or endangered under the California Environmental Quality Act (under Section 15380 of CEQA, a species not included on any formal list "shall nevertheless be considered rare or endangered if the species can be shown to meet the criteria" for listing); and
- Taxa of special concern by local agencies.

1. Special-Status Plants and Communities

The Natural Diversity Database of the California Department of Fish and Game and the Electronic Inventory of the California Native Plant Society were searched for records of special-status species or communities in or near the Livermore Planning Area. Thirty-four special-status plant species with potential to occur in the Livermore Planning Area were found and are listed in Table 11-1, along with a description of their habitats.

2. Special-Status Wildlife

The Natural Diversity Database of the California Department of Fish and Game was searched in 2001 for records of special-status wildlife species in or near the Livermore Planning Area. Twenty-eight

special-status animal species with potential to occur in the Livermore Planning Area were found and are listed in Table 11-2, along with a description of their habitats.

C. REGULATORY CONTEXT

The Livermore Planning Area is located within the geographic range of numerous sensitive plant communities/habitats and special-status plant and wildlife species. Biological resources on the site may be subject to agency jurisdictions and regulations, as described below.

1. U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service has jurisdiction over species that are formally listed as threatened or endangered under the federal Endangered Species Act. The Endangered Species Act protects listed wildlife species from harm or "take," broadly defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." An activity is defined as a "take" even if it is unintentional or accidental.

An endangered plant or wildlife species is one that is considered in danger of becoming extinct throughout all, or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. In addition to endangered and threatened species, which are legally protected under the Endangered Species Act, the U.S. Fish and Wildlife Service has a list of candidate species. A *candidate species* is one for which the U.S. Fish and Wildlife Service currently has enough information to support a proposal to list it as a threatened or endangered species.

Section 9 of the Endangered Species Act and its applicable regulations restrict certain activities with respect to endangered and threatened plants. However, these restrictions are less stringent than those applicable to fish and wildlife species. The provisions prohibit the removal of, malicious damage to, or destruction of any listed plant species "from areas under federal jurisdiction." Listed plants may not be cut, dug up, damaged or destroyed, or removed from any other area (including private lands) in knowing violation of a State law or regulation.

2. U.S. Army Corps of Engineers

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers is responsible for regulating the discharge of fill material into waters of the U.S. Waters of the U.S. and their lateral limits are defined in 33 CFR (Code of Federal Regulations) Part 328.3 (a) and include streams that are tributary to navigable waters and their adjacent wetlands. As described previously, many sensitive biological resources are associated with streams and wetlands. Wetlands that are not adjacent to waters of the U.S. are termed "isolated wetlands" and may be subject to U.S. Army Corps of Engineers jurisdiction.

In general, a U.S. Army Corps of Engineers permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit depends on the amount of acreage and the purpose of the proposed fill and is subject to discretion from the U.S. Army Corps of Engineers. There are two categories of U.S. Army Corps of Engineers permits: individual and nationwide (general) permits. Where specified activities would have minimal adverse impacts, nationwide permits may be used. Eligibility for a nationwide permit simplifies the permit review process. Nationwide permits cover

Table 11-1: Special-Status Plant Species Potentially Occurring in the Livermore Planning Area[a]

Species and Common Name	Legal Status[b]	Description	Habitat	Blooming Period
Amsinkia grandiflora Large-flowered fiddleneck	FE/CE/1B	Annual wildflower	Grassland, cismontane woodland.	Apr – May
Amsinckia lunaris Bent-flowered fiddleneck	-/-/1B	Annual wildflower	Grasslands, cismontane woodland, and coastal bluff scrub.	Mar – Jun
Arctostaphylos auriculata Mt. Diablo manzanita	-/-/1B	Evergreen shrub	Canyons and slopes in sandstone chaparral.	Jan – Mar
Aster lentus Suisun marsh aster	-/?/1B	Rhizotamous perennial herb	Brackish and fresh-water marshes and swamps.	Aug – Nov
Astragalus tener var. *ferrisiae* Ferris's milk-vetch	-/-/1B	Annual herb	Meadows and valley and foothill grassland – alkaline soils.	Apr – May
Astragalus tener var. *tener* Alkali milk-vetch	-/-/1B	Annual herb	Playas, valley and foothill grassland, and vernal pools – adobe and alkaline soils.	Mar – Jun
Atriplex cordulata Heartscale	-/-/1B	Annual herb	Alkaline flats and scalds in sandy chenopod scrub and grasslands.	May – October
Atriplex depressa Brittlescale	-/-/1B	Annual herb	Clay or alkaline chenopod scrub, playas, grassland.	May-October
Atriplx joaquiniana San Joaquin saltbush	-/-/1B	Annual herb	Alkaline chenopod scrub, meadows, and grasslands.	April – September
Balsamorhiza macrolepis var. *macrolepis* Big-scale balsamroot	-/-/1B	Perennial wildflower	Grasslands, chaparral, and cismontane woodland.	Mar – Jun
Blepharizonia plumosa ssp. *Plumosa* Big tarplant	-/-/1B	Annual herb	Dry annual grasslands with clay or clay-loam soils. Often on slopes or burns.	July – October
Calochortus pulchellus Mt. Diablo fairy lantern	-/-/1B	Perennial bulb	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland	Apr – Jun
Caulanthus coulteri var. *lemmonii* Lemmon's jewel flower	-/-/1B	Annual wildlflower	Pinyon and juniper woodland, valley and foothill grassland	Mar – May
Centromadia parryi ssp. *Congdonii* Congdon's tarplant	-/-/1B	Annual herb	Valley and foothill grassland – alkaline soils	Jun – Nov
Cordylanthus mollis ssp. *Hispidus* Hispid bird's beak	-/-/1B	Annual hemi-parasitic wildflower	Meadows, playas, valley and foothill grasslands – alkaline soils	Jun – Sept
Cordylanthus palmatus Palmate-bracted bird's beak	FE/CE/1B	Annual hemi-parasitic wildflower	Chenopod scrub, valley and foothill grasslands – alkaline soils	July – Sept
Deinandra bacigalupii Livermore tarplant	-/-/1B	Annual wildflower	Alkaline meadows	Jun – Oct
Delphinium californicum ssp. Interius Hospital canyon larkspur	-/-/1B	Perennial herb	Cismontane woodland and chaparral	Apr – Jun
Delphinium recurvatum Recurved larkspur	-/-/1B	Perennial wildflower	Chenopod scrub, valley and foothill grasslands – alkaline soils	
Eriogonum nudum var. *decurrens* Ben Lomond buckwheat	-/-/1B	Perennial herb	Chaparral and cismontane woodland – sandy soils	Jun – Oct

Table 11-1 *continued*

Species and Common Name	Legal Status[b]	Description	Habitat	Blooming Period
Eriogonum truncatum Mt. Diablo buckwheat	-/-/1A	Annual herb	Chaparral, coastal scrub, valley and foothill grasslands – sandy soils	Apr – Nov
Erodium macrophyllum Round-leaved filaree	-/-/2	Perennial wildflower	Cismontane woodland, valley and foothill grassland	Mar – Jul
Eschscholzia rhombipetala Diamond-petaled California poppy	-/-/1B	Annual wildflower	Alkaline slopes and flats in clay grasslands.	Mar – Apr
Helianthella castanea Diablo helianthela	-/-/1B	Perennial wildflower	Rocky soils on edge of chaparral or scrub and grassland or woodland.	Apr – Jun
Hibiscus lasocarpus Rose-mallow	-/-/2	Perennial herb	Freshwater marshes and swamps	Jun – Sept
Lasthenia conjugans Contra Costa goldfields	FE/-/1B	Annual wildflower	Mesic grasslands, vernal pools, and cismontane woodland.	Mar – Jun
Lilaeopsis masonii Mason's liaeopsis	-/CR/1B	Perennial herb	Tidal zones in muddy or silty soil of brackish and freshwater marshes, swamps, and riparian scrub.	Apr – Oct
Madia radiata Showy madia	-/-/1B	Annual wildflower	Chaparral, grassland, cismontane woodland, and chenopod scrub – clay soils	Apr – May
Plagiobothrys glaber Hairless popcorn-flower	-/-/1A	Annual herb	Alkaline meadows, coastal marshes and swamps	Mar – May
Senecio aphanactis Rayless ragwort	-/-/2	Annual herb	Chaparral, cismontane woodland, and coastal scrub – alkaline soils	Jan – Apr
Streptanthus albidus ssp. *Peramoenus* Most beautiful jewel-flower	-/-/1B	Annual herb	Chaparral, cismontane woodland, valley and foothill grassland – serpentine soils	Apr – Jun
Trifolium amoenum Showy Indian clover	-/-/1B	Annual wildflower	Coastal bluff scrub, valley and foothill grasslands, and seeps	Apr – Jun
Trifolium depauperatum var. *hydrophilum* Saline clover	-/-/1B	Annual wildflower	Freshwater marshes, swamps, and valley and foothill grasslands	Apr – Jun
Tropidocarpum capparideum Caper-fruited tropidocarpum	-/-/1A	Annual wildflower	Valley and foothill grassland – alkaline hills	Mar – Apr

[a] Includes occurrences within one mile of the Planning Area boundary (high probability of also occurring within Planning Area).

[b] Legal Status: Federal/State/California Native Plant Society: FE = Federally listed as endangered; FT = Federally listed as threatened; CE = State of California listed as endangered; CT = State of California listed as threatened; CR = State of California listed as rare; CSNC = State of California significant natural community. California Native Plant Society Listings: 1A = Plants presumed extinct in California; 1B = Plants rare, threatened, or endangered in California and elsewhere; 2 = Plants rare threatened or endangered in California, but more common elsewhere.

Sources: Natural Diversity Database of the California Department of Fish and Game; Electronic Inventory of the California Native Plant Society. California Native Plant Society: Inventory of Rare and Endangered Plants of California.

Table 11-2: Special-Status Animal Species Potentially Occurring in the Livermore Planning Area[a]

Species	Status[a]	Habitat[b]	Seasonal Occurrence[c]	Potential Occurrence Within the Planning Area
Invertebrates				
Longhorn Fairy Shrimp *Branchinecta longiantenna*	FE	Grassland vernal pools along eastern margin of central coast mountains. Prefer clear water depressions in sandstone or in clay and grass bottomed pools.	Adults: Winter and Spring Eggs: In soil year-round	Vernal pools and seasonally ponded areas provide potential habitat. Known from unspecified locations in Alameda County.[d]
Vernal Pool Fairy Shrimp *Branchinecta lynchi*	FT	Grassy or mud-bottomed swales filled with rainwater in unplowed grasslands are the most common habitat for this species. Occasionally found in sandstone depressions as well. Range includes grassland areas in the Central Valley and the Central Coast Mountain Range.	Adults: Winter and Spring Eggs: In soil year-round	Vernal pools and other seasonally ponded areas (i.e., stock ponds) in grasslands provide potential habitat for this species. Other seasonal wetlands in low-lying areas may also support this species depending on depth, extent, and duration of inundation.
Fish				
Steelhead *Onchorhynchus mykiss*	FT	Coast - coastal rivers and creeks. Inland - Sacramento and San Joaquin Rivers and tributaries.	Seasonal	Seasonal migration corridor in creeks feeding into Alameda Creek.
Amphibians				
California Tiger Salamander *Ambystoma californiense*	C/CSC	Quiet water of ponds, reservoirs, lakes, temporary rain pools, and streams comprise breeding habitat. Adults emerge from their subterranean burrows for only a few weeks a year during the late winter and early spring after heavy rains (Bury 1971). Suitable habitat includes open woodland and grassland. Require underground refuges such as burrows (Stebbins 1985).	Adults: Year-round Larvae: Winter and Spring	Various pools and riparian areas in Planning Area provide potential habitat. Many sightings documented in Planning Area. Development has eliminated many of previously used habitats.[d]
California Red-Legged Frog *Rana aurora draytonii*	FT/CSC	Inhabits marshes, slow parts of streams, lakes, reservoirs, ponds, and other permanent water with emergent vegetation. When not breeding the red-legged frog may be found in damp woods and uplands (Stebbins 1985).	Year-round	Potential habitat in creeks and ponds throughout the Planning Area. Several documented sightings in creeks, ponds, and pools throughout Planning Area.[d]
Foothill Yellow-legged Frog *Rana boylii*	CSC	Occurs in partly shaded shallow streams and riffles in a variety of habitats. Need cobbles on stream bottom for egg-laying. Metamorphosis requires at least 15 weeks (Stebbins 1985).	Year-round	Potential habitat occurs in creeks with cobbly bottoms in the hills of the Planning Area.
Western Spadefoot *Scaphiopus hammondi*	CSC	Grasslands, washes, floodplains, vernal pools, and alkali flats with sandy or gravelly soils. Will also use surrounding valley or foothill woodlands (Stebbins 1985).	Year-round	Arroyos, washes and creeks provide potential habitat in Planning Area.

Table 11-2 *continued*

Species	Status[a]	Habitat[b]	Seasonal Occurrence[c]	Potential Occurrence Within the Planning Area
Reptiles				
Western Pond Turtle *Clemmys marmorata*	CSC	Permanent or nearly permanent water (fresh to brackish) in a wide variety of habitat types. Require basking sites and upland areas for egg laying.	Year-round	Potential habitat in creeks, stock ponds, and freshwater marshes throughout the Planning Area. Documented sightings from Tassajara Creek[d] and Arroyo Las Positas and Arroyo Seco (LSA, 2002)
California Horned Lizard *Phrynosoma coronatum frontale*	CSC	Found in many dry scrub, grassland, and forested habitats. Often associated with alkali meadows and flats. Favors open areas with patches of loose soil with shrubs or trees for cover. May use mammal burrows for refuge and hibernation	Year-round. Active: April – Oct.	Potential habitat in dry scrub, grasslands, and arroyos.
San Joaquin Whipsnake *Masicophis flagellum ruddocki*	CSC	Open, dry habitats including grasslands and scrub with little or no tree cover. Needs mammal burrows for egg laying and refuge.	Year-round	Grasslands and scrub habitats where burrows are available provide potential habitat. Documented sightings on Lawrence Livermore National Laboratory land east of Livermore.[d]
Alameda Whipsnake *Masticophis lateralis euryxanthus*	FT/ST	Occurs in northern coastal scrub or chaparral communities of the East Bay Hills in Alameda and Contra Costa counties. Grasslands are also important as foraging habitat. Rock outcrops are especially important hunting habitat. Western fence lizard is the primary prey species. Inhabits south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	Year-round	Abundant potential habitat in woodlands and scrub surrounded by grasslands. Many documented sightings in unspecified locations in Alameda County.[d]
Birds				
Sharp-Shinned Hawk *Accipiter striatus*	CSC	Favored habitats include woodland edges and riparian forests. Riparian forests and grasslands provide potential nesting and foraging habitats, respectively. Often nests near water	Resident and migrant	Potential habitat occurs in forests particularly riparian areas throughout the Planning Area. Breeding records from east of Fremont and near CSU, Hayward.[d]
Cooper's Hawk *Accipiter cooperi*	CSC	Favors woodland edges and riparian areas for foraging and nesting. Feed primarily on avian prey which is abundant at forest edges and in riparian areas (Zeiner et al 1990a).	Year-round resident	Potential habitat occurs in forests particularly riparian areas throughout the Planning Area. Breeding records from Sunol Regional Wilderness.

Table 11-2 *continued*

Species	Status[a]	Habitat[b]	Seasonal Occurrence[c]	Potential Occurrence Within the Planning Area
Golden Eagle *Aquila chrysaetos*	CSC	Mountainous or hilly terrain surrounded by open country for hunting. Nests on cliffs, rock outcrops, trees, and artificial structures.	Year-round. Breeds: Jan – Aug.	Potential habitat in woodlands and rolling hills around Planning Area. May forage over grasslands throughout area. Breeding records from several nearby areas including Del Valle Regional Recreation Area, San Antonio Reservoir, and Sunol Valley Regional Park.[d]
Bald Eagle *Haliaeatus leucocephalus*	FT/CE	Uses diverse habitats where large bodies of water, such as lakes or rivers, are nearby. Nests in tall trees, typically within one mile of water.	Year-round	Forested habitats around reservoirs and lakes in Planning Area provide potential habitat. Breeding records from Del Valle Reservoir.[d]
Swainson's Hawk *Buteo swainsoni*	ST	Typically found in areas where suitable nest trees, such as cottonwoods, valley oak, walnut, and willow grow adjacent to suitable foraging areas. Native grasslands, pasture lands, and agricultural fields that lack dense cover provide suitable foraging areas.	Breeds: Spring and Summer (A small population is known to winter in the Sacramento-San Joaquin Delta)	Potential nesting and foraging habitat occurs throughout the plan area, in agricultural and grassland areas with large trees nearby for nesting.
Ferruginous Hawk *Buteo regalis*	CSC	Open grasslands in sagebrush flats, desert scrub, low-foothills surrounding valleys, and edges of pinyon-juniper habitats (Zeiner et al 1990a)	Winter resident	Potential Winter foraging habitat in grasslands/ croplands in Planning Area.
Northern harrier *Circus cyaneus*	CSC	Marshlands, grasslands, meadows, and desert sinks. Mostly found in flat, or hummocky open areas. Nests on ground.	Year-round	Potential nesting and foraging habitat in grasslands and agricultural fields throughout the Planning Area.
White-tailed Kite *Elanus leucurus*	FP	Open grasslands, meadows, or marshes for foraging in proximity to isolated, dense-topped trees for nesting and perching.	Year-round	Potential nesting and foraging habitat throughout Planning Area in grasslands and agricultural areas. Breeding record near Newark.[d]
American Peregrine Falcon *Falco peregrinus anatum*	CE	Open country near cliffs or man-made structures for nesting.	Year-round	Known from La Costa Valley Area.[d]
Prairie Falcon *Falco mexicanus*	CSC	Perennial grasslands, savannas, rangeland, and some agricultural fields. Forages in open terrain, nests in open terrain with canyons, cliffs, and rock outcrops.	Year-round/ and migrant	Potential foraging and nesting habitat within valleys and foothills in the Planning Area.

Table 11-2 *continued*

Species	Status[a]	Habitat[b]	Seasonal Occurrence[c]	Potential Occurrence Within the Planning Area
Burrowing Owl *Athene cunicularia*	CSC	Open, dry, nearly or quite level grassland, prairie, and desert floor. Subterranean nester that generally uses existing mammal burrows, but will also excavate its own burrows. Burrow depths of 12-18 inches below ground apparently maintain thermal stability of the nest chamber (Olenick 1987).	Year-round	Potential breeding and foraging habitat in open grasslands and agricultural areas throughout the Planning Area. Many documented records throughout Planning Area and County.
Loggerhead Shrike *Lanius ludovicianus*	CSC	Open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover.	Year-round and Winter visitor	Grasslands and agricultural fields with nearby trees or scrub provide potential breeding and foraging habitat throughout Planning Area. Observed in grasslands near Arroyo Las Positas (LSA 2002).
California Horned Lark *Eremophila alpestris actia*	CSC	Open grasslands and agricultural fields, alkali flats and mountain meadows. Nests on the ground.	Year-round	Potential habitat throughout open country of Planning Area. Documented records from east of San Ramon.[d]
Tricolored Blackbird *Agelaius tricolor*	CSC	Breeds near fresh water, preferably emergent wetland but also in thickets of willow and other shrubs. Feeds in grassland and cropland.	Year-round and migrant	Potential foraging habitat in grassland and agricultural areas throughout Planning Area. Potential breeding habitat in marshes associated with creeks and ponds throughout Planning Area. Many documented records from unspecified locations in Livermore and surrounding areas.[d]
Mammals				
Townsend's Big-Eared Bat *Plecotus townsendii townsendii*	CSC	Variety of habitats. Prefers mesic sites. Roosts in caves, mines, tunnels, buildings, or other human made structures.	Year-round	Potential foraging habitat present within the plan area. Roosting habitat could include abandoned barns and buildings throughout the plan area.
Pallid Bat *Antrozous pallidus*	CSC	Variety of habitats. Most common in open, dry habitats with rocky areas for roosting. Roosts in caves, crevices, mines, hollow trees, and buildings.	Year-round	Potential foraging habitat present in the Planning Area, particularly in the oak woodlands of the Planning Area. Roosting habitat includes barns, buildings, rock outcrops, particularly in the undeveloped portions of the Planning Area.
San Joaquin Kit Fox *Vulpes macrotis mutica*	FE/ST	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	Year-round	Potential foraging and denning habitat in grasslands of the Planning Area.

[a] FE Federally listed as endangered
FT Federally list as threatened
C Federal candidate for listing as threatened or endangered
SE State listed as endangered
ST State listed as threatened
CSC State species of special concern

Table 11-2 *continued*

FP Fully protected in California
* Sensitive for one or more of the following reasons: a) taxa are biologically rare, restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when in California; b) population(s) in California may be peripheral to the major portion of a taxon's range, but is threatened with extirpation in California; c) taxa are closely associated with a habitat that is declining in California (CNDDB, 1994).
** Species of local interest. No official listing status, but occurrences limited to the Antioch Dunes (or only a few other sites).

[b] Based on California Natural Diversity Database (2000) and Zeiner et al. (1988, 1990a, 1990b).
[c] Based on Zeiner et al. (1988, 1990a, 1990b).
[d] Based on California Natural Diversity Database (2000).

Source: Natural Diversity Database of the California Department of Fish and Game; Zeiner et al. (1988, 1990a, 1990b); LSA Associates, 2001.

construction and fill of waters of the U.S. for a variety of routine activities, such as minor road crossings, utility line crossings, streambank protection, recreational facilities and outfall structures.

To qualify for a nationwide permit, a project must demonstrate that it has no more than a minimal adverse effect on the aquatic ecosystem. The U.S. Army Corps of Engineers typically interprets this condition to mean that there will be no net loss of either habitat acreage or habitat value. This condition usually results in the need for mitigation of impacts to any creek or wetland.

An individual permit is required where a nationwide permit is not applicable. The consideration of an individual permit includes, but is not limited to, factors such as significant acreage of wetlands or waters of the U.S., areas of high biological or unique value, or length of watercourse affected. The Environmental Protection Agency's 404(b)(1) guidelines require that an applicant clearly demonstrate that the proposed discharge is unavoidable and is the least environmentally damaging practicable alternative that will achieve the overall project purpose. The guidelines also establish a regulatory presumption that there is a practicable alternative that would have less impact on the aquatic ecosystem. If this presumption is not rebutted, a permit may not be issued. The 1990 Memorandum of Agreement between the Environmental Protection Agency and U.S. Army Corps of Engineers concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines summarizes the hierarchical approach to assessing mitigation under the guidelines. The first priority is to avoid impacts, second to minimize impacts, and third is to provide compensatory mitigation for unavoidable impacts.

3. California Department of Fish and Game

The California Department of Fish and Game has jurisdiction over threatened or endangered species that are formally listed by the State under the California Endangered Species Act. The California Endangered Species Act is similar to the federal Endangered Species Act both in process and substance; it is intended to provide additional protection to threatened and endangered species in California. The California Endangered Species Act does not supersede the federal Endangered Species Act, but operates in conjunction with it. Species may be listed as threatened or endangered under both acts (in which case the provisions of both State and federal laws would apply) or under only one act.

The California endangered species laws prohibit the taking of any plant listed as threatened, endangered, or rare. In California, an activity on private lands (such as development) will violate Section 9 of the Endangered Species Act if a plant species, listed under both State and federal endangered species laws, is intentionally removed, damaged, or destroyed.

Under the State Fish and Game Code, the California Department of Fish and Game also has jurisdiction over species that are designated as "fully protected." These species are protected against direct impacts. The California Department of Fish and Game maintains informal lists of *species of special concern*, which are broadly defined as plants and wildlife that are of concern to California Department of Fish and Game because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California. These species, as well as threatened and endangered species, are inventoried in the California Natural Diversity Database.

The California Department of Fish and Game also exerts jurisdiction over the bed and banks of watercourses according to the provisions of Section 1601 to 1603 of the Fish and Game Code. The Depart-

ment will require a Streambed Alteration Permit for the fill or removal of any material from any natural drainage. California Department of Fish and Game's jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

4. California Native Plant Society

The California Native Plant Society has developed lists of plants of special concern in California.[1] A California Native Plant Society List IA plant is a species, subspecies, or variety that is considered to be extinct. A List 1B plant is considered rare, threatened, or endangered in California and elsewhere. A List 2 plant is considered rare, threatened, or endangered in California, but is more common elsewhere. A List 3 plant is a species for which California Native Plant Society lacks necessary information to determine if it should be assigned to a list or not. A List 4 plant has a limited distribution in California.

All List 1 and List 2 plant species meet the requirements of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for State listing. Therefore, List 1 and 2 species should be considered under CEQA. Some List 3 plant species also meet the requirements of these portions of the Fish and Game Code and are eligible for State listing. Very few List 4 plants are eligible for listing, but may be locally important, and their listing status could be elevated if conditions change.

5. CEQA Guidelines, Section 15380

Although threatened and endangered species are protected by specific federal and State statutes, the CEQA *Guidelines* in Section 15380(b) provide that a species not included on the federal or State lists 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 definitions in the federal Endangered Species Act and the California Fish and Game Code. This section was included in the *Guidelines* primarily to deal with situations in which a public lead agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the U.S. Fish and Wildlife Service or California Department of Fish and Game. 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.

6. Regional Water Quality Control Board

Pursuant to Section 401 of the Clean Water Act, projects that apply for a U.S. Army Corps of Engineers permit for discharge of dredge or fill material, and projects that qualify for a Nationwide Permit, must obtain water quality certification from the Regional Water Quality Control Board that the project will uphold State water quality standards. Alternatively, the Regional Water Quality Control Board may elect to notify an applicant that the State may issue Waste Discharge Requirements in lieu of a Section 401 certification for a project.

[1] Skinner and Pavlik, 1994.

7. Other Statutes, Codes, and Policies Affording Species Protection

The federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. The federal Bald and Golden Eagle Protection Act prohibits persons within the United States (or places subject to U.S. jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof." Additionally, birds of prey (hawks, eagles, falcons, and owls) are protected in California under the State Fish and Game Code (Section 3503.5). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the California Department of Fish and Game and would be considered a significant impact.

12. GEOLOGIC AND SEISMIC HAZARDS

The City of Livermore is located in a geologically young and seismically-active region. The composition of topography, geologic material, soils, and groundwater conditions affect geologic hazards at any given site. The following chapter describes the geologic conditions and seismic hazards in the City of Livermore and vicinity.

A. TOPOGRAPHY

Livermore consists of two general topographic areas: the lowland area and the upland area. The lowland area is generally located in central Livermore, including the Downtown area. Elevations in the lowland area generally range from about 350 feet above mean sea level (msl) in the western portion of the Planning Area to about 600 feet above msl in the eastern portion of the Planning Area.

The upland areas include the hills to the northwest, northeast, and the south of Livermore. Just north and northeast of Downtown are several isolated hills that represent the surface expression of structural folding and uplift of major geologic units. The upland area consists of moderate to steeply sloping hills, and is generally located northwest of the lowland area (although minor uplands occur to the south and northeast). Elevations in the upland areas range from approximately 500 feet above msl to more than 1,200 above msl.

B. GEOLOGY

The geology of Livermore has been mapped by the California Division of Mines and Geology (CDMG, now referred to as the California Geological Survey) as part of a landslide hazard investigation of the Livermore Valley.[1] The portion of this mapping that coincides with the Planning Area is presented as Figure 12-1. The geologic units are described in Table 12-1.

The lowland area of Livermore is underlain by alluvium (designated Qal in Figure 12-1) that is younger than two million years old, and consists mainly of unconsolidated gravel, sand, silt, and clay deposits subject to redistribution by fluvial (stream) processes.

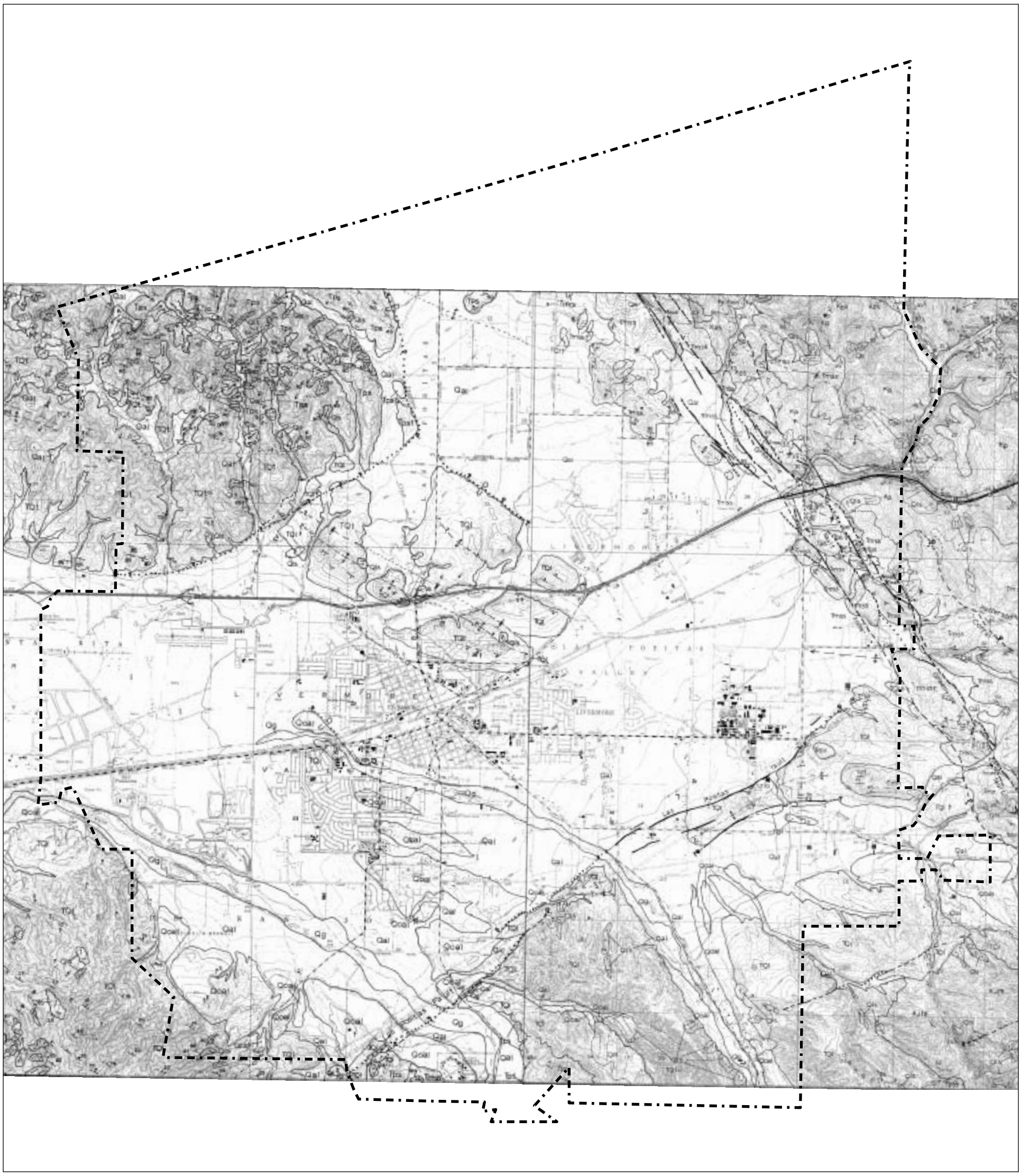
The upland area consists primarily of tilted sedimentary rocks of Tertiary age (between 2 million and 65 million years old). The Green Valley and Tassajara formations and the nonmarine sedimentary rock form the prominent portions of the uplands and recent alluvial deposits mantle the canyon bottoms and fringes of the uplands.

[1] California Division of Mines and Geology, 1991. *Landslide Hazard in the Livermore Valley and Vicinity, Alameda and Contra Costa Counties, California, Landslide Hazard Identification Map No, 21*, DMG Open File Report 91-2.

Table 12-1: Geologic Units in the Planning Area

Map Symbol	Unit Name	Age	Description
Qal	Alluvium	Miocene - Pleistocene	Area underlain by unconsolidated sand, silt, gravel, and clay deposits generally subject to redistribution by fluvial processes. Stream channels are generally incised, locally being subject to unstable banks which can slump into the channel due to undercutting.
Qls	Landslide Deposits	Holocene - Pleistocene	Shown only in selected area where underlying geologic relations are obscured. Arrows indicate general direction of movement. Landslide boundaries shown here are generalized and do not necessarily match those shown on Plate B (Landslides and Related features). Landslides that are currently stable can become mobilized by increased precipitation or human activities.
Qg	Stream Gravel	Holocene - Pleistocene	Unconsolidated deposits of pebbles and cobbles with minor sand and clay.
Qoal	Older Alluvium	Holocene - Pleistocene	Predominantly floodplain deposits consisting of unconsolidated to semi-consolidated sand, gravel, silt, and clay. Typically slightly elevated above modern drainage courses and less likely to be reworked by streams than Qal.
Tql	Livermore Gravel	Plio-Pleistocene	Massive buff to reddish-gray cobble-pebble gravel containing debris from Franciscan complex rocks. Also contains minor to major amounts of gray claystone. Contains scattered vertebrate fossils. Landslides in this unit are concentrated along canyon walls or bluff-like edges of the deposit.
Tqt	Green Valley and Tassajara Formations, Undivided	Plio-Pleistocene	Red and maroon conglomerate, brown sandstone, blue, gray, brown and red siltstone and claystone with minor gray limestone, lignite and tuff. Expansive soils are common, leading to creep-related movement. Earthflows are the most common type of slope failures in areas underlain by this unit.
Tps	Nonmarine Sedimentary Rocks	Pliocene	Weakly indurated pebble conglomerate, sandstone and greenish-gray claystone.
Tmn	Neroly Sandstone	Upper Miocene	Nonmarine blue to gray, medium-grained, thick-bedded pebbly sandstone with conglomeratic lenses and minor brown siltstone and andesite tuff. In this area, unit is weakly to moderately prone to landsliding.
Tmss	Cierbo Formation	Upper Miocene	Formation consists of a variety of rock types, mainly tan, arkosic, marine sandstone which is locally fossiliferous. White quartzose sands are also common. The sands are poorly sorted, coarse grained, massive to cross bedded, friable and contain rounded pebbles of quartz and chert. This unit is one of the dominant bedrock units in the Planning Area and is very susceptible to slope failures. Some of the larger landslides and landslide complexes occur in this formation. Abundant fault strands may locally weaken the rocks

Source: California Division of Mines and Geology, 1991. *Landslide Hazard in the Livermore Valley and Vicinity, Alameda and Contra Costa Counties, California, Landslide Hazard Identification Map No, 21*, DMG Open File Report 91-2.



LSA

FIGURE 12-1

LEGEND

GEOLOGIC UNITS

cf	ARTIFICIAL CUT AND FILL
Qal	ALLUVIUM
Qls	LANDSLIDE DEPOSITS
Qg	STREAM GRAVEL
Qoal	OLDER ALLUVIUM
TQl	LIVERMORE GRAVEL
TQt	GREEN VALLEY AND TASSAJARA FORMATIONS, UNDIVIDED
Tps	NONMARINE SEDIMENTARY ROCKS
	SAN PABLO GROUP UNDIFFERENTIATED
Tmn	NEROLY SANDSTONE
Tmcs	NONMARINE SEDIMENTARY ROCKS
Tmss	CIERBO FORMATION
Tts	TESLA FORMATION
Km	MORENO FORMATION
	PANOCHE FORMATION
Kp	MICACEOUS CLAY SHALE
Kps	SANDSTONE
Ks	MARINE CLAY SHALE
	FRANCISCAN COMPLEX
Kjfs	SHEARED SHALE AND SANDSTONE
Kjfc	SHEARED CHERT

N

0 .5 1
MILES

PLANNING AREA BOUNDARY

UNIT CONTACT: SOLID WHERE WELL LOCATED; DASHED WHERE GRADATIONAL OR APPROXIMATELY LOCATED.

STRIKE AND DIP OF BEDDING

INCLINED BEDDING OR APPROXIMATE DIP

VERTICAL BEDDING

OVERTURNED BEDDING

AXIS OF ANTICLINAL FOLD: DASHED WHERE APPROXIMATELY LOCATED; ARROWHEAD ON AXIS SHOWS DIRECTION OF PLUNGE.

AXIS OF SYNCLINAL FOLD: DASHED WHERE APPROXIMATELY LOCATED; ARROWHEAD ON AXIS SHOWS DIRECTION OF PLUNGE.

FAULT: SOLID WHERE WELL LOCATED; DASHED WHERE APPROXIMATELY LOCATED; DOTTED WHERE CONCEALED; QUERRIED WHERE EXISTENCE DOUBTFUL; DOUBLE ARROWS INDICATE STRIKE-SKIP MOVEMENT.

FAULTS SHOWING DIP

LANDSLIDES: ARROWS SHOW THE DIRECTION OF MASS MOVEMENT

LANDSLIDES: QUERRIED WHERE UNCERTAIN

Livermore General Plan Update
Master Environmental Assessment
Geologic Map of the Planning Area

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF MINES AND GEOLOGY, 1991.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-1.AI (04/22/03)

C. SOILS

Soil is generally defined as the unconsolidated mixture of mineral grains and organic material which mantles the land surfaces of the earth. Soils can develop on unconsolidated sediments and weathered bedrock. The characteristics of soil reflect the five major influences on their development: topography, climate, biological activity, parent (source) material, and time. Soils in Alameda County have been mapped by the United States Department of Agriculture (USDA) Soil Conservation Service. The general soil map for the Planning Area (Figure 12-2) illustrates the five soil associations that underlie the City and vicinity.

A discussion of farmland types and locations is provided in the Open Space and Agricultural Resources chapter.

D. MINERAL RESOURCES

A large portion of the Planning Area is underlain by alluvial deposits which contain significant reserves of sand and gravel deposits suitable for use as aggregate in the production of Portland Concrete Cement. Due to the value of these materials for this use, California Division of Mines and Geology (now the California Geological Survey) has mapped and classified the aggregate resources of the Livermore-Amador Valley, including the Planning Area.[2] Most of the valley floor south of I-580 is classified as an area of significant mineral resources. This portion of the Planning Area includes areas classified as Mineral Resource Zone 2 (MRZ-2) and Mineral Resource Zone 3 (MRZ-3). A MRZ-2 is an area where adequate information indicates that significant mineral deposits are present. Most of the central portion of the Planning Area is classified as MRZ-2. Areas classified as MRZ-3 are considered to contain mineral deposits, but the significance of the deposits could not be determined on the basis of available information. The portions of the Planning Area classified MRZ-3 are generally adjacent to the MRZ-2 areas. The areas generally north of I-580 and within and surrounding the Lawrence Livermore National Laboratory are classified as MRZ-1 (no significant mineral deposits) and MRZ-4 (areas where information is inadequate for assignment to any other MRZ).

As part of the California Geological Survey Mineral Lands Classification Program, areas classified as MRZ-2 are considered in the determination of "resource sectors" (sectors). Sectors are areas where mineral extraction is occurring and areas that have current land uses that are similar to areas where mining has occurred in the past. Under the program, urbanized areas within MRZ-2 lands are not typically identified as sectors. Sectors within the Livermore Valley were identified in 1986; an update of the mineral land classification was prepared in 1996.[3] The Planning Area contains six resource sectors and a portion of one other sector (Figure 12-3). Aggregate resources within these sectors is estimated to be approximately 100 million tons. One sector (B-4) located north of Alden

[2] Stinson, M.C., Manson, M.W., and Plappert, J.J., 1987. Mineral Land Classification: Aggregate Materials in the San Francisco Bay Area, Part II, Classification of Aggregate Resource Areas, South San Francisco Bay Production-Consumption Region. California Department of Conservation, Division of Mines and Geology, Special Report 146 Part II, 55 p. + maps.

[3] Kohler-Antablin, S., 1996. Update of Mineral Land Classification Aggregate Materials in the South San Francisco Bay Production-Consumption Region. California Department of Conservation, Division of Mines and Geology, Open-File Report 96-03, 54 p. + maps.

Lane and east of Isabel Avenue has been urbanized, limiting the availability of the aggregate resources.

The resource sectors within the Planning Area were designated by the State Mining and Geology Board in 1987 as "areas of regional significance." Under the State Mining and Reclamation Act, specific actions are required during consideration of land use planning in areas designated as "areas of regional significance" in order to conserve important mineral deposits. The lead agency is required (State Mining and Reclamation Act Section 2761) to establish mineral resource management policies which recognize and emphasize the conservation and development of identified mineral deposits. Additionally, State Mining and Reclamation Act (Section 2763) requires that, prior to permitting land uses which would threaten the potential to extract minerals within areas of regional significance, a lead agency must prepare a statement specifying its reasons for permitting the proposed use. The State Mining and Geology Board Reclamation Regulations define incompatible (relative to the potential for mineral extraction) land uses as "land uses inherently incompatible with mining and/or that require public or private investment in structures, land improvements, and landscaping and that may prevent mining because of the greater economic value of the land and its improvements."

E. SEISMICITY

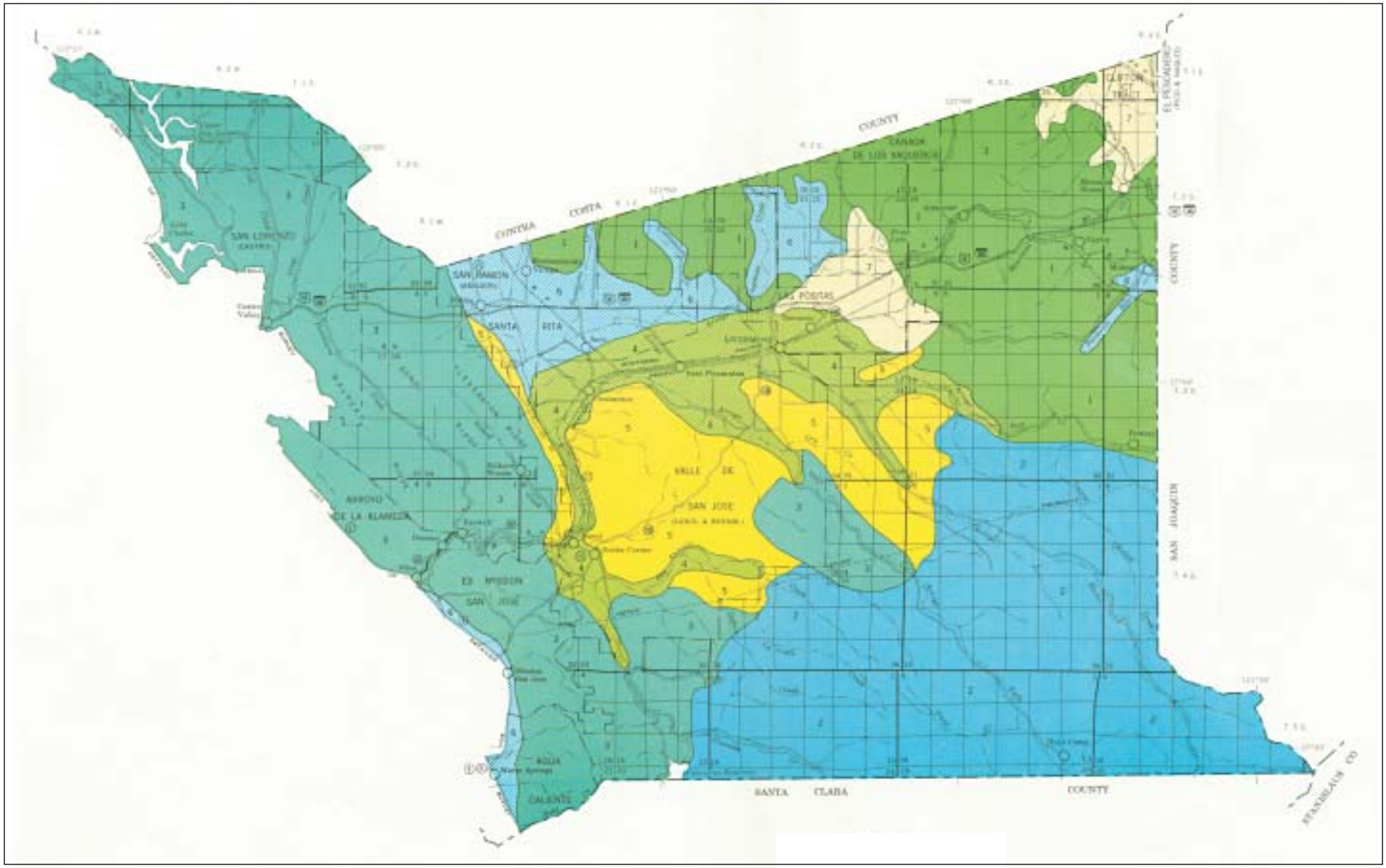
The Planning Area is located in the vicinity of the San Andreas Fault Zone, a complex of active faults forming the boundary between the North American and Pacific lithospheric plates. Movement of the plates relative to one another results in the accumulation of strain along the faults, which is released during earthquakes. Numerous moderate to strong historic earthquakes have been generated in northern California by the San Andreas Fault Zone. The level of active seismicity results in classification of the area of seismic risk Zone 4 (the highest risk category) in the California Building Code.

The San Andreas Fault Zone includes numerous faults found to be active by the California Geological Survey under the Alquist-Priolo Earthquake Faults Act. An "active" fault must show evidence of fault rupture in the last 11,000 years. Regional faults are shown on Figure 12-4.

Major earthquakes have occurred in the vicinity of Livermore in the past, and can be expected to occur again in the near future. The 1999 Working Group on California Earthquake Probabilities estimated that there is a 70 percent probability of at least one earthquake with a magnitude of 6.7 or greater to occur on one of the major faults within the San Francisco Bay region before 2030.[4] Furthermore, they determined that there is a 30 percent chance of one or more earthquakes with a magnitude of 6.7 or greater occurring somewhere along the Calaveras, Concord-Green Valley, Mount Diablo Thrust, and Greenville faults before 2030.[5]

[4] United States Geological Survey (USGS), 1999. Earthquake Probabilities in the San Francisco Bay Region: 2000 to 2030 - A Summary of Findings, Open File Report 99-517.

[5] USGS, 2000. *Understanding Earthquake Hazards in the San Francisco Bay.* U.S. Geological Survey Fact Sheet 152-99. Website: geopubs.wr.usgs.gov/fact-sheet/fs152-99/index.html



LSA

LEGEND

1. ALTAMONT-DIABLO ASSOCIATION
2. VALLECITOS-PARRISH ASSOCIATION
3. MILLSHOLM-LOS GATOS-LOS OSOS ASSOCIATION
4. YOLO-PLEASANTON ASSOCIATION
5. POSITAS-PERKINS ASSOCIATION
6. CLEAR LAKE-SUNNYVALE ASSOCIATION
7. RINCON-SAN YSIDRO ASSOCIATION

N

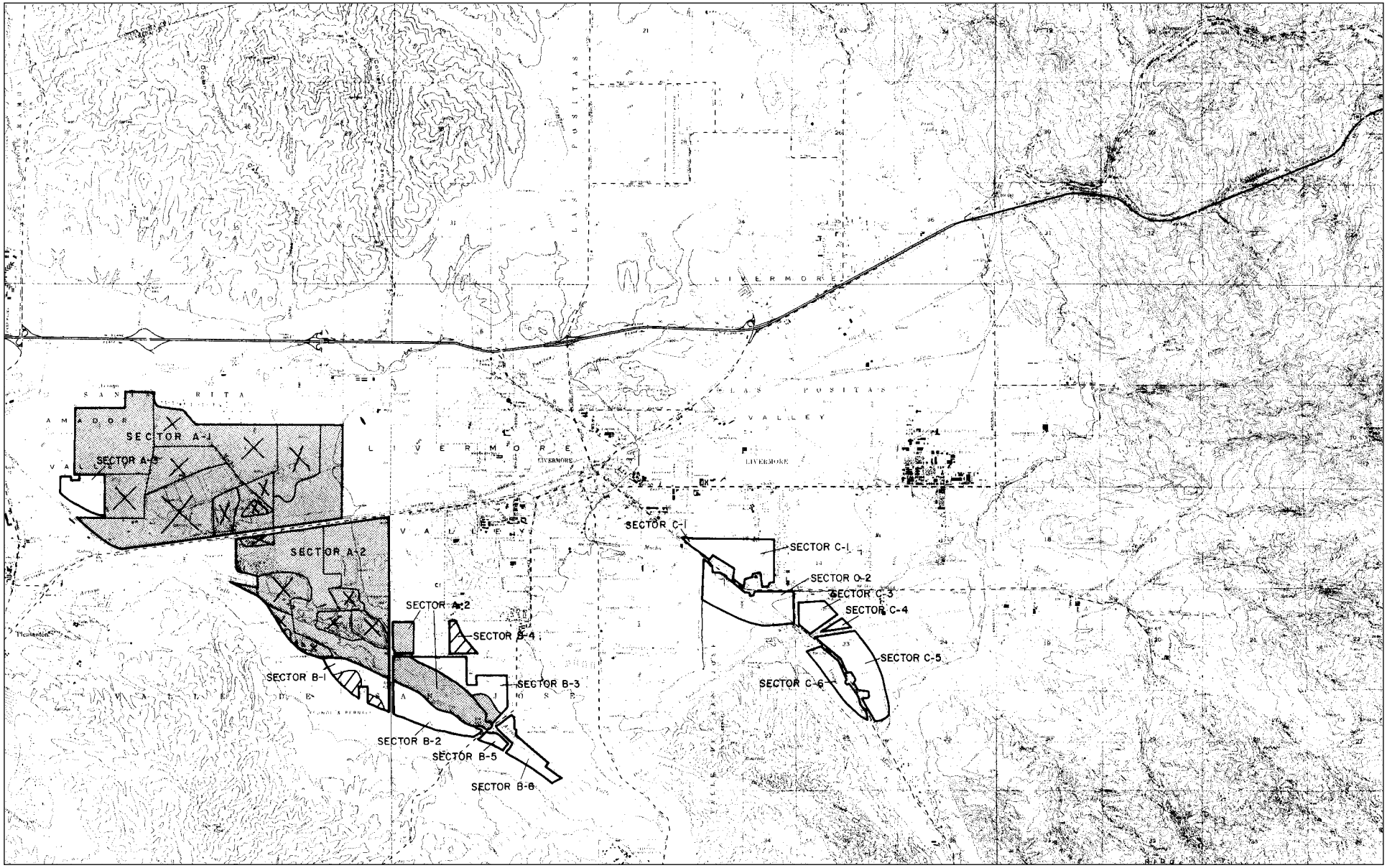
0 2 4
MILES

SOURCE: USDA, SOIL CONSERVATION SERVICE; CALIFORNIA AGRICULTURAL EXPERIMENT STATION, 1965.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-2.AI (04/22/03)

FIGURE 12-2

Livermore General Plan Update
Master Environmental Assessment
General Soils Map of the Planning Area



LSA

LEGEND

- SECTOR BOUNDARY
- PROPERTIES OWNED OR CONTROLLED BY AGGREGATE PRODUCERS
- DEPLETED RESOURCES
- AREAS URBANIZED OR URBANIZING

N

0 .75 1.5

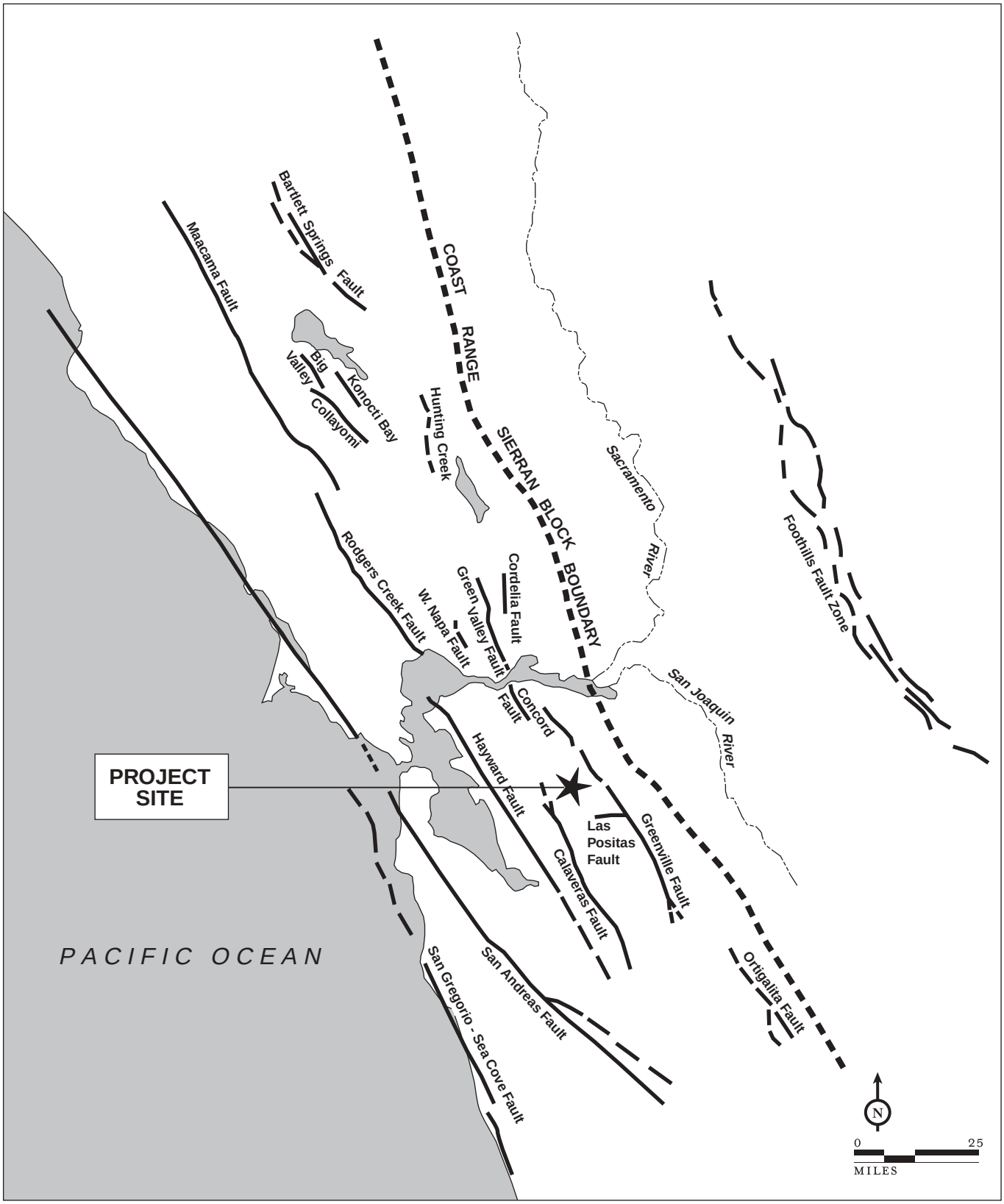
MILES

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF MINES AND GEOLOGY, 1996.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-3.AI (04/22/03)

FIGURE 12-3

Livermore General Plan Update
Master Environmental Assessment
Mineral Resource Sectors within the Planning Area



LSA

FIGURE 12-4

ACTIVE FAULT –
FAULT HAS EVIDENCE OF SURFACE
DISPLACEMENT WITHIN THE LAST 11,000 YEARS
(DASHED WHERE INFERRED)

Livermore General Plan Update
Master Environmental Assessment
Regional Faults

SOURCE: BASELINE, 1999

I:/IMAGES\GRAPHICS\JOBS\ CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-4.AI (04/22/03)

Within the City of Livermore, geologic reports are required in connection with rezoning, specific plans, or subdivisions in areas of high damage susceptibility. Geologic and engineering studies are required for critical structures regardless of their location.

1. Faults

Two known active faults, the Greenville and Las Positas faults, are mapped within the Planning Area. The Greenville fault transects the northeast portion of the area. The Greenville fault is the eastern-most strand of the San Andreas fault system in the San Francisco Bay Region.[6] The Greenville fault is a northwest-trending strike-slip fault system that extends from near Clayton to the eastern margin of the Livermore Valley in northern Alameda County. The fault is recognized as a major structural feature. The Greenville fault is an active Holocene fault zoned under the Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA). Surface fault rupture occurred on the Greenville fault during an earthquake in 1980.[7] The fault has been divided into three distinct segments, North, Central, and South by the U.S. Geological Survey (USGS). Each segment is considered capable of generating earthquakes in the range of M6.6 to 6.9.[8] If all segments were to rupture in a single seismic event, a M7.2 earthquake would be expected. The USGS estimates the probability of a M6.7 or greater on the Greenville fault during the period 2000 to 2030 to be 6 percent (0.06).

The Las Positas fault, a northeast-southwest trending strike slip fault, crosses the southeast corner of the Planning Area. This fault is also considered to be active under the A-PEFZA. Two branches of the fault, North and South branches, have been identified. Active seismicity has been detected along the South branch of the fault near its intersection with the Greenville fault.[9] The Las Positas fault could potentially generate a M6.3 earthquake.[10] The probability of an earthquake on the fault has not been determined.

In addition to the known active faults which are recognized under the A-PEFZA, recent research regarding the structural geology and tectonics of the Mount Diablo-Livermore region indicate that there is another potential source of large magnitude earthquakes in the region. A structural trend of folds and thrust faults have been mapped in the hills north of the Livermore Valley which reflect shortening of the earth's crust caused by contractional (compressional) tectonic forces.[11] The largest of these features is the Mount Diablo anticline. Recent research has interpreted this feature to be a

[6] Unruh, J.R., Sawyer, T.L., 1997. *Paleoseismic Investigation of the Northern Greenville Fault, Eastern San Francisco Bay Area, California,* U.S. Geological Survey National Earthquake Hazards Reduction Program Award No. 1434-HQ-97-GR-03146.

[7] Ibid.

[8] USGS, 1999. Op. cit.

[9] Scheimer, J.F., Taylor, S.R., and Sharp, M., 1982. Seismicity of the Livermore Valley Region, 1969-1981, in Hart, E.W., Hirschfeld, S.E., and Schulz, S.S., eds., Proceedings, Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, California Divisions of Mines and Geology Special Publication 62, p. 155-165.

[10] Wesnousky, S.G., 1986. Earthquakes, Quaternary Faults, and Seismic Hazard in California, Journal of Geophysical Research, Vol. 91, No. B12 p. 12,587-12,631.

[11] Crane, R.C., 1995. Geology of the Mount Diablo Region and East Bay Hills, in Sangines, E.M., Anderson, D.W., and Buising, A.V., eds. Recent Geologic Studies in the San Francisco Bay Area: Society of Economic Paleontologists and Mineralogists, Pacific Section Volume 76, p. 87-114.

large fold developed above a buried ("blind") thrust fault.[12] The contraction of the earth's crust in this area is further interpreted to be the result of the transference of slip along the Greenville fault which terminates at the eastern margin of this contractional zone to the Concord fault located to the northwest. The accumulation of strain on the "blind" Mount Diablo Thrust presents the potential for an earthquake along this structure. The USGS considers the fault capable of generating a M6.7 earthquake with a 4 percent probability of occurring during the period 2000 to 2030.[13] The recurrence time (time between earthquakes) is approximately 500 years, but the date of the last earthquake is not known. An earthquake on the fault would not be expected to cause fault rupture at the surface and is not, therefore, covered under the A-PEFZA. However, strong groundshaking would be expected within the Livermore area during such an earthquake. Recent earthquakes on similar faults have occurred in California at Coalinga (M6.5; 1983) and Northridge (M6.7; 1994).

Several other major active faults are located within a few miles of the Planning Area. Historically active faults (exhibiting evidence of movement in the last 200 years) in the vicinity include the Calaveras and Hayward faults, located approximately eight and 17 miles to the west/southwest, respectively. The Calaveras fault is a major active right-lateral strike-slip fault that extends for about 75 miles from southern Contra Costa County to Hollister in San Benito County. Historical earthquakes with associated surface fault rupture have occurred on the Calaveras fault. The 62-mile-long Hayward fault extends from San Pablo Bay to an obscure convergence with the Calaveras fault east of San Jose. The Hayward fault is currently considered to be at highest risk for the occurrence of a large earthquake.[14] The largest regional fault, the San Andreas fault, is located approximately 35 miles west of Livermore. Table 12-2 provides information about the active faults in the vicinity of Livermore. Figure 12-5 shows a map of the active faults in the vicinity of Livermore.

2. Geological Effects of Earthquakes

The following subsection describes the geological effects of earthquakes, including groundshaking, liquefaction, and landsliding.

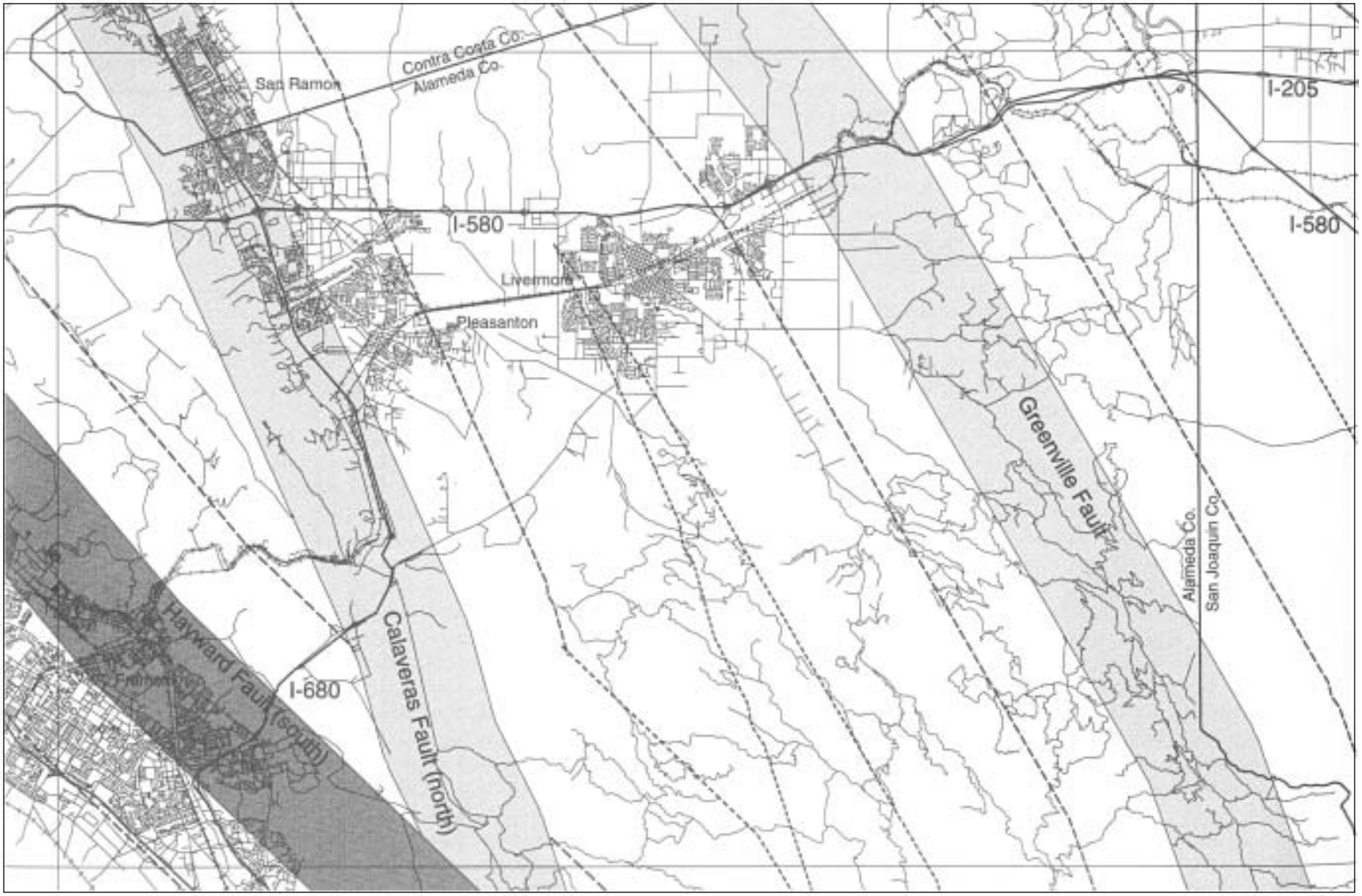
a. Ground Shaking. The intensity of ground shaking that would occur in Livermore as a result of an earthquake in the Bay Area is partly related to the size of the earthquake, its distance from the City, and the response of the geologic materials within the Planning Area. As a rule, the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of ground shaking.

Based on the location of the City and the proximity to nearby active faults, only a small portion of the Planning Area (the northeast portion) would be expected to experience surface rupture during a major earthquake (on the Greenville fault). However the entire City could experience ground shaking during an earthquake on one of several faults.

[12] Unruh, J.R., 2000. Characterization of Blind Seismic Sources in the Mt. Diablo-Livermore Region, San Francisco Bay Area, California, Final Technical Report, U.S. Geological Survey National Earthquake Hazards Reduction Program Award Number 99-HQ-GR-0069, 30 p.

[13] USGS, 1999. op. cit.

[14] United States Geological Survey (USGS), 1999. Earthquake Probabilities in the San Francisco Bay Region: 2000 to 2030 - A Summary of Findings, Open File Report 99-517.



LSA

LEGEND

SHADED ZONES ARE WITHIN 2 KM OF KNOWN SEIMIC SOURCES.

A FAULT

B FAULT

CONTOURS OF CLOSEST HORIZONTAL DISTANCE TO KNOWN SEISMIC SOURCES

5 KM

10 KM

15 KM

N

0 2.5 5

KILOMETERS

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF MINES AND GEOLOGY, 1998.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-5.AI (04/22/03)

FIGURE 12-5

Livermore General Plan Update

Master Environmental Assessment

Vicinity Active Faults

Table 12-2: Active Faults in the Vicinity of Livermore

Fault	Location and Direction from Planning Area	Recency of Movement	Fault Classification[a]	Historical Seismicity	Maximum Magnitude[b]
San Andreas	35 miles west	Historic (1906; 1989 ruptures)	Active	M7.1, 1989 M8.25, 1906 M7.0, 1838 Many <M6	7.9
Hayward	17 miles southwest	Pre-historic (1868 ruptures) Holocene	Active	M6.8, 1868 Many <M4.5	7.1
Calaveras (northern)	8 miles west	Historic (1961 rupture) Holocene	Active	M5.6-M6.4, 1861 M4-M4.5, swarms 1970 1990	6.8
Greenville	Crosses northeast portion of Planning Area	Historic (1980 rupture) Holocene	Active	M5.6, 1980	6.9

[a] An "Active Fault" is defined by the State Mining and Geology Board as one which has had surface displacement within Holocene time (about the last 11,000 years).

[b] The maximum moment magnitude is the strongest earthquake that is likely to be generated along a fault zone, based on the geologic character of the fault and earthquake history (CDMG, 1996).

Sources: Jennings, C.W., 1994. *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions.* CDMG Geologic Data Map No. 6. California, State of, Department of Conservation, Division of Mines and Geology (CDMG), 1996. *Probabilistic Seismic Hazard Assessment for the State of California.* DMG Open-File Report 96-08.

The distribution of ground shaking intensity has been mapped by the Association of Bay Area Governments.[15] Ground shaking intensity is described using the Modified Mercalli Scale, which ranges from I (not felt) to XII (widespread devastation). When various earthquake scenarios are considered, ground shaking intensities will reflect both the effects of strong ground accelerations and the consequences of ground failure. Possible earthquake intensities are described below.

A large earthquake on the Greenville fault is projected to produce the maximum ground shaking intensities in Livermore with Modified Mercalli (MM) intensity ranging from strong (MM VII) to very violent (MM X). MM IX is associated with damage to buried pipelines and partial collapse of poorly-built structures.

b. Liquefaction. Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake ground shaking. Liquefaction has resulted in substantial loss of life, injury, and damage to property. In addition, liquefaction increases the hazard of fires because of explosions induced when underground gas lines break, and because the breakage of water mains substantially reduces fire suppression capability.

[15] Association of Bay Area Governments (ABAG), 1995. *The San Francisco Bay Area **B** On Shaky Ground.* April.

As shown on Figure 12-6, most of the Planning Area is underlain by materials that have very low to moderate liquefaction potential.[16] In particular, the upland areas have a very low potential for liquefaction. Liquefaction potential increases in the vicinity of major drainage channels where loose granular sediments have accumulated as a result of stream processes. The liquefaction potential for sediments in the vicinity of Arroyo las Positas, Arroyo Mocho, and Arroyo del Valle increases to high to very high.

The potential for liquefaction also depends on soil conditions and groundwater levels, which may fluctuate. In general, where there is any potential for liquefaction, site-specific studies are needed to determine the extent of the hazard if development were to occur in the area.

Lateral spreading (lurching) may also occur where open banks and unsupported cut slopes provide a free face. Ground shaking, especially when inducing liquefaction, may cause lateral spreading toward unsupported slopes.

c. Landsliding. The strong ground motions that occur during earthquakes are capable of inducing landslides, generally where unstable slope conditions already exist. Slope instability is discussed below.

3. Response of Structures to Earthquakes

Structures in Livermore are subject to damage from large earthquakes. The degree of hazard depends in part on the seismic hazards at a particular location and partly on the type of structure, its materials, and construction quality. Within the City, damage can be caused by strong ground shaking, ground failure due to liquefaction or landsliding, or secondary hazards such as fire.

a. Fault Rupture Damage. One known active fault (Greenville Fault) crosses the Planning Area and may present fault rupture hazards in the northeastern area. The fault rupture hazard for the remaining portion of the Planning Area is considered to be very low. Fault rupture hazards in the City should be reevaluated if data suggest that such a hazard is present.

b. Liquefaction Damage. Liquefaction poses a substantial potential hazard to structures and infrastructure located along creeks in the Planning Area. Where liquefaction is accompanied by lateral spreading and settlement, damages to structures and infrastructure can be dramatic. Several strategies for managing damage can be used, including:

- foundation design, including deep foundations in areas subject to liquefaction;
- flexible materials in some types of infrastructure that will allow a degree of resistance to damage from liquefaction-induced settlement and soil movement; and
- engineering of the soil medium and groundwater management.

Most available technology for reducing liquefaction hazards is relatively expensive compared to construction on soils in which liquefaction hazards are absent.

[16] Knudsen, K.L., J.M. Somers, R.C. Witter, C.M. Wentworth & E.J. Helley, 2000. *Preliminary Maps of Quarternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California Geology.*

c. Landslide Damage. Large landslides can cause significant damage to structures, infrastructure, and roads. The risk of a landslide depends on a number of complex factors: rock type, slope, gradient, drainage, and aspects of engineered structures. Landslide hazard in some cases can be managed through landslide remediation and/or foundation design. Engineering methods, such as landslide material removal, slope reconfiguration, surface water and groundwater control, and soil water management, can be employed to reduce the potential hazard of slope instability.

d. Ground Shaking Damage. Ground shaking presents the most widespread hazard to structures and infrastructure within the Planning Area. Ground shaking intensity, however, is highly variable from one site to another. In addition, the effect of ground shaking on structures is related to the form, structural design, materials, construction quality, and location. Engineers analyze the response of structures with different frequencies to specific ground motions, known as acceleration response spectra.

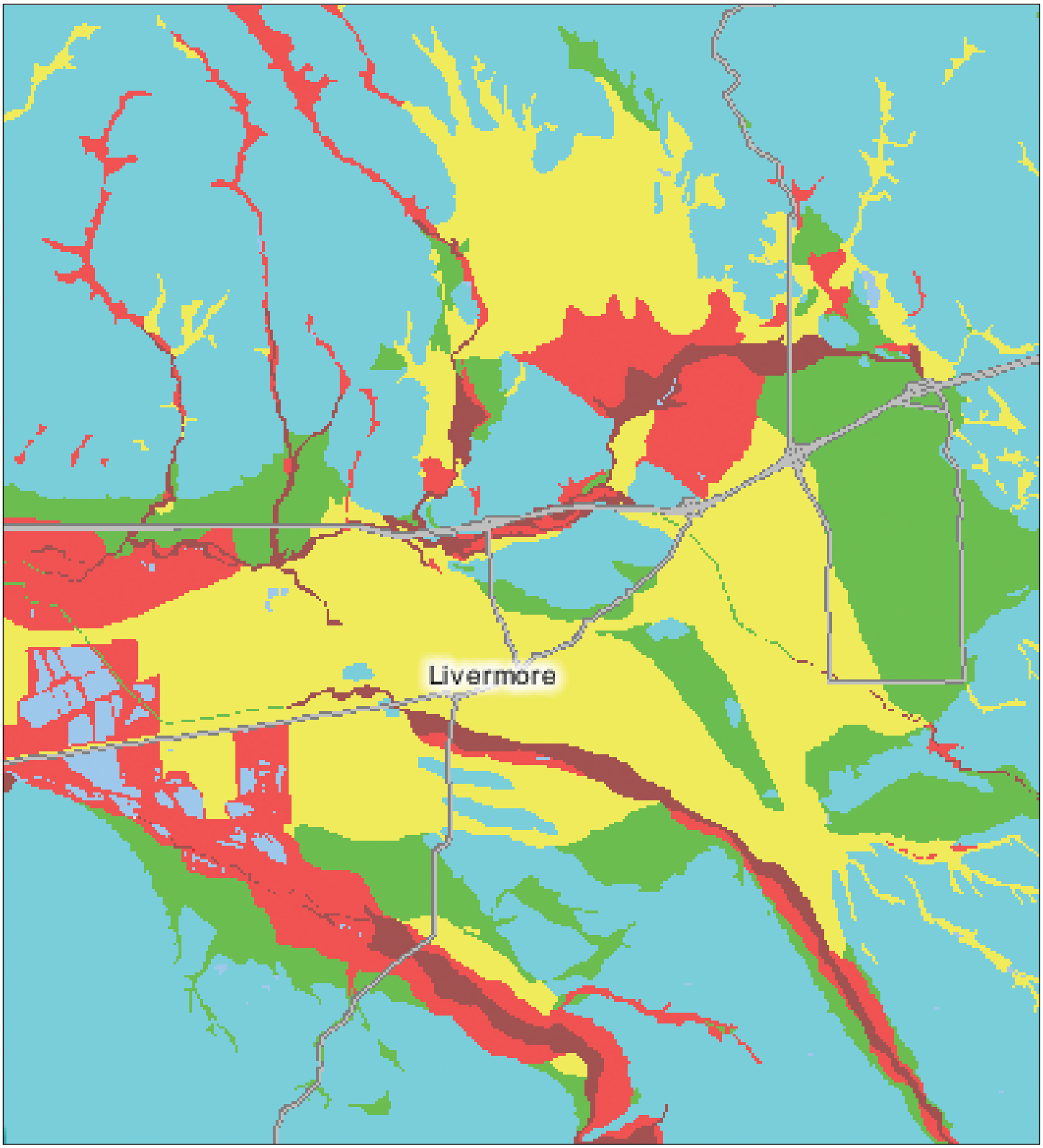
Since the 1970s, the Uniform Building Code in California has incorporated standard response spectra[17] as a basis for structural design. The objective of the Uniform Building Code is to protect the life and safety of building occupants and the public. The response spectra establish the minimum standards for which a building must be designed. The Uniform Building Code considers primary lateral seismic forces and general soil type; incorporation of vertical forces into code design requirements is currently being considered. For large earthquakes, the Uniform Building Code primarily ensures that the building will not collapse, but some structural and non-structural damage may be expected.

Buildings constructed prior to code revisions in the 1970s generally would not meet current design provisions for earthquake forces identified in the Uniform Building Code. Expected damage to different types of buildings is described below:

- The most severe hazards are presented by unreinforced masonry buildings constructed of brick or concrete block. Under strong intensity ground shaking, many of these structures may be expected to collapse or require demolition.
- Other types of buildings that may also be severely damaged are older buildings of steel and concrete framing that were not designed to resist earthquake vibrations and older reinforced brick and masonry structures.
- Light wood-frame, such as most residential structures, and sheet metal buildings would be expected to have moderate damage in most conditions.
- Steel-frame structures designed to resist earthquake vibrations have an excellent record in earthquakes.

New construction in Livermore is required to meet the requirements of the California Building Code. Buildings of special occupancy are required by the State to meet more stringent design requirements than the Uniform Building Code. Special occupancy buildings include hospitals, schools, and other structures that are important to protecting health and safety in the community.

[17] Standard response spectra are plots of the response of structures with different natural periods to specific earthquake ground motions.



LSA

LEGEND

METROPOLITAN TRANSPORTATION SYSTEM
WATER
LIQUIFICATION
VERY HIGH
HIGH
MODERATE
LOW
VERY LOW

N

0 .75 1.5
MILES

FIGURE 12-6

Livermore General Plan Update
Master Environmental Assessment
Liquefaction Susceptibility Map

SOURCE: ABAG, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-6.AI (04/22/03)

F. SLOPE INSTABILITY

The California Geological Survey prepared a landslide hazard identification map for the Livermore Valley[18] to be used, at least in part, as a planning tool for new development. The mapping indicates those areas that are considered "least susceptible," "marginally susceptible," "generally susceptible," and "most susceptible" to slope failure. The criteria used to delineate the relative hazard areas included the nature of the geologic materials underlying the surface, the steepness of slopes, the presence or absence of visible slope failures, and the presence or absence of active forces that could cause failures (e.g., stream processes, shrink-swell soils).

As shown on Figure 12-7, most of the northwest corner of the Planning Area is susceptible to landslides with the majority of slopes considered "marginally susceptible" to "most susceptible" to slope failure. In addition, isolated upland areas in the northeast, central, and southeast portions of the Planning Area are also considered prone to slope failure.

Most of the lowland area, with its relatively gentle slopes, is not prone to landslides. This general overview of slope stability and landslide potential in the City of Livermore is not intended as a substitute for detailed site investigations, which should precede any final planning decisions and/or specific development proposals.

[18] California Division of Mines and Geology (now known as the California Geological Survey), 1991. *Landslide Hazard in the Livermore Valley and Vicinity, Alameda and Contra Costa Counties, California, Landslide Hazard Identification Map No, 21*, DMG Open File Report 91-2.

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LSA

FIGURE 12-7

Livermore General Plan Update
Master Environmental Assessment
Landslide Hazard Susceptibility
Map of the Planning Area

LEGEND

PLANNING AREA BOUNDARY

RELATIVE LANDSLIDE SUSCEPTIBILITY AREAS

1 LEAST	2 MARGINALLY	3 GENERALLY	4 MOST SUSCEPTIBLE

INCREASING LANDSLIDE SUSCEPTIBILITY

UNMAPPED AREA

N

0 .5 1
MILES

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF MINES AND GEOLOGY, 1991.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_12-7.AI (04/22/03)

13. HYDROLOGY AND WATER QUALITY

The existing hydrological setting, including drainage, flooding, and water quality as of 2002, for the City of Livermore is described in this chapter. The discussion presented is based on information contained in previous technical and planning documents and interviews with State and local agency staff. In addition, the regulatory framework subsection provides a brief discussion of the role of federal, State, and local agencies that are involved in water resource issues.

A. CLIMATE

The climate of the Livermore area is characterized as Mediterranean, with cool wet winters and warm dry summers. Between 1930 and 2001, the mean annual rainfall in the area was approximately 14.5 inches. The majority of rain falls between October and April.[1] Analysis of long-term precipitation records indicates that wetter and drier cycles lasting several years are common in the region. Severe, damaging rainstorms occur at a frequency of about once every three years.

B. DRAINAGE AND SURFACE WATER BODIES

The City is located in the northern portion of the Livermore Valley watershed, mostly on the valley floor, with some upland areas to the northwest and south (see Figure 13-1). The valley is surrounded by the hills of the Diablo Range.

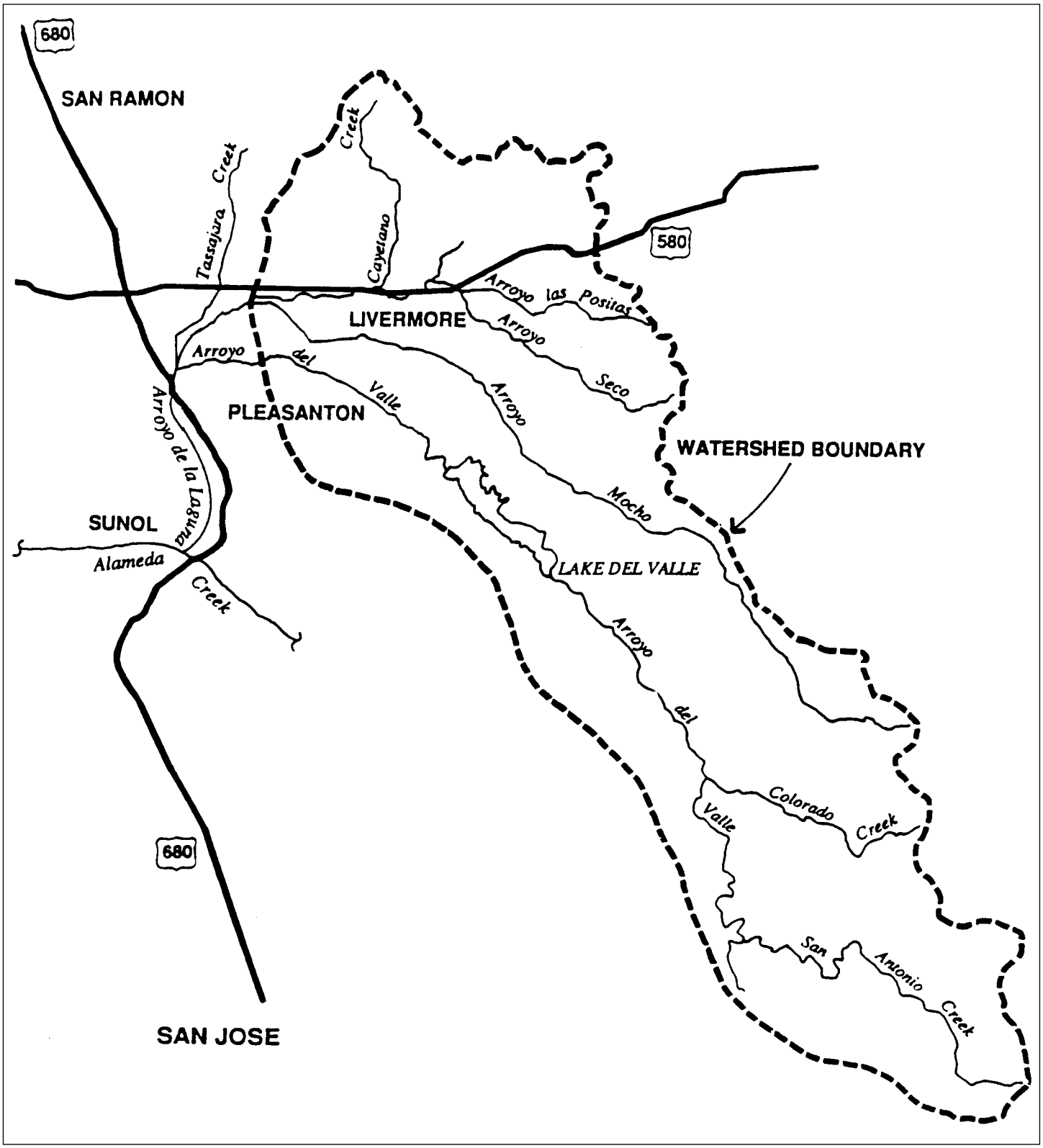
1. Waterways

Several creeks and arroyos, which typically flow from east to west, cross the Livermore Valley. The principal waterways within the Planning Area are shown in Figure 1, and include Arroyo las Positas, Cayetano Creek, Arroyo del Valle, Arroyo Mocho, and Arroyo Seco.

The Arroyo del Valle flows through the southeastern portion of the Planning Area, but drains a relatively small area of the City (the majority of the drainage area contributing to Arroyo del Valle is in the central and southern portion of the Livermore Valley). Arroyo Mocho flows through the southerly portion of the Planning Area, draining approximately 4,000 acres of the Planning Area south of I-580, including much of the Downtown area.[2] Arroyo las Positas generally flows along I-580 through much of the Planning Area. The major tributaries to Arroyo Las Positas include Arroyo

[1] Western Regional Climate Center, 2002. Website: www.wrcc.dri.edu/elimsmsfo.html.

[2] City of Livermore, 1995. Final Report, Storm Drainage Master Plan, prepared by Camp Dresser & McKee. March.



LSA

FIGURE 13-1

Livermore General Plan Update
Master Environmental Assessment
Livermore Valley Watershed

SOURCE: BASELINE ENVIRONMENTAL CONSULTING, 2002.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\ FIG_13-1.AI (04/22/03)

Seco, Altamont Creek, Cayetano Creek, and Collier Creek. Arroyo las Positas and its tributaries drain approximately 20,000 acres within the Planning Area.[3]

2. Constructed Drainage System

The following description of the City's drainage system is included in the Storm Drainage Master Plan,[4] (page 2-2): "The majority of the City's storm drains are pipes which ultimately drain to one of the major channels discussed in the preceding subsection. The pipes are generally concrete, with some corrugated metal pipes and some HDPE. There are a few ditches or open channels within the existing developed areas, such as the Granada Channel which flows through the residential development and drains to Arroyo Mocho. Most of the drainage reaches are relatively short due to the proximity of the major channels" Detention basins have been used in a limited number of situations to manage runoff (one at Shea Business Park and a second at Altamont Creek, just downstream of Laughlin Road).

According to the City's Storm Drainage Master Plan, the City has "undertaken a master planning effort to ensure adequate storm drainage system capacity for existing and future users, to plan for stormwater facilities in developing areas, and to provide uniform guidelines to developers designing new storm drains in the City."

Runoff from the General Plan Update Planning Area represents a relatively small contribution to the total flow in Arroyo del Valle and Arroyo Mocho, and therefore future development in the Planning Area in these subwatersheds is not anticipated to significantly affect local peak flows. However, future development in the Arroyo Las Positas subwatershed (including the tributary creeks) may significantly affect future peak flows in those drainages.

C. FLOODING HAZARDS

Most flooding within the City of Livermore is caused by heavy rainfall and subsequent runoff volumes that cannot be adequately conveyed by the existing storm drainage system combined with surface water bodies. It could also result from the catastrophic failure of nearby Del Valle Dam which would result in the release of a large volume of water in a relatively short period of time. The Planning Area is not susceptible to inundation by coastal hazards, such as tsunamis, extreme high tides, or sea level rise, due to the elevation of the area and the distance from the margin of the San Francisco Bay and Pacific Ocean.

1. Special Flood Hazard Zones

Heavy rainfall and subsequent runoff volumes that cannot be adequately conveyed by the existing storm drainage system cause much of the flooding in the City. Flood prone areas are shown in Figure 13-2. Please note that the information on this figure is very general and does not reflect recent changes and improvements to the flood management system. More detailed maps are available for review at the Livermore Planning Division. Areas subject to flooding are mainly found along Arroyo las Positas, Arroyo Mocho and Altamont Creek.

[3] Ibid.

[4] Ibid.

Portions of the City are located within the 100-year and 500-year special flood hazard zones, as mapped by the Federal Emergency Management Agency (FEMA),[5] and are therefore, according to FEMA, susceptible to regional flooding hazards. The flood hazard maps (Flood Insurance Rate Maps or FIRMs) are used to determine eligibility areas for inclusion in the federal flood insurance program. Last updated in 1997 for Livermore, the FIRMs are used to identify flood prone areas, with the most susceptible areas denoted as special flood hazard zones. Except for a few areas as shown in Figure 2, the majority of the City is defined as being subject to minimal flooding.

2. Dam Failure Inundation

Portions of the City are located within the dam failure inundation hazard areas for nearby reservoirs, including for the Del Valle Dam and the Patterson Dam (Figures 13-3a and 13-3b).[6] Patterson Dam is located east of Greenville Road and north or Patterson Pass Road. Both of these dams are under the jurisdiction of the California Department of Water Resources (DWR), Division of Safety of Dams (DWR). Existing dams under DWR jurisdiction are periodically inspected to ensure adequate maintenance and to direct the owner (in this case, DWR) to correct any deficiencies found. Regular inspections and required maintenance of the dams substantially reduce the potential for catastrophic failure.

There are no State or local restrictions for development within dam failure inundation areas. The Emergency Services Act requires that cities and counties prepare emergency evacuation plans for areas that could be inundated in the event of a dam failure. The City is currently developing an evacuation plan for the Del Valle and Patterson dam failure inundation areas as an annex to the Overall Emergency Management Plan, which was anticipated to be completed in August 2002.[7]

3. Flood Control

The Alameda County Flood Control and Water Conservation District, Zone 7 has embarked on a watershed-wide Flood Control Master Plan. Zone 7 currently owns and maintains about 40 miles of flood control channels, including creeks and concrete-lined channels, in the watershed. Most of these channels are in the Pleasanton area. However, Zone 7 owns portions of Arroyo las Positas, Arroyo Seco, and Altamont Creek in the Livermore Planning Area. Zone 7 has an ongoing program of channel acquisition which is funded by developer fees. Under this program, the agency enters into an agreement with a developer to take ownership (including maintenance responsibilities) of facilities that are constructed to Zone 7 standards. The developer is reimbursed a predetermined amount for the channel improvements and right-of-way. When the flood control system is completed, Zone 7 could own and maintain about 120 miles of creeks and channels, including the primary

[5] Federal Emergency Management Agency (FEMA), 1997. Flood Insurance Rate Map, Community Panel Numbers 060008 0005 B and 060008 0010 B. September 17.

[6] Based on review of the dam inundation maps of the California Office of Emergency Services website: www.oes.ca.gov/dim.nsf.

[7] Sabina Imrie, 2002. EMS Manager and Disaster Preparedness Manager, Livermore-Pleasanton Fire Department. Personal communication with LSA Associates, Inc., July 10.

Leonardo-Regala, Janice, 2002. President, Dimensions Unlimited, Inc. Personal communication with LSA Associates, Inc., July 10.

LSA

LEGEND

- 100 YEAR FLOOD
- 500 YEAR FLOOD
- WATER BODIES

N

0 2 4

MILES

Note: This flooding hazard information is very general and does not reflect recent improvements to the flood management system.More detailed maps are available for review at the Livermore Planning Division.

FIGURE 13-2

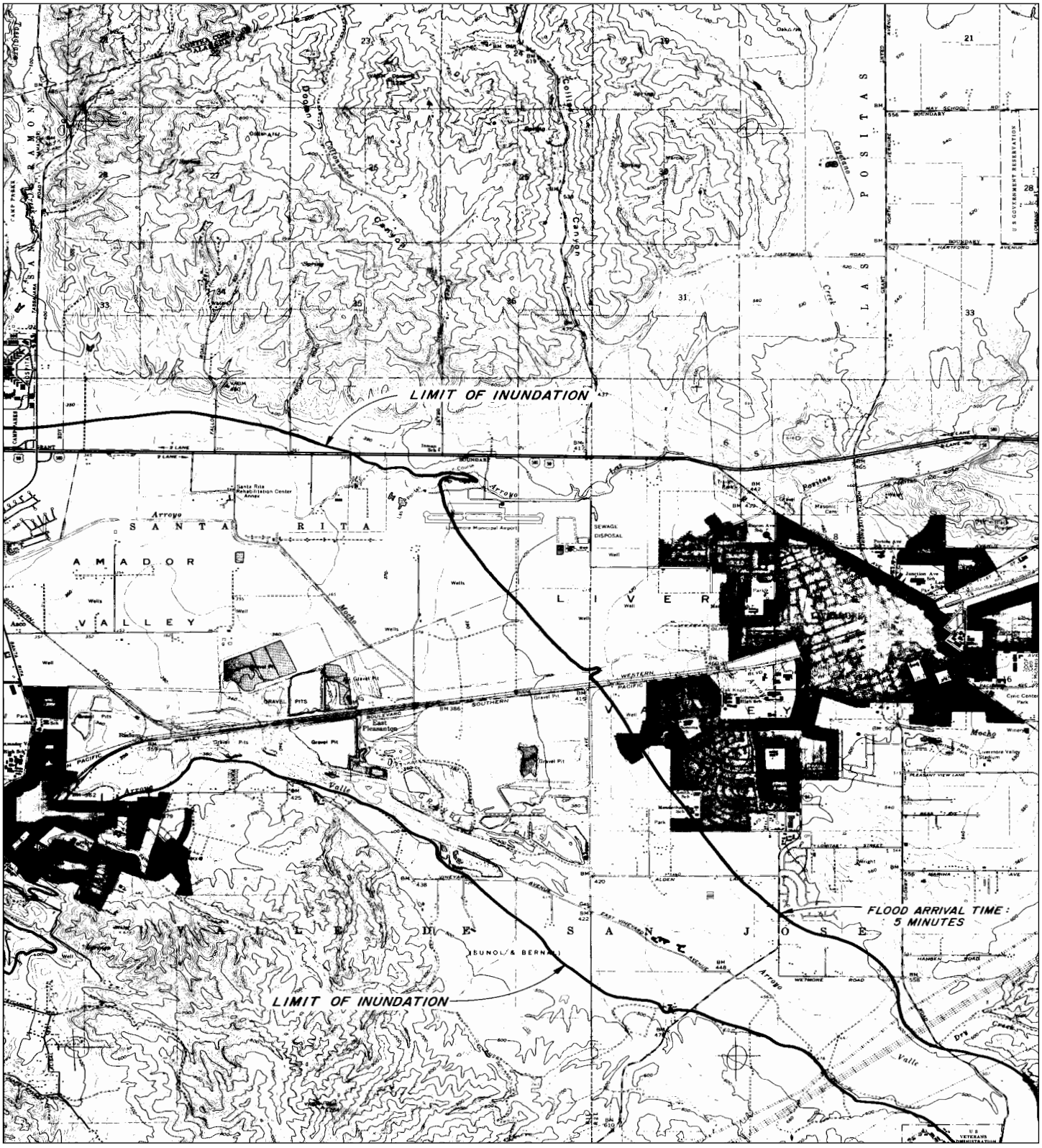
Livermore General Plan Update

Master Environmental Assessment

Flooding Hazards in the City of Livermore

SOURCE: ESRI/FEMA (WWW.ESRI.COM/HAZARDS/MAKEMAP.HTML), 2003.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_13-2.AI (05/21/03)



LSA

FIGURE 13-3a

Livermore General Plan Update
Master Environmental Assessment
Dam Failure Inundation Areas
Del Valle Dam

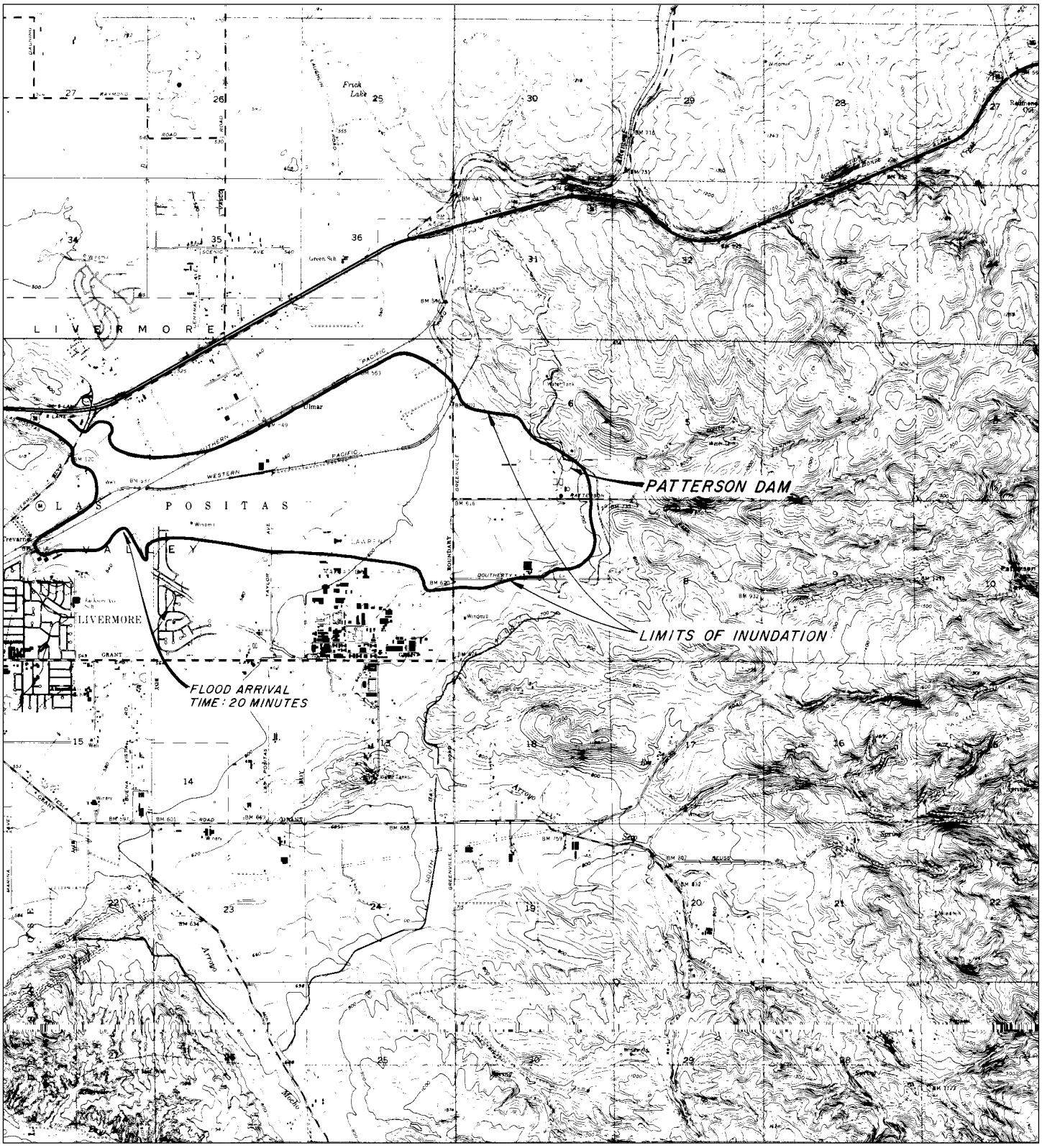
N

0 2500 5000
FEET

Note:
Map does not imply that failure of the dam or resulting flooding is a probable occurrence. The inundation limits shown are approximate. They are based on the face topography and a severe, hypothetical dam failure mode. The limits include all potential flooded areas.

SOURCE: STATE OF CALIFORNIA, DEPARTMENT OF WATER RESOURCES, 1974.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_13-3A.AI (04/22/03)



LSA

FIGURE 13-3b

Livermore General Plan Update
Master Environmental Assessment
Dam Failure Inundation Areas
Patterson Dam

N

0 2500 5000
FEET

Note:
Map does not imply that failure of the dam or resulting flooding is a probable occurrence. The inundation limits shown are approximate. They are based on the face topography and a severe, hypothetical dam failure mode. The limits include all potential flooded areas.

SOURCE: STATE OF CALIFORNIA, DEPARTMENT OF WATER RESOURCES, 1974.

I:\IMAGES\GRAPHICS\JOBS\CLV135 LIVERMORE GP EIR\FIGURES\NEW MEA FIGURES\FIG_10-3B.AI (04/22/03)

drainage features in the City of Livermore. As of 2002, Zone 7 owned and maintained the portion of Arroyo Mocho westerly of El Charro Road to the confluence with the Arroyo de la Laguna. Zone 7 also owns and maintains the over-flow section of the Arroyo Mocho between Murrieta Boulevard and Isabel Avenue. Existing flood problems are in the downstream portion of Arroyo Las Positas in the city-owned portion of the Arroyo.

D. GROUNDWATER SUPPLY, EXTRACTION, AND RECHARGE

The Planning Area is located within the Mocho I, Mocho II, and Amador subbasins of the Livermore-Amador Valley Groundwater Basin (often referred to as the "Main Basin"). The Planning Area is underlain by an important groundwater aquifer and is designated an "area of hydrologic significance." Regional groundwater flow within the basin is generally to the west toward Arroyo de la Laguna. Major groundwater recharge occurs along Arroyo Mocho and Arroyo las Positas in the vicinity of the Planning Area.[8] Groundwater recharge takes place in Livermore, but the well heads are in Pleasanton.

The Main Basin is an important water supply source for Zone 7, which supplies water to the City of Livermore. Zone 7 manages the Main Basin. Extraction of water resources is carefully balanced with natural and artificial recharge (surface water imports) so that overdraft of the system does not persist. The Main Basin has a capacity of approximately 250,000 acre-feet of water. Currently, the Main Basin holds approximately 200,000 acre-feet of water. In the event of drought, the groundwater stored in the Main Basin could supplement surface water supplies to sustain the entire Valley's population for 3 to 5 years.[9] A discussion of the water supply and distribution system is included in the *Public Utilities and Service Systems* chapter.

E. WATER QUALITY

The following subsection provides a discussion on the quality of surface water and groundwater.

1. Surface Water

The quality of surface water in the Planning Area is affected by land uses within the watersheds and the composition of the underlying geologic materials. Drainage from the City (and nearby upstream areas) contributes to the overall quality of water in the local creeks and arroyos.

The Regional Water Quality Control Board (the Board) periodically reviews available data on surface water bodies and evaluates whether beneficial uses for the water body may be impaired. If a water body is designated as "impaired" for a particular pollutant, then the water body is listed under Section 303(d) of the Clean Water Act. As of 2002, of the waterways that flow through the Planning Area, only Arroyo Del Valle is listed as impaired for the pesticide diazinon. However, the draft 303(d) list,[10]

[8] United Stated Geological Survey, 1985. Water-Quality Conditions and an Evaluation of Ground- and Surface-Water Sampling Programs in the Livermore-Amador Valley, California, Water Resources Investigations Report 84-4352.

[9] Zone 7 Water Agency, undated. Innovative Answers to the Tri-Valley's Water Supply and Flood Control Questions, 1999-2000 Report.

[10] Regional Water Quality Control Board, 2002. 2001 San Francisco Bay Regional Water Quality Control Board 303(d) and TMDL Priority List, available at http://www.swrcb.ca.gov/tmdl/docs/segments/region2/.

which was in circulation and under review at the time of this writing (2002), also includes both Arroyo las Positas and Arroyo Mocho (and continued listing of Arroyo Del Valle) for diazinon.

Potential sources of diazinon include structural pest control applications around buildings or landscaped areas by homeowners or Pest Control Operators, as well as agricultural use. Diazinon use by homeowners and Pest Control Operators is being phased out by Environmental Protection Agency mandate over the next few years. However, agricultural uses are still allowed. Pending modifications to the City's next National Pollutant Discharge Elimination System Permit (see Section F.2) may include provisions to ensure that proposed new development projects do not increase the loading of 303(d) listed pollutants to any impaired waterbody. The Alameda Countywide Clean Water Program is developing a Diazinon Pollutant Control Plan to reduce diazinon discharge.

The Clean Water Act gave the State Water Resources Control Board and the U.S. Environmental Protection Agency the authority to establish Total Maximum Daily Loads for impaired waterways. As described by the Board, in a general sense, the Total Maximum Daily Load process leads to a "pollution budget" designed to restore the health of a polluted body of water. The Total Maximum Daily Loads process provides a quantitative assessment of water quality problems, contributing sources of pollution, and the pollutant load reductions or control actions needed to restore and protect the beneficial uses of a waterbody impaired from loading of a particular pollutant. A Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards which will insure the protection of beneficial uses. This calculation accounts for seasonal differences and also includes a margin of safety. In addition, the Total Maximum Daily Load contains the reductions needed to meet water quality standards and allocates those reductions among the pollutant sources in the watershed.[11]

The proposed schedule calls for the implementation of a diazinon Total Maximum Daily Load by 2004 for the waterways described above. No other water bodies in the vicinity of the site are designated as impaired on the 303(d) list.

2. Groundwater Quality

In general, the groundwater quality in the Main Basin meets primary drinking water standards, except for the parameters of total dissolved solids and hardness.[12] Zone 7 monitors the quality of the groundwater through a network of monitoring wells and each retailer can, in turn, monitor at their individual turnouts, if necessary. In 2000, Zone 7 began working with the United States Geological Survey and the Lawrence Livermore National Laboratory on the Ambient Groundwater Assessment Program for the Main Basin. Eventually all the basins in the State are expected to be evaluated, but the Main Basin was one of the first selected. The purpose of the program is to assess how vulnerable the groundwater basin is to contamination and to provide information on methods to enhance groundwater quality protection.

3. Salt Loading

[11] Regional Water Quality Control Board, North Coast Region, 2002. Introduction to TMDLs, available at http://www.swrcb.ca.gov/rwqcb1/.

[12] Zone 7 Water Agency, undated. Innovative Answers to the Tri-Valley's Water Supply and Flood Control Questions, 1999-2000 Report.

Salts (generally measured as total dissolved solids are initially introduced into the Main Basin with imported water supplies and via runoff from saline/alkali soils which is eventually recharged into the Main Basin through the Arroyo system. Additional in-valley sources of salt include the use of recycled water and water softener regeneration. Although the water may leave the Main Basin by evaporation, evapotranspiration, or through surface and groundwater outflow, much of the salts stay behind, potentially leading to a build-up of salt in the soil and groundwater. Excessive salt loading can result in a degraded water supply, particularly if concentrations exceed the Secondary Drinking Water standard of 500 milligrams per liter (mg/L). It is estimated by Zone 7 that if the salt loading continues unchecked, the usability of the groundwater in the Main Basin could be affected within 10 years.[13]

Zone 7—in conjunction with EOA, Inc., a technical advisory group (TAG) composed of retailers, and a groundwater management advisory committee (GMAC) composed of Zone 7 citizens—has prepared a Salt Management Plan (SMP) to implement strategies that fully offset current and future sources of salt loading in the Main Basin. Data compilation work began in 1994, with technical analyses and presentations continuing through 1999. The SMP provides the technical information and analysis that support the August 1999 Zone 7 Board-approved salt management strategy. These include increased conjunctive[14] use and wellhead demineralization of shallow water with brine export in the western portion of the service area. Zone 7 was working on preparing and reviewing the SMP report draft which was expected to be completed in Fall 2002.[15]

F. REGULATORY FRAMEWORK

The following section describes the regulatory agencies concerned with hydrology and water quality issues.

1. Federal Emergency Management Agency (FEMA)

In 1968, Congress created the National Flood Insurance Program (Program) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Program makes federally-backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. The Program is managed by FEMA, the agency responsible for conducting floodplain studies and publishing FIRMs that delineate flood hazard areas. The City of Livermore is a participating community in the Program. All new development must comply with the minimum requirements of the Program.

2. Regional Water Quality Control Board

Water quality in surface and groundwater bodies is regulated by the State and Regional Water Quality Control Boards. The City is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (the Board), which is responsible for implementation of State and federal water quality

[13] Zone 7 Water Agency, undated, Innovative Answers to the Tri-Valley's Water Supply and Flood Control Questions, 1999-2000 Report.

[14] Conjunctive use is defined as a coordinated and defined management scheme to maximize the efficient use of both surface and groundwater resources.

[15] Chahal, Jarnail, 2002. Engineer, Zone 7 Water Agency. Personal communication with LSA Associates, Inc. August 16.

protection guidelines in the vicinity of the project site. The Board implements the Water Quality Control Plan (Basin Plan),[16] a master policy document for managing water quality issues in the region. The Basin Plan establishes beneficial water uses for waterways and water bodies within the region. Beneficial uses of surface waters in the vicinity of the City include water contact recreation, non-contact water recreation, industrial service supply, irrigation supply, navigation, shellfish harvesting, fishing, and preservation of rare and endangered species. Beneficial uses of the groundwater aquifer underlying the Planning Area include municipal and domestic supply, industrial process supply, industrial service supply, agricultural supply, and wildlife habitat.

Runoff water quality is regulated by the Federal National Pollutant Discharge Elimination System Nonpoint Source Program (established through the Clean Water Act). The National Pollutant Discharge Elimination System Nonpoint Source Program objective is to control and reduce pollutants to water bodies from nonpoint discharges and is administered by the California Regional Water Quality Control Boards. The City is an active participant in the Alameda Countywide Clean Water Program, a consortium of the 14 cities, the Alameda County Public Works Agency and the two flood control districts formed to address nonpoint source pollutant issues in the region. The San Francisco Bay Board issued a National Pollutant Discharge Elimination System permit to the Alameda Countywide Clean Water Program's 17 participating agencies in 1991. Through the Clean Water Program, the agencies attempt to develop effective countywide strategies to reduce stormwater pollution and to maintain consistent requirements throughout the county. The Stormwater Management Plan developed by the program divides activities into General Program tasks done at the program level on behalf of all participants, and Specific Program Tasks to be conducted by the agencies in their own areas. These tasks fall into several major categories, including; Public Information/Participation/ Monitoring and Special Studies, Industrial & Illicit Discharge Control, New Development, and Municipal Maintenance Activities. In addition, the Program has developed performance standards for all of the specific program tasks so agencies can track and report their progress. Agencies prepare detailed reports which are compiled by Alameda Countywide Clean Water Program staff for submittal to the Board. The Clean Water Program coordinates its activities with other pollution prevention programs, such as wastewater treatment plants, household hazardous waste collection programs, and wastewater recycling.[17]

The Alameda Countywide Clean Water Program is at the end of its current five-year permit, and the Board was expected to reissue the permit by February or March 2003. This reissued permit will contain increased requirement in many areas, however significantly increased requirements are expected in the New Development section of the permit. As of 2002, the permit mandated that the City require new and redevelopment projects to install controls to reduce pollutants in stormwater, and to implement alternate site designs to reduce the amount of impervious surfaces. The reissued permit is expected to strengthen these requirement to more specifically address the *volume* of runoff as a "pollutant," and require more prescriptive controls to reduce post development flow to pre-development levels where there is "potential" for increased downstream erosion or sedimentation. The permit also includes specific sizing requirements for treatment controls, and requires that agencies develop a Hydrograph Modification Plan to ensure that there is no increase in the potential for downstream erosion or sedimentation from potential projects.

[16] San Francisco Bay Regional Water Quality Control Board, 1995. Water Quality Control Plan. June 21.

[17] Alameda Countywide Clean Water Program, 2002. Website: www.co.alameda.ca.us/pwa/water.htm.

3. Alameda County Flood Control and Water Conservation District, Zone 7

Zone 7 is one of 10 active zones of the Alameda County Flood Control and Water Conservation District. The District was established in 1949 to solve problems of flooding, drainage, channel erosion, and water supply and conservation in Alameda County. Zone 7 includes all of eastern Alameda County (including the City of Livermore), an area of approximately 425 square miles. Zone 7 is a multi-functional agency that is currently active in management of the groundwater basin for water supply, water quality monitoring, surface water treatment and conveyance, and flood control. Zone 7 has an elected Board with policy and oversight responsibilities.

14. HAZARDOUS MATERIALS

Existing conditions as of 2002 related to the transportation, storage, use, generation, and disposal of hazardous materials[1] in the City of Livermore as of 2002 are described in this chapter. First, the regulatory agency framework associated with hazardous materials is described; next, the responsibilities of the City under the Certified Unified Program Agency program and various other hazardous materials programs are identified. Sites in the City of Livermore where a release of hazardous materials to the environment has been reported are also listed.

Products as diverse as gasoline, paint, solvents, film processing chemicals, household cleaning products, refrigerants and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use, or processing, is considered to be a hazardous waste. Biohazardous wastes are composed of medical waste which may contain hazardous or infectious materials. Of concern to all communities is the handling, transportation, and disposal of such wastes. Improper handling of hazardous materials or wastes may result in significant effects to human health and the environment.

A. REGULATORY AGENCY FRAMEWORK

Because of the large number of federal, State, regional, and local agencies involved in the regulation of hazardous materials, the following discussion of the regulatory framework provides the context necessary for understanding current status of hazardous materials in Livermore. Beginning in the 1970s, governments at the federal, State, and local level became increasingly concerned about the effects of hazardous materials on human health and the environment. Numerous laws, agencies, and regulations were developed to investigate and mitigate these effects. As a result, the storage, use, transport, and disposal of hazardous materials and waste is highly regulated by federal, State, and local laws and regulations. A description of agency jurisdiction is summarized below.

1. Federal Agencies

The U.S. Environmental Protection Agency is the only federal agency that is responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The federal regulations are primarily codified in Title 40 of the Federal Code of Regulations (40 CFR). The legislation is outlined in the Resource Conservation and Recovery Act of 1976 (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA);

[1] The California Health and Safety Code defines a hazardous material as, "...any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." (Health and Safety Code §25501). Infectious and biohazardous wastes, such as those generated by medical facilities, are regulated differently under State laws and regulations, but are also discussed in this section.

and the Superfund Amendments and Reauthorization Act. These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, and/or dispose of hazardous materials. The Environmental Protection Agency provides oversight and supervision for federal Superfund investigation/remediation projects, evaluates remediation technologies, and develops hazardous materials disposal restrictions and treatment standards.

2. State Agencies

State regulatory agencies are described below.

a. Department of Toxic Substances Control. The California Environmental Protection Agency, Department of Toxic Substances Control is authorized by Environmental Protection Agency to enforce and implement Federal hazardous materials laws and regulations. California regulations pertaining to hazardous materials equal or exceed federal regulations. Most State hazardous waste regulations are contained in Title 22 of the California Code of Regulations. The Department of Toxic Substances Control acts as the lead agency for some soil and groundwater cleanup projects, such as Annual Work Plan and Voluntary Cleanup Program sites, although most contaminated sites are overseen by other agencies, such as the Regional Water Quality Control Board. The Department of Toxic Substances Control provides cleanup and action levels for subsurface contamination; these levels are equal to, or more restrictive than, federal levels. The Department of Toxic Substances Control has developed land disposal restrictions and treatment standards for hazardous waste disposal in California.

b. Air Resources Board. The California Toxic "Hot Spots" Information and Assessment Act of 1987 requires that industries provide information to the public on emissions of toxic air contaminants and their impact on public health. The Act requires the Air Resources Board and local air quality districts to inventory sources of over 200 toxic air contaminants, to identify high priority emission sources, and to prepare a health risk assessment for each of these priority sources.

c. State Water Resources Control Board. The State Water Resources Control Board issues regulations on how to implement underground storage tank programs. It also allocates monies to eligible parties who request reimbursement of funds to clean-up soil and groundwater pollution from underground storage tank leaks.

d. California Department of Fish and Game. This agency responds to surface water pollution incidents.

e. California Office of Emergency Services. The Office of Emergency Services is the state agency which develops regulations for the Hazardous Materials Business Plan and California Accidental Release Prevention Program. The Office's State Warning Point acts as the Governor's 911 Dispatch Center. The State Warning Point, under the federal Superfund Amendments and Reauthorization Act Title III requirements, must be notified as soon as possible after an incident. The Office of Emergency Services compiles statewide statistics on spills and releases, and dispatches other regional, State, and federal agencies to the scene, if necessary.

3. Regional Agencies

The regional regulatory agencies which deal with hazardous materials issues are described below.

a. Regional Water Quality Control Board. The City of Livermore is located within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board. The Regional Water Quality Control Board is authorized by the Porter-Cologne Waste Quality Act of 1969 to protect the waters of the State. The Regional Water Quality Control Board may also act as lead agency to provide oversight for sites where the quality of groundwater or surface waters are threatened and approves site closure. The Regional Water Quality Control Board also responds if, in an emergency, surface and groundwater is impacted.

b. Bay Area Air Quality Management District. The City of Livermore is under the jurisdiction of the Bay Area Air Quality Management District, the local enforcement agency for Air Resources Board regulations. This regional agency regulates point source air pollutants, as well as mobile sources (e.g., automobiles). The Bay Area Air Quality Management District issues air pollution permits for many Livermore businesses, such as auto body shop spray paint booths and furniture refinishers. Bay Area Air Quality Management District staff also respond to odor and asbestos complaints, when requested by City staff or the general public.

4. Local Agencies

The local regulatory agencies which deal with hazardous materials issues are described below.

a. Livermore-Pleasanton Fire Department. The Hazardous Materials Division of the Livermore-Pleasanton Fire Department, as a Certified Unified Program Agency, has primary responsibility for enforcing most regulations pertaining to hazardous materials in the City of Livermore. The Livermore-Pleasanton Fire Department also acts as first responder to hazardous materials incidents within the City.[2]

b. Alameda County Department of Environmental Health. The Alameda County Department of Environmental Health may act as lead agency to ensure proper remediation of leaking underground petroleum product tank sites and certain other contaminated sites within the City of Livermore.

5. The Polanco Redevelopment Act

As cities age and patterns of development change, former industrial properties, gasoline stations, and other parcels with land uses associated with hazardous materials are often abandoned. These properties, where soils and groundwater are known or suspected to be contaminated, are often referred to as "brownfields." The threat of toxic contamination and potential liability for cleanup costs drives developers away from "brownfields" and encourages growth on previously undeveloped parcels at the outskirts of urban areas. This results in the inefficient use of land and blight in older portions of cities. The Polanco Redevelopment Act[3] (the Act) was enacted to encourage the safe reuse of potentially contaminated properties. The Act grants redevelopment agencies substantial discretion and authority in the cleanup process. The powers granted under the Act can allow a redevelopment agency to significantly speed up the investigation and remediation process of potentially contami-

[2] Stefani, Danielle, 2002. Hazardous Materials Coordinator, Livermore-Pleasanton Fire Department. Personal communication with Todd Taylor of Baseline Environmental Consulting. June.

[3] California Health and Safety Code, section 33459, et seq.

nated properties, and provides mechanisms for recovery of the costs incurred. Following successful assessment and remediation of a property under the provisions of the Act, developers and future land owners are no longer liable for future cleanup costs incurred as a result of historic contamination. The provisions of the Act will expire in 2004, but legislation currently under consideration in the State Senate (Senate Bill 1684) would make the Act permanent.

Additional legislation and programs have been implemented to assist in the redevelopment of "brownfields." In 2001, the California Land Environmental Restoration and Reuse Act[4] was enacted, which will enable cities and counties who adopt implementing ordinances to direct the investigation and remediation of privately owned, nonproductive, contaminated properties, provided that the properties are smaller than five acres. A companion law[5] will require the adoption of a guidance document with numerical cleanup screening levels for all contaminated properties in California. The guidance document is designed to provide uniform criteria for screening contaminated properties in California.

B. HAZARDOUS MATERIALS PROGRAMS IN LIVERMORE

Most of the City of Livermore's hazardous materials programs are administered and enforced under the Certified Unified Program Agency program. The Certified Unified Program Agency program encompasses several existing hazardous materials programs: Hazardous Materials Business Plan, California Accidental Release Plan, underground storage tank programs, hazardous waste, tiered permit, and aboveground storage tank programs which are described below. Other non- Certified Unified Program Agency programs described in this section relate to hazardous materials emergency response, clean-up of contaminated sites, stormwater pollution prevention, and regulation of ozone-containing compounds. Hazardous waste generation and treatment also are discussed below.

1. Certified Unified Program Agency Program Background

The Certified Unified Program Agency program was established under State Senate Bill 1082 in 1993 to reduce the cost and improve the efficiency of hazardous materials regulations. Chapters 16.04 and 16.06 of the Livermore Municipal Code officially established the Livermore-Pleasanton Fire Department as the Certified Unified Program Agency for the City of Livermore. The Livermore-Pleasanton Fire Department verifies compliance with hazardous material programs through inspections. Enforcement actions for hazardous materials violations are handled by the Alameda County District Attorney, City Attorney, or an Administrative Enforcement Order process.

Although all California cities are eligible for the Certified Unified Program Agency program, most of the Certified Unified Program Agencies in the State are counties. Alameda County is unique in that the Livermore-Pleasanton Fire Department and seven cities (Berkeley, Fremont, Hayward, Newark, Oakland, San Leandro, and Union City) have been certified as Certified Unified Program Agencies, more than any other county in the State. The Livermore-Pleasanton Fire Department meets with the Alameda County District Attorney and representatives of all the County's Certified Unified Program

[4] California Health and Safety Code, section 25401, et seq.

[5] California Health and Safety Code, section 57008, et seq.

Agency's each month to assist in maintaining uniformity in enforcement of hazardous materials regulations throughout Alameda County,

2. Certified Unified Program Agency Hazardous Materials Programs in Livermore

The hazardous materials programs administered by the Livermore-Pleasanton Fire Department under the Certified Unified Program Agency are described below:

a. Hazardous Materials Business Plan. Businesses that store hazardous materials in excess of specified quantities, as set forth by City, State, and federal regulations, must report their chemical inventories to the Livermore-Pleasanton Fire Department. This information informs the community on chemical use, storage, handling, and disposal practices. It is also intended to provide essential information to firefighters, health officials, planners, elected officials, workers, and their representatives so that they can plan for and respond to potential exposures to hazardous materials.

Under State law, facilities or businesses that use, produce, store or generate hazardous substances are required to have a Hazardous Materials Business Plan, which is updated annually, or when the inventory of the business changes. There are various required elements of the Hazardous Materials Management Plan, including disclosure of the type and quantity of materials, storage location, and specific product information, such as the constituency of the materials. Additionally, the law requires a site-specific emergency response plan, employee training, and the designation of emergency contact personnel.

b. California Accidental Release Program. State Senate Bill 1889 required California to implement a new federally mandated chemical Accidental Release Prevention Program. The California Accidental Release Prevention Program is designed to protect people from the release of "regulated substances" into the environment. "Regulated substances" are chemicals that pose a major threat to public health and safety or the environment because they are highly toxic, flammable or explosive. Examples of regulated substances are ammonia, chlorine gas, hydrogen, nitric acid, and propane. Businesses that use significant quantities of acutely hazardous materials must prepare a detailed engineering analysis of the potential accident factors present at a business and the mitigation measures that can be implemented to reduce this accident potential.

c. Underground Storage Tank Programs. Because of fire hazards, flammable liquids, such as gasoline, have historically been stored in underground storage tanks. Underground storage tanks holding hazardous materials or hazardous waste must be installed, monitored, operated, and maintained in a manner which complies with all existing federal and State regulations and protects public health, the environment, and the waters of the State. Tanks must be constructed with primary and secondary levels of containment and be designed to protect public health and the environment for the lifetime of the installation. Examples of these requirements include corrosion protection, structural strength standards, compatibility with the materials to be stored, and overfill protection.

Livermore-Pleasanton Fire Department staff are responsible for underground storage tank installation oversight, including review of locations and plans for design, secondary containment, tank tightness, corrosion protection, over-spill protection, overfill protection, and monthly monitoring. Aside from review of the actual tanks, Livermore-Pleasanton Fire Department staff review the plans for primary and secondary piping and dispensers, as well as for location, design, leak and crash protection, vapor recovery, and emergency shutoff.

Owners and operators of underground storage tanks must implement leak monitoring programs that comply with all regulations. Programs may include: daily visual inspection, interstitial space monitoring, continuous electronic monitoring systems, automatic line leak detectors, etc. Operators must also prepare a response plan for unauthorized releases.

Prior to the removal of any underground storage tank, a detailed permit application must be submitted, including the qualifications of the company performing the excavation and the certification of a registered geologist. Livermore-Pleasanton Fire Department staff must be present at the tank removal, once the permit has been approved. City staff visually inspect the tank and associated piping for any holes or punctures that may have caused a release of product from the tank. They also supervise soil and groundwater sampling, explosive levels, placement of the tank, and review health and safety requirements at excavations.

Once the tank is removed and transported out of the City, all hazardous wastes that may have been excavated during removal must be properly manifested and disposed in accordance with applicable regulations. Proper disposal or transport of soil stock piles is also required. Based on the analytical data that is submitted in the closure report by the property owner, the case may be referred to other agencies for oversight of additional investigation and remedial action.

d. Aboveground Storage Tank Programs. Inspections and permits are required for facilities storing hazardous materials in aboveground storage tanks. In addition, any facility operating aboveground storage tanks with a single tank capacity of 1,320 gallons or an aggregate container capacity of 1,320 gallons must complete a Spill Prevention Control and Countermeasure Plan to provide a detailed engineering analysis of the potential for release from aboveground storage tanks present at a facility and the measures, such as secondary containment and emergency response, that can be implemented to reduce the release potential.

3. Non-Certified Unified Program Agency Hazardous Materials Programs in Livermore

Emergency response contaminated site cleanup and stormwater pollution prevention are non-Certified Unified Program Agency programs, and are described below.

a. Emergency Response. The Livermore-Pleasanton Fire Department acts as first responder to all chemical emergencies, such as hazardous material spills that occur at businesses or on City streets, illegal dumping, complaints, or potential releases involving hazardous materials. Hazardous Materials Division staff help identify substances spilled, notify responsible State agencies concerned with such incidences, determine how the public can best be protected from any harmful effects, and may oversee site clean-up.

b. Contaminated Site Cleanup. The Livermore-Pleasanton Fire Department refers sites with known or suspected contamination to other agencies, such as the Department of Toxic Substances Control, Alameda County Department of Environmental Health, and Regional Water Quality Control Board, for clean-up. Contaminated site clean up is governed by State and regional regulations and policies. Once a release of hazardous material has been identified, State laws set forth specific protocol for preliminary site assessment, remedial action, and closure that must contain the following information: leak type and quality, water quality survey of the surrounding area for other sources of contamination, nearby wells, subsurface conditions, geology, adjacent land uses, and subsurface

utility locations. A detailed soil and water investigation must be conducted to identify the lateral and vertical extent of the pollutants. Once this subsurface investigation is completed, the property owner is required to prepare and implement a corrective action plan. This plan must provide for a risk analysis for identified pollutants, feasibility study for various clean-up methods, and a recommendation for the most cost-effective corrective action. Once this corrective action plan is reviewed and approved by regulatory agency staff, clean-up activities can begin. Some site clean-ups can take several years to complete.

Once investigation and remediation has been completed at a site, the overseeing regulatory agency submits a letter to the property owner certifying that no further action is required. Sites that have been issued "no further action" letters are considered closed, and the residual contamination remaining at the site, if any, would not be expected to pose a threat to human health or the environment. Sites that are closed may remain on lists of hazardous material release sites for several years following closure; the length of time on the lists varies by regulatory agency.

(1) Department of Toxic Substances Control Responsibilities. The Department of Toxic Substances Control has responsibility for oversight of Annual Work Plan sites (commonly known as State Superfund sites). Annual Work Plan sites are those hazardous material sites that have the greatest potential to effect human health and the environment. Sites evaluated for the Annual Work Plan that do not fall into this highest priority category are often referred to other agencies, such as the Regional Water Quality Control Board, for oversight. The Department of Toxic Substances Control also oversees other State programs, such as review of proposed school sites and implementation of the Voluntary Cleanup Program.

Six sites in the City of Livermore have been evaluated by the Department of Toxic Substances Control; only one site, the Lawrence Livermore National Laboratory, is listed on the Annual Work Plan database, updated March 2003 (see Table 14-1). This site is also listed on the U.S. Environmental Protection Agency's National Priority List of hazardous waste sites, commonly referred to as Superfund sites.

(2) Local and Regional Agency Responsibilities. The Alameda County Department of Environmental Health is responsible for the oversight of cleanup at sites within the City of Livermore that have affected soil and groundwater quality. The Regional Water Quality Control Board typically gives "no further action" closure letters, certifying that site cleanup is completed or was not necessary, based on the County's recommendations. In Livermore, most of these contaminated sites have reported releases of petroleum products from leaking underground storage tanks. Releases from leaking tanks can contaminate groundwater and migrate away from the tank location. Although recent regulations requiring double-wall construction and leak monitoring equipment for underground storage tanks should reduce the number of releases in the future, many underground tanks installed in previous decades have failed, resulting in petroleum contamination in soils and groundwater.

As of January 2003, 21 sites within the City of Livermore were under oversight due to leaking underground storage tanks (see Table 14-2). An additional 51 sites within the City of Livermore have reported releases from underground storage tanks, but these cases have been closed, indicating that remediation is complete or was not necessary (see Table 14-2).

Table 14-1: Hazardous Material Sites in the City of Livermore Currently or Formerly Overseen by the Department of Toxic Substances Control

Site Name/Address	List	Site Status
Lawrence Livermore National Lab 7000 East Avenue	Annual Work Plan	The site has been affected by releases of volatile organic compounds and petroleum hydrocarbons. Groundwater treatment and soil vapor extraction are continuing. This site is also listed on the U.S. Environmental Protection Agency's National Priority List of hazardous waste sites, commonly referred to as Superfund sites.
South Livermore School Site Wente Street/Robertson Park Road	School Site List	After review of a Phase I site assessment, the Department of Toxic Substances Control determined no additional investigation at the site was required.
Livermore Sewage Ponds Rincon Avenue at Sunset Drive	No Further Action	The site was investigated to determine if it was a source of low concentrations of volatile organic compounds in a nearby well. No source was identified at the site, and no further investigation or remediation is proposed.
Livermore Senior Housing East of Murrieta Boulevard	Voluntary Cleanup Program	Arsenic associated with former railroad tracks was identified in site soils. Affected soils were encapsulated under a parking lot and a deed restriction was implemented in accordance with an agreement with the Department of Toxic Substances Control.
Hexcel Corporation 10 Trevarno Road	Regional Water Quality Control Board Referral	Improper storage/disposal of waste solvents and other materials has affected groundwater. Regional Water Quality Control Board is overseeing cleanup of the site.
Livermore Arcade Site First Street and South P Street	Regional Water Quality Control Board Referral	Improper disposal of drycleaning solvents at the site has affected groundwater. Regional Water Quality Control Board is overseeing cleanup of the site.

Source: Department of Toxic Substances Control, 2003. Site Mitigation and Brownfields Reuse Program Database, http://www.dtsc.ca.gov/database/Calsites/Index.cfm, data refreshed March 5.

The Regional Water Quality Control Board also oversees sites on the Spills, Leaks, Incidents, and Cleanups database. These sites are those with reported releases of hazardous materials potentially affecting groundwater that are not associated with underground storage tanks. There were 16 Spills, Leaks, Incidents and Cleanup sites within the City of Livermore in 2002 (see Table 14-3). Five of these sites were active (indicating that investigation and/or remedial action may occur in the future) and the remaining 11 were either inactive or closed, with no further investigation or remedial action proposed.

c. Stormwater Pollution Prevention. The City of Livermore Water Resources Division manages the storm water program in Livermore. The City of Livermore participates in the Alameda County Urban Runoff/Clean Water Pollution Prevention program, to more closely monitor discharges into the stormwater system. The authority for this program comes from the Federal Clean Water Act Amendments of 1990. Unlike discharges to the sanitary sewer system, any discharge that enters the stormwater system in Livermore flows directly to surface water bodies without treatment. If storm-water were polluted with oils, soaps, or even food products, the pollution could affect surface water quality.

Table 14-2: Current and Former Leaking Underground Storage Tank Cases in the City

Site Name	Address
CURRENT LEAKING UNDERGROUND STORAGE TANK CASES (Currently Under Regulatory Oversight)	
Arco	899 Rincon Avenue
Arco	785 Stanley Boulevard East
Arrow Rentals	187 L Street North
Bay Counties Petroleum Inc	3357 Gardella Plaza
Beacon	1619 1st Street
Beacon	2620 Old 1st Street East
Call Mac Transportation	461 McGraw Avenue
Chevron	4904 Front Road South
Chevron Calico Lumber	3360 1st Street
Del Valle Continuation High School	2253 5th Street
Desert Petroleum BP	2008 1st Street
Groth Brothers Oldsmobile	59 L Street South
K Mart	1122 Stanley Boulevard East
Laidlaw Transit Inc	2900 Ladd Avenue
Livermore Agricultural Office	2418 Railroad Avenue
Livermore Gas and Mini Mart	160 Holmes Street
Livermore Water Plant	101 Jack London Boulevard
Shell	809 Stanley Boulevard East
Texaco	930 Springtown Boulevard
Unocal	1771 1st Street
Unocal	4700 1st Street
FORMER LEAKING UNDERGROUND STORAGE TANK CASES (Remediation Complete Or Not Necessary)	
American Savings Bank	1429 College Avenue
Arco	909 Bluebell Drive
Associated Concrete Products	1901 Isabel Avenue
BP	4707 1st Street
Capitol Metals	261 Vasco Road South
Chabot College	3033 Collier Canyon Road
Chevron	1334 1st Street
Chevron	1925 Barcelona Street
Classic Truck Lines	5830 Las Positas Road
Codiroli Motor Company	3737 1st Street
DePaoli Property	1679 1st Street
East Bay Gunite	5237 Front Street South
El Dorado Motel	3927 1st Street
Ericson Property	444 N Street North
Evan Property	1253 Portola Avenue
Exxon	1175 Catalina Drive
Geno's Deli	1000 Vasco Road North
Gerald E Mcpeak	1453 1st Street
International Auto Car	2551 2nd Street
J & W Development	2920 4th Street
J & W Development	330 Wood Street
Kenetech Windpower	6952 Preston Avenue

Table 14-2 *continued*

Site Name	Address
Las Positas Golf Course	909 Clubhouse Drive
Lawrence Livermore Nat Lab Building 298	7000 East Avenue
Leprino Foods	6211 Las Positas Road
Livermore Corporation Yard	2500 Railroad Avenue
Livermore Dublin Disposal Company	6175 Front Street South
Livermore Fire Station #1	4550 East Avenue
Livermore German Auto	2730 Old 1st Street
Livermore Honda	3800 1st Street
Livermore Municipal Airport	1800 Friesman
Livermore Municipal Airport	636 Terminal Court
Mill Springs Park Apartments	1809 Railroad Avenue
MTM General Store and Gas	115 Vasco Road South
North K Associates	2322-38 1st Street
Pacific Bell	2388 2nd Street
PG&E	3797 1st Street
Portola Meadows Apt Tract 5430	1830 Portola Avenue
Residential	1733 Murdell Lane
Robert & Edna Carpenter	524 Livermore Avenue South
Rynck Tire Center	1682 1st Street
Rynck Tire Center	1485 1st Street West
Shell	318 Livermore Avenue South
Shell	1155 Portola Avenue
Silver Metal Products	2150 Kitty Hawk Road
Springtown Golf Course	1968 Bluebell Drive
Tri-Valley Transportation	5481 Brisa Street
Unocal	900 Livermore Avenue South
Valley Memorial Hospital	1111 Stanley Boulevard East
Walmart	2700 Las Positas Road
Wente Brothers Winery	4590 Tesla Road

Source: San Francisco Bay Regional Water Quality Control Board, 2003. LUSTIS (UST) Database. January.

Table 14-3: Current and Former Spill, Leak, Investigation, and Cleanup Cases in the City

Site Name	Address	Last Database Update
CURRENT SPILL, LEAK, INVESTIGATION AND CLEANUP CASES (Currently Under Regulatory Oversight)		
Hexcel Corp	End of Trevarno Road	8/5/1989
Industrial Ladder	115 Mines Road North	8/5/1989
Intel Corp Livermore Fabrication Plant 3	250 Mines Road North	4/22/1992
Lawrence Livermore Lab DOE		1/31/1992
Salinas Reinforcing Inc	355 South Vasco Road	3/20/1998
INACTIVE SPILL, LEAK, INVESTIGATION AND CLEANUP CASES (No Additional Investigation or Remedial Action Planned)		
Davey Tree	2617 South Vasco	1/14/1989
Livermore Arcade Shopping Center	1st and P Street South	4/3/1990
Livermore, City of	1767 Portola Avenue	9/18/1991
Livermore Department of Public Works	Rincon & Juniper & Spruce	8/4/1994
Livermore Sewage Ponds	Pine Street	None
Miller Outpost Shopping Center	1332 Railroad Avenue	8/4/1994
Norli Property	Adjacent to Hexcel (SW)	4/28/1989
PG&E	WPRR & North Street	2/23/1987
Portola Meadows Apt Tract 5430	1830 Portola Avenue	11/9/1992
CLOSED SPILL, LEAK, INVESTIGATION AND CLEANUP CASES (Remediation Complete or Not Necessary)		
Calico Lumberyard Former	3360 1st Street	4/27/1992
Pestana Construction	6709 South Front Road	9/26/1995

Source: San Francisco Bay Regional Water Quality Control Board, 2002. Spills, Leaks, Investigations, and Cleanup Database. October.

Under the Alameda County Urban Runoff/Clean Water Pollution Prevention program, the County has obtained an NPDES permit. A condition of this permit is that each municipality in the County implement a series of programs. Chapter 13.45 of the Livermore Municipal Code details the City's Stormwater Management and Control Program (see discussion in the *Hydrology and Water Quality* chapter).

4. Hazardous Waste Sources and Programs

Once a hazardous material has been used or processed, what remains is in some cases considered a hazardous waste. Many businesses and residences in Livermore generate some amount of hazardous wastes. The most common hazardous wastes generated by businesses in Livermore are generated from gasoline service stations, dry cleaners, automotive mechanics, auto body repair shops, machine shops, printers and photo processors. Wastes generated by these businesses include used or surplus cleaning and paint solvents, lubricants, and oils. Medical wastes, defined as potentially infectious waste from sources such as laboratories, clinics, and hospitals, are regulated differently than other hazardous wastes generated by businesses.

Hazardous waste programs in the City are governed by federal and State regulations (described in subsection A of this report), as well as the Alameda County Hazardous Waste Management Plan. The Alameda County Hazardous Waste Management Plan was developed beginning in 1989 by the County Waste Management Authority's Hazardous Waste Committee, and Advisory Council and others, in response to the 1986 Tanner Bill (Assembly Bill 2984) or Section 25135.7 d of the California Health and Safety Code. The purpose of the Alameda County Hazardous Waste Management Plan was to forecast the potential future waste generation in the County, to encourage an aggressive waste reduction strategy, and to establish acceptable siting criteria which incorporated the fair-share principle. This discussion of hazardous waste is divided into three categories: hazardous wastes generated by businesses, household hazardous waste, and medical waste.

a. Hazardous Wastes Generated by Businesses. Although inspections by the Livermore-Pleasanton Fire Department take place on a regular basis, each Livermore business is ultimately responsible for ensuring compliance with proper storage, labeling, record keeping, and manifesting requirements. Livermore-Pleasanton Fire Department staff look for compliance with applicable regulations and building and fire codes. Typically, these regulations and codes require engineering controls, such as secondary containment, in areas where hazardous materials are used and stored. These engineering controls can minimize the effects of routine spills and prevent more serious releases.

Besides checking compliance with regulations and codes, Livermore-Pleasanton Fire Department staff look for obvious evidence of hazardous material releases, such as spills or staining on floor areas surrounding hazardous material storage. Inspections can also provide an opportunity for Livermore-Pleasanton Fire Department staff to provide information regarding hazardous waste minimization and current best management practices for the handling and disposal of hazardous wastes.

The transfer, storage, and disposal of hazardous waste can be quite expensive and requires detailed record-keeping. All businesses that generate hazardous waste must obtain a Federal Environmental Protection Agency or California Environmental Protection Agency waste identification number. Hazardous waste generators are financially liable for their waste from "cradle to the grave." Thus, if there is a clean-up required of a hazardous waste disposal site or landfill, all the generators, based on the amount of their manifested waste disposed of at that site, will be required to help pay for the clean-up.

b. Household Hazardous Waste. Many of the items routinely used by Livermore residents, such as paints and thinners, cleaning products, motor oil, and other such items, are hazardous materials. Because they are commonly used around the house, many people are unaware of the potential hazards associated with the use and disposal of these items. An undetermined, but probably large, percentage of these materials are improperly stored and disposed of; half-finished items may be stored in kitchens, garages or basements, or may be poured down storm drains, dumped into the garden, or placed into the household garbage can. None of these disposal methods is satisfactory as they expose the occupants and others, to unnecessary risks and could potentially contaminate soils and groundwater at transfer stations and solid waste disposal sites.

The City participates in household hazardous programs with the Alameda County Waste Management Authority. The programs are designed to increase public awareness of household hazardous waste issues and provide safe and convenient disposal options for household hazardous waste. A household

hazardous waste drop-off facility has been established in Livermore at 5584 La Ribera Street, which accepts waste during specified hours or by appointment.

c. Medical Wastes. Beginning in 1991, the Medical Waste Management Act established new definitions and requirements for generators of medical waste. This Act defines medical waste as biohazardous waste, sharps waste, or waste which is generated or produced as a result of the diagnosis, treatment, or immunization of human beings or animals, in medical research, or in the production or testing of biologicals. Medical waste may also contain infectious waste. In the City of Livermore, the State enforces the Medical Waste Management Act. The Medical Waste Management Act establishes handling, tracking, storing, hauling, treating and disposal requirements for medical waste. Typical medical waste generators regulated by the Act include hospitals, nursing homes, veterinarians, laboratories, clinics, dentists, and physicians. Medical waste generators who generate more than 200 pounds of medical waste per month and/or perform on-site treatment of medical wastes must register with the State.

15. VISUAL RESOURCES

This chapter describes the visual resources of Livermore in 2002. Visual resources include the elements that provide a "sense of place" within Livermore and contribute to its unique identity. These elements encompass both natural and man-made features of the local environment, as well as the broader aspects that contribute to how the City is perceived, or "read" as a place. This chapter describes Livermore's natural setting and its landmark features, as well as describes the City in terms of its urban design characteristics, including its important views and scenic corridors, districts, and urban edges and gateways.

A. GENERAL SETTING

Livermore is located in the Livermore Valley, in eastern Alameda County. The Livermore Valley is bordered to the north, south, and east by rolling hills, within which the urbanized area of the City lies. Livermore's northern half is bisected by Interstate 580 (I-580), which runs east-west through Alameda County. The Union Pacific Railroad, which now serves the ACE train commuter rail service, roughly parallels I-580 to the south. In 2002, State Route (SR) 84[1] ran through the City in an approximately southwest-northeast orientation, first as Vallecitos Road, then as Holmes Street, and then as First Street through the Downtown to connect with I-580. Other major regional connectors include Stanley Boulevard from the west, North Livermore Avenue and Vasco Road from the north, and Tesla Road, Mines Road, and South Livermore Avenue from the southeast.

1. Natural Setting

The most distinctive features of Livermore's natural setting are the hills and ridgelines that surround the City, most of which lie outside the City limits. Ridgelines are pronounced along the southern edge of the City, where views of rolling hills, interspersed with woodland areas, are complemented by intervening vistas of agricultural land and vineyards. Significant ridgelines are also located north of the I-580 corridor, particularly those associated with Brushy Peak to the northwest, as well as the Altamont Hills east of Vasco Road and Greenville Road. Other open space to the north consists of more moderate topography, with rolling hills and rangelands. Several creeks and arroyos lie within the Planning Area, including Altamont Creek, Arroyo Seco, Arroyo Mocho, Arroyo Las Positas, Collier Canyon Creek, and Arroyo del Valle. These creeks and arroyos support vegetation and trees for portions of their length, imparting important topographical and natural features to the general landscape.

2. Urban Setting

Livermore's historic Downtown lies south of the railway corridor and I-580, in an area bounded roughly by Stanley Boulevard and the railway to the north, Fourth Street to the south and east, and

[1] Upon certification of the environmental document for the Isabel/I-580 Interchange and with the completion of the route transfer process with Caltrans, Isabel Avenue will be designated as the new SR 84. The State will relinquish Holmes and First Streets to City jurisdiction.

Murietta Boulevard to the west. Residential development extends outward from the Downtown core. Older residential developments, mostly built before Livermore's major growth period in the 1950s, lie adjacent to the Downtown to the north, south, and east. Streets in these areas generally conform to the more traditional grid street and block pattern seen in the Downtown.

Beyond the center of the City, radiating outward to the rural fringe, are numerous residential subdivisions. Mostly built since 1950, these residential neighborhoods occupy the greater part of the City's land area. The urban fabric of these areas reflects a classic suburban development pattern; large tracts of one- and two-story single-family homes of largely similar style arranged on cul-de-sacs and curvilinear local streets. Multi-family housing and apartment complexes are generally located along larger streets and arterials, such as East Avenue, Murrieta Boulevard and Livermore Avenue.

Other significant features of the urbanized area include a swath of industrial development (contains both Low and High Intensity Industrial designations) that extends east from First Street Downtown to the eastern City limits, and also south from I-580/east of South Vasco Road to Lawrence Livermore National Laboratory (LLNL) and Sandia Laboratory. The outlying urban edge reflects the interface of the City and surrounding open space and agricultural areas. Here, newer residential development is interspersed with older ranches, generally consisting of a home clustered with outbuildings, surrounded by pasture, vineyards, or other cultivated lands.

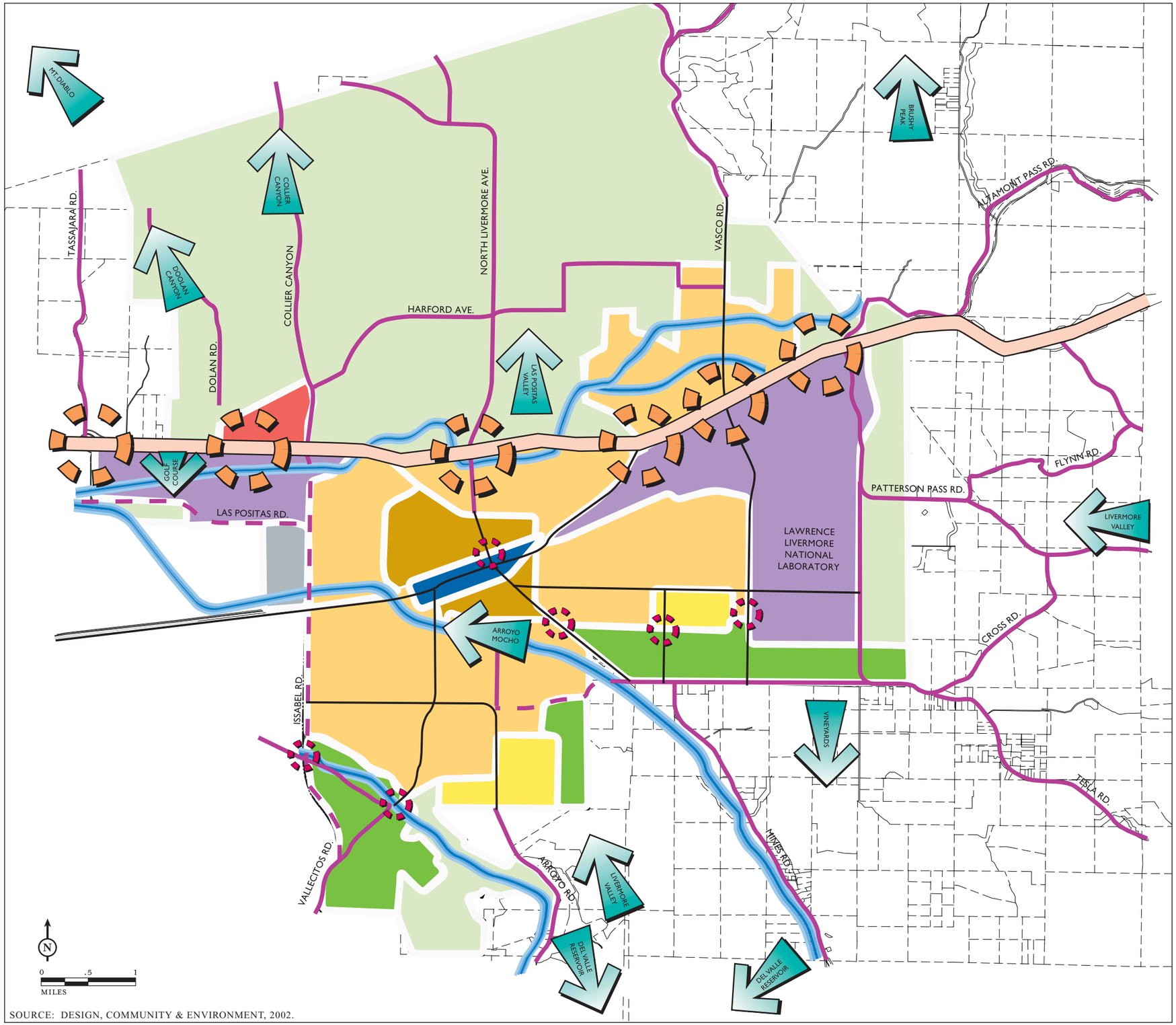
B. COMMUNITY DESIGN CHARACTERISTICS

A number of important elements contribute to the overall urban or community design of the City. Contributing community design characteristics include corridors, including views, view corridors, and transportation corridors, gateways, edges, and districts. Each of these elements, as they apply to the City are described below. Figure 15-1 illustrates the characteristics described below.

1. Scenic Views and View Corridors

The City's location within the Livermore Valley provides diverse views related to topographical changes looking outwards from the interior, urban area. While the majority of the City lies on relatively flat terrain, some northern areas are built upon, providing some topographical variety within the City itself. Hill and ridgeline views are available from many vantage points within the City limits. Mount Diablo is visible to the northwest and Brushy Peak is prominent to the northeast.

Within the urbanized area, scenic views to surrounding hillside open space are most readily available along the urban edge, and within areas of the City and Planning Area that have experienced less development. The newest residential subdivisions of South Livermore (east of Arroyo Road and south of Alden Lane) are situated on a rise, and enjoy scenic vistas to the south. New development in the Altamont Creek (northeast) area is afforded attractive views of the surrounding area due to the lack of intervening development to the north and northeast. In the more central areas of the community, views towards the hills are available while traveling along the City's major arterials, where the roadway corridor permits a relatively clear sightline to outlying areas.



SOURCE: DESIGN, COMMUNITY & ENVIRONMENT, 2002.

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LSA

LEGEND

- Planning Area Boundary
- City Limit Line
- I-580 Scenic Corridor
- Major Scenic Streets (Existing)
- Major Scenic Streets (Proposed)
- Non-Scenic Segment
- Waterways
- Scenic Vistas
- Gateways
- District Gateways

DISTRICTS

- Downtown
- Light Industrial
- Business Park
- Wine Region
- Parks / Open Space
- Quarry
- Central Residential
- Peripheral Suburban
- New Urban Edge Development

FIGURE 15-1

Livermore General Plan Update
Master Environmental Assessment
Visual Resources Diagram

2. Scenic Routes and Corridors

The Scenic Route Element, as last amended in 2000, identifies a number of roadways in the Planning Area that are considered "Scenic Routes." These roadways are so designated because they pass through areas of high scenic value, or provide access to important scenic, recreational, cultural or historic points. Figure 15-1 shows the scenic routes identified in the Scenic Route Element.

The Scenic Route Element identifies protection of scenic views from I-580 as being of particular importance. Heavily traveled I-580 provides some of the best views of Livermore's surrounding ridgelines. Policies and programs of the Scenic Route Element specifically seek to preserve and protect scenic views within the designated I-580 Scenic Corridor through control of grading, landscaping, and building height. The I-580 Scenic Corridor is defined as the area within 3,500 feet of the freeway centerline and visible from the roadway.

In addition to I-580, rural roads that pass through undeveloped parts of the Planning Area constitute the most important scenic roadway corridors in the Planning Area.

3. Creek Corridors

The following major creeks and arroyos pass through the Planning Area from west to east: Cottonwood Creek, Collier Canyon Creek, Cayetano Creek, Valle Dry Creek, Kellogg Creek Altamont Creek, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, and Arroyo Del Valle. Most of these are above-ground waterways, even in urbanized areas. Waterfront trails are provided along stretches of some major creeks, such as Altamont Creek in northeast Livermore, and Arroyo Mocho through the central part of the City. The sycamore woodlands of Arroyo Del Valle are central to the scenic value of Sycamore Grove Park in South Livermore. Creek canyons are an important component of the scenery and topography of Livermore's surrounding hillside areas.

4. Districts

For the purposes of this particular discussion, the community has been divided into districts which display different characteristics and urban design patterns that are most often associated with historic context, predominant land use, or a combination of the two. These districts are shown in Figure 15-1. The most distinct districts in Livermore are those associated with the historic Downtown and the wine region of South Livermore.

Although many of the vineyards and wineries that characterize South Livermore's wine region lie outside of the City limits, this area is nonetheless considered an important district for the Livermore Planning Area and the City's overall community character. Vineyards and other agricultural uses dominate the wine region; numerous wineries are in operation, and the clusters of buildings and facilities, surrounded by hillside vineyards, provide a specific and identifiable landscape within this area.

The Trevarno Road Historic District is a small, but distinct district located off First Street. The district consists of a walnut-tree lined street of historic homes built in the early 20th century as housing for executives of the Coast Manufacturing and Supply Company, one of Livermore's most important early industries. The two-story brick building that once served as the Company's headquarters now serves as offices for the Livermore Area Recreation and Park District.

The rest of the City consists of a number of residential, commercial and industrial areas; these are described in greater detail below.

5. Gateways

Gateways are the entries to a city, district, or neighborhood. They act as a point of distinction between different areas and contribute to a sense of arrival in one place from another. For the most part, gateways in Livermore are associated with the City's major transportation corridors. These include exits off of I-580 at Portola Avenue, North Livemore Avenue and First Street, as well as the points along the freeway where the transition is made from the surrounding rural area to the urbanized area. Important gateways also include entries to the City from other major regional connectors such as Stanley Boulevard, Vallecitos Road/Holmes Street, Vineyard Avenue, and South Livermore Avenue/Tesla Road.

Gateways can also be found at the entrance to the Downtown and the Livermore Valley wine region in South Livermore. The only gateway to the Downtown area that is formally demarcated is found at the intersection of South Livermore Avenue and First Street, where landscaping, a prominent fountain, and signage promotes a sense of transition or arrival to the "heart" of Livermore. Gateways to the wine region are, in general, not formalized, but the very distinct difference in landscape as one travels from the built-up area of Livermore south to the vineyards, clusters of winery buildings, agricultural fields, and vineyard signage serves to distinguish gateways to the wine region along Tesla Road, Wetmore Road, and Arroyo Road.

6. Urban Edge Definition

Edges are the lines of definition that separate urban from rural environments. Livermore has a relatively irregular and generally ill-defined urban edge, reflective of the lack of natural physical growth constraints in the Livermore Valley. Whereas cities adjacent to a large body of water, steep mountains, or on a major river tend to have well-defined urban edges created by those features, Livermore has grown in a more haphazard fashion without definite geographic limits. In Livermore, the juncture of urbanized and rural areas is most often defined by a peripheral roadway, on one side of which is the "back wall" edge of a residential subdivision over which one can see rooftops, and the other side, undeveloped agricultural land. Such an example can be seen traveling south on Isabel Avenue on the City's western edge or north on Laughlin Road in the northeast. I-580 also creates an urban edge in the segments where development does not extend to both sides of it. Hills to the north of I-580 contrast, to some degree, with the more urbanized commercial uses along the southern I-580 frontage. Although low-rise development along I-580 preserves views of the hills beyond, the low-density, big-box retail developments visible from I-580 near North Livermore Avenue and First Street do not provide a well-defined sense of Livermore's urban character.

In South Livermore, as a result of guidelines for development set forth in the City's *South Livermore Valley Specific Plan*, the urban edge is softer, with clusters of houses surrounded by agricultural open space, creating a "feathered" edge of transition from an urban to rural environment.

Within the City, soundwalls also create edges to many residential neighborhoods. Soundwalls are needed to shield homes from traffic noise on the large arterial roads skirting residential subdivisions. However, older soundwalls, like the one that extends along much of the southern side of Portola Avenue between Livermore Avenue and First Street, create an unattractive edge along major

corridors. More recent residential development along these major arterials has included aesthetic backing wall treatments with significant landscaping between the roadway and soundwall, thereby improving the overall visual appearance of the wall.

C. URBAN DESIGN CHARACTERISTICS

Livermore can be divided into areas characterized by broadly similar land uses, including residential, commercial, industrial, and institutional uses. This section describes and summarizes the location and general urban design qualities of these different land uses.

1. Residential

Residential uses comprised the largest land use type in the City in 2002. The development of Livermore's residential neighborhoods has occurred in several distinct phases, each of which has made its contribution to the City's character and has resulted in typical development types in different areas of the City. These phases are characterized as follows:

a. Central Residential Districts. Residential development in the Downtown and immediately surrounding area reflects the early phase of the City's development, lasting from the late 19th Century to the 1950s. Residential development from this period is limited, focused around a few blocks north, south, and east of the Downtown area and following a more traditional grid pattern of streets and blocks. The urban environment in these areas consists mostly of modest, one-story, single-family homes, most often built in ranch or bungalow styles. Streets in these older residential neighborhoods are generally wide and lined with mature trees, with relatively narrow, short setback distances from the street.

b. Peripheral Suburban Areas. Livermore has experienced very rapid growth since 1950, and its urban fabric reflects typical patterns of postwar suburban development seen throughout the United States. Single-family housing dominates Livermore's outlying residential areas. Within individual subdivision developments, architectural styles and building types are generally similar, with little that visually distinguishes one residential neighborhood from another. Local streets are wide and curvilinear with most non-local traffic concentrated on peripheral arterial roads. Houses are oriented with their rear yards adjacent to the street to shield homes from the sound and sight of traffic on arterial roadways. Multi-family housing is also typically found along major streets.

Many of the peripheral roadway frontages in Livermore are edged with soundwalls for much of their length. As a result, views along many of the City's major paths of vehicular travel are of these walls and the backs of houses or roofs, with little sense of the community that lies on the other side of them.

c. Residential Development at the Urban Edge. Residential areas at the edge of the City reflect the interface of new urban development with the open space and agricultural uses that surround Livermore. As a result of the *South Livermore Valley Specific Plan*, the newest residential development in South Livermore consists of smaller "clusters" of 40 to 60 single-family homes, surrounded by areas of undeveloped open space, creating a "feathered" or transitional urban edge. Newer development is also interspersed with older ranches and small farms spread along outlying roads. In areas north of I-580, residential development is limited to the Springtown and Altamont Creek neighborhoods, as well as adjacent to the TKG Business Park along Collier Canyon Road.

2. Commercial and Industrial

Livermore's commercial and industrial areas have developed in tandem with the City's residential growth. The urban design character of these non-residential land uses are described below:

a. Downtown. Downtown is the City's historic commercial center, reflecting the City's historic importance as a regional commercial center for the surrounding agricultural and ranching community. The core of the Downtown, or Central Business area, is primarily centered along First Street between Maple Avenue and L Street. In 2002, the Downtown had a mixture of commercial uses located in a variety of one- and two-story buildings. Much of the Downtown is walkable, with generous sidewalks. Due to its designation as SR 84, however, First Street through the Downtown is much wider than is typical of an older Downtown "Main Street." While First Street has wider sidewalks, retail shops, and even more outdoor eating areas then most of Downtown, walkability and pedestrian ambiance is hindered by traffic, particularly through commuter and truck traffic.

The Downtown is also the location of many of the City's most prominent and distinguished local and historic landmarks, including the Shenone, Bank of Italy, and Carnegie Buildings, the Raboli residence, Saint Michaels Church, the Southern Pacific Railroad Depot, the old City Hall/Fire House building, and the Mills Square Flagpole. Despite the area's significant existing assets, development patterns of the past 50 years have consistently focused commercial and residential development away from the historic center. Disinvestment in the Downtown has resulted in numerous vacant and underutilized properties throughout the area and a general lack of vitality.

b. Community and Neighborhood Retail Centers. Outside of the Downtown, most of Livermore's commercial activity is concentrated in auto-oriented retail centers, many of which are clustered close to I-580. Design of these retail centers reflect their auto-orientation, with large "big-box" stores fronted by large parking areas.

Scattered throughout the City, but generally located along major streets, are numerous neighborhood-serving retail centers. These range from larger shopping centers with full-service grocery stores, drug stores, and banks, to smaller strip-mall developments with a series of smaller businesses, neighborhood restaurants, convenience stores, and personal services. Examples of such centers include Peppertree Plaza, Vintner Square, Arroyo Park, and the Granada Shopping Center.

c. Industrial Areas. Industrial areas of Livermore are concentrated in the City's eastern half, particularly in the area between I-580 south to the railroad, extending east from Downtown to Greenville Road. The other major concentration of industrial uses is clustered around the Municipal Airport in the western part of the City. These areas are characterized by low-density, light industrial development that houses small-scale manufacturing operations, auto-related businesses, and warehouses. Buildings are generally low-rise, one- and two-story structures with minimal architectural features or detail. Parking and loading spaces are adjacent to the individual building or complexes.

There are no heavy industry or large-scale industrial facilities within City limits. However, large-scale sand and gravel extraction operations are located in close proximity to Livermore. The majority of these operations are sited west of the City, between Pleasanton and Livermore, extending south from the Livermore Airport in the north to Vineyard Avenue in the south. As seen from Stanley

Road, the quarry operations are characterized by groups of large mechanical structures used for raw material extraction and processing, as well as heaps of extracted material. Extensive areas of exposed dirt and large pits form the remainder of the quarry area.

d. Business Parks and Office. The City's large-scale dedicated business parks are found in an area of "campus style" office developments in northwest Livermore, around North Canyons Parkway. Groups of office buildings, surrounded by parking facilities, pedestrian walkways, and landscaped communal areas are linked to nearby thoroughfares by secondary roads. Other smaller office developments are scattered throughout the City, generally concentrated along major streets, and in the light industrial areas described above.

3. Laboratory Facilities

In addition to the industrial and commercial uses described above, prominent features of Livermore's urban environment are the Lawrence Livermore National Laboratory (LLNL) and Sandia Laboratory facilities, located adjacent to the eastern City limits, in unincorporated Alameda County.

Research facilities associated with LLNL and Sandia Labs dominate the urban landscape in this area, extending south from Patterson Pass Road, north to Tesla Road, and east between Vasco Road and Greenville Road. Laboratory buildings and facilities, and associated employee parking are distributed across the site. Several multi-story buildings are visible along Vasco Road, and because they are the tallest buildings in the City, they are highly visible when viewed from Vasco Road looking east, as well as west from Greenville Road.

4. Open Space

An important aspect of Livermore's community character is the numerous amount of public parks and open space resources found in the City. These open space areas provide Livermore residents with opportunities for relaxation and exercise, as a venue for community and family events, as well as a welcome escape from hot summer weather. Numerous local parks are scattered throughout the City, but prominent public open space areas include Robertson, Sycamore Grove, and Robert Livermore Parks.

In 2002, the City also had an extensive bikeways and trails network that provided additional opportunities for recreation and could be used for transportation purposes. This network also provided opportunities for traveling through the scenic rural and historic areas of the City, such as along creeks and through the South Livermore wine region.

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APPENDICES

APPENDIX A

ISSUES PAPER: JOBS/HOUSING MATCH AND CITYWIDE REAL ESTATE MARKET DEMAND

Livermore General Plan Update

Issues Paper:
Jobs/Housing Match
and
Citywide Real Estate Market Demand

Prepared for:
City of Livermore

August 2002

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Executive Summary

Purpose of Issues Paper

This Issues Paper provides background information to assist the General Plan Steering Committee in making informed policy decisions regarding land use, employment uses and housing issues. The Existing Economic Conditions Working Paper outlined demographic trends and real estate market conditions. This paper provides additional background information regarding housing policy, analysis of the current jobs/housing match in Livermore, and projections of future demand and needed supply of land for residential, office and industrial land uses in Livermore.

Housing Element & the Housing Implementation Program (HIP)

Several simultaneous regulatory systems impact future land use policies related to the General Plan Update. Pursuant to California Government Code Section 65584, ABAG prepared a Regional Housing Needs Determination (RHND) for Livermore for its current Housing Element planning cycle from 1999 to 2006. The RHND goals for Livermore are 5,107 units during the 1999 to 2006 period, including 917 units in the City's sphere of influence. The RHND distributed by income category allocates 875 units to very low income households (those earning up to 50 percent of the Area Median Income), 482 units to low income households (those earning up to 80 percent of the Area Median Income), 1,403 units to moderate income households (those earning up to 120 percent of the Area Median Income), and 2,347 units to above moderate income households (those earning above 120 percent of the Area Median Income).

Although the methodology for calculating RHND in the Bay Area may change in the future, and Livermore's future RHND beyond 2006 is unknown at this time, if the current allocation is simply extrapolated forward, 20,428 units would be allocated from 1999 to 2025. Excluding estimates of housing constructed between 1999 and 2002 (according to the California State Department of Finance), 19,060 units would hypothetically be required to be built by 2025. It should be noted that Housing Element law only requires that a jurisdiction identify the *potential* to build units; there is no way of ensuring that units will be built. If a portion of the RHND is not built in the current Housing Element cycle through 2006, then these same potential units may be identified again as a production goal for the next Housing Element cycle.

Since the 1970s, Livermore has implemented a growth management policy through the competitive Housing Implementation Program (HIP), which establishes guidelines for the allocation of residential units to be developed over a three-year period. The HIP program uses an annual growth rate in the range of 1.5 percent to 3.5 percent for the three-year period, depending on the current period's growth rate. Though the HIP regulates annual housing growth, the program need not limit the projections of the General Plan Update. The HIP will allow estimated residential growth ranging from 11,172 to 32,996 units between 2002 and 2025, and would therefore not constrain the City's ability to meet Regional Housing Needs Determination goals if these were set at levels similar to the current Housing Element planning cycle.

Jobs/Housing Balance and Match

This paper analyzes the jobs/housing balance in Livermore in 1990 (the ratio of quantity of local employment to the quantity of employed residents). In 1990, there were a total of 37,366 jobs located in Livermore (and nearby national laboratories), and a total of 31,491 employed residents living in Livermore. Thus, even if every employed resident of Livermore held a job located in Livermore, the economic base needed to "import" 5,875 workers in 1990.

Despite this ratio of more jobs than employed residents in 1990, few local jobs were held by local residents. Of the 37,366 jobs, just over 22 percent were held by Livermore residents in 1990.

This paper also assessed the "match" of jobs to local housing based on wages earned in local jobs, resulting household incomes, and the cost of Livermore's rental and for-sale housing under current market conditions. The analysis estimates that there are 3,000 very low income households and 1,200 moderate income households with a member working in Livermore that cannot find housing affordable at their income level in Livermore. Additionally, there are almost 4,000 more housing units affordable only to above moderate income households than there are Livermore jobs in this income category

The jobs/housing match analysis considers only people working in Livermore jobs, and does not account for needed affordable housing for the non-working residents of Livermore. According to the 2000 Census, Livermore was home to approximately 1,350 unemployed persons, 2,300 nonworking disabled persons and 4,000 households with residents over 65. These populations represent non-working Livermore residents, many of whom can not likely afford current housing costs in the City.

To improve this type of mismatch between jobs and housing and reduce in- and out-commuting, many communities are pursuing policy options such as increased initiatives to provide workforce housing related to local jobs, and/or economic development strategies to locally attract higher wage jobs that are typically held by Livermore residents working elsewhere.

Demand for Housing, Office, and Industrial Land

This paper analyzes the likely demand for residential acreage based on a range of household growth estimates and capture of this growth in Livermore, as well as analysis of the likely mix of single- and multifamily units demanded to 2025. The resulting demand is then converted to acres of land needed to support it, and this acreage demand is compared to currently designated residential acreage that could be developed. The "bottom line" finding of this analysis is that 782 to 1,330 acres of residentially developable land will be demanded from 2002 to 2025. However, as of May 2002, City staff has identified approximately 230 acres of vacant residentially designated land and approximately 70 acres of underutilized land with residential use designations, meaning that future housing demand exceeds currently designated land in this use category.

In contrast, the analysis for future office and industrial land demand indicates that Livermore has a potential surplus of vacant land designated for these uses. Based on City land use data, BAE understands that, currently, approximately 345 acres of industrial-designated land is vacant. Both office and industrial uses are allowed on industrial-designated lands. Approximately 148 acres of Business Commercial land (BCP General Plan designation land allows some industrial and most office uses) is vacant. Additionally, some of the office development could occur downtown on vacant or redeveloped land. With 133 acres currently approved for pipeline office and industrial development and office and industrial demand ranging from 21 to 225 acres, there appears to be a surplus of currently designated office and industrial land. Thus, land designated for job generating purposes will not be fully demand by the market by 2025, and could be re-designated for residential uses as part of the General Plan Update Land Use Element.

Introduction

Purpose of Issues Paper

This Issues Paper is intended to provide background information to assist the General Plan Steering Committee in making informed policy decisions regarding land use, employment uses and housing issues. The Existing Economic Conditions Working Paper outlined demographic trends and real estate market conditions. This paper provides additional background information regarding housing policy, analysis of the current jobs/housing match in Livermore, and projections of future demand and needed supply of land for residential, office and industrial land uses in Livermore.

Projections of future demand are an important factor in determining the potential future jobs/housing match and formulating long-term General Plan land use policies. BAE has developed estimates projecting citywide demand for residential, office, and industrial/R&D land uses from 2002 to 2025. BAE's demand estimates are based on published projections, as well as BAE's research regarding existing conditions and expected market demand as presented in the Phase I Working Paper.

Definition of Study Area

The Study Area for this paper is the City of Livermore. This analysis compares Livermore to the Tri-Valley subregion as a whole, comprised of the surrounding communities of Alamo, Blackhawk, Danville, Dublin, Pleasanton, and San Ramon. The Tri-Valley area is subject to similar market forces as Livermore, and has been developed with similar characteristics over time.

In order to place Livermore's trends into perspective, this paper also analyzes a Commute Region, comprised of the counties of Alameda, Contra Costa, and Santa Clara. Together, these counties represent a large geographic area to which most of Livermore's residents commute for employment. The Commute Region is used as area of analysis in this document because it represents a relatively self-contained regional economy which impacts future market conditions in Livermore.

Housing and Growth Management Background

The following section provides background information regarding California Housing Element law and Livermore's growth management programs. This section provides context for other policies that affect housing policy in Livermore. Some of the information presented here has been excerpted from Livermore's June 2002 Draft Housing Element.

Role of Housing Element and Regional Housing Needs Determination

The Housing Element is Livermore's primary policy document regarding the development, rehabilitation, and preservation of housing for all economic segments of the population within the City's boundaries. Accordingly, the Housing Element identifies and analyzes the existing and projected housing needs of the City and states goals, policies, quantified objectives and implementation programs for the preservation, improvement, and development of housing. The Housing Element also identifies sites for housing development that are adequate to accommodate the City's allocation of the regional housing need.

Along with seven other mandated elements, the State requires that a Housing Element be a part of the General Plan of each municipality pursuant to Section 65580(c) of the Government Code. The purpose of the Housing Element is to adopt a comprehensive, long-term plan to address the housing needs of the City of Livermore.

In 1980, the State Legislature passed AB2853, which put into statute much of the former advisory guidelines regarding housing element content, including needs assessment; goals, objectives and policies; and implementation program. Since that time, the Legislature has made a number of modifications to the law. SB910, a bill that would have implemented major changes to the allocation and enforcement of housing needs, recently died in the Assembly. That bill would have increased the legal consequences of noncompliance with State housing element laws and creates automatic enforcement mechanisms tied to State Housing and Community Development's review of housing elements. It is likely that these provisions will resurface in new legislation in the next legislative session.

Housing Element Relationship to General Plan

State Law requires that a General Plan and its constituent elements "comprise an integrated, internally consistent and compatible statement of policies." This implies that all elements have an equal legal status and no one element is subordinate to any other element. The Housing Element must be consistent with land use goals and policies set forth in the Land Use Element, and must be closely coordinated with the Circulation Element. The Housing Element must also be consistent with area Specific Plans such as the South Livermore Specific Plan.

Regional Housing Needs Determination (RHND)

Pursuant to California Government Code Section 65584, the State, regional councils of government (in this case, ABAG) and local governments must collectively determine each locality's share of regional housing need. In anticipation of the State-mandated Housing Element

update cycle that requires Bay Area jurisdictions to update their Housing Elements by December 31, 2001, ABAG allocated housing unit production needs for each jurisdiction within the Bay Area. These allocations set housing production goals for the planning period that runs from January 1, 1999 through June 30, 2006. The allocations include total production goals for all housing types, as well as breakdowns allocated by household income level to identify affordable housing production goals.

In allocating the region's future housing needs to jurisdictions, ABAG is required to take into account planning considerations pursuant to Section 65584 of the Government Code. These planning considerations are: (1) market demand for housing; (2) type and tenure of housing; (3) employment opportunities; (4) commuting patterns; (5) suitable sites and public facilities; (6) loss of assisted multi-family units; (7) special housing needs; and (8) reduction of impact to lower income households.

According to ABAG's Regional Housing Needs Determination (RHND) for the current Housing Element planning cycle, the total housing need for Livermore is projected to be 5,107 units during the 1999 to 2006 period, including 917 units in the City's sphere of influence. The RHND distributed by income category allocates 875 units to very low income households, 482 units to low income households, 1,403 units to moderate income households, and 2,347 units to above moderate income households.

The methodology for calculating RHND in the Bay Area has changed over time and may change in the future. Livermore's future RHND beyond 2006 is unknown at this time, but if the current allocation is simply extrapolated forward, 20,428 units would be allocated from 1999 to 2025. Excluding estimates of housing constructed between 1999 and 2002 (according to the California State Department of Finance), 19,060 units would hypothetically be required by 2025.

On the other hand, future housing allocations to Livermore could vary substantially from this simple forward projection of the current planning cycle's goals. For example, the availability of residential land and projected job growth are both variables which ABAG has considered in past assignments of housing allocations. If Livermore lowers its supply of available residential land and/or reduces its expected job growth, ABAG could allocate significantly fewer residential units to Livermore in future years. Livermore's total need for identified housing potential over the next 20 years may be less than the sum of the four 5-year housing allocations in this period.

Moreover, Housing Element law only requires that a jurisdiction identify the *potential* to build units; there is no way of ensuring that units will be built. If a portion of the RHND is not built in the current Housing Element cycle through 2006, then these same potential units may be identified again as a production goal for the next Housing Element cycle.

Livermore Growth Management and Housing Implementation Program

The purpose of growth management in Livermore is to ensure that public services and infrastructure are able to keep pace with residential development, while reducing the impacts of traffic congestion, air pollution, and urban sprawl. In the 1970s, the City adopted a target

residential unit growth rate of two percent per year to manage the level of residential development. This rate was later amended to allow annual residential unit growth of between 1.5 percent and 3.5 percent, depending on a number of factors such as regional population growth, housing demand, and employment growth, among others.

The primary tool used to implement the City's growth management policies is the competitive Housing Implementation Program (HIP). The HIP establishes guidelines for the allocation of residential units to be developed over a three-year period. As defined in the General Plan, the program uses an annual growth rate in the range of 1.5 percent to 3.5 percent for the three-year period. The number of units to be allocated is determined by the current period's growth rate. The allocation of units is a competitive process and all proposed residential developments are subject to the HIP, with the exception of housing projects that include between 35 percent and 50 percent of units for very-low income residents, and developments of four units or less.

In any given year, the HIP can target geographic areas and specific types of units that will be given preference for permit allocation. The program uses two mechanisms to target types of housing and location of desired housing. The first is the "reserved category." Under this category, only projects that meet a specific category criterion (such as within a specific plan area) will be considered. The second mechanism is the "emphasized category" that identifies select housing types and/or locations. In an emphasized system, all types of projects will compete together for permit allocations, but those projects that emphasize certain housing types or locations will be given preference in ranking. Emphasized categories may include infill housing, very low-income housing, low and moderate-income housing with density bonuses, or projects with smaller unit sizes. Projects that address these categories have an advantage in competing for annual housing allocations. In addition to the City's inclusionary requirements, categories that target the production of below market rental or ownership housing are typically included in each HIP cycle to address local affordable housing needs and the City's share of the regional housing need.

The HIP affords the City a great deal of flexibility with regard to residential growth. Within a three year cycle, the program permits units to be borrowed from or transferred to future years, depending on the opportunities or constraints in the three-year program. In fact, all units for the three-year program may be allocated in just one year of the cycle. Alternately, fewer units may be allocated in one year and more in another to allow time for the City to address infrastructure and environmental constraints.

Table 1: HIP Housing Unit Growth Rate Calculations

Target Growth Rate	2002 Units (a)	2025 Units	Increase 2002-2025
1.5%	27,357	39,694	11,172
3.5%	27,357	64,651	32,996

Notes:
(a) Total Housing Units January 2002, State of CA Dept. of Finance.
Source: BAE, 2002. California Department of Finance, Table E-5, 2002. City of Livermore, 2002.

Though the HIP regulates annual housing growth, the program need not limit the projections of the General Plan Update. As shown on Table 1, the HIP will allow residential unit growth ranging from 11,172 to 32,996 units between 2002 and 2025.

Jobs/Housing Match Analysis

What is Job/Housing Match?

The relationship between jobs and housing is a key driver of existing development patterns in the Bay Area. Workers are often forced to commute long distances from areas with ample supplies of inexpensive housing to areas that offer large numbers of jobs. Or conversely, workers with higher earnings must commute to the location of high wage jobs that are not available in their local economy. These patterns can have negative consequences for both the environmental and economic sustainability of the community and the region.

Jobs/housing balance is a measure of the number of jobs available in a specific area compared to the number of housing units in the same area (or more precisely, the number of employed residents living in these housing units). However, just analyzing the quantity of jobs and housing and in area does not address the relationships between wages earned by people holding the local jobs, resulting household incomes, and the cost of housing in the same area.

The additional analysis to "match" these economic relationships defines the jobs/housing match. For example, in addition to the *number* of jobs available, the *types* of jobs available in an area can be analyzed to determine if the occupations or wages paid "match" the costs of available housing supply, thereby reducing potential long commutes by workers or residents of an area. Alternatively, the occupations of employed residents can be compared to the available jobs base of the area to determine their relationships, providing the basis for economic development strategies that seek to attract higher wage jobs to high housing cost areas. This step of matching jobs, occupations and wages, and housing costs to assess gaps is critical to mitigate potential traffic congestion and other growth impacts.

Jobs/Housing Relationships in 1990

Detailed data from the 2000 Census tracking place of work linked to residences will not be available until 2003. Thus, this paper provides two types of analyses to approximate the jobs/housing match in Livermore today. First, the more detailed data available from 1990 Census is examined. Second, a more current estimate of local Livermore jobs and current housing prices is presented.

Table 2 explores the underlying relationships between Livermore residents' employment at all locations and the local jobs present in the City of Livermore and the immediate vicinity during 1990[1]. This figure includes employment at Lawrence Livermore National Labs (LLNL) and Sandia National Labs, which are located outside of Livermore's city boundaries and have often been excluded from City of Livermore jobs data. Overall, Table 2 indicates that in 1990, there were a total of 37,366 jobs located in Livermore, and a total of 31,491 employed residents living

[1] Data from the 1990 Census is the most recent data available to conduct this detailed analysis until the Census releases additional data for 2000.

in Livermore. These findings indicate that even if every employed resident of Livermore held a job located in Livermore, the economic base needed to "import" 5,875 workers in 1990, especially workers concentrated in the "other professionals," education, and transportation sectors.

On a sectoral basis, Livermore's residents worked in jobs within the region concentrated in "other" professional and related services, retail sales, durable manufacturing, and construction. Jobs located in Livermore were also concentrated in "other" professional services, but to a higher degree and with many more actual jobs than residents held in this sector. This was also found for the retail sales and durable manufacturing sectors. Jobs deficits are concentrated in "other" professional services (with over 4,600 fewer jobs than employed residents), public administration (682 fewer jobs than employed residents), and educational services (547 fewer jobs than employed residents). Finance, insurance and real estate and retail and wholesale trades showed surpluses of 398 to 468 jobs.

Table 2: Employed Residents versus Local Employment by Sector, 1990

	Employed Residents		Local Employment			
Industry	Number	Percent	Number	Percent	# Difference	% Difference
Agriculture, forestry, and fisheries	389	1.2%	808	2.2%	(419)	-0.9%
Mining	114	0.4%	95	0.3%	19	0.1%
Construction	2,689	8.5%	3,119	8.3%	(430)	0.2%
Manufacturing, nondurable goods	1,327	4.2%	1,188	3.2%	139	1.0%
Manufacturing, durable goods	3,377	10.7%	3,370	9.0%	7	1.7%
Transportation	797	2.5%	1,299	3.5%	(502)	-0.9%
Communications and other public utilities	1,217	3.9%	955	2.6%	262	1.3%
Wholesale trade	1,537	4.9%	1,139	3.0%	398	1.8%
Retail trade	4,863	15.4%	4,393	11.8%	470	3.7%
Finance, insurance, and real estate	2,028	6.4%	1,560	4.2%	468	2.3%
Business and repair services	2,015	6.4%	2,015	5.4%	-	1.0%
Personal services	645	2.0%	639	1.7%	6	0.3%
Entertainment and recreation services	313	1.0%	480	1.3%	(167)	-0.3%
Health services	1,618	5.1%	1,758	4.7%	(140)	0.4%
Educational services	2,058	6.5%	2,605	7.0%	(547)	-0.4%
Other professional and related services	5,153	16.4%	9,815	26.3%	(4,662)	-9.9%
Public administration	1,302	4.1%	1,984	5.3%	(682)	-1.2%
Armed Forces	49	0.2%	144	0.4%	(95)	-0.2%
Totals	**31,491**	**100.0%**	**37,366**	**100.0%**	**(5,875)**	

Source: 1990 Census Transportation Planning Package; BAE, 2002.

Note: Data reflects compilation of Traffic Analysis Zones approximating Livermore incorporated area in 2000 plus national laboratories: 5121, 5123, 5126, 5128, 5129, 5132, 5134, 5135, 5141, 5142, 5143, 5151, 5152, 5153, 5161, 5162, 5163, 5170, 5181, 5183,

Beyond this basic examination of the number of jobs and the sectors in which the jobs were categorized in 1990, the Census from 1990 also indicated the actual breakdowns of jobs held by local residents vs. commuters into Livermore, as well as where Livermore residents worked. As shown on Table 3 below, many of the jobs in Livermore were not held by Livermore residents; other workers commuted into Livermore to work, while many Livermore residents commuted elsewhere to their jobs. Only 22.2 percent of the jobs located in Livermore in 1990 were held by Livermore residents, and only 15.7 percent of working Livermore residents worked in their hometown.

Table 3: Livermore Place of Residence and Place of Work- 1990

Livermore Jobs by Place of Residence - 1990	Percent
Livermore Jobs Held by Livermore Residents	22.2%
Livermore Jobs Held by Other Tri-Valley Residents	28.2%
Livermore Jobs Held by Other Commute Region Residents	40.5%
Livermore Jobs Held by Others Living Outside Commute Region	9.2%
Total Jobs in Livermore	**100.0%**

Livermore Employed Residents by Place of Work - 1990	Percent
Employed Livermore Residents Working in Livermore	15.7%
Employed Livermore Residents Working Elsewhere in Tri-Valley	27.7%
Employed Livermore Residents Working Elsewhere in Commute Region	53.4%
Employed Livermore Residents Working Outside Commute Region	3.3%
Total Employed Livermore Residents	**100.0%**

Source: 1990 U.S. Census, CTTP: BAE 2002.

Given recent trends in residential and commercial real estate development, it is possible that proportion of jobs located in Livermore held by local residents may be increasing due to increasing local professional and research and development (R&D) employment. However, these trends cannot be directly analyzed until detailed 2000 Census data becomes available in year 2003.

One indicator is available with respect to Livermore in-commuting from the Central Valley. Since 1990, San Joaquin County has increasingly provided housing for Livermore workers. Highway I-580 as well as SMART buses and the ACE commuter railway provide access to Livermore for San Joaquin residents. In October 2000, the San Joaquin Partnership and the San Joaquin Council of Governments released the *Altamont Pass Commuter Survey* that quantified the origin and destination of auto, bus and rail commuters from San Joaquin County to the Bay Area. The various surveys conducted in 2000 received a 19.2 percent response rate for auto commuters and a 68.9 percent response rate for transit commuters. The survey identified 709 Altamont Pass commuters with destinations in Livermore. Extrapolating from the response rates of the surveys, approximately 8 to 10 percent of 2000 Livermore jobs are held by residents of San Joaquin and Stanislaus Counties.

Estimate of Current Match: Livermore Jobs and Existing Housing Supply

To further explore today's match of Livermore jobs to existing housing supply, 1990 Census data was used to estimate distribution of Livermore's jobs, wages, and household incomes by industrial sector as compared to current housing prices. This analysis is intended to determine the affordability of Livermore housing for individuals or households that currently work in Livermore. Housing affordability is generally defined as the amount a household can afford to spend based on 30 percent of their gross income for rental housing if the household rents its unit, and 35 percent of gross household income for mortgage payments if the household owns its unit.

Methodology

As a first step, BAE developed a distribution of household incomes of employees within each major industrial sector, based on data from the 1990 Public Use Microdata Samples (PUMS). To accomplish the analysis, BAE first inflated all the PUMS income figures from 1989 to 2001 dollars using the San Francisco-San Jose-Oakland CMSA Consumer Price Index (CPI).[2] Next, BAE analyzed the PUMS data to develop a household income distribution for every industry, using intervals that matched the 2001 HUD income limits[3]. Finally, as shown on Table 4, BAE aggregated the data into major industry sectors in Alameda and Contra Costa County. Income by industry of employed residents in these counties was assumed to correspond to income levels of Livermore employees.

Table 4: Income Distribution by Industry

Income Distribution by Industry	Very Low ≤ $35,800	Low $35,801 to $53,850	Moderate $53,851 to $85,900	Moderate > $85,900	Total
Mining and Agriculture	21.1%	14.4%	23.8%	40.7%	100%
Construction	15.8%	12.6%	27.0%	44.6%	100%
Manufacturing	14.3%	12.9%	28.0%	44.8%	100%
gh Technology	6.3%	9.5%	23.4%	60.7%	100%
Transportation and Public Utilities	10.5%	10.7%	27.4%	51.4%	100%
Wholesale Trade	12.7%	11.5%	27.2%	48.6%	100%
Retail Trade	20.6%	14.0%	25.2%	40.1%	100%
Finance, Insurance, and Real Estate	11.2%	11.6%	23.6%	53.5%	100%
Services	17.7%	12.4%	23.6%	46.3%	100%
siness Services	19.6%	14.0%	23.0%	43.4%	100%
Government	25.2%	11.9%	21.6%	41.2%	100%

Source: Census 1990 Public Use Microdata Samples. HUD income limits, 2001. BAE, 2002.

[2] The San Francisco-San Jose-Oakland CMSA encompasses the nine-county Bay Area, plus Santa Cruz County.

[3] The 2001 HUD income limits categorizes households income levels based primarily on the percentage of area median income (AMI) a household earns. Very low income households earn less than 50 percent of AMI, low income households less than 80 percent of AMI, moderate income households less than 120 percent of AMI, and above moderate income households earn above 120 percent AMI.

The second part of the analysis focuses on current Livermore housing costs, as summarized on Tables 5 and 6. For for-sale units, Table 5 presents all full and verified sales of single family, multifamily, and single family attached homes in Livermore recorded during a roughly eight month period ending in May 2002. This data was obtained from First American Real Estate Solutions (FARES), a subscription service reporting County Assessor's data for recorded real estate sales. This data is more comprehensive than typical Multiple Listing Service (MLS) sales data, since FARES includes all sales, not just those involving a Realtor. This data was assumed to represent the current sale price distribution of all Livermore for-sale housing.

Table 5: Residential Sales in Livermore, 2001-2002 (a)

	ALL UNITS	ALL UNITS	ONE BEDROOM	TWO BEDROOM	THREE BEDROOM	FOUR+ BEDROOM
	Number of Units	% o Total	Number of Units	Number of Units	Number of Units	Number of Units
Less Than $100,000	2	0.3%	0	0	2	0
$100,000 to $199,999	18	2.4%	8	4	5	0
$200,000 to $299,999	79	10.6%	0	36	38	2
$300,000 to $399,999	413	55.3%	1	27	289	88
$400,000 to $499,999	149	19.9%	0	2	65	82
$500,000 to $599,999	51	6.8%	0	0	10	41
$600,000 and above	35	4.7%	0	1	4	30
Total (a)	**747**	**100.0%**	**9**	**70**	**413**	**243**

Source: First American Real Estate Solutions; BAE, 2002.

Notes: (a) Represents full and verified single-family residence sales in Livermore from August 2001 to May 2002. Total unit count include sales for which bedroom data is not available.

Table 6 shows the distribution of gross rental costs in Livermore based on 2000 Census data collected based on 1999 rents. When used in the match analysis, 1999 rental costs were inflated to reflect increases in Livermore rents seen between the Census 1999 data and the 2002 RealFacts data (a data source which surveys approximately 30 percent of the Livermore rental housing supply on a quarterly basis to track occupancy and rent increase trends).

Table 6: Livermore Gross Rent Distribution

	Number of Units	Percentage Of Units
Less than $200	195	2.7%
$200 to $299	191	2.6%
$300 to $499	375	5.2%
$500 to $749	690	9.5%
$750 to $999	1,865	25.7%
$1,000 to $1,499	3,072	42.4%
$1,500 or more	775	10.7%
No cash rent	90	1.2%
Median (dollars)	$1,035	

Source: U.S. Bureau of the Census, Census 2000

The final step in the "match" analysis is described in detail in the next section. The analysis combines the distribution of Livermore employment by industry, the resulting household incomes of these workers, and the number of for-sale and rental housing affordable to each income category.

Jobs/Housing Match Findings

As shown in Table 7, many employees currently working in Livermore cannot afford to live in the City. This analysis shows major housing affordability gaps at the very low and moderate levels, a match of jobs to housing affordability at the low income level and a surplus of housing affordable only to above moderate households. Specifically, Table 7 estimates that there are 3,000 very low income households and 1,200 moderate income households with a member working in Livermore that cannot find housing affordable at their income level. Additionally, there are almost 4,000 housing units affordable only to above moderate income households than there are Livermore jobs in this income category

Table 7: Livermore Existing Jobs/Housing Match Estimate

Jobs by Household Income (a)	Very Low ≤ $35,800	Low $35,801 to $53,850	Moderate $53,851 to $85,900	Above Moderate > $85,900	Total
Mining and Agriculture	10	7	11	19	**46**
Construction	964	769	1,653	2,728	**6,114**
Manufacturing	452	409	885	1,420	**3,166**
Technology	23	35	86	222	**366**
Transportation and Public Utilities	74	76	193	362	**704**
Wholesale Trade	290	264	623	1,112	**2,288**
Retail Trade	596	403	729	1,159	**2,886**
Finance, Insurance, and Real Estate	126	130	264	598	**1,117**
Services	2,191	1,539	2,930	5,741	**12,402**
siness Services	90	64	105	199	**457**
Government	2,722	1,281	2,331	4,445	**10,780**
Total 2000 Jobs By Income Level	**7,536**	**4,977**	**9,810**	**18,004**	**40,328**
% Jobs	18.7%	12.3%	24.3%	44.6%	**100.0%**
Households By Income Category (a)					
2000 Households of Local Employees by Income	4,949	3,269	6,442	11,824	**26,484**
% Households	18.7%	12.3%	24.3%	44.6%	**100.0%**
Rental Affordable Housing Inventory	312	434	0	N/A	746
For-Sale Affordable Housing Inventory	16	34	8	N/A	58
Rental Market Rate Supply by Affordability	1,457	2,298	2,313	361	6,429
For-Sale Market Rate Supply by Affordability	113	406	2,895	15,389	18,803
Total Supply	**1,898**	**3,171**	**5,216**	**15,750**	**26,036**
	7.3%	12.2%	20.0%	60.5%	**98.3%**
Housing (Gap)/Surplus	**(3,051)**	**(97)**	**(1,226)**	**3,926**	

Notes:

(a) Assumes ABAG *Projections 2002* 2000 Employed Residents per Households in Tri-Valley = 1.523

It should be further noted that the above analysis considers only workers in Livermore and does not account for needed affordable housing for the non-working residents of Livermore. According to the 2000 Census, Livermore was home to approximately 1,350 unemployed persons, 2,300 nonworking disabled persons and 4,000 households with residents over 65. These populations represent non-working Livermore residents that likely could not afford current housing costs in the City.

Residential Demand Estimates

This section estimates the future demand for residential uses and land in Livermore through 2025, based on regional growth projections and on existing conditions in the single family and multi-family markets in Livermore and the region.

Livermore has experienced very rapid residential growth since 1950, and its urban fabric reflects to a large extent typical postwar patterns of suburban development. In 2000, Livermore's housing stock consisted of 72.7 percent single family detached homes, 9.5 percent single family attached homes, and 17.8 percent multifamily units. The Tri-Valley area had a lower proportion of single family homes, at 68.7 percent, and the Commute Region had an even lower proportion of single family homes, at 57.8 percent.

Recent construction of housing in Livermore have been concentrated at even higher levels of single family than the overall existing stock. Over 90 percent of building permits issued in Livermore from 1990 to the present have been for single family homes.

Demand for New Housing in Livermore

Future housing demand in Livermore will be based on household growth, which in turn is affected by demographic characteristics such as birth and mortality rates, as well as in-migration trends driven by employment opportunities and growth. Growth in the number of households is also a function of changes in household formation rates and average household size, and are influenced by household income, wealth, and home equity appreciation.

The Association of Bay Area Governments (ABAG) and the California Department of Finance (DOF) are the two agencies primarily responsible for forecasting future growth in the Bay Area. A range of citywide demand estimates have been developed based on data from these agencies' projections and on existing market condition data presented in the Phase I Economic Working Paper. Housing growth projections generally produce results that are more accurate for larger population bases than smaller subregional segments. Because of this, the demand estimates presented in this paper are based on growth projections in the Tri-Valley and Commute Region , with varying methods used to estimate Livermore's share of this growth.

Market Area Housing Demand

ABAG projections are based on demographic, economic, transportation, and land use assumptions. Land available for development, land use policies determining growth and densities are factored into ABAG's projections. According to ABAG, between 2002 and 2025, the Tri-Valley area is expected to add 44,510 new households, and the Commute Region is expected to add 245,290 new households.

The DOF also prepares county-level population projections for the State, based on demographic trends of births, deaths, and net migration that dictate household creation. However, unlike ABAG, DOF forecasts are not constrained by factors such as local planning, land availability, and

development feasibility that limit the construction of housing. The DOF projects population growth of approximately 988,000 people in the Commute Region from 2000 to 2020, an annual compounded growth rate of 1.08 percent. Using ABAG projections of household size in 2020, the Commute Region is expected to add approximately 388,000 households from 2002 to 2025.

Livermore's Share of Market Area Housing Demand

In order to determine residential demand in Livermore, the City's share of future regional growth was estimated based on past trends. From 1990 to 2000, actual household growth in Livermore represented 24.9 percent of the growth in the Tri-Valley and 3.3 percent of the growth in the Commute Region. According to DOF estimates, household growth in Livermore since the 2000 Census represented 23.6 percent of the growth in the Tri-Valley and 2.4 percent of the growth in the Commute Region. According to ABAG projections from 2000 to 2025, household growth in Livermore is expected to represent 24 percent of the growth in the Tri-Valley and 3.6 percent of the growth in the Commute Region.

As shown on Table 8, three scenarios have been created representing a blend of the varying past trends and projections outlined above, and also incorporating currently known "pipeline" units that are already permitted or under construction. The three Livermore demand scenarios are a "low" estimate based on capturing a 24 percent of the ABAG's projected growth for the Tri-Valley, a "medium" estimate based on capturing 3.6 percent of DOF's projected Commute Region growth, and a "high" estimate based on capturing seven percent of ABAG's Commute Region projected growth (almost doubling the expected share of growth according to ABAG). These scenarios indicate that Livermore housing demand from 2002 to 2025 could range from 10,703 to 17,170 units[4]. Table 8 also incorporates the "pipeline" of projects (see Appendix Table A-1 for detailed information). Livermore has 1,247 units in 12 currently selling single family residential developments and BAE research indicated that approximately 640 of these single family units are unsold as of mid-2002. Planned and proposed projects include an additional 197 single family units and 600 multifamily and attached single family units. Thus, "residual" demand over the next twenty years beyond currently selling or planned projects will range from 9,266 to 15,733 units.

Table 8: Range of Potential Livermore Housing Demand 2002 - 2025

	Geographic Basis	Demand Forecast 2002-2025	Livermore Share	Units Demanded	Less Existing Pipeline		Residual Demand
					SF	MF	
Low (a)	Tri Valley Area	44,510	24%	10,703	837	600	9,266
Medium (b)	Commute Region	388,039	4%	14,034	837	600	12,597
High (a)	Commute Region	245,290	7%	17,170	837	600	15,733

Source: BAE, 2002.

(a) Based on ABAG projections.

(b) Based on DOF population projections 2000 to 2020.

[4] Note that ABAG's estimated growth of the Livermore subregion from 2002 to 2025 is 10,718 units, consistent with the low end of this range.

It should be also noted that these projections represent *demand* for housing; they are not the same as a housing requirement. It is up to the City to determine whether and how to meet some or all of this projected housing demand.

Market Segmentation of Livermore Housing Demand

Market forces and Livermore General Plan and zoning designations will determine the mix of housing types to be constructed. Future market preferences for housing product types are very difficult to predict without conducting direct consumer research via focus groups and other primary research, and can also change dramatically over time depending on house prices and other factors. To provide a general estimate of potential market segmentation of Livermore's 2002 to 2025 housing demand, BAE used three techniques: the overall mix of housing types in the Commute Region, comparisons to recent development in relevant cities in the Commute Region, and the mix of housing represented by planned and proposed projects in Livermore.

Mix in the Commute Region

The mix of housing types the market will demand in Livermore can be estimated based on the current housing mix in the Commute Region. It is likely that as Livermore becomes more integrated into the Commute Region, the mix of new housing in the City will reflect the overall mix of housing that currently exists in the region. In 2000, the overall housing stock in the Commute Region was 58 percent single family and 42 percent multifamily (including townhomes and single family attached housing, which for this analysis, are considered as multifamily housing types).

Comparison to Other Cities

As another method to estimate single/multifamily market demand in Livermore in future years, BAE evaluated the mix of housing units recently built in other cities in the region. BAE identified Walnut Creek, Fremont, and Mountain View as cities where recent development patterns may reflect future market demand in Livermore. Each of these cities have amenities that attract all types of housing development and face increasing demand in the face of dwindling land supply. Development patterns from 1996 to the present were examined, as shown in Table 9, and housing mixes were found to range from 56 percent single family and 44 percent multifamily to 46.5 percent single family and 53.5 percent multifamily.

Table 9: Units Permitted 1996-2002

City	Single Family	Pct.	Total Multi Family	Pct.	Tota
Walnut Creek	354	46.5%	407	53.5%	761
Fremont	2,624	56%	2,047	44%	4,671
Mountain View	1,133	60%	759	40%	1,892
Total	4,111	56%	3,213	44%	7,324

Sources: U.S. Census Bureau; BAE, 2002.

(a) 2002 data reported as cumulative to June 2002.

Planned and Proposed Projects

Projects currently awaiting approval in Livermore also demonstrate market demand and development constraints that represent the likely future housing mix in Livermore. Currently, 197 single family units and 600 multifamily units are being processed for approvals in the development "pipeline," a mix of 25 percent single family and 75 percent multifamily units.

Range of Potential Market Demand by Housing Type

These three analyses suggest that future residential demand in Livermore will be composed of 55 percent single-family and 45 percent multifamily units during the 23 year planning period from 2002 to 2025. This means that there will be a demand for 5,096 to 8,653 single-family units and 4,170 to 7,080 multifamily units.

Comparison of Demand and Livermore's Residential Land Supply

Both single family and multifamily housing will contain many different product types with different characteristics and densities. To determine the average future density of single family and multifamily housing, Tables A-1 through A-4 (see Appendix) were analyzed for current development trends in Livermore and the Tri-Valley. As land values rise (due to land scarcity) and housing prices increase, it is likely that Livermore's single family housing will be more heavily weighted towards compact, ten to twelve unit per acre developments, such as Beck's Reserve and Birchwood Park, and fewer developments built at three to five units per acre. Average single family densities of eight units per acre are likely to be achieved.

Multifamily residential densities range from 15 to over 50-plus units per acre. Fifteen units per acre typically results in townhouse-style development, 25 units per acre typifies garden apartments, 40 units per acre are often three- to four-story projects with podium or submerged parking, and 50 to 70 units per acre can be achieved in downtown transit-oriented development. Analysis of the currently selling and planned projects indicates that townhomes and garden apartment products have achieved market and developer acceptance in the Tri-Valley. Dublin has several pending multifamily projects with densities ranging from 35 to 60 units per acre. Additionally, condo resale prices in Livermore have achieved parity with single family homes on a price per square foot basis, indicating strong demand for this product type. These factors suggest that the Livermore market could accommodate a mixture of multifamily product types ranging from townhomes to podium and downtown housing, averaging 28 units per acre.

As indicated on Table 10, the three demand scenarios analyzed showed demand for 782 to 1,330 acres of residentially developed land, based on the average densities described above. As of May 2002, City staff has identified approximately 230 acres of vacant residentially designated land and approximately 70 acres of residentially designated underutilized land. According to the industrial and office demand analysis, available land designated for job generating purposes will not be fully used by 2025 and could be re-designated for residential uses.

Table 10: Estimate of Residential Acreage To Meet Demand

		Share		Future Demand (units)		Average Density Per Acre		Acres		
	Residual Demand	SF	MF	SF	MF	SF	MF	SF	MF	Total Acres
Low Demand Estimate	9,266	55%	45%	5,096	4,170	8	28	631	151	782
Medium Demand Estimate (a)	12,597	55%	45%	6,928	5,669	8	28	860	204	1,064
High Demand Estimate	15,733	55%	45%	8,653	7,080	8	28	1,076	255	1,330

Source: BAE, 2002.

(a) Based on DOF population projections 2000 to 2020. All others based on ABAG projections.

Industrial and Office Demand Estimates

To assess the market demand for office and industrial space in Livermore through 2025, demand was estimated for the Commute Region and then apportioned via a capture rate methodology to Livermore. This approach assumes that future market support in Livermore depends upon the outlook for the Commute Region as a whole and that Livermore space demand will generally mirror trends in the Commute Region.

The demand estimates were prepared with a methodology considering projected employment growth; estimated square-foot-per-employee space requirements; assumed vacancy allowances; projected Livermore capture rates; existing Livermore vacant inventory of the building type; and planned and proposed development of the building type.

Office Demand Estimate

Planned & Proposed Livermore Office Supply

Livermore has a substantial pipeline of planned business parks, as shown on Table B-1 and B-2 (see Appendix). Including pending approvals in existing business parks, developers have obtained or are seeking approval for over 4.6 million square feet of building space in Livermore on 250 acres. Of this total, approximately 30 acres and 546,000 square feet of office uses have been approved. This includes projects that are office or office/flex uses. All other industrial and R&D developments with a minor office component have been considered in the industrial market analysis.

Many of the projects already approved are currently moving forward to building permit and construction phases. However, as in any planned project, it is not clear if these projects will be built as currently approved. Changing market conditions can delay the construction of business park supply and final land use and configuration can be altered to meet changing market conditions.

Future Office Demand in the Commute Region

Future demand for office space in this paper is based on projected employment growth. Table 11 shows ABAG projections for new employment between 2000 and 2025 for the Commute Region. To estimate demand in terms of square feet of new office space, the proportion of each industry sector that will occupy office and office/flex space was estimated and square-foot-per-employee space requirements were applied by industry sector. Square-foot-per-employee space requirements were derived primarily from the Institute of Transportation Engineers (ITE) *Trip Generation*, which is a compilation of traffic studies and surveys that derive trip and employee generation rates for various land uses on a square foot basis.

These calculations derive a demand estimate for office space for the Commute Region from 2000 to 2025, which has been adjusted to reflect only 2002 to 2025 growth (assuming linear growth). An occupancy factor was applied, anticipating a 10 percent stabilized vacancy allowance to

Table 11: Estimate of Office Demand

COMMUTE REGION DEMAND

Industry	2000	2025	# Change 2000-2025	Proportion in Office (a)	Employees in Office (a)	Sq. ft. per Employee (b)	Sq. ft. Demanded (c)
Manufacturing	411,400	527,570	116,170				
High Technology	*244,530*	*316,150*	*71,620*	*45%*	32,229	*405*	*13,053,000*
Other Manufacturing	*166,870*	*211,420*	*44,550*	*15%*	6,683	*279*	*1,864,000*
Transp., Comm., Utilities	103,460	138,320	34,860	15%	5,229	279	1,459,000
Wholesale Trade	129,440	166,840	37,400	15%	5,610	279	1,565,000
F.I.R.E.	114,430	154,870	40,440	50%	20,220	279	5,641,000
Services	830,980	1,120,890	289,910				
Business Services	*292,810*	*399,020*	*106,210*	*95%*	100,900	*279*	*28,151,000*
Other Services	*538,170*	*721,870*	*183,700*	*5%*	9,185	*279*	*2,563,000*
Government	158,060	213,980	55,920	15%	8,388	279	2,340,000
Total 2000 - 2025	**1,747,770**	**2,322,470**	**574,700**		**188,443**		**56,636,000**
Total 2002 - 2025							**52,105,000**
Total With Occupancy Allowance	90%						**57,894,000**

LIVERMORE DEMAND	**Low**	**High**
Estimated Share of Commute Region Job Growth	3.6%	5.4%
Market Area Share of Commute Region Office Demand (sq. ft.) (c) (d)	**2,084,000**	**3,126,000**

RESIDUAL DEMAND ANALYSIS	**Low**	**High**
Vacant Square Feet in Market Area - 2002 Q1	821,000	821,000
Pipeline Square Feet in Market Area (e)	546,400	546,400
Total Vacancies	**1,367,400**	**1,367,400**
Residual Demand for Office Space in Market Area (sq. ft.) (c)	**717,000**	**1,759,000**
FAR	**0.8**	**0.8**
Acreage Demanded for Office Uses	**20.58**	**50.48**

Notes:

(a) Based on the percentage of Commute Region employment within the major industrial sectors that would likely occupy office space.

(b) All employee densities are from Trip Generation, 5th ed., Institute of Transportation Engineers. High Technology Manufacturing sector references Land Use Code 760: R&D Center. All other sectors reference Land Use Code 750: Office Park.

(c) Rounded to the nearest 1,000.

(d) Product of Share of Commute Region Growth and total county office demand.

(e) Includes office projects that are under construction or have received building permits. Excludes R&D space.

facilitate turnover and fluid market conditions. These calculations estimated that demand in the Commute Region will be 57.9 million square feet from the present to 2025, as shown in Table 11.

As presented on Table 12, Livermore captured 1.9 percent of the jobs in the Commute Region from 1990 to 2000. According to ABAG, Livermore will capture approximately 3.6 percent of the jobs in the Commute Region from 2000 to 2025. The demand estimate shown in Table 11 assumes the capture rate may range from 3.6 percent to 5.4 percent in order to accommodate variations in job distribution within the Commute Region. Based on the range of Livermore capture and other factors outlined above, Table 11 shows approximately 2.1 million to 3.1 million square feet of office uses demanded from 2002 to 2025.

Table 12: ABAG Job Projections

	1990	2000	2025	Change 90-00	Change 00-25
Livermore	33,630	40,360	65,800	6,730	25,440
Commute Region	1,849,580	2,205,120	2,905,480	355,540	700,360
Livermore Share of Commute Region				1.9%	3.6%

Source: ABAG *Projections 2002*, 2002.

Note: 1990 and 2000 Jobs represent data from the U.S. Census.

Residual Demand and Future Office Supply

Table 11 indicates that Livermore currently has 820,633 square feet of vacant office and office/flex space available for lease, and 546,405 square feet of office space either approved, seeking building permits or under construction. After considering this available pipeline, between 717,000 and 1,759,000 square feet of residual future demand is unmet. This relatively low amount of additional demanded office space is heavily affected by the amount of existing vacant space along with the amount of approved or pending office space already in the pipeline.

Assuming a mix of future development between one- and two-story office and office/flex, as well as three- to six- story Class A and B office at a 0.8 Floor Area Ratio (FAR), 21 to 50 acres of land dedicated to office uses beyond the amount in the pipeline could be absorbed in Livermore by 2025.

Industrial Market Analysis

Planned & Proposed Livermore Industrial Supply

Livermore has a substantial pipeline of planned business parks, as shown on Table B-1 and B-2. Including pending approvals in existing business parks, developers have obtained or are seeking over 4.6 million square feet of building space in Livermore, on 250 acres. Approximately 103

acres and 1,119,000 square feet of industrial and warehouse uses have been approved. This considers projects that are primarily industrial or R&D development and have only a minor office component.

Many of the projects already approved are currently moving forward to building permit and construction phases. However, as in any planned project, it is not clear if these projects will be built as currently approved. Changing market conditions can delay the construction of business park supply and its final land use and configuration can be altered to meet changing market conditions.

Future Industrial Demand

The estimate of future industrial demand is based on projected employment growth. Table 13 shows ABAG projections for new employment between 2000 and 2025 by industry sector. The proportion of each industry sector that will occupy industrial space was estimated and square-foot-per-employee space requirements were applied by industry sector. Square-foot-per-employee space requirements were derived primarily from the Institute of Transportation Engineers (ITE) *Trip Generation.*

These calculations derive a demand estimate for industrial space for the Commute Region from 2000 to 2025, which has been adjusted to reflect only 2002 to 2025 growth (assuming linear growth). An occupancy factor was applied anticipating a 10 percent stabilized vacancy allowance to facilitate turnover and fluid market conditions. These calculations estimated that demand in the Commute Region will be 82.3 million square feet from the present to 2025, as shown in Table 13.

From 1990 to 2000, Livermore captured 1.9 percent of the jobs in the Commute Region. Livermore will capture approximately 3.6 percent of the jobs in the Commute Region from 2000 to 2025 according to ABAG. The demand estimate assumes the capture rate may range from 3.6 percent to 7.2 percent in order to accommodate variations in job distribution within the Commute Region and Livermore's strength in providing high quality industrial locations. Based on the range of Livermore capture and other factors outlined above, Table 13 shows that approximately 2.96 million to 5.9 million square feet of industrial uses could be demanded from 2002 to 2025.

Residual Demand and Future Industrial Supply

Table 13 and Table B-1 indicates that Livermore currently has 2,128,000 square feet of vacant existing industrial, R&D and warehouse space available for lease, and 1,119,00 square feet of industrial space approved, seeking building permits or under construction. After completion of pending pipeline projects, between zero and 2.7 million square feet of residual future demand is unmet.

The City has reported average lot coverage of 35 percent for light industrial uses and 40 percent for heavy industrial uses. Based on a mix of future development consisting primarily of one-story light and heavy industrial buildings, a FAR of .35 has been assumed. With a FAR of 0.35, up to 175 acres of land dedicated to industrial uses could be occupied in Livermore by 2025.

Surplus Office and Industrial Land

Based on City land use data, BAE understands that, currently, approximately 345 acres of industrial-designated land is vacant. Both office and industrial uses are allowed on industrial-designated lands. Approximately 148 acres of Business Commercial land (BCP General Plan designation land allows some industrial and most office uses) is vacant. Additionally, some of the office development could occur downtown on vacant or redeveloped land. With 133 acres currently approved for pipeline office and industrial development and office and industrial demand ranging from 21 to 225 acres, there appears to be a surplus of currently designated office and industrial land. Thus, land designated for job generating purposes will not be fully demand by the market by 2025, and could be re-designated for residential uses as part of the General Plan Update Land Use Element.

Table 13: Estimate of Industrial Demand

COMMUTE REGION DEMAND

Industry	2000	2025	# Change 2000-2025	Proportion in Industrial/R&D (a)	Employees in Ind/R&D (a)	Sq. ft. per Employee (b)	Sq. ft. Demanded (c)
Manufacturing	411,400	527,570	116,170				
High Technology	244,530	316,150	*71,620*	*55%*	39,391	*405*	*15,953,000*
Other Manufacturing	166,870	211,420	*44,550*	*85%*	37,868	*462*	*17,495,000*
Transp., Comm., Utilities	103,460	138,320	34,860	50%	17,430	781	13,613,000
Wholesale Trade	129,440	166,840	37,400	85%	31,790	781	24,828,000
F.I.R.E.	114,430	154,870	40,440	0%	-	-	0
Services	830,980	1,120,890	289,910				
Business Services	292,810	399,020	*106,210*	*0%*	-	-	*0*
Other Services	538,170	721,870	*183,700*	*5%*	9,185	*462*	*4,243,000*
Government	158,060	213,980	55,920	10%	5,592	781	4,367,000
Total 2000 - 2025	**1,747,770**	**2,322,470**	**574,700**		**141,256**		**80,499,000**
Total 2002 - 2025							**74,059,080**
Total With Occupancy Allowance	90%						**82,287,867**

LIVERMORE DEMAND	**Low**	**High**
Aggressive Estimated Share of Commute Region Job Growth	3.6%	7.2%
Livermore Share of Commute Region Industrial Demand (sq. ft.) (c) (d)	**2,962,000**	**5,925,000**

RESIDUAL DEMAND ANALYSIS

Vacant Square Feet in Market Area - 2002 Q1	2,128,000	2,128,000
Pipeline Square Feet in Market Area (e)	1,119,000	1,119,000
Total Vacancies	**3,247,000**	**3,247,000**
Residual Demand for Ind. Space in Market Area (sq. ft.) (c)	**(285,000)**	**2,678,000**
FAR	**0.35**	**0.35**
Acreage Demanded for Ind. Uses	**(18.69)**	**175.65**

Notes:

(a) Based on the percentage of Commute Region employment within the major industrial sectors that would likely occupy office space.

(b) All employee densities are from Trip Generation, 5th ed., Institute of Transportation Engineers. Land uses referenced are 760: R&D Center, 110: General Light Industrial, and 150: Warehousing.

(c) Rounded to the nearest 1,000.

(d) Product of Share of County Job Growth and total county office demand.

(e) Includes industrial and R&D projects that are under construction or have received building permits.

Appendix A: Updated Existing Conditions Data for Housing

Appendix Table A-1: Livermore and Tri-Valley Single Family Projects Currently on the Market

Project Name Contact Information	Project Status	Sold	Current Available	Absorption	Units	Homes/ Acre	BR / Ba	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
LIVERMORE											
Alden Lane	25 units being built	24	7	5	114	3 to 4				High	
Holmes St. @ Alden Lane											Started construction
The Verbena							4/2.5	2,661	$680,900		January 2002
The Lantana							4/3	3,068	$704,900		
The Mariposa							5/3.5	3,536-4,158	$733,900		
The Hawthorn							5/4.5	3,348	$664,900		
The Acacia							5/4.5	3,672-4,099	$845,900		
Dunsmuir	106 have sold	106	6	2	122	4 to 5				High	Open 2 years
East ave & Vasco Rd											
Gregory							4/2	2,275	$605,900		
Morgan							4/3	2,845	$676,900		
Morris							5/3	3,011	$695,900		
Wright							6/3	3,522	$715,900		
Lindenwood	selling houses	12	109	4	121	N/A					
Charlotte Way									starting from	High	
The Avondale							3+/3	2,781	$679,950		Opened in March 2002;
The Hawthorne							5/4	3,261			2 sold
The Princeville							5+/4	3,544			
The Savoy							5/4	3,548			
Los Olivos	Selling, models	13	7		94	N/A				High	
Wetmore Rd	open about July										
Lucini	10th						3/2.5	3,079	$815,490		
Talinga							4/3.5	3,540	$865,490		
Carapelli							4/3.5	3,750	$911,490		13 sales with models not
Lusitana							4/3.5	4,142	$958,490		even open yet
Verdala							4/2.5	4,365	$991,490		
Ponderosa Legacy	in "Phase 3" 15 of	15	9	1.5	76	N/A					
Saraloga Court	18 available for										Slowed to 3 sales in the
The Bay	sale have sold						4/4	3,436	$1,002,900		last 4 weeks due to lack
The Morgan							4/3.5	3,768	$1,075,900		of model availability
The Palomino							4/4.5	4,451	$1,180,900		during "phase III" - july
											20th they will be releasing
											more units for sale
LIVERMORE (cont.)											
Prima					149	4					
Isabel Ave and Concannon Bvld	143 sold - 3 #6's	143	6								
Residence One	left and 3 models						3/2.5	2,424	$618,000		Slowed down due to few
Residence Two	left						3/2.5	2,834	$667,000		remaining options
Residence Three							4/3	3,017	$719,000		
Residence Four							4/2.5	3,325	$745,000		
Residence Six							5/4	3,837	$820,000		
VinSanto		20	4	4.8	174	4					

Appendix Table A-1: Livermore and Tri-Valley Single Family Projects Currently on the Market

Project Name Contact Information	Project Status	Sold	Current Available	Absorption	Units	Homes/ Acre	BR / Ba	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
Arroyo Rd.											
Model 1							4/3	2,750	$747,000		Opened in March - selling
Model 2							4/3	2,866	$733,000		about 7/month
Model 3							4/3.5	3,318	$794,500		
Model 4							4/3.5	3,125	$781,000		
Model 5							4/3.5	3,619	$845,000		
Model 6							4/4	3,749	$784,000		
Vinters Green		129			156	N/A				Still strong	HOA
Alden Lane											
Napa							3/2.5	2,530	$631,950		
Sonoma							4\3	2,894	$662,950		
Monterey							4\3	2,831	$652,950		
Livermore							4\4.5	3,197	$713,950		
Pulte Homes - Sevillano		9	13	1.8	50	2.9	N/A	N/A	N/A		
2342 Pendolino											
Pulte Homes - Birchwood Park		56	6	7.85	62	13.8	N/A	N/A	N/A		
5881 Hazelwood Common											
Shea Homes - Falbrook		51	18	3.11	79	4.2	N/A	N/A	N/A		
Alden Lane & Hwy 84											
Beck Properties - The Reserve		29	7	10.14	50	12.45	N/A	N/A	N/A		
Livermore Ave & Cromwell Way											
Livermore Totals		**607**	**192**		**1247**						
DUBLIN											
Chantemar at Dublin Ranch	6 units away	85	6	2.5	91	5 to 6				Good	
Tassajara Dr											
Chantemar Plan 1							5+/3	3,546	from 700,000		
Chantemar Plan 2							6/4	3,770			
Chantemar Plan 3							6/4	3,859	to 823,000		
Dublin Ranch Golf Course - Gleneagles		48	4	4	105	10				about 100 call/day	
El Charro Rd	46 sold										Golf, Park, Pool,
Fairfax - Plan One							4+/3	2,830	$692,975	Opened	Recreational Facilities,
Corte Madera - Plan Two							4+/2.5	2,950	$712,975	January	Tennis
Almonte - Plan Three							4/2.5	2,700	$714,975	40% sold	
Mill Valley - Plan Four							4+/2.5	3,030	$741,975		
DUBLIN (cont.)											
Dublin Ranch Golf Course - St. Andrews		64	7	6.5	97	about 4 or 5, maybe a little more				Very Good - Selling quickly	
El Charro Rd	58 of 63 homes										
Dublin	currently under						4+/3.5	3,504	$797,975		
Cupertino	construction have						5/4.5	3,595	$822,975		Golf, Park, Pool, Tennis
Danville	been sold						4/4.5	3,609	$827,975		
Pleasanton							4+/3.5	3,980	$840,975		

Appendix Table A-1: Livermore and Tri-Valley Single Family Projects Currently on the Market

Project Name Contact Information	Project Status	Sold	Current Available	Absorption	Units	Homes/ Acre	BR / Ba	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
Pinnacle at Dublin Ranch Golf Club		17	0	17	110	4					
El Charro Rd	Plan to Build										Gated, Golf
Newcastle							5+/4.5	4,650	$1,159,975		
Santa Barbara							5/5.5	4,921	$1,199,975		
Atherton							5/5.5	5,035	$1,211,975		
Carlsbad							6/6.5	5,532	$1,259,975		
Rainsong		17	6	3.4	73	10				Very good	
Cascade Creek Lane											
The Bach	started						4/2.5	2,395	$669,950		
The Chopin	construction 2						4/2.5	2,527	$649,950		
The Strauss	completed						5/3	3,078	$674,950		
The Vivaldi							5/4	3,122	$699,450		
Riva		33	10	6.6	99	12				Very good	
Cascade Creek Lane	started construction										
The Amalfi							3/2.5	1,884	$545,950		
The Como							4/2.5	1,968	$537,950		
The Napoli							4/3.5	2,179	$563,950		
The Ravello							4/2.5	2,335	$609,950		
Tassajara Meadows	30 homes left	165	5	5	204	about 13				Still pretty good	
Tassajara Circle	to release										
Plan 1							3/2.5	1,658	$514,000		
Plan 2							3/2.5	1,842	$531,000		
Plan 3							4/2.5	2,000	$545,000		
Plan 4							4/3	2,127	$559,995		
Dublin Totals		**429**	**38**		**779**						
PLEASANTON											
Birdle Creek	3 homes left	99	3	3.3	102	3					9 1acre lot home will be ad
Sycamore Creek & Hidden Creek	to sell										
The Primeur							5/3	3,229	$1,189,000	Good	
The Carlton							6/4	3,246	n/a		
The Hillstar							6/5	4,067	n/a		
The Avalon							6/5.5	4,436	$1,349,000		
Nolan Farms	2 model homes	29	2	2	36	2.8				Good	
Fair St At Division St	Sold out of										
Residence 1	Residence 1,2 & 3						3/2.5	2,542	$925,000		
Residence 2							4/3.5	3,248	$800,000		
Residence 3							5/3.5	3,254	$1,410,750		
Residence 4							3+/4.5	3,591	$1,269,500		
Residence 5							5/4.5	4,129	$1,266,579		
Castlewood Heights		16	12	1.68	28	1.6	N/A	N/A	N/A		
Pulte Homes											22 are built or partially built

Appendix Table A-1: Livermore and Tri-Valley Single Family Projects Currently on the Market

Project Name Contact Information	Project Status	Sold	Current Available	Absorption	Units	Homes/ Acre	BR / Ba	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
Walnut Hills SFRs KB Home		4	82	11.5	101	5.5	N/A	N/A	N/A		Oak Knolls will be built acr With released lots they are
Norris Canyon Estates Norris Canyon Rd		56	35	3	289	3	N/A	N/A	N/A	approx. 3 sales/mo.	
Atherton Colonial							5/5.5	5,010	$1,423,975		
Menlo Manor							4+/5.5	5,320	$1,470,975		Amenities: Clubhouse,
New Castle Manor							5+/4.5	4,610	$1,396,975		Common Space, Gated,
Moraga Mediterranean							3+/2.5	3,249	$1,279,975		Jogging/Biking Trails,
Santa Barbara Elite Renaissance							5+/5.5+	6,000	$1,599,975		Tennis, Tot Lot
Orinda Colonial							5+/5.5	6,640	$1,634,975		
Terrazzo Alcosta Rd		38	3	3.2	41	6.2				High	Almost sold out - started
Plan One							3/3	3,001	SOLD OUT		in August
Plan Two							4/3	2,882	$774,900		
Plan Three							5/3	3,274	SOLD OUT		
Plan Four							5/3.5	3,394	SOLD OUT		
Pleasanton Totals		**242**	**137**		**597**						
SAN RAMON											
Windemere: Fiore Albton Rd	Started to Build spring 2002	22	2	15.6	68	6					
Lucca - Plan One							4+/3.5	3,618	$850,000	very good	Central multi-use park, tot
Siena - Plan Two							4+/4.5	3,838	$875,000		lots, ball fields, and trails
Volterra - Plan Three							6+/5	4,192	$900,000		
Windemere: Taramea Bollinger Rd & Albton Rd	Selling	50	30	10	168	13				approx. 10 sales/mo.	
Arvendi - Plan One							4+/2.5	2,651	$646,900		
Fantini - Plan Two							3+/2.5	2,850	$672,400		
Marigola - Plan Three							4+/2.5	3,135	$702,900		Central multi-use park, tot
Filoli - Plan Four							4+/3.5	3,149	$715,900		lots, ball fields, and trails
Windemere: Montage Bollinger Rd & Windemere Pkwy	Selling	27	1	13.7	115	10.37					
Caymus - Plan One							3/2.5	1,938			
Esquire - Plan Two							4/2.5	2,303			
Sterling - Plan Three							4/2.5	2,381			Central multi-use park, tot
Talisman - Plan Four							4+/3	2,383			lots, ball fields, and trails
Windemere: Amberley Bollinger Rd & Windemere Pkwy	Selling	30	4	15	96	10.37					
Colebrook - Plan One							4+/3	2,365			
Roxbury - Plan Two							4+/3	2,538			
Waterford - Plan Three							4+/3.5	2,697			Central multi-use park, tot lots, ball fields, and trails

Appendix Table A-1: Livermore and Tri-Valley Single Family Projects Currently on the Market

Project Name Contact Information	Project Status	Sold	Current Available	Absorption	Units	Homes/ Acre	BR / Ba	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
Windemere: Canadoro		56	0	10.9	101	14				approx.	
Bollinger Rd										16 sales/mo.	
Cortona - Plan One							3+/2-1/2	1,598	$501,990		
Lugano - Plan Two							3+/2-1/2	1,778	$520,900		
Como - Plan Three							4+/2-1/2	2,012	$550,900		Central multi-use park, tot
Verona - Plan Four							4+/2-1/2	1,992	$550,900		lots, ball fields, and trails
San Ramon Totals		**185**	**37**		**548**						

Source: BAE, 2002.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Appendix Table A-2: Planned and Proposed Single Family Residential Projects n Livermore and Tri-Valley

Development Name & Address	Type	Units per Acre	Project Status	Approved Units
Livermore				
WPH - Cornerstone Place	SFR		On sale 1Q03	51
Copper Ridge	SFR		Will be on sale next year as a separate property from adjacent Dunsmuir	61
Warmington Homes	SFR		Approved by City Council, but plans are out for corrections	38
Seven Hills Venture	SFR		Recent Submittal. To be scheduled.	21
Altamont Construction, Inc. for Gabriel Silveria	SFR		Application Incomplete	4
East Bay Habitat for Humanity	SFR		Recent Submittal. To be scheduled.	22
				197
Dublin				
Yarra Yarra Ranch Phase II	SFR	5.75	PD Approved. Selling soon.	50
Yarra Yarra Ranch Phase III	SFR		Sales in 2nd half of 2003	193
Dublin Ranch - Areas B-E	SFR	7.77	PD approval, no subdivision maps filed	1,875
Dublin Ranch Town Center - Areas F & H	SFR	15.27	PD Approval	2,180
Dublin Ranch West Tassajarra Rd	SFR		Processing Underway	
Pinn Bros - Nielsen/Silveria Annex.	SFR		Processing Underway	
Tassajarra Meadows	SFR	8.12	Unknown	95
Schaefer Ranch	SFR		Inactive	466
				4,859
Pleasanton				
Oak Knolls	SFR		Under Construction	102
Moller Ranch/Boulevard Dev.	SFR	0.5	Under Construction	99
Lemoine Property/ 4456 Foothill Rd	SFR	0.3	Growth Management Program Approval	13
Vineyard Hill/s	SFR	1.2	Growth Management Program Approval	27
Costas/ Hahner/ 2287 Vineyard Ave	SFR	1.12	Growth Management Program Approval	38
Apperson Ridge/ 2200 Vineyard Ave	SFR	0.3	Development Plan Approval	21
Avignon/ 1689 Vineyard Ave	SFR	0.74	Development Plan Approval	47
Heinz/ Vineyard Avenue	SFR	1.21	MSF	18
Dublin Canyon Rd.	SFR	0.2	Development Plan Approval	12

Appendix Table A-2: Planned and Proposed Single Family Residential Projects n Livermore and Tri-Valley

Development Name & Address	Type	Units per Acre	Project Status	Approved Units
Carlton Oaks/ Canyon Oaks	SFR	3.6	Under Construction	360
TTK Partnership/ Happy Valley Rd	SFR	1.3	Development Plan Approval	12
Pleasanton Golf Course Lots	SFR	0.1	Development Plan Approval	37
Hatsushi 2798 Vineyard Ave	SFR	1.07		14
Equus Heights/Dong Yu	SFR	0.2	TM approval lapsed for 15 units on remaining Yee property	7
Lauer/ 2221 Martin Dr.	SFR	1.2	Growth Management Program Approval	6
Walsh/ 447 Kottinger Dr.	SFR	1.3	Growth Management Program Approval	2
Moreira/ 558 Sycamore Rd	SFR	2	Future development	4
Thompson/6240 Sunol Blvd	SFR	3.1	Growth Management Program Approval	3
Miller/ Vineyard Ave	SFR	0.95	Development Plan Approval	2
Merritt Property	SFR	1.9	Project Denied by voters	89
Sycamore Heights/ New Cities	SFR	1.4	Project cancelled	49
				962
San Ramon				
Windemere Master Plan:			The main office at Windemere said to project will eventually add up to 930 SFR, 160 THs, 32 condominiums, and 1000 apartments	
Windemere: Belrose	SFR		Will be open in 1Q03 or 2Q03	
				930
TOTALS			**0**	**6,948**

Source: BAE, 2002.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Appendix Table A-3: Tri-Valley Multifamily and Single Family Attached Projects Currently on the Market

Project Name Contact Information	Project Status	Unit Mix	Units/Acre	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
LIVERMORE							
None Currently Selling							
DANVILLE							
None Currently Selling							
DUBLIN							
Dublin Ranch Villages (see below)	4 distinct communities include 1396 condos and townhomes. Courtyards, Cottages, Villages available in June 2002, Terraces will release July 13, 2002.		20-35	1,240 sf-2,250 sf	150 units of the 1,396 units, below market rate		Each of the four communities has a pool, spa, clubhouse, exercise facilities. Two city parks included in the larger site. A downtown, pedestrian-friendly street will go through the middle of the four communities.
The Villas 3501 Dublin Blvd. Dublin		Total 289 units		1 BR,1.5 BA-1,240 sf 1 BR+den,2 BA-1,300 sf 1 BR+den,2.5 BA-1,417 sf 2 BR,2BA-1,420 sf 2 BR,2.5 BA-1,417 sf	$339,975 $375,975 $395,975 $405,975 $415,975		Common space, pool, recreational facilities, private garages, BART access
The Courtyards 3501 Dublin Blvd. Dublin		Total 281 units		2 BR,2 BA-1,290 sf 2 BR,2BA-1,515 sf 2 BR,2BA-1,530 sf 2 BR,2.5 BA-1,565 sf 2 BR,2 BA-1,661 sf 3 BR,2.5 BA-1,780 sf 3 BR,2.5 BA-1,540 sf 3 BR,3BA-1,675 sf 3 BR,3 BA-1,915 sf 3 BR,2.5 BA-2,175 sf	$395,975 $399,975 $409,975 $435,975 $435,975 $449,975 $459,975 $484,975 $499,975 $509,975		Common space, pool, recreational facilities, private garages, BART access
DUBLIN (cont.)							

Appendix Table A-3: Tri-Valley Multifamily and Single Family Attached Projects Currently on the Market

The Cottages 3501 Dublin Blvd. Dublin		Total 200 units		1 BR,2 BA-1,320 sf 2 BR,2 BA-1,634 sf 2 BR+loft,2.5 BA-1,906 sf 2 BR+loft,2.5 BA-1,979 sf 3 BR+loft,2.5 BA-2,112 sf 3 BR,2 BA-2,158 sf 3 BR+loft,2.5 BA-2,112 sf 3 BR+loft,2.5 BA-2,250 sf	$416,975 $444,975 $500,975 $515,975 $539,975 $549,975 $569,975 $579,975	Common space, pool, recreational facilities, private garages, BART access
The Terraces 3501 Dublin Blvd. Dublin		Total 626 units		7 floor plans will be available no specifics available at this time	N/A	Common space, pool, recreational facilities, BART access
Eleven 80 Castle Companies Dougherty Rd. @ Iron Horse Trail Dublin	10 homes currently released	60 attached Single Family homes	25-35	1,396 sf 3BR/2.5 BA 1,792 sf 3BR/2.5 BA w/loft	$395K $440K	Each unit has 2 car garage, home network system, security system, designer kitchens and
PLEASANTON						
None Currently Selling						
Rental						
Ironhorse Trail Archstone Communities 6233 Dougherty Road Dublin	Recently renting	177 Apts.	29	65 - 705 sf 1BR/1BA 17 - 776 sf 1BR/1BA 8 - 830 sf 1BR/1BA 8 - 991 sf 2BR/2BA 2 - 1,077 sf 2BR/2BA 65 - 1,050 sf 2BR/2BA 12 - 1,309 sf 3BR/2BA	$1,575/mo. $1,625/mo. $1,650/mo. $1,825/mo. $1,925/mo. $1,900/mo. $2,400/mo.	Pool, spa, fitness center, clubhouse, in-unit washr/dryer. Rental rates are not fixed. Beginning to rent and rent may move lower in response to market demand.
SAN RAMON						
None Currently Selling						

Source: BAE, 2002.

Note: All information is preliminary. Further data collection will occur in preperation of the General Plan Market Analysis Report.

Appendix Table A-4: Tri-Valley Multifamily and Single Family Attached Planned and Proposed Developments

Project Name Contact Information	Project Status	Unit Mix	Units/Acre	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
LIVERMORE							
Valley Care Phase I	Approved	250 Sr Appts					Senior care facility - 900 E. Stanley Boulevard. Building to begin OCT 2002
Valley Care Phase II	Approved	76 Sr Appts	34.5	76 units on a 2.2 acre lot			Design to begin 4Q 2002
Creekside Villas Western Pacific Housing N. Vasco Rd, 1057 Livermore	Design Review Committee Meeting 6/20/02	116 Condos	16.11	19- 1023 sf-2 BR,2BA 36-1193 sf-2BR,2BA 61-1384-1494 sf- 3 BR,2.5 BA	12 units affordable Market rate rents not available yet		
Vineyard Terrace Western Pacific Housing Collier Canyon, No. of 580 Livermore	Approved Under Construction	96 attached condos	13.5	6-580 sf-1 BR,1BA 50-1053-1310 sf- 2 BR,2BA 40-1621 sf- 3 BR,2.5 BA	10 units-low income, market rate-low $200's-high $300's	112 calls	Near Dublin BART
East Town Village Bancor Properties LLC 2911 First St. Livermore	Application Incomplete-requesting additional units, to be determined	68 Attached 3-story Townhouses	3.78	12-1100sf-2 BR,2.5 BA 28-1421 sf-3 BR,3BA 28-1728 sf-3 BR,3 BA	7 units low income, prices not available		Commercial daycare facility, number of children unknown, won't be determined until site plan approval processed
Carmen Avenue Apartments Anita Gandalfo 2891 Carmen Ave. Livermore	Application incomplete-no entitlements processed/ap-proved,	20 attached apartments	20	All 975 sf-2 BR, 2BA	3 units low income, 1 unit disabled accessible, rental rates not available		None known
DANVILLE							
None planned or proposed							

Appendix Table A-4: Tri-Valley Multifamily and Single Family Attached Planned and Proposed Developments

Project Name Contact Information	Project Status	Unit Mix	Units/Acre	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
DUBLIN							
Dublin Ranch - The Terraces 3501 Dublin Blvd. Dublin	Under construction Release date : July 13 2002	Total 626 units	61	7 floor plans will be available no specifics available at this time	N/A		Common space, pool, recreational facilities, BART access
Waterford Place Shea Properties 4800 Tassajara Road Dublin	Under Construction	390 Apts.	45	599sf-708sf-1 BR,1BA 807sf-922sf-1 BR,1BA+Den 1040sf-1097sf-2BR,2BA 1367sf-2BR,2BA+Den	All market rate	Waiting list 1st bldg release- end of June'02	Courtyards with pool and spa or fountain, gated, rec room, 14 seat theater, business center, fitness center, in-unit w/d, private patio or balcony
Ironhorse Trail Archstone Communities 6233 Dougherty Road Dublin	Under Construction	177 Apts.	29				Pool, spa, fitness center, clubhouse, in-unit w/d
PLEASANTON							
Carlton Oaks/Canyon Oaks Greenbriar Homes Bernal Property Pleasanton	Approved	36 duets	3.6	1400 sf 3 BR,2.5 BA	$199,950	Demand far exceeded supply	Close to Pleasanton downtown, 50 acre sports park being planned within the property
Walnut Hills KB Homes Bernal Property Pleasanton	Approved	20 duets	5.5	1400 sf 3 BR,2.5 BA	$199,950	Demand far exceeded supply	Close to Pleasanton downtown, 50 acre sports park being planned within the property
Valley Avenue Apartments Greenbriar Homes Bernal Property Pleasanton	Approved	100 apts.	20.4	738 sf-1BR,1BA 895 sf-2 BR,1BA 1040 &1100 sf-2BR,2BA 1202-1236 sf-3 BR,2BA	31 low and very low income rentals out of 100 units		Two totlots, community building
SAN RAMON							

Appendix Table A-4: Tri-Valley Multifamily and Single Family Attached Planned and Proposed Developments

Project Name Contact Information	Project Status	Unit Mix	Units/Acre	Sq. Ft.	Sale Price or Rent	Interest	Amenities/Comments
Windemere:	The project will eventually add up to have 160 Townhomes, 32 condominiums, and approximately 1000 apartments						
Delamore	On sale Spring of 2003						
Ambridge	On sale 1Q03 or 2Q03						
Shelbourne	On sale 1Q03	140 luxury condos					
Valley Vista Senior Village 20801 San Ramon Valley Rd. San Ramon Durwin Shepson	EIR completed, plans being reviewed	100 apts.		340-750 sf Studio, 1 BR/1 BA, 2 BR/2BA	N/A		Senior apartment
Merrill Gardens 18888 Bollinger Canyon Rd. San Ramon Bob Price	Under construction. Adding to existing residential care facility	39 apts.		N/A	Market rate Rental apts.		

Source: BAE, 2002.

Note: All information is preliminary. Further data collection will occur in preparation of the General Plan Market Analysis Report.

Appendix B: Updated Existing Conditions Data for Office and Industrial

Appendix Table B-1: Pipeline Summary

	OFFICE SUMMARY		INDUSTRIAL SUMMARY		FLEX/MIXED USE SUMMARY	
	Total Acreage	Total SF Approved	Total Acreage	Total SF Approved	Total Acreage	Total SF Approved
No approvals	0.3	133,350	13.84	159,348	150	2,700,000
Planning Commission Approved	31.59	341,117	43.45	161,604	12.6	153,975
In planning process	5.6	80,000	17.3	309,115	4.2	56,700
Permitted (a)	0	0	15.09	269,037	0	-
Under Construction (a)	8.3	125,288	2.83	46,214	7.5	122,317
TOTAL	45.79	679,755	92.51	945,318	174.3	3,032,992
TOTAL APPROVED	45.49	546,405	78.67	785,970	24.3	332,992
TOTAL CHECK	45.79	679,755 4,658,065	92.51	945,318	174.3	3,032,992

(a) Might change after conversation with Colliers

Appendix Table B-2: Currently Developing, Planned & Proposed Business Parks in Livermore

Project Name, Address & Developer	Total Acreage	Total SF Approved	Land Use	Status	Comments
Greenville Rd. & I-580 The Pinnacle Group	n/a	69,850 not approved	Office & Retail	Application Incomplete	Application Incomplete
1950 Railroad Dillett & Farrell, LLC	0.3	63,500	Office	Design Review Committee Meeting - 7/18/2002	63,000 Office + 10 screen cinema
Tri-Valley Business Campus Constitution & Independence	n/a	26,273	Office	Planning Commission Approved - 6/18/02	Office + 3 building pads
Shea Business Center (a) 2837 Collier Canyon Rd.	18.7	287,844	Office	Planning Commission Approved - 6/5/01	5 concrete tilt-up structures
N. Livermore Ave. & Las Positas Rd. Eighty-Eight & Associates	12.89 est.	27,000	?	City Council Meeting 6/24/02	4 commercial buildings
Tri-Valley Technology Park (a) 3099 Independence Dr.	5.6	80,000	Office	Plan Check Out for Corrections - 6/5/02	Project will not be built this year due to market conditions.
Airport Business Center (a) 50 Wright Brothers Avenue	2.0	27,988	Office & Commercial	Near Completion	3 buildings, 1 office, the rest retail
TKG Business Park (a) Sub-park: Independence Plaza 333 & 365 North Canyon Pkwy	6.3	97,300	Office	Near Completion	Two 2-story office buildings Part of Tri-Valley Technology park
Airport Executive Centre E. Airway Blvd. & Rutan Drive	10.7	146,784	Industrial	Design Review Committee Meeting - 7/18/2002	4 single story buildings with parking. office 50% warehouse 50%
5162 Preston Ave. Avi & Ruth Weizman	3.14	12,564	Industrial	Design Review Committee Meeting - 7/18/2002	warehouse & outdoor storage yard for private irrigation supply business.
Airway Business Park (a) Kittyhawk Rd. & Armstrong St.	4.8	67,190	Industrial	Planning Commission Approved - 8/7/01	Two Industrial Buildings 15-50% Office, 50-85% Warehouse
National Dr. & Exchange Ct. P.E.S Enterprises	4.23	62,914	Industrial	Planning Commission Approved - 9/18/01	Five industrial buildings 15-20% office and 80-85% warehouse.
400 Longfellow Ct. Principal Capital Management	34.42 est.	31,500	Industrial	Planning Commission Approved - 06/18/01	Book storage

Appendix Table B-2: Currently Developing, Planned & Proposed Business Parks in Livermore

Project Name, Address & Developer	Total Acreage	Total SF Approved	Land Use	Status	Comments
National Corporate Center National Drive & Hawthorne Pl.	12.6	186,064	Industrial	City Council Approved - 4/23/01	Fifteen industrial buildings on separate parcels. Office 25%, Warehouse 75%
Yorkshire National Industrial Park 7275 National Drive	3.1	65,796	Industrial	Planning Staff Approved - 3/25/02	Three tilt-up buildings for office, warehouse & heavy industrial use.
Airport Business Center (a) 308 Stealth St.	1.6	57,255	Industrial	Plan Check Out for Corrections - 7/30/01	Industrial shell w/ mezz & spec space 15-20% Office, 80-85% Warehouse
6610-6670 Brisa St. Barry Swenson, Builder	10.02	189,519	Industrial	Permit Ready to Issue 11/2/01	15-20% Office, 80-85% Warehouse
6500 National Dr. (at Exchange) BREMCO Construction	2.63	40,638	Industrial	Permit Issued 4/2/02	Tilt-up for warehouse/distribution, manufacturing & lumbar wholesales
Livermore Gateway West (a) 5900 Las Positas Rd	2.44	38,880	Industrial	Permit Issued 11/7/01	Office 15-20%, Warehouse 80-85%
Pacific Corporate Center 401 Lawrence Dr.	2.83	46,214	Industrial	Near Completion	
The Oaks 625 W. Jack London Blvd.	150	2,700,000	Flex	Planning Commission Meeting - 6/03/02	60% Office, 40% Warehouse
Bennett Dr. & Las Positas Rd. Ware & Malcomb Architects	12.6	153,975	Flex	Planning Commission Approved - 08/21/01	Seven, one-story R&D buildings.
151 Greenville Rd. Panattoni Construction/ Selway Tool	4.2	56,700	Flex	Plan Check Out for Corrections - 1/16/02	42% Office and 58% Warehouse
Greenville Corporate Center 7501 & 7551 Longard Rd.	7.5	122,317	Office Flex	Near Completion	Industrial uses with spec space. 75% office, 25% manufacturing.

Source: City of Livermore, BAE, 2002.

Note: All information is preliminary. Further data collection will occur in preperation of the General Plan Market Analysis Report.
(a) Pending or recent entitlements for existing business parks.

office	warehouse	ind	office	retail	RD
1					
		1			
33%	33%	33%			
25%				75%	
		100%			
1					
50%	50%				
15%	85%				
15%	85%				

	office	warehouse	ind	office	retail	RD
	25%	75%				
	15%	85%				
	15%	85%				
BREMCO - 925-447-2700 private building for Saroyan Lumber -- owner didn't identify as part of any office or industrial park.		1				
	15%	85%				
	60%	40%				
						1
	42%	58%				
	1,930,383	1,719,858	-	-	20,991	153,975
	75%	25%				
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Appendix Table B-3: Current Office Supply

Development Name & Location	Map #	Available Built Space (sq. ft.)	Total Built & Entitled for Development	Vacant & Total Land within Park	Land Use	Comments
Tri-Valley Tech Park (a)	8	365,018	1,000,000	66	Class A & B Office	5,000 to 1 mil sf sites available
Independence Dr.				*306.0*	R&D/Biotech	available space does not include space listed in pipeline table
Shea Center (a)	10	50,000	190,000	170	Office/R&D	300 acres total, 130 entitled (incl. KLA 44 acres).
Collier Canyon Blvd.			1,900,000	*300*		
Greenville Business Center	8	113,000	375,573	0	Distribution &	
Las Positas Rd. & Mountain Vista			375,573	*22.4*	Office Space	
Pacific Corporate Center	8	193,768	401,737		Office/Flex	Includes Greenville Corporate Center
Longard Rd. near			499,405	*24.5*		Industrial uses with spec space. 75% office, 25% manufacturing.
Greenville Rd. & Las Positas Rd.						
Vineyard Office Complex		9061	63,225	N/A	Office	
7401-7445 E. Southfront Rd.						
LIVERMORE TOTAL		**721,786**	**2,030,535**	**236.00**		
			3,774,978	**652.94**		

Sources: BAE 2002

GLOSSARY

Product Classifications:

Class "A" Office: Modern, steel-framed low, mid or high-rise structures used exclusively for office tenants.

Class "B" Office: Wood and steel mix framed low to mid-rise structures and older brick or concrete structures used predominately for office.

Office/Flex or R&D/Flex: One to three story structures with extensive glass, heavy office buildout and 3.0/1,000 parking ratio. Buildings may include high-end production facilities, laboratory space and grade level truck doors.

Warehouse/Distribution: Buildings with a minimum 20-foot clear height, dock-high truck loading and parking ratios of 2.0/1000 or less.

Industrial/Light Industrial: Buildings with drive-in and/or dock-high truck capabilities, clear heights of less than 20 feet and parking ratios of 2.0/1000 or less.

Lease Terms:

Full Service (FS): Rental type generally used in office product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, maintenance, janitorial, and utilities.

Industrial Gross (IG): Rental type generally used in industrial product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, and maintenance.

Triple Net (NNN): Rental type where the tenant pays rent to the landlord and additionally assumes all costs regarding the operation, taxes and maintenance of the premises and building.

CAM: Common area maintenance charge. Generally used in Industrial Gross and NNN leases where the tenant pays a share of the costs associated with the maintenance of the common areas.

TIA: Tenant Improvement Allowance. Negotiable amount given to tenant to move into space, often used as incentives to attract tenants in a competitive market.

Appendix Table B-4: Current Industrial Supply

Development Name & Location	Map #	Available Built Space (sq. ft.)	Total Built & Entitled for Development	Vacant & Total Acres (b) within Park	Land Use	Comments
Lincoln Technical Park		109,800	145,200	0	Industrial &	
477 N. Canyons & Independence			180,000	*16.7*	R&D Flex	
Livermore Valley Bus. Park		54,960	860,854	N/A	R&D-Flex &	
Independence Dr. & Constitution			860,854		Warehouse	
KLA Tencor, Phase II	10	N/A	257,056	*14.0*	Office, Industrial	Completed 1/30/02. 43.7 acres owned by KLA, built on about 1/3
1 & 101 Portola Ave.			497,056		& Warehouse	of it, (included in Shea's 130 entitled acres).
Airway Business Park (a)	6	285,600	394,600	7	Warehouse &	
Kitty Hawk Rd. & Armstrong St.			800,010	*56.0*	Lt. Manufacturing	Total built space does not include project in pipeline.
Airway Business Center	6	6,575	409,088	N/A	Lt. Industrial	
Kitty Hawk Rd. & Airway St.		2400 offi	409,088			
Airport Business Center	6	114,415	420,000	*22.9*	Office, R&D	15 Small Industrial Buildings, ranging in size from 9,400 to 40,755 sf.
Wright Bros. Ave & Stealth St.			500,000		& Industrial	
Greenville Business Center	8	113,000	375,573	0	Distribution &	
Las Positas Rd. & Mountain Vista			375,573	*22.4*	Office Space	
Greenville Business Park		21,200	2,500,000	*200*	Warehouse &	
Las Positas Rd. & Greenville Rd.			2,500,000		Distribution	
Greenville Station	8	12,000	170,000	0	Industrial &	Three single-story tilt-up for light industrial users.
Las Positas Rd. & Mountain Vista		dist	170,000	*10.7*	Manufacturing	
Amador Business Center		66,000	1,167,454	0	Warehouse/Dist.	100% built out - no subparks
7650 Marathon Dr. at Greenville Rd.			1,167,454	*58.8*		
Marathon Business Center	12	154,000	154,000	10	R&D &	Project Completed - 4/19/2002. Six industrial buildings with office
Greenville Rd. & Patterson Pass			316,300	*20.5*	Lt. Industrial	4 completed, permit ready for 2. 15-20% office, 80-85% warehouse.
7900 National Drive	8	62,032	62,032	*4.4*	Office &	Project Completed - 4/1/2002
Jerry Willis/Valmark Industries					Warehouse	38% Office, 67% Warehouse
Livermore National Industrial Park	12	444,215	444,215	*27.6*	Office &	Project Complete - 3/12/2002
Livermore National Business Park					Warehouse	Three industrial buildings, 15-20% Office, 80-85% Warehouse
501 Hawthorne Pl./						
7400-7500 National Dr.						

Appendix Table B-4: Current Industrial Supply

Development Name & Location	Map #	Available Built Space (sq. ft.)	Total Built & Entitled for Development	Vacant & Total Acres (b) within Park	Land Use	Comments
Hawthorne Technology Park National Dr.		108756	108756	N/A	Warehouse	4 buildings
Copper Hill Business Park (a) 2800-2950 Collier Canyon Rd.	5	43,887	78,000 78,000	*6.2*	Office & R&D	2 Buildings sold, 2 remaining built but empty 15-50% Office, Warehouse 50-85%
Livermore Gateway **Ellis Partners**		38,400	425,000	0 *25.2*	Warehouse & Manufacturing	Project completed in 2000.
Livermore Gateway West (a) Las Positas Rd. & Vasco Rd.	8	151,100	433,600 654,534	*29*	Warehouse & Lt. Manufacturing	9 buildings, incl. 2 machine shops & small mfg & small retail pads Avail. & total built space do not include project in pipeline table
Arroyo Business Center Bennett Dr. & Las Positas Rd.	11	83,230	1,200,000	N/A	Distribution & Manufacturing	7 buildings on site, avail. space does not include new construction
Commerce Way Bus. Park		N/A	90,000 90,000	N/A	Lt. Industrial	
Las Positas Bus. Center Las Positas Rd. & Pullman Rd.		20,804	78,379 78,379	N/A	Industrial & Warehouse	
Vasco Industrial Park Industrial Way & Las Positas Rd.		508,474	756,272	N/A	Lt. Industrial, Warehouse/Dist.	15 buildings, ranging from 3,296 sf to 148,394 sf.
Livermore Distribution Center 7337 Las Positas Rd.		198,400	341,450	*13.35*	Industrial	
Livermore Commerce Center 6336 Patterson Pass		N/A	113,311 113,311	N/A	Warehouse/Dist.	
Vasco Commons 6254 Preston Ave.		8,736	28,416	N/A	Incubator	
Altamont Business Centre 6776 Preston Ave.		6,776	151,139	*6.36*	Manufacturing & Distribution	
Livermore Business Park 121 Pullman St.		7,561	47,015	N/A	Manufacturing & Distribution	

Appendix Table B-4: Current Industrial Supply

Development Name & Location	Map #	Available Built Space (sq. ft.)	Total Built & Entitled for Development	Vacant & Total Acres (b) within Park	Land Use	Comments
Livermore Industrial Park				N/A	Warehouse	
290 Rickenbacker Cir		2,250	6,854			
60 Rickenbacker Cir.		2651	5,709	N/A	Warehouse	
Graham Court		7,144	48,360	*2.16*	Incubator	
5937 Graham Court						
Vasco Commerce Center		12,600	12,600	N/A	Incubator	
5666 La Ribera St.						
Kittyhawk Business Park		23,448	23,448	N/A	Flex	
30 Lindbergh Ave.						
Green Valley		189,520	189520	N/A	Distribution	Planned
Brisa St./East Livermore						
Vineyard Office Complex		9,061	63,225	N/A	Office	
7401-7445 E. Southfront Rd.						
6111 Southfront		5,485	26,000	N/A	Incubator	
Adler Creek		4,183	73,314	N/A	Warehouse	
2021 Las Positas Ct.						
LIVERMORE TOTAL		**1,892,374**	**11,660,440** **12,359,669**	**17.0** **536.3**		

Sources: BAE 2002

GLOSSARY

Product Classifications:

Class "A" Office: Modern, steel-framed low, mid or high-rise structures used exclusively for office tenants.

Class "B" Office: Wood and steel mix framed low to mid-rise structures and older brick or concrete structures used predominately for office.

Office/Flex or R&D/Flex: One to three story structures with extensive glass, heavy office buildout and 3.0/1,000 parking ratio. Buildings may include high-end production facilities, laboratory space and grade level truck doors.

Warehouse/Distribution: Buildings with a minimum 20-foot clear height, dock-high truck loading and parking ratios of 2.0/1000 or less.

Industrial/Light Industrial: Buildings with drive-in and/or dock-high truck capabilities, clear heights of less than 20 feet and parking ratios of 2.0/1000 or less.

Lease Terms:

Full Service (FS): Rental type generally used in office product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, maintenance, janitorial, and utilities.

Appendix Table B-4: Current Industrial Supply

Development Name & Location	Map #	Available Built Space (sq. ft.)	Total Built & Entitled for Development	Vacant & Total Acres (b) within Park	Land Use	Comments

maintenance, janitorial, and utilities.

Industrial Gross (IG): Rental type generally used in industrial product where the landlord's rental rate contains all costs associated with occupying the premises inclusive of taxes, insurance, and maintenance.

Triple Net (NNN): Rental type where the tenant pays rent to the landlord and additionally assumes all costs regarding the operation, taxes and maintenance of the premises and building.

CAM: Common area maintenance charge. Generally used in Industrial Gross and NNN leases where the tenant pays a share of the costs associated with the maintenance of the common areas.

TIA: Tenant Improvement Allowance. Negotiable amount given to tenant to move into space, often used as incentives to attract tenants in a competitive market.

APPENDIX B

TRANSPORTATION INFORMATION AND WORKSHEETS

Table B-1: Estimated Existing Intersection Level-of-Service Results

Intersection	Type[a]	AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)[b]	V/C	LOS	Delay (sec)[b]	V/C
Airway Blvd./I-580 EB Ramp	Signalized	E	-	0.97	B	-	0.62
Airway Blvd./I-580 WB Ramp	Signalized	A	-	0.40	A	-	0.31
Airway Blvd./Kitty Hawk Road	Signalized	C	-	0.75	A	-	0.49
Concannon Blvd./Arroyo Road	Signalized	A	-	0.51	B	-	0.68
Bluebell Drive/Springtown Blvd.	Signalized	A	-	0.54	E	-	0.91
College/L Street	Unsignalized	C	13.0	1.22	C	14.4	1.14
Concannon Blvd./S. Livermore	Signalized	B	-	0.60	C	-	0.74
Concannon Blvd./Murdell Lane	Unsignalized	C	19.4	1.39	B	8.9	1.16
East Ave./Charlotte Way	Signalized	A	-	0.40	A	-	0.36
East Ave./Dolores Street	Signalized	A	-	0.48	A	-	0.51
East Ave./Hillcrest Ave.	Signalized	B	-	0.68	A	-	0.51
East Ave./Loyola Way	Signalized	A	-	0.41	A	-	0.41
East Ave./Maple Street	Signalized	A	-	0.46	A	-	0.34
East Ave./Mines Street	Signalized	A	-	0.53	A	-	0.53
Fourth Street/South Livermore To East Ave.	Signalized	C	-	0.73	C	-	0.78
East Stanley Blvd./Fenton Street	Signalized	A	-	0.38	A	-	0.50
East Stanley Blvd./Isabel Connector Ramp	Signalized	A	-	0.58	A	-	0.58
East Stanley Blvd./Murdell Lane	Signalized	A	-	0.59	A	-	0.50
East Stanley Blvd./Murrieta Blvd.	Signalized	C	-	0.77	A	-	0.55
East Stanley Blvd./Wall Street	Signalized	A	-	0.59	C	-	0.78
East Stanley Blvd.-Railroad Ave./South S Street	Signalized	A	-	0.45	A	-	0.59
First Street/I-580 EB Ramps	Signalized	D	-	0.84	B	-	0.65
First Street/I-580 WB Ramps	Signalized	D	-	0.85	A	-	0.40
First Street/Inman Street	Signalized	C	-	0.72	D	-	0.86
First Street/Las Positas Rd.	Signalized	A	-	0.56	C	-	0.73
First Street/North Mines Rd.	Signalized	C	-	0.73	D	-	0.81
First Street/Old First Street	Signalized	A	-	0.59	B	-	0.65
First Street/Portola Ave.	Signalized	C	-	0.77	D	-	0.81
First Street/Railroad Ave.- Maple Street	Signalized	C	-	0.76	E	-	0.92

Intersection	Type[a]	AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)[b]	V/C	LOS	Delay (sec)[b]	V/C
First Street/South L Street	Signalized	A	-	0.42	A	-	0.57
First Street/South Livermore Ave.nue	Signalized	A	-	0.50	A	-	0.47
First Street/South P Street	Signalized	A	-	0.56	A	-	0.55
First Street/Southfront Street	Signalized	F	-	1.84	D	-	0.83
Fourth Street/South P Street	Signalized	A	-	0.25	A	-	0.32
Fourth Street/Inman Street	Unsignalized	D	24.2	0.91	C	10.3	0.73
Fourth Street/Maple Street	Unsignalized	C	14.9	0.84	B	6.9	0.59
Las Positas Rd./Greenville Rd.	Signalized	A	-	0.51	A	-	0.47
National Drive/Greenville Rd.	Signalized	A	-	0.44	A	-	0.44
Northfront Rd./Greenville Rd.	Unsignalized	F	74.6	-	F	OVRFL	-
Patterson Pass Rd./Greenville Rd.	Unsignalized	F	OVRFL	-	F	OVRFL	-
Southfront Road/Greenville Rd.	Signalized	A	-	0.39	A	-	0.42
Alden Lane/Holmes Street	Unsignalized	E	39.8	-	F	5.8	-
Catalina Drive/Holmes Street	Signalized	A	-	0.50	A	-	0.49
Concannon Blvd./Holmes Street	Signalized	B	-	0.66	C	-	0.71
First Street/Holmes Street	Signalized	A	-	0.09	A	-	0.46
Fourth Street/Holmes Street	Signalized	D	-	0.85	C	-	0.79
Mocho Street/Holmes Street	Signalized	A	-	0.59	A	-	0.52
Vancouver Way- El Caminito/Holmes Street	Signalized	A	-	0.56	B	-	0.63
Concannon Blvd./Isabel Ave.	Signalized	B	-	0.70	B	-	0.61
Stanley Connector Ramp/Isabel Ave.	Signalized	A	-	0.40	A	-	0.41
East Vineyard Avenue/Isabel Ave.	Signalized	D	-	0.81	A	-	0.45
East Jack London Blvd./Isabel Ave.	Signalized	B	-	0.63	A	-	0.49
Las Positas Rd./North Mines Rd.	Unsignalized	F	64.0	-	F	OVRFL	-
Audry Street- Charlotte Way/North Mines Rd.	Signalized	A	-	0.32	A	-	0.34
Patterson Pass Rd./North Mines Rd.	Signalized	B	-	0.63	A	-	0.56
Tesla Road/Mines Road	Unsignalized	E	36.7	-	E	46.6	-
Murrieta Blvd./Fenton Street	Signalized	A	-	0.31	A	-	0.28
Jack London Blvd./Murrieta Blvd.	Signalized	B	-	0.62	A	-	0.33
Olivina Avenue/Murrieta Blvd.	Signalized	A	-	0.39	A	-	0.38

Intersection	Type[a]	AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)[b]	V/C	LOS	Delay (sec)[b]	V/C
North Canyons Parkway/Airway Blvd.	Signalized	A	-	0.25	A	-	0.38
North Canyons Parkway/Collier Canyon Rd.	Signalized	A	-	0.27	A	-	0.33
Chestnut Street/North Livermore Ave.	Signalized	A	-	0.54	A	-	0.39
Cromwell Way/North Livermore Ave.	Signalized	A	-	0.29	A	-	0.59
North Livermore Ave./I-580 EB Ramp	Signalized	A	-	0.28	A	-	0.40
North Livermore Ave./I-580 WB Ramp	Signalized	A	-	0.31	A	-	0.27
Las Positas Rd./North Livermore Ave.	Signalized	A	-	0.46	B	-	0.65
Portola Ave./North Livermore Ave.	Signalized	B	-	0.68	B	-	0.63
Railroad Ave./North Livermore Ave.	Signalized	B	-	0.64	B	-	0.60
Junction Ave./North Livermore Ave.	Unsignalized	F	OVRFL	-	F	62.2	-
Olivina Avenue-Chestnut Street/North P Street	Signalized	A	-	0.31	A	-	0.30
Northfront/I-580 WB Ramps	Unsignalized	F	OVRFL	-	C	23.1	-
Pine Street/North L Street	Unsignalized		0.0	-	A	3.6	0.38
Pine Street/North P Street	Unsignalized	B	7.9	0.69	B	5.1	0.53
Portola Ave./North L Street	Signalized	B	-	0.63	D	-	0.86
Portola Ave./Murrieta Blvd.	Signalized	B	-	0.64	C	-	0.70
North P Street- Paseo Laguna Seco/Portola Ave.	Unsignalized	F	OVRFL	-	F	49.7	-
Railroad Ave./North L Street	Signalized	A	-	0.37	A	-	0.50
Railroad Ave./North P Street	Signalized	A	-	0.47	A	-	0.53
Fourth Street/South L Street	Signalized	A	-	0.40	A	-	0.47
Second Street/South L Street	Signalized	A	-	0.30	A	-	0.40
Southfront Road/I-580 EB Ramps	Unsignalized	F	OVRFL	3.33	F	OVRFL	4.20
Vallecitos Road/Isabel Ave.nue	Signalized	D	-	0.89	E	-	0.92
East Vineyard Avenue/East Vallecitos Rd.	Unsignalized	D	30.5	-	F	OVRFL	-
Brisa Street/South Vasco Rd.	Signalized	B	-	0.68	A	-	0.55
Dalton Ave./North Vasco Rd.	Unsignalized	E	37.8	-	F	OVRFL	-
East Ave./South Vasco Rd.	Signalized	A	-	0.41	A	-	0.56
Garventa Ranch Rd./North Vasco Rd.	Signalized		-	-	A	-	0.54
Industrial Drive/South Vasco Rd.	Signalized	B	-	0.67	C	-	0.77
Las Positas Rd./South Vasco Rd.	Signalized	A	-	0.48	B	-	0.65

Intersection	Type[a]	AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)[b]	V/C	LOS	Delay (sec)[b]	V/C
Mesquite Way- Emily Way/South Vasco Rd.	Signalized	A	-	0.27	A	-	0.28
Northfront Rd./North Vasco Rd.	Signalized	C	-	0.79	D	-	0.81
Patterson Pass Rd./South Vasco Rd.	Signalized	D	-	0.87	A	-	0.55
Scenic Ave./North Vasco Rd.	Signalized	A	-	0.59	A	-	0.58

[a] Signalized intersections assessed using NCHRP Circular 212 methodology and TRAFFIX software.
[b] Delay is shown for unsignalized intersections, four-way intersections analyzed using 1994 HCM four-way stop method, other stop controlled intersections analyzed using 2000 HCM unsignalized method.

Note: OVRFL – Indicates oversaturated conditions for long periods of time, or extensive vehicle queues. Average vehicle delay is not possible to accurately estimate under these conditions.

Source: Meyer, Mohaddes Associates, Inc., 2002.

APPENDIX C

CULTURAL RESOURCES INFORMATION

C-1 NATIONAL REGISTER OF HISTORIC PLACES

C-2 PROPERTIES ELIGIBLE FOR THE NATIONAL REGISTER

C-3 BRIDGES IN THE PLANNING AREA

APPENDIX C-1

NATIONAL REGISTER OF HISTORIC PLACES

APPENDIX C-1
NATIONAL REGISTER OF HISTORIC PLACES

This appendix explains the use of the codes that should be entered in the "National Register of Historic Places Status Code" field in the header of the Primary Record when an evaluation of a historical resource is completed. The codes found here represent a short list of the most frequently used status determination, selected from a more extensive list that is available from the Office of Historic Preservation on request. Be sure to read the entire list before deciding which code to use. Take special care that evaluations for districts and their components fit together properly. Note that districts themselves are given "S" ratings, while contributors receive "D" ratings. Thus, a district judged eligible for the National Register is rate "3S", but the district's contributors are rated "3D".[1]

The initial number in a code indicates the general status.

1. Listed in the National Register
2. Determined eligible for the National Register in a formal process involving federal agencies.
3. Appears eligible for listing in the National Register in the judgment of the person(s) completing or reviewing the form.
4. Might become eligible for listing.
5. Ineligible for the National Register but still of local interest.
6. None of the above
7. Undetermined.

Each general status is divided into more specific codes as follows:

1. Listed in the National Register:
   1S. Separately listed.
   1D. Contributor to a listed district.
   1B. Both 1S and 1D.

2. Determined eligible for listing in the National Register:
   2S1. Determined eligible for separate listing by the Keeper of the National Register.
   2S2. Determined eligible for separate listing through a consensus determination by a federal agency and the State Historic Preservation Officer.
   2S3. Determined eligible for separate listing by a unit of the National Park Service other than the Keeper of the National Register.
   2D1. Contributor to a district determined eligible by the Keeper.
   2D2. Contributor to a district determined eligible for listing through a consensus determination.

[1] Office of Historic Preservation, 1995. *Instructions for Recording Historical Resources.* Office of Historic Preservation, Sacramento.

2D3. Determined eligible for listing as a contributor to a district by a unit of the National Park Service other than the Keeper of the National Register.
2B5. Determined eligible by more than one method listed above.

3. Appears eligible for listing in the National Register:
   3S. Appears eligible for separate listing.
   3D. Contributor to a district that has been fully documented according to OHP instructions and appears eligible for listing.
   3B. Both 3S and 3D.

4. Might become eligible for listing:
   4R. Meets both of the following conditions: (1) Is located within the boundaries of a fully documented district that is listed in, determined eligible for, or appears eligible for the National Register: and (2) may become a contributor to the district when it is restored to its appearance during the district's period of significance.
   4S. May become eligible for separate listing in the National Register when one of the following occurs (use the code for the most important reason if more than one applies):
      4S1. The property becomes old enough to meet the Register's 50-year requirement.
      4S2. More historical or architectural research is performed on the property.
      4S7. The architectural integrity of the property is restored.
      4S8. Other properties, which provide more significant examples of the historical or architectural associations connected to this property, are demolished or otherwise lose their architectural integrity.
   4D. Contributor to a fully documented district that may become eligible for listing, when (use the code for the most important reason if more than one applies):
      4D1. The district becomes old enough to meet the Register's 50-year requirement.
      4D2. More historical or architectural research is performed on the district.
      4D7. The integrity of the district is restored.
      4D8. Other districts, which provide more significant examples of the historical or architectural associations connect to this district, are demolished or otherwise lose their architectural integrity.
   4X. May become eligible as a contributor to a district that has not been fully documented.

5. Not eligible for National Register but of local interest because the resource:
   5S1. Is separately listed or designated under an existing local ordinance, or is eligible for such listing or designation.
   5S3. Is not eligible for separate listing or designation under and existing local ordinance but is eligible for special consideration in local planning.
   5D1. Is a contributor to a fully documented district that is designated or eligible for designation as a local historic district, overlay zone, or preservation area under an existing ordinance or procedure.
   5D3. Is a contributor to a fully documented district that is unlikely to be designated as a local historic district, overlay zone, or preservation area but is eligible for special consideration in local planning.
   5N. Needs special consideration for reasons other than the above.

6. None of the above:
   - 6W. Removed from listing by the Keeper of the National Register.
   - 6X. Determined ineligible for listing in the National Register by the Keeper of the National Register.
   - 6Y. Determined ineligible for listing in the National Register through a consensus determination of a federal agency and the State Historic Preservation Officer.
   - 6Z. Found ineligible for listing in the National Register through an evaluation process other than those mentioned in 6Z and 6Y above.

7. Not evaluated.

APPENDIX C-2

PROPERTIES ELIGIBLE FOR THE NATIONAL REGISTER

APPENDIX C-2
PROPERTIES ELIGIBLE FOR THE NATIONAL REGISTER

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Description
	Altamont Pass Rd	01-005915		1922	2S2	Y	H	Bridge #33C-6, Carroll Overhead
2647	Arroyo Rd	01-003349		1885	3	Y	H,L,LH	Christopher Buckly Estate
2647	Arroyo Rd	01-006790		1893	1S	Y	H,L	Ravenswood Carriage House
2647	Arroyo Rd	01-006787		1893	1S	Y	H,L,HRI	Ravenswood Main House
2647	Arroyo Rd	01-006788		1893	1S	Y	H,L	Ravenswood Bedroom House
2647	Arroyo Rd	01-006789		1893	1S	Y	H,L	Ravenswood Tank House
242	Church St	01-003353		1893	3S	Y	H,L	Wagoner Winery
2211	College Ave	01-003357		1876	3S	Y	H,L	
2551	College Ave	01-003359		1925	3S	Y	H,L	
3057	East Ave	01-003360		1880	3S	Y	H,L,LH	H Callaghan House
1886	Fifth St	01-003577		1887	3S	Y	H,L	
2145	Fifth St	01-003580		0	3S	Y	H,L	
2253	Fifth St	01-003582		1922/1923	3S	Y	H,L,LHG	Livermore Grammar School; same as Fifth Street School
	First St	01-003473		1905	3S	Y	H,LH,HRI	Mills Square Flagpole
2156/ 2160	First St	01-005900 01-003495		1873	3S	Y	H,L,D,HRI,LH,LHG	IOOF Oddfellows Hall; enlarged in 1874(LHG)
22192223/ 2235	First St	01-003502		1914	3S	Y	H,L,D,LHG	L Schenone Building
2247	First St	01-003505		1909	3S	Y	H,L,D,LH	Masonic Building
2250	First St	01-003506		1922	1S	Y	H,L,D,LH	Bank of Italy, Livermore City Hall
2365	First St	01-003512		1875	3S	Y	H,L,D,LHG	Old City Hall
4260	First St	01-006836		1927	3S	Y	H,LH	Robert Schenone House
2210	Fourth St	01-003561		1910	3S	Y	H,L	Beck Home
925	Junction Ave	01-003465		1910	3	Y	H,LHG	Highway House, Durant Garage; LHG says this should be removed: see 2016 Pine St.
372	Maple St	01-003445		1912	3S	Y	H,L,LH	Saint Michael's School
458	Maple St	01-003446		1918	3S	Y	H,L,LH	Saint Michael's Church
	May School Rd	01-003601		1890	3S	Y	H,HRI,LH,LHG	May School Site; LHG wants date removed
156	McLeod St	01-003447		1922	3S	Y	H,L,D	Jail, Delinquent Dog
256	McLeod St	01-003449		1931	3S	Y	H,L	Wallace Meyers Medical Office
291	McLeod St	01-003451		1890	1S	Y	H,L	DJ Murphy
309	N. Livermore Ave	01-003423		1879	3S	Y	H,L	

Table C-2 *continued*

Street Address		Primary #	Trinomial	Date	Code	Eligible	Source	Description
577	N. Livermore Ave	01-003428		1870	3S	Y	H,L	IDES Hall, Eglesia Apostolica
699	N. Livermore Ave	01-003430		1929	3S	Y	H,L	California Water Service Co Pump House
455	Olivina Ave	01-003459		1852	3S	Y	H,L,HRI	Martin Mendenhall Ranch
157	S J St	01-003379		1914	3S	Y	H,L	Foresters Hall
813	S J St	01-003383		1927	3S	Y	H,L	St Paul's Hospital, C&J Livermore
615	S K St	01-003390		1885	3S	Y	H,L	
522	S L St	01-003400		1931	3S	Y	H,L	Veterans Memorial Building
580	S L St	01-003405		1894	3S	Y	H,L,LHG	Oscar Meyers House; LHG: built 1895
585	S L St	01-003406		1898	3S	Y	H,L,LHG	Wm H Taylor House; LHG: built 1897
220	S Livermore Ave	01-003433		1939	3S	Y	H,L,D	Livermore Post Office
392	S Livermore Ave	01-003434		1910	3S	Y	H,L,LHG	McGill Home, Stockin
508	S Livermore Ave	01-003435		1875	3S	Y	H,L	
2046	Second St	01-003526		1917	3S	Y	H,L,LH	Raboli residence
2058	Seventh St	01-003594		1884	3S	Y	H,L	Morrill Wagoner House
1881	Sixth St	01-003585		1888	3S	Y	H,L,LH	Frank Fasset House
4590	Tesla Rd	01-003603		1883	3D	Y	H,LH,HRI,CHL	Concannon Vineyard
2155	Third St	01-003542		1910	3S	Y	H,L,LH	Carnegie Library
1100	Vallecitos Rd	01-006749			2D3	Y	H	Kalthoff Vineyards

Source: LSA Associates, Inc., 2002.

APPENDIX C-3

BRIDGES IN THE PLANNING AREA

APPENDIX C-3
BRIDGES IN THE PLANNING AREA

Bridge Name	Bridge #	Date	Code	Eligible	Source	Location/Post Mile
Arroyo del Valle Bridge	33C0058	1959	5	N	C	South Del Valle Pkwy
Arroyo Mocho	33C0070	1940	5	N	C	.1 m W of Murrieta Blvd
Arroyo Las Positas	33C0079	1972	5	N	C	375 ft S of I-580
Arroyo Mocho Creek	33C0099	1974	5	N	C	.4 mi S of Tassajara Rd
Arroyo Mocho	33C0101L	1967	5	N	C	1.5 mi S of I-580
Arroyo Mocho	33C0101R	1982	5	N	C	1.5 mi S of I-580
Arroyo del Valle	33C0103	1951	5	N	C	S of Del Valle Pkwy
Arroyo Mocho	33C0121	1988	5	N	C	13.8 mi SE of Tesla Rd
Arroyo Mocho	33C0122	1988	5	N	C	12.6 mi SE of Tesla Rd
Arroyo Mocho	33C0123	1988	5	N	C	4.8 mi SE of Tesla Rd
Arroyo Mocho	33C0124	1960	5	N	C	3.2 mi SE of Tesla Rd
Arroyo Mocho	33C0125	1987	5	N	C	.7 mi SE of Tesla Rd
Arroyo Seco	33C0129	1958	5	N	C	.1 mi N of East Ave
Arroyo Las Positas	33C0144	1980	5	N	C	At Airway Blvd
Altamont Creek	33C0193	1970	5	N	C	Just N of Firestone Rd
Arroyo Seco	33C0194	1968	5	N	C	.3 mi N of East Ave
Arroyo Mocho	33C0195	1987	5	N	C	.2 mi S of College Ave
Livermore Ave underpass	33C0197	1974	5	N	C	Between Chestnut and Railroad
Arroyo Las Positas	33C0198		5	N	C	.1 mi S of I-580
Arroyo del Valle	33C0199	1956	5	N	C	.2 mi N of Vineyard Ave
Arroyo del Valle	33C0239	1983	5	N	C	.05 mi N of Vineyard Ave
Arroyo Seco	33C0240	1962	5	N	C	.2 mi N of Tesla Rd
South Bay Aqueduct	33C0241	1962	5	N	C	2.1mi S of I-580
Arroyo del Valle Creek	33C0378	1983	5	N	C	.1mi N of Vineyard Ave
Arroyo Seco	33C0379	1964	5	N	C	200' S of Charlotte Way
Arroyo Seco	33C0380	1987	5	N	C	300' W of Lucille St
Arroyo Seco	33C0381	1987	5	N	C	500' E of Mulqueeney St
Arroyo Seco	33C0382	1985	5	N	C	.3 mi E of W Positas Rd
Arroyo Seco	33C0383	1985	5	N	C	500' W of Las Positas Rd
Arroyo Las Positas	33C0397	1981	5	N	C	1 mi N of I-580
Arroyo del Valle	33C0411	1985	5	N	C	.8 km N of Bernal Ave
Arroyo Las Positas	33C0413		5	N	C	.4 km E of Vasco Rd
Arroyo Seco	33C0415	1999	5	N	C	.1 km W of State Rte 84
Arroyo Seco	33 0011	1932	5	N	C	04-ALA-084-29.52
Arroyo Positas	33 0012	1972	5	N	C	04-ALA-580-13.82
Cottonwood Creek	33 0013	1972	5	N	C	04-ALA-580-15.63
Arroyo del Valle	33 0049	1940	5	N	C	04-ALA-084-24.45
Arroyo Mocho	33 0050	1939	5	N	C	04-ALA-084-26.61-LVMR
East First St OH	33 0059	1977	5	N	C	04-ALA-084-R28.17-LVMR
Arroyo Seco	33 0066	1954	5	N	C	04-ALA-580-11.04-LVMR
Arroyo Las Positas	33 0085	1972	5	N	C	04-ALA-580-11.72
Portola Ave OC	33 0140	1972	5	N	C	04-ALA-580-13.22-LVMR
N Livermore Ave UC	33 0153	1972	5	N	C	04-ALA-580-12.53
First St. Separation	33 0389	1965	5	N	C	04-ALA-084-R29.68-LVMR
Vasco Rd OC	33 0400	1970	5	N	C	04-ALA-580-9.68
Airway Blvd OC	33 0408R	1999	5	N	C	04-ALA-580-14.95-LVMR
Airway Blvd OC	33 0408L	1972	5	N	C	04-ALA-580-14.98-LVMR
El Charro Road OC	33 0431	1972	5	N	C	04-ALA-580-16.70
Collier Canyon Creek	33 0501	1972	5	N	C	04-ALA-580-14.44
Arroyo Las Positas	33 0673	1969	5	N	C	04-ALA-580-9.40-LVMR