



LIVERMORE  
CALIFORNIA

**COMMUNITY SERVICES  
AND  
INFRASTRUCTURE REPORT**

**CITY OF LIVERMORE**

**2017 COMMUNITY SERVICES AND  
INFRASTRUCTURE REPORT**

ADOPTED: JULY 10, 2017

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GINA BONANNO

LORETTA KASKEY

NEAL PANN

**PLANNING DIVISION**

STEVE STEWART, PLANNING MANAGER

STEPHEN RILEY, PRINCIPAL PLANNER

SUSAN FROST, SPECIAL PROJECTS COORDINATOR

LORI PARKS, ASSOCIATE PLANNER

FANNY LUDWIG, DIVISION CLERK

## **2017 Community Services and Infrastructure Report List of Contributors**

### **Background and History**

- Susan Frost, City of Livermore

### **School Service**

- Chris Van Schaack, Livermore Valley Joint Unified School District

### **Water Supply and Distribution**

- Pam Lung, City of Livermore
- Joel Waxdeck, City of Livermore
- Amparo Flores, Zone 7
- Frank Vallejo, California Water Company

### **Wastewater Disposal Capacity**

- Helen Ling, City of Livermore

### **Fire Service**

- Danielle Stefani, Livermore Pleasanton Fire Department

### **Traffic**

- Bob Vinn, City of Livermore
- Debbie Bell, City of Livermore

### **Police Service**

- Mathew Sarsfield, City of Livermore

### **Parks and Open Space**

- John Lawrence, Livermore Area Recreation and Park District

### **Solid Waste Disposal Service**

- Judy Erlandson, City of Livermore

### **Air Quality**

- Andrea Gordon, Bay Area Air Quality Management District
- David Vintze, Bay Area Air Quality Management District

### **Employment**

- Susan Frost, City of Livermore
- Lori Parks, City of Livermore

### **Housing**

- Susan Frost, City of Livermore
- Lori Parks, City of Livermore

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# EXECUTIVE SUMMARY



## Overview

The Community Services and Infrastructure Report is typically prepared and used every three years as the basis for the City Council to establish the City's annual allocation of housing units and the policies for the next three-year Housing Implementation Program (HIP) cycle. The General Plan requires annual average housing allocations to be within an average residential growth rate range of 140 units to 700 units per year (General Plan Policy LU-2.1.P.6). The General Plan states future average growth shall not exceed the community's capability to provide services (General Plan Policy LU-2.1.P.3). This Report provides the information to ensure the growth rate for the next three years does not exceed the City's capability to provide services.

After the completion of the 2014 Community Services and Infrastructure Report, the Council approved an annual average allocation of 450 housing units for the three-year cycle from 2014 through 2016, for a total of 1,350 units. For the 2017 to 2019 cycle, continuing an annual allocation of 450 housing units is recommended. Existing community services and infrastructure are adequate to accommodate the recommended growth rate.

## Background

The 450 annual housing units allocations available in each of the past three years were distributed among three programs: (1) Transferable Development Credits (TDCs); (2) Downtown Specific Plan (DSP); and (3) Housing Implementation Program (HIP) units (the non-TDC, non-DSP, units). Established General Plan TDC and DSP housing unit allocation policies are vital for implementing General Plan policies. The DSP allocations are intended to promote residential development that contributes to the continued revitalization of downtown; the TDC allocations are intended to support the open space preservation program in North Livermore and facilitates infill development that creates a variety of housing types and more efficiently uses existing infrastructure. Accordingly TDC and DSP projects are exempt from HIP. Actual allocations are made when a project (e.g. tentative subdivision map) is approved. The following information summarizes the TDC, DSP and HIP programs for the 2014-2016 three-year cycle:

TDC - Two hundred (200) units/year: Transferable Development Credits (TDC) Program – The General Plan guarantees TDC housing allocations be made available at a rate of 100 per year from 2004 through 2009, and at a rate of 200 per year from 2010 through 2016, totaling 2,000 allocations available for TDC-retiring projects through 2016 (General Plan Policy LU-2.1.P.15). Of the 2,000 TDC allocations available, 1,527 allocations have

been used through April 2017, leaving 473 TDC allocations available. As of the end of 2016, the set-aside of allocations for TDC projects under current General Plan policy has been completed.

DSP - Two hundred (200) units/year: Downtown Specific Plan (DSP) – The DSP includes a growth management policy to make available a maximum of 2,000 housing unit allocations in the DSP area over a ten-year period, from 2004 through 2013 at a rate of 200 per year (DSP, p. 4-16). Therefore, no new allocations for the DSP area were granted in the 2014-2016 cycle. Unused portions of the DSP available allocation pool carry forward until used (General Plan Policy LU-2.P6 and DSP Chapter 4, Growth Management Policy 4, page 16). Of the 2,000 DSP available allocations, 434 have been allocated through April 2017 leaving 1,566 DSP available allocations.

HIP - Fifty (50) units/year: Housing Implementation Program (HIP) – The remaining units are allocated through HIP. In the last three-year HIP cycle (2014-2016), a total of 33 allocations were granted. The HIP allocation pool, unlike the TDC and DSP allocation pools, does not carry forward, and is “use it or lose it” within each 3-year HIP cycle. Accordingly, the 117 unused 2014-2016 HIP allocations became unavailable at the end of 2016.

## **The Process of Preparing the Community Services and Infrastructure Report**

In years past, the Council appointed a Growth Review Committee to work with City staff in the preparation of the Community Services and Infrastructure Report. Consistent with more recent years (2008-2016) however, on March 27, 2017 Council directed staff to prepare an administrative update of the current Report. The Report would be presented to the Planning Commission, who will serve as the Growth Review Committee and make a recommendation on housing allocations. There were several reasons for foregoing the appointment of a new Growth Review Committee, including:

- The City has seen less residential growth compared to previous nine years or last three HIP cycles.
- General Plan growth management policies have been effectively implemented through the Housing Implementation Program (HIP). While the TDC and DSP growth management programs are currently fully allocated, requests under HIP have been small over the past several years.
- There are not many vacant or underdeveloped sites available within the City limits that can be developed under the HIP program. Larger residential development projects, such as the Isabel Neighborhood Plan, will include growth management programs (implemented through a Specific Plan) consistent with General Plan policies.
- There has not been major policy, environmental or infrastructure changes negatively impacting the City’s ability to serve growth for the next three

years identified since the adoption of the 2014 Community Services and Infrastructure Report.

Given the absence of major policy changes and conditions that could significantly impact the City's growth, the preparation of the 2017 Community Services and Infrastructure Report has primarily focused on updating the data.

## Growth-Limiting Factors

The 2017 Community Services and Infrastructure Report evaluates the following subjects:

- School Service
- Water Supply and Distribution
- Wastewater
- Fire Service
- Traffic
- Police Service
- Parks and Open Space
- Solid Waste Service
- Air Quality
- Employment
- Housing

The following are highlights of the 2017 Report.

**Water Supply and Distribution System.** Livermore's water supply and distribution system is sufficient for the foreseeable future. However, there are localized areas, such as near Southfront Road and Vasco Road, where existing pipelines will need to be replaced to accommodate growth in these areas.

In August 2007, a federal court order reduced Delta water supplies by up to 30 percent for a year while State and federal agencies complete a long-term plan to protect the endangered Delta smelt. In December 2010, a federal judge struck down the biological opinion of the U.S. Fish and Wildlife Service that restricted water delivery to the area. Despite this favorable ruling for California water supplies, legal battles over water exports from the Delta are likely to continue.

With the above-referenced Delta issue and the drought, long-term water supply is a potential growth-limiting factor, however the City currently does have the capacity to achieve General Plan buildout. This determination is based on the City having a Water Efficient Landscape Ordinance in place for several years and which will apply to all new residential development; making reclaimed water available for landscape irrigation in much of the west end of the City including the Las Positas Golf Course; and working with our partner agencies in establishing appropriate conservation measures.

**Stormwater System.** The City updated its Storm Drain Connection Fee Study in 2004. The Study assumed that a number of improvement projects that address storm drain deficiencies would be constructed in the future once fees are collected to fund their construction. It appears now that some of these development-driven

projects (e.g., in the areas of Second Street, Brisa Street, Village Drive, and Southfront Road) may need to be constructed sooner than anticipated and funds may have to be borrowed to fund their construction. The City is planning to refine the 10-year flooding projections, which will be used to prioritize storm drain deficiency projects and develop an implementation plan. The City will need to identify sources to fund the high-priority projects. Depending on the outcome of further study, the stormwater system could be a growth-limiting factor in certain areas of the City; however, this concern is typically mitigated on site through the development review and design process (e.g., through stormwater retention design).

**School Services.** The primary source of funding for capital improvements to serve new students in the District are developer fees. Funds from new homes built in Livermore are earmarked for the schools impacted by those new developments. Additionally, in July of 2016, over 66% of Livermore voters supported the passage of Measure J, a \$245 million General Obligation Bond for school facilities. The first of three sets of bonds has been sold, providing the initial revenue stream to begin renovation and new construction needed at sites throughout the District.

More than 90 percent of the District's revenue comes from or through the State Budget. Any financial difficulties of the State of California impact all public agencies, including public school districts. Additionally, the funding formulas used by the State were developed a number of years ago when Livermore was considered a "rural" district. This classification continues today resulting in significantly fewer dollars from the State as compared neighboring districts. This inequity in State funding is unfair to Livermore students and should be corrected over the next eight years with the State's adoption of the new Local Control Funding Formula (LCFF).

The School District can anticipate enrollment growth from two primary sources - residential development and increasing numbers of children in existing homes. A study of student yield factors found that, on average, each new single-family home in the District generates 0.44 students and each new multi-family unit generates 0.49 students, K-12. The current total school capacity within the District is 15,500 students. According to District demographic reports, the peak over the next 10 years will be 14,709 students. The District's Facilities Master Plan focuses on building improvements and facility capacity expansions required to accommodate any approved, but unbuilt, housing units and future development within the 2003 to 2025 General Plan. The District continues to update its Master Plan using current and additional capacity needs, enrollment projections, and projected program needs.

The District is prepared to accommodate future growth.

**Traffic.** Traffic conditions have not changed significantly in the past three years, considering the low rate of residential growth and employment. The conclusions stated in the 2014 Community and Infrastructure Report are still applicable. Mainly, traffic impacts are a regional problem that cannot be completely eliminated through independent action of the City. A higher residential growth rate will add traffic to the City's roadways faster than a lower growth rate. A higher residential growth rate would also generate traffic impact fee revenue faster and could help deliver

improvement projects sooner. Additional traffic from residential development is 50 percent of the traffic expected to be added from all development. Traffic volumes will also increase due to nonresidential development and growth in regional traffic. Project-specific traffic studies will be necessary to determine and identify mitigations for specific impacts. The application of smart growth policies, such as the development of pedestrian-oriented areas (the Downtown) and transit-oriented development (the Brisa Neighborhood Plan), can reduce local traffic.

***Parks and Open Space.*** Parks and recreation facilities provide an important amenity to the community, which affects the health and quality of life for its residents. The Livermore Area Recreation and Park District (LARPD) updated its Master Plan in 2016. Currently, there are incremental shortfalls in neighborhood, community and open space park lands. Overall, LARPD needs to expand the total acreage of all parkland categories to meet established standards through 2035 as residential population increases. The City will continue to work with LARPD to address the deficiency of all park categories.

***Employment and Housing.*** The current General Plan and the Association of Bay Area Governments forecast steady job growth in Livermore for the next 20 years. Residential growth will be needed to achieve a desirable jobs-housing balance. Otherwise, workers will be imported to fill jobs, thus contributing to regional problems such as traffic congestion and declining air quality.

Equal in importance to a jobs-housing balance is achieving a desirable jobs-housing match, i.e., ensuring that the types of jobs created in the City are commensurate with the occupations of Livermore residents. The cost of housing has increased relative to household income in Livermore in the past three years, and there remains a gap between median house price and moderate household income. There are two basic methods of matching jobs to housing. First, create higher paying jobs that match the income City residents need to afford housing cost. Second, establish more affordable housing units that are within reach of the typical household in Livermore.

The General Plan provides a blueprint for achieving a jobs-housing balance and jobs-housing match. Implementation of the General Plan has provided positive signs that the policies will lead to the desired results. In recent years, attached residential units have accounted for a greater percentage of new units built. Attached units are typically more affordable than detached single-family units. Also, the City has a minimum requirement for affordable units in a new residential development of 15 percent of the total number of units (except the Downtown Specific Plan maintains a 10 percent requirement). There has been progress in promoting more affordable housing in the City, but it will remain a challenge for the City in the coming years.

# Growth Rate Recommendation

The 2003 to 2025 General Plan establishes an overriding goal for the City of Livermore to manage growth in a manner that best serves the health, safety, and general welfare of its residents. Consistent with this goal, all residential growth in the City must advance the following General Plan goal:

*Develop and phase new housing at a rate that can be absorbed by public infrastructure and in a manner that fits within Livermore’s character. [Objective LU-2.1]*

The General Plan establishes a residential growth policy wherein residential growth may occur within a fixed range between 140 and 700 dwelling units annually. Based on information in the 2017 Community Services and Infrastructure Report and General Plan policy, a total annual allocation of 450 units is recommended for the 2017-2019 HIP cycle. Allocations would be distributed as summarized in the *Recommendation* below.

## Recommendation

HIP provides the only option for a developer who wishes to build a project of more than four units outside of the Downtown Specific Plan area and not participating in the Transferable Development Credits program. Based on the 2017 Community Services and Infrastructure Report, there are no immediate growth-limiting factors with respect to public infrastructure and services.

The following table of the prospective 2017-2019 HIP program maintains 450 allocations per year. The table reflects a continuation of 50 HIP units (non-DSP, non-TDC) made available annually on a “use it or lose it” basis. The table also includes additional units allocated to the TDC program.

**Table 1. Recommended Housing Allocations for 2017-2019**

PROGRAM	NEW ALLOCATIONS		
	2017	2018	2019
<b>DSP - DOWNTOWN SPECIFIC PLAN</b> <i>(1,566 unused allocations as of 4/17)</i>	No new allocations.		
<b>TDC - TRANSFERABLE DEVELOPMENT CREDITS</b> <i>(1,673 unused allocations as of 4/17 including the new ones to the right)</i>	400	400	400
<b>HIP - HOUSING IMPLEMENTATION PROGRAM</b>	50	50	50
<b>TOTALS</b>	<b>450</b>	<b>450</b>	<b>450</b>

# BACKGROUND AND HISTORY



## Growth Management

During the 1960s, the City experienced rapid residential growth. During this period, the average yearly population growth rate was 8.85 percent. The rate of development was having a negative impact on the City's sewage handling capacity, potable water delivery capability, and the local school system.

In 1972, the citizens of Livermore adopted the "SAVE" initiative, Measure B, which prohibited additional residential development unless it could be established that adequate sewage capacity, water supply, and school facilities were available. Around the same time, the Livermore Valley was declared a critical air basin. Because of this designation, the State and Federal governments denied funding for sewer expansion and upgrades. To obtain funding for expansion of the sewer treatment plant, the City agreed to limit the growth rate. As a result of these circumstances, the City amended its General Plan in 1976 to phase development and control the growth rate. The amendments sought to encourage coordination between the extension of public services and the location of new development. In 1978, the City adopted Resolution No. 280-78 that established a two percent growth rate and Residential Development Policy (RDP). This policy was the City's first growth management program.

The City used the RDP until 1987 when it determined the system was too complex and produced questionable results. As a result of recommendations from the Growth Policy Review Committee, the City replaced the RDP with the Housing Implementation Program (HIP) and a residential population growth rate between 1.5 and 3.5 percent to more effectively meet the City's needs. In 2005, by adoption of resolution 2005-015, the City converted the acceptable growth rate range from a percentage to housing unit numbers ranging from 140 to 700 per year.

The following table provides an overview of residential development in the City of Livermore. The growth rate numbers includes the units for various programs that have come into being at various points in time, such as the South Livermore Valley Specific Plan, the Downtown Specific Plan, and Transferable Development Credits programs.

**Table 1: Residential Development 1959 to 2016**

Year	History	Growth Rate Cap <sup>1</sup>	Targeted Housing
2014-2016	3-Year HIP. Approved 33 units through HIP	450 units/year <sup>2</sup>	Transfer of Development Credit program and green building
2011 - 2013	3-year HIP. Approved 51 units through HIP.	450 units/year	Downtown Specific Plan, and Transfer of Development Credit program
2008 - 2010	3-year HIP. Approved 31 units through HIP.	450 units/year	Affordable and infill housing. Downtown Specific Plan, and Transfer of Development Credit program
2005 - 2007	3-year HIP. Approved 714 units, including 264 units committed from 2008-2010 HIP cycle.	450 units/year	Affordable and infill housing, Downtown Specific Plan, and Transfer of Development Credit program
2004	Special 1-year HIP to complete South Livermore Valley Specific Plan. DSP and TDC programs started.	450 units/year	Affordable housing
2002 - 2003	First two years of a three-year HIP (02-04). 200 units set aside for South Livermore Valley Specific Plan each year.	1.5%	Infill and affordable housing
2001	Special 1-year HIP. 200 units set aside for South Livermore Specific Plan.	1.5%	Infill and affordable housing
2000	Special 1-year HIP. 200 units set aside for South Livermore Valley Specific Plan.	1.5%	Infill and affordable housing
1997 - 1999	3-year HIP. 200 units set aside for South Livermore Valley Specific Plan each year.	1.5%	Lower cost housing, small projects, projects in College Assessment District, and Alden Lane Annex.
1994 - 1996	3-year HIP.	2.5%	Lower cost housing, small projects, projects in College Assessment District, and Alden Lane Annex.
1991 - 1993	3-year HIP.	2.5%	Lower cost housing, small projects, projects in College Assessment District, and public lands.
1989 - 1990	2nd phase of HIP (1988 – 1990). Approved 3,000 units over three-year program including 903 borrowed from 1988.		Move-up housing (1,900 square-foot or more)

<sup>1</sup> Growth rate cap includes all programs (e.g., in recent years includes HIP, DSP and TDC units)

<sup>2</sup> Approximate percent is 1.5% when 450 units per year is the growth rate.

Year	History	Growth Rate Cap <sup>1</sup>	Targeted Housing
1988	HIP establishes growth management criteria including targeting unit types or geographic, competitive review process, and growth rate.	3.5%	(1.5% transferred to 1989)
1987	RDP replaced by Housing Implementation Program (HIP) and Council amends General Plan to institute growth rate ranging from 1.5% to 3%.		
1985	RDP revised – eliminated affordable housing, government subsidized and custom lot categories. Created categories for Senior Housing, Housing in Redevelopment District.	2%	Senior housing; Housing in Redevelopment District
1984	RDP amended – increased units in affordable category to 200.	2%	Affordable Housing units
1983	RDP amended - established category for government subsidized housing. Not subject to 2 % limitation.	2%	Category for Government Subsidized Housing
1981 - 1982	RDP amended - established category for custom lots (limited to 75 units). Allocation for both years processed concurrently.	2%	Category for Custom Lots
1980	RDP amended to establish special category for projects containing affordable housing. Number of units limited to 150 dwellings and these were part of 2% growth rate.	2%	Category for Affordable Housing
1979	City receives more development requests than 2% rate can accommodate. Residential Development Policy (RDP) utilized to allocate housing units. RDP established very involved project review process.	2%	
1978	Sewer treatment plant expanded, housing allocated at 2% growth rate. Allocation distributed via “first come, first served” method.	2%	
1976	General Plan amended establishing a 2% growth rate and time phasing of development to coordinate extension of public services and location of development	2%	
1972	Citizens adopt “SAVE” initiative that prohibited additional residential development unless it could be established that there was adequate sewage capacity, water supply, and school facilities.		
70s	City Council adopted ordinance limiting number of dwelling units that could be built pending expansion of water treatment facilities. Livermore declared critical air basin and denied State/Federal funding for sewer needs. To obtain funding, Livermore agrees to limit growth rate.		

Year	History	Growth Rate Cap <sup>1</sup>	Targeted Housing
60s	Rapid growth rate generated environmental concerns. Annual avg. Growth rate was over 8%. Rate of development causing impact on sewage, drinking water handling capacity and local school system. Air quality problems peaked in 1969.		Concepts of density zoning and transfer were introduced to encourage development flexibility.
1959	Growth occurred outward from older City center. Growth was regulated by conventional Zoning and Subdivision Regulations. Many large single-family subdivisions were processed and built.		Planned Unit Development (PUD) concept introduced to provide housing diversity.

## Growth Management Policies and Programs

The 2003 to 2025 General Plan establishes the goals, policies, and procedure for implementing the City's Growth Management Program. The following sections of this Chapter excerpt the General Plan provisions relevant to residential growth. For additional information and context, the reader should refer to the 2003 to 2025 General Plan Land Use Element.

### Goals for Urban Growth

The General Plan establishes the following goals for residential development:

*Protect the unique qualities of Livermore, which include a historic Downtown, a variety of residential neighborhoods, vineyards, ranches, natural habitats, and open space. [Goal LU-1]*

*The City recognizes that it has an overriding responsibility to promulgate policies and programs, which will result in the management of growth to best serve the health, safety, and general welfare of its residents. (NLUGBI) [Goal LU-2]*

*Provide areas for high-density mixed-use development near transit. [Goal LU-3]*

*Ensure that new development mitigates significant environmental, design, and infrastructure impacts. [Goal LU-4]*

*It is the goal of the City to establish a coherent and logical pattern of urban uses that protects and enhances open space and agricultural uses by providing a clear and permanent boundary for urban uses within the City's Planning Area. The provisions of Goal LU-5, as readopted by the North Livermore Urban Growth Boundary Initiative shall be amended only by a vote of the people. [Goal LU-5]*

*Establish a Transferable Development Credits Program. [Goal LU-9]*

*Provide adequate housing within the Urban Growth Boundary. [Goal LU-11]*

*It is the goal of the City to establish a coherent and logical pattern of urban uses that protects and enhances open space and agricultural uses by providing a clear*

*and permanent boundary for urban uses within the City's Planning Area. The provisions of Goal LU-18, as readopted by the South Livermore Urban Growth Boundary Initiative, shall be amended only by a vote of the people. [Goal LU-18]*

## **General Plan Growth Policies**

The General Plan growth policies establish the procedures by which the City reviews and manages growth:

*Future growth shall not exceed the community's capability to provide services. School classroom facilities, sewage treatment capacity, treated domestic water, public parks and recreation, and public safety services shall be the principal factors considered. [LU-2.1 P3]*

*The quality and design of residential facilities shall also be an important component of the City's population growth policies. It shall be the continuing responsibility of the City to monitor these factors to assure compliance with the goals and policies of the Plan. [LU-2.1 P4]*

*The City shall establish a growth range, which supports the goals and policies for well-managed growth. The Planning Commission shall develop general policy recommendations, and the Growth Review Committee, appointed by the City Council, shall develop growth range recommendations for well-managed growth. Recommendations shall take into consideration the following factors [LU-2.1 P5]:*

- a) State and federal policies and standards relating to the environment, including air quality;*
- b) The need for the City to accommodate a reasonable share of regional population growth with regards to Association of Bay Area Governments (ABAG) population projections;*
- c) Energy conservation;*
- d) Historical growth patterns relative to the Bay Area and Alameda County;*
- e) The need to encourage infill development in the City;*
- f) The need to provide very-low and low-income housing consistent with ABAG's housing needs determination;*
- g) The need to support viable local employment and commerce opportunities;*
- h) The need for well-designed, high quality housing;*
- i) The need to ensure that public facilities and services can adequately support future growth; and*
- j) The desirability of providing a jobs/housing balance, as well as a jobs/housing match.*

## **Residential Growth Rate**

General Plan Policies LU-2.1.P6, P9, and P14 establish the framework for the City's growth management program as follows:

*It shall be the residential growth policy of the City to plan for an average residential population growth fixed range between 140 and 700 dwelling units annually (based on 0.5 to 2.5 percent of 2002 housing units). The computation of the growth range shall not include small projects of four (4) units or less, which are exempt from growth management. The City may guarantee yearly housing allocations through approved specific plans to encourage and support residential development within the specific plan planning area. In this circumstance, the Citywide yearly housing allocation shall not be less than the number of dwelling units guaranteed under approved specific plans.*

*To promote development and redevelopment in the Downtown, 200 units per year shall be authorized within the Downtown Area, for a maximum of 2,000 units for the period beginning February 2004 and ending December 31, 2013. For this period of time, Downtown Area units are not required to participate in the competitive review process. Please refer to the Downtown Specific Plan for the implementation details of this policy.*

*The City shall guarantee 100 housing allocations per year for six years (2004 through 2009) and 200 housing allocations per year for an additional seven years (2010 through 2016) to projects that were approved to exceed baseline density in compliance with the City's TDC Ordinance. In addition, these housing allocations shall be granted to applicants who acquire TDCs, or pay in-lieu fees at the rates specified in the TDC Ordinance for projects that exceed the baseline density regardless of whether baseline density is actually exceeded. Unused allocations for TDC-retiring projects may be carried forward up to 13 years, or the end of 2016. Housing allocations for TDC-retiring projects are reserved for development sites outside of the Downtown Area unless and until all housing allocations reserved for the Downtown have been used. Development in the Downtown Area is exempted from the TDC Program. [LU-2.1.P15] (Note: General Plan Goal LU-9 establishes the basic framework for the TDC Program)*

## **Implementation**

General Plan Land Use Element Policies LU-2.1 P7 through P15 establish and implement the growth rate. In Policy LU-2.1.P10, the General Plan establishes the basic framework for the Housing Implementation Program. The policy requires the following general steps in implementing the City Council's adopted growth rate:

*The detailed implementation process of the growth determination shall be adopted by resolution of the City Council and outlined in the program administration pamphlet, but shall include the following general steps [LU-2.1.P10]:*

- (a) *Determine a Specific Three-Year Housing Implementation Program. Using the Housing Element of the General Plan as a guide, the City shall develop a Three-Year Housing Plan. In developing the Plan, the City shall consider, among other issues, infrastructure requirements and limitations as they relate to the proposed growth, including but not*

limited to capacities of the sewer and water and street systems of the City; service requirements including schools, safety, and administrative services; environmental impacts and constraints; the very-low and low income housing needs of the City; and the current job growth rate in Livermore.

The Program would delineate:

- (1) The type and/or location of residential units targeted for development;
  - (2) Project specific criteria that will be used to evaluate individual projects; and
  - (3) The process and schedule by which the Competitive and Non-Competitive Housing Implementation Program will be undertaken.
- (b) Determine the Specific Yearly Growth Determinations for the Three-Year Period. Using the total number of dwelling units to be built during the three-year period as determined in (10a) above, the annual growth determination shall be determined. This annual growth determination must be within the range of 140 to 700 units, as set by the General Plan.
- (c) Calculation of Yearly Housing Allocation. Determine the yearly housing allocation in the range of 140 to 700 units.
- (d) Determine Allocation Recipients in a competitive Review Process. Developers shall submit an application consisting of:
- (1) A concept site plan showing street and lot layout, number and types of units, building footprints, etc.
  - (2) Typical elevations of building, walls, carports, fences, etc.
  - (3) Plans that show landscaping, usable open spaces and other amenities.
- The City will evaluate and rank the applications using the goals of the Three-Year Housing Plan (See LU P7(1)), and the other criteria and standards of the implementation process.
- (e) Award Housing Allocations. Those projects determined eligible to receive allocations will proceed with the normal subdivision, site plan, design review, and other necessary approval processes.
- (f) Exempt Projects. Projects that are exempt from either the competitive process or the growth range are subject to the normal subdivision, site plan, design review, and other necessary approval processes.

# SCHOOL SERVICE



## Introduction

This Chapter is based on information from the Livermore Valley Joint Unified School District (District) in Winter 2017. As this report goes to print, the District is financially stable with a 3 percent reserve for economic uncertainty. The well-educated, increasingly diverse Livermore community supports and expects strong academic and extracurricular programs that provide a well-rounded education for each student. The Livermore community shows its trust in the work of the District through its ongoing support of a parcel tax and its recent support of Measure J, a facilities bond measure passed in June 2016. The Board of Education is very proud of the comprehensive educational program it provides for the children of Livermore.

## Overview

Livermore schools have a history that is rich in the traditions of academic excellence, and look forward to a bright future. Embracing the challenge of preparing students for success, the District's mission promises: Each student will graduate with the skills needed to contribute and thrive in a changing world. With this guiding principle, District educators offer innovative approaches to meeting the diverse needs of the entire student population. Implementation of California State Standards includes hands-on learning opportunities that collaboratively engage students in creative problem-solving. Students are supported as they develop critical thinking, resilience, and cultural competence.

Sources of great pride include:

- A high quality instructional program and staff
- A high level of involvement and support by parents/guardians and community members
- Robust partnerships with community businesses and organizations
- Partnerships with the Tri-Valley Regional Occupation Program (TVROP) and Las Positas Community College, that provide high school students with internship and college credit opportunities

- Focus on Science, Technology, Engineering, and Math (STEM) education at elementary, middle, and high school levels, enhanced by curriculum developed by Project Lead the Way (PLTW)
- Technology integrated into curriculum, instruction, and assessment, preparing students for digital literacy and 21<sup>st</sup> century careers
- International Baccalaureate Programmes that span primary, middle and high school years, offering the Class of 2018 students the first LVJUSD IB Diploma
- Vibrant arts education that includes music, theater, and visual arts
- Focus on health and wellness that includes opportunities for competitive athletics in 24 California Interscholastic Federation (CIF) sports
- A 125-year tradition of agricultural education that merges with 21<sup>st</sup> century hands-on learning
- A cooperative, problem-solving relationship with employee groups
- A participatory site-level decision making process
- A strong School Board that is supportive of staff
- A financially-sound budget

The District encompasses a 240-square mile area, including the City and surrounding vicinity. The District maintains the public Transitional Kindergarten (TK)-12 schools in Livermore. In 2016/2017, the District encompassed nine elementary schools serving students from TK through fifth grade, three middle schools serving students from sixth to eighth grade, two TK-8 schools, two comprehensive high schools serving students in grades nine through twelve, and three alternative schools. Table 2.1 lists these schools with 2016/2017 school year data for enrollment.

**Table 2.1: Livermore Valley Joint Unified School District Schools**

School	Location	2016/2017 Enrollment
Altamont Creek Elementary	6500 Garaventa Ranch Road	565
Arroyo Seco Elementary	5280 Irene Way	668
Croce Elementary	5650 Scenic Avenue	603
Jackson Elementary	554 Jackson Avenue	531
Marylin Avenue Elementary	800 Marylin Avenue	400
Joe Michell K-8 School	1001 Elaine Avenue	749
Rancho Las Positas Elementary	401 East Jack London Blvd	569
Emma C. Smith Elementary	391 Ontario Drive	769
Sunset Elementary	1040 Florence Road	794
Christensen Middle School	5757 Haggin Oaks Avenue	681
East Middle School	3951 East Avenue	644
Junction Avenue K-8 School	298 Junction Avenue	856
Mendenhall Middle School	1701 El Padro Drive	976
Granada High School	400 Wall Street	2141

School	Location	2016/2017 Enrollment
Livermore High School	600 Maple Street	1810
Vineyard Alternative 1-12 School	1401 Almond Avenue	134
Del Valle Continuation High School	2253 Fifth Street	118

The current total school capacity within the District is 15,500 students as follows: TK-5, 7,600 students; 6-8, 3,400 students; and 9-12, 4,500 students. According to District demographic reports (January 2017), the peak over the next 10 years will be 14,709 students. The District’s Facilities Master Plan (Master Plan) focuses on building improvements and facility capacity expansions required to accommodate any approved but unbuilt housing units and future development(s) within the 2003 to 2025 General Plan. The District continues to update its Master Plan using current and additional capacity needs, enrollment projections, and projected program needs.

Currently, the limits per developer fee are set at \$3.20 per square foot for residential development and \$0.51 per square foot for commercial and industrial development. The District recognizes the need for additional funding beyond the existing statutory developer fee to provide new facilities similar to those currently within the City. The District has gained community support through the passage of a general facilities bond, in June 2016. In addition, the Board of Education has entered into a sales agreement for one surplus property.

The District recommends that those who seek additional information about the Livermore Valley Joint Unified School District visit the District’s website at [www.livermoreschools.com](http://www.livermoreschools.com).

## School Facility Funding

The District has four major potential funding sources to address long-term facility needs: new residential development fee revenues, commercial-industrial development fee revenues, General Obligation Bond proceeds, and State grant funding.

Since Proposition 13<sup>1</sup>, local school districts have been required to rely on the State School Building Program for new facilities. Under this program, the State will reimburse the District for 50 percent of the cost of new eligible facilities. However, the District has to fund the entire cost of each project from local sources prior to reimbursement. In addition, State funding is very competitive because there are always far more projects approved for funding than there are dollars in the form of bonds approved by the voters, making the State Building Program an unpredictable and unreliable source of funds for school construction in the near future.

In 1977, the Legislature took its first major step towards a statewide solution to the school financing problem by enacting The School Facilities Act. This legislation authorized cities and counties to enact development fees for temporary school facilities. However,

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<sup>1</sup> Proposition 13, approved by the voters in 1978, rolled back property tax value to 1976 assessed value level and limited property tax increases to no more than 2% per year as long as the property is not sold. Once sold, the property is reassessed at 1% of the sale price and the 2% yearly cap becomes applicable to future years.

subsequent to the adoption of The School Facilities Act, there was uncertainty as to whether the Act preempted cities and counties from imposing fees for the construction of permanent school facilities. In 1985, the California Supreme Court clarified this issue in *Candid Enterprises, Inc., v. Grossmont Union High School District* (1985) 39 Cal.3d 878, holding that the Act did not preempt local governments from adopting other financing mechanisms for both temporary and permanent facilities.

In 1986, the Legislature responded to *Candid Enterprises, Inc., v. Grossmont Union High School District* by enacting a wide-ranging statutory scheme (collectively the “1986 legislation”) with the express intent of occupying and preempting the field of school impact mitigation, including impact fees and environmental impact mitigation. The 1986 legislation authorized the governing board of any school district to levy a State-established fee against development projects for the purpose of funding the construction or reconstruction of school facilities. This fee was intended to be in addition to the City-imposed fee for temporary school facilities authorized by the School Facilities Act. The 1986 legislation limits both City and District-imposed fees, which the State Allocation Board adjusts for inflation every two years.

In 1999 the citizens of Livermore approved Measure L, which provided \$110 million over a 10-year period for renovation of existing facilities. However, funding available for planned projects were affected by an increase in construction costs of 30 percent over the past seven years. This limited the scope of what could be accomplished with the original \$110 million.

In June 2016 the citizens of Livermore approved Measure J, which will provide \$245 million for renovation of existing and construction of some new facilities. The determined need exceeds the funding available through the bond, so while the District will see improvement in facilities, there will still be a need for continued renovation and construction beyond the life of the current bond measure.

The District recommends that those interested in the issues related to the construction and operation of public schools in Livermore inform themselves on the complex manner in which the State of California provides funds for its public schools. The District also recommends that the City continues to support the District’s efforts to maintain local sources of operational funds, including the parcel tax and facilities bond, that are independent of the politics associated with the State Budget.

## **Enrollment**

The District anticipates enrollment growth from two primary sources: increases in residential development and increases in numbers of children in existing homes. A study of student yield factors (January 2017) found that, on average, each new single-family home in the District generates 0.44 students and every multi-family unit generates 0.49 students, grades K-12. The District is prepared to accommodate this future growth.

## **Additional Facilities**

The District will meet the demand of additional students from the existing housing stock, previous Housing Implementation Program (HIP) allocations, and new HIP allocations, for the next ten year period at the elementary level, ten year period at the middle school level, and the current school year at the high school level. To provide additional capacity at the high school level, two new state of the art science centers were constructed at Granada High School and Livermore High School.

The District's passage of Measure J will provide additional funding for renovation and expansion. The Board of Trustees is currently in the process of prioritizing the facilities needs that will be met through Measure J funds. In addition to development mitigation fees requires under AB 2926, the District will require additional mitigation to meet the school facilities needs resulting from future HIP allocations through 2025.

## **Facilities Cost**

Facility cost per housing unit is captured based on permanent facilities and interim facilities. Interim facilities are typically portable buildings used to house students generated from new homes on a temporary basis. Interim facilities are located at an existing school site until there are sufficient numbers of students to warrant the construction of a new school or until such time as the new school can be built.

The cost of constructing new school facilities is broken down into several components and is described more fully in the 2012 Developer Fee Justification Study (Livermore Valley Joint Unified School District).

## **Charter Schools**

Independent of the District, the Tri-Valley Learning Corporation operates two public schools in Livermore, Livermore Valley Charter School (LVCS) and Livermore Valley Charter Preparatory High School (LVCP). The LVCS campus is located at North Canyons Parkway and Constitution Drive and offers elementary and middle school education. LVCS's current enrollment is approximately 290 K-8 grade students. The LVCP campus is located at 3090 Independence Avenue with approximately 275 9-12 grade students.

## **Las Positas College**

Las Positas College (LPC) began as an extension center to Chabot College in 1963, with an enrollment of 810 students, offering classes in various locations in the Livermore Valley. In 1975 the campus began operation at its current location and construction of various classrooms buildings have continued over the years. The campus is located on a 147-acre site and long-range plans include the build-out of the campus in the coming years. LPC offers a two-year curriculum for students seeking career preparation, transfer to a four-year college or university, job retraining, or personal enrichment. LPC primarily serves students in the service area of Livermore, Dublin and Pleasanton. LPC also serves

a large number of students from nearby cities such as Tracy, San Ramon and Danville. LPC currently enrolls approximately 9,326 day and evening students. LPC has experienced an increase in enrollment over the last 10 years with students taking an increasing number of units each semester.

With the ever expanding and growing population in the Tri-Valley area, LPC provides opportunities for local residents to take advantage of the programs and classes offered. Sustaining growth by offering a curriculum to meet the ever changing business, industrial, public, and world environment permits the college to attract students well into the future. LPC provides valuable educational services not available elsewhere in the Tri-Valley area. With higher costs for attending four-year colleges and universities, local residents recognize the tremendous economic savings in completing the first two years of college courses at the community college level. LPC continues to have one of the highest transfer rates in the State.

LPC developed an Educational Master Plan (EMP) to guide its development from 2003 through 2010. In March 2004, the community showed its support of the development by passing a bond that allowed LPC to build out the campus. LPC opened its first physical education complex in Fall 2005 and a multi-disciplinary classroom building in Spring 2007. In addition, a Performing Arts Complex, Child Development Center, Aquatics Center and a new Student Services and Administration Building were constructed.

The current EMP (2015-2020) articulates a strategy to support and expand student access and learning outcomes. The EMP directly influences both the instructional curriculum and student services programs, which in turn shape the organizational structure and staff needs, and ultimately dictate the physical environment and classroom buildings.

The Chabot-Las Positas Community College District (CLPCCD) developed the 2015-2020 Districtwide Strategic Plan (Strategic Plan), the 2012 Facilities Plan, and the 2007 Information Technology (IT) Master Plan. The Strategic Plan provides a framework for achieving the CLPCCD's vision and mission and support for CLPCCD's educational goals. The Strategic Plan provides clear operational direction and guidance on how the CLPCCD can support LPC's work. The 2012 Facilities Plan provides an inventory and assessment for all CLPCCD facilities and develops a vision and set of goals for the next ten to twenty years. The IT Master Plan, adopted in 2007 with annual updates through 2014, includes a detailed description of the technology needed to support LPC's needs and focuses on improvements to the IT decision-making processes and support for on-going IT infrastructure capacity.

## **Conclusions**

The primary source of funding for capital improvements to serve new students in the District are developer fees. Funds from new homes built in Livermore are earmarked for the schools impacted by those new developments. Additionally, in July of 2016, over 66 percent of Livermore voters supported the passage of Measure J, a \$245 million General Obligation Bond for school facilities. The first of three sets of bonds has been sold, providing the initial revenue stream to begin renovation and new construction needed at sites throughout the District.

Equally important, consistent funding is required for the day-to-day operation of those newly constructed or renovated school facilities. Because more than 90 percent of the District's revenue comes from or through the State Budget, the financial difficulties of the State of California impact all public agencies, including public school districts.

Finally, there is the issue of equalization of funding provided by the State on a per student basis. The formulas used by the State were developed a number of years ago when Livermore was considered a "rural" district. While Livermore has not been a "rural community" for some time now, the dollars the State provides for the education of Livermore students is still based on that assumption. The State formula applied to neighboring Districts generates substantially more dollars per student than for LVJUSD. For example, if similar funding of neighboring districts were applied to Livermore, it would equate to over \$11 million more per year. This inequity in State funding is unfair to Livermore students and should be corrected over the next eight years with the State's adoption of the new Local Control Funding Formula (LCFF).

The School District can anticipate enrollment growth from two primary sources - residential development and increasing numbers of children in existing homes. A study of student yield factors (January 2017) found that, on average, each new single-family home in the District generates 0.44 students and each new multi-family unit generates 0.49 students, K-12.

The District is prepared to accommodate future growth.

# WATER SUPPLY AND STORMWATER MANAGEMENT



## Introduction

This chapter describes the agencies that supply and distribute water to the City of Livermore and provide and manage the potable water, stormwater drainage and flood protection infrastructure. These agencies work closely together to provide integrated water management. Our arroyos serve dual flood protection and water supply functions and are managed cohesively so as to complement each other. During major storms arroyos carry high flows out of the area to protect lives and property from flooding. At other times, these same arroyos replenish the groundwater basin with water purchased from the State Water Project. The recharging of the groundwater basin with surplus water in wet years provides a contingency water supply for use during droughts, summertime peak demands and emergencies and improves ground water quality. Lake Del Valle, built for water storage and flood protection purposes, is owned and operated by the State Department of Water Resources for water storage/ flood protection and operated by the East Bay Regional Park District for recreational purposes. Along these same lines, the sand and mining gravel pits, a significant resource located at the center of the Valley between Pleasanton and Livermore, are in the process of being reclaimed for water supply storage, groundwater recharge, water quality enhancements, and stormwater detention as an integrated use of the Chain of Lakes.

### ***City of Livermore Water Supply Sources***

Potable water and raw water for agricultural irrigation are provided to the City of Livermore from a variety of sources. Zone 7 Water Agency (Zone 7) is the water wholesaler for the entire valley. California Water Service Company (Cal Water) and Livermore Municipal Water (LMW) provide retail service. 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, central and southern portions of the City which covers approximately two-thirds of the City, while LMW serves the northwest, northeast, and east portions, which is approximately one-third of the City. These water sources are briefly described below.

## **Zone 7 Water Agency**

Zone 7 of the Alameda County Flood Control and Water Conservation District (also known as Zone 7 Water Agency or Zone 7) was created by Livermore-Amador Valley voters in 1957 to address the critical issues of water supply, water quality and flood

protection in the region. Zone 7 has a number of key roles including providing flood protection, supplying wholesale water using imported and local supplies, and managing the Livermore-Amador Valley Groundwater Basin as the Groundwater Sustainability Agency. In these roles Zone 7 works with the State Department of Water Resources to provide State Water Project water supplies to the region and to manage Lake Del Valle for water storage, flood control, and recreational uses. Zone 7 also works with the quarry owners and operators to reclaim the existing and future quarry pits creating the Chain of Lakes for groundwater recharge, water storage and flood control purposes.

Treated water is supplied to both LMW and Cal Water by Zone 7. Zone 7 serves a population of approximately 240,000 in a service area comprised of approximately 425 square miles in eastern Alameda County. Currently, Zone 7 serves the Livermore population of 85,312<sup>1</sup> and with ongoing collaborative conservation efforts with the City and other water service partners will have sufficient capacity to serve the projected build-out of approximately 101,091<sup>2</sup> residents. Zone 7 also supplies water to the cities of Pleasanton, Dublin, and a portion of San Ramon through an agreement with Dublin San Ramon Services District.

Figure 1 shows the approximate flood control and water service areas for the City.

<sup>1</sup> California Department of Finance, January 1, 2010

<sup>2</sup> Population projection analyzed in the *Livermore Draft General Plan and Downtown Specific Plan Environmental Impact Report*, City of Livermore, June 2003, p. 80, and subsequent amendment in 2007. Further changes in the General Plan and Downtown Specific Plan may change this number and Zone 7 will revise its projections accordingly

Figure 1: Flood Control and Water Service Areas

LSA

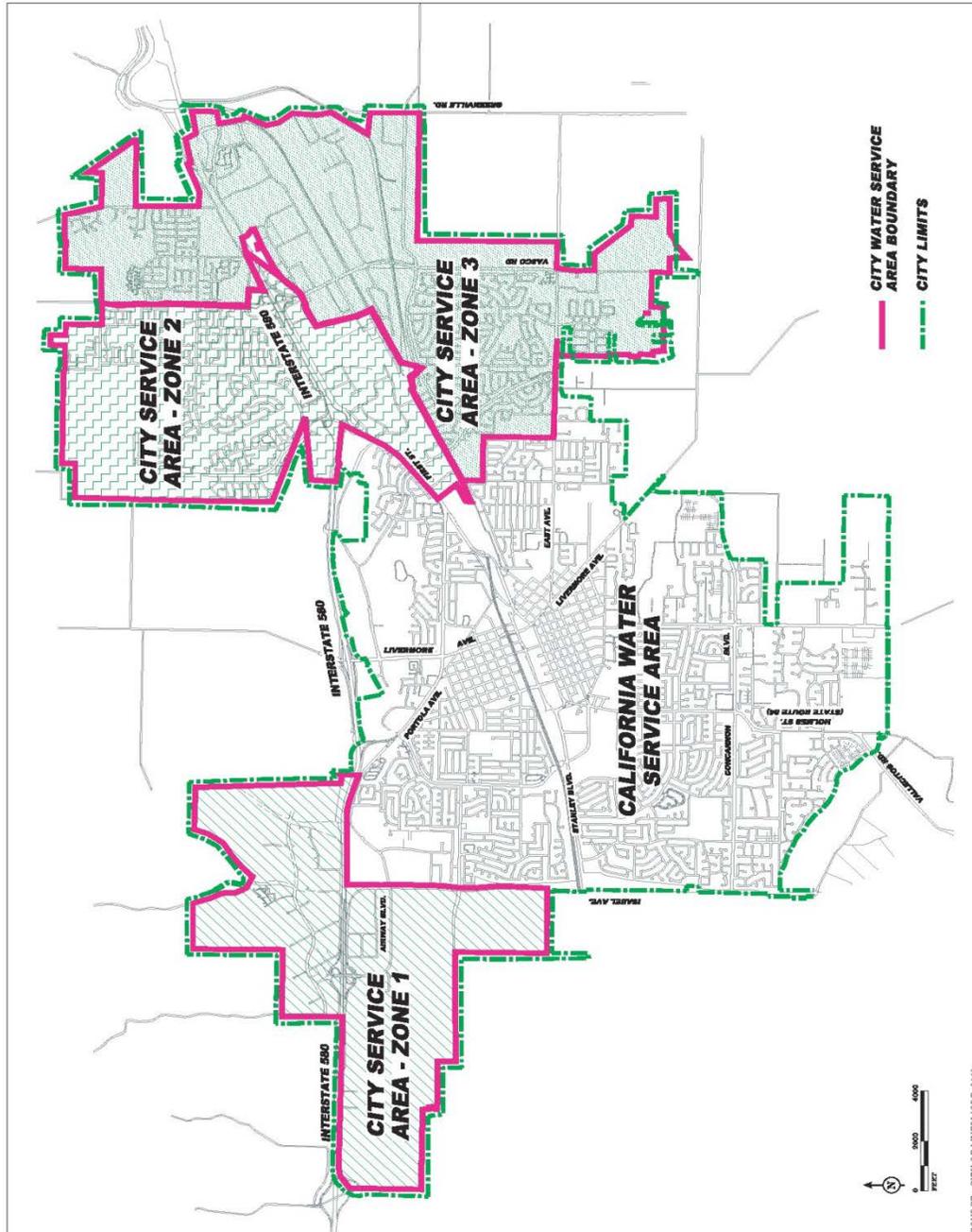


FIGURE 6-3  
Livermore General Plan Update  
Master Environmental Assessment  
Water Service Areas

SOURCE: CITY OF LIVERMORE, 2010.  
IMAGEGRAPHICS/SOCIETY115/LIVERMORE OF BERKSHIRE/NEW MEDIA FIGURES/FIG\_6-3\_A1 (06/21/09)

## **Zone 7 Water Agency - System Background**

As shown in Figure 2, Zone 7 provides water to the Valley from imported surface water. Approximately 80 percent of the water supplied by Zone 7 comes from the State Water Project (SWP). In the Livermore area, SWP facilities are comprised primarily of the South Bay Aqueduct (SBA), which began deliveries in 1962, and Lake Del Valle. The SBA also conveys water to the Alameda County Water District (ACWD) and the Santa Clara Valley Water District (SCVWD). Together, Zone 7, ACWD, and SCVWD are referred to as the SBA contractors. The balance of the Zone 7 service area supply is from local runoff collected in Lake Del Valle and a water transfer with the Byron Bethany Irrigation District (BBID); small amounts of water may also be available through the Yuba Accord and the Dry Year Transfer Program, both administered by the SWP. Excess water supplies are stored in the local groundwater basin, and in the Kern County groundwater banks (Semitropic Water Storage District and Cawelo Water District); stored water is recovered when needed to meet peak demands during the year (local groundwater only) and during dry years (local groundwater and Kern County banks).

Zone 7 operates the Del Valle and Patterson Pass Water Treatment Plants (WTPs). These plants treat water from the SWP and other surface water supplies before distribution throughout the Valley. The Del Valle WTP, located south of Livermore, has an average hydraulic capacity of 36 million gallons per day (MGD), but this capacity is occasionally limited by treatment challenges associated with poor source water quality. The Patterson Pass WTP, east of Livermore, had a nominal design capacity of 12 MGD until Zone 7 completed work on an ultrafiltration membrane pilot project in 2003 to increase the nominal capacity of the Patterson Pass WTP to 19 MGD. The ultrafiltration membranes will be replaced with conventional filters and Patterson Pass WTP's capacity will increase to 24 MGD in the next few years.

Zone 7 groundwater supplies come from the Livermore-Amador Valley Groundwater Basin, which is replenished by natural and artificial recharge. Zone 7, the City of Pleasanton, and Cal Water employ wells that draw groundwater to supplement the surface water supplies. Zone 7 currently has seven production wells that are located in Pleasanton, and three wells located near the Chain of Lakes. The peak total capacity of these production wells is approximately 42 MGD and the normal operating capacity of these wells is approximately 32 MGD. Valley groundwater receives little treatment because the basin is deep and the water is of good drinking water quality. However, Zone 7 does operate the Mocho Groundwater Demineralization Plant to remove salts from the groundwater basin and improve delivered water quality.

The Chain of Lakes, which will be completed after full reclamation of sand and gravel pits over the next few decades, is an important resource located central to the Tri-Valley directly over the main portions of the groundwater basin used for water supply. Zone 7 manages the Chain of Lakes, which will be used for flood control, water storage and groundwater recharge.

As a flood protection agency, approximately one-third of the creeks in the Livermore-Amador Valley are owned and maintained by Zone 7.

Figure 2: Zone 7 – Regional Water Map



## ***Livermore's Water Demands on Zone 7***

The following tables show the amount of water, in acre-feet<sup>1</sup>, provided to Livermore residents over the previous five years by both the LMW and Cal Water.

**Table 1: Zone 7 Treated Water to Livermore Municipal (in acre-ft)**

Year	Delivery Acre-feet
2012	6,598
2013	6,731
2014	5,064
2015	4,556
2016	4,818

**Table 2: Zone 7 Treated Water to California Water Service (in acre-ft)**

Year	Delivery Acre-feet
2012	7,538
2013	8,752
2014	5,405
2015	4,545
2016	5,134

**Table 3: California Water Service Groundwater Pumpage (in acre-ft)**

Year	Groundwater Pumped, acre-feet
2012	3,069
2013	2,667
2014	2,821
2015	2,360
2016	2,424

Tables 1 through 3 indicate that most of the water delivered to Livermore residents is treated surface water. The total water delivered by Zone 7 to the LMW and Cal Water combined in 2016 (Tables 1 and 2) was approximately 10,000 acre-feet. Note that demands were lower in 2014-2016 because of the drought.

Zone 7 also supplies untreated water to agricultural users and golf courses in Livermore, through deliveries from the SBA. In 2016, the demand for these uses was approximately 5,000 acre-feet. The City of Livermore anticipates the potential for continued increased demand in agricultural production in the South Livermore Valley over the next 20 years.

<sup>1</sup> An acre-foot is approximately 326,000 gallons, or the amount of water needed to supply the indoor and outdoor needs of two families for a year.

## ***Zone 7 Future Water Demands***

In the recent past, Zone 7 completed a number of planning documents that evaluated future treated and untreated water demands and recommended projects to meet Zone 7's long-term water supply needs, along with recommended improvements to raw water conveyance and treated water transmission needs.

Zone 7 evaluated their future treated water demands for Municipal and Industrial (M&I) customers based on build-out demand projections provided by the Zone 7 retailers (General Plans, and/or Urban Water Management Plans). The current estimated long-term treated water demands for M&I uses is estimated to be 47,900 acre-feet per year by the year 2035. Zone 7's current Capital Improvement Program includes a number of capital improvement projects that are necessary to meet the projected build-out treated water demands. These projects include additional water supplies, additional surface water treatment plant capacity, additional groundwater production wells, transmission system improvements, and storage in the Chain of Lakes.

## ***Zone 7 Raw Water Supplies***

Zone 7 has developed a robust water supply system consisting of imported surface water, local runoff, groundwater recharge activities, and non-local storage. This diverse water supply system allows Zone 7 to store excess water during normal and wet years, and draw on these reserves during dry years to create a sustainable and reliable water supply for the Livermore-Amador Valley.

Each year Zone 7 receives water from its contracts with the Department of Water Resources (DWR) for importing State Water Project (SWP) water, its water right permit for diversions from Arroyo del Valle, its contract with Byron Bethany Irrigation District (BBID), and its contract with DWR for Yuba Accord Water. The exact quantity of water supply available through these contracts is uncertain at the beginning of the year because the yield depends on many factors, including both local precipitation and snowfall in the Sierra Nevada mountain range.

Table 4 presents a summary of Zone 7's projected water supplies available during a normal hydrologic water year as presented in Zone 7's 2015 Urban Water Management Plan. Under dry, drought, or emergency conditions, the percentage distribution of sources used by Zone 7 to meet demands may shift. It is assumed that new supplies (e.g., desalination and/or potable reuse) would provide approximately 10,000 acre-feet (AF) per year by 2025 in addition to 8,000 AF per year from the California WaterFix by 2030.

**Table 4. Summary of Zone 7's Projected Normal Year Water Supplies (AF)**

<b>Water Supply</b>	<b>Detail</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Purchased or Imported Water	State Water Project	50,000	50,000	50,000	50,000
Purchased or Imported Water	Yuba Accord	145	145	N/A	N/A
Purchased or Imported Water	Byron Bethany Irrigation District	2,000	2,000	2,000	2,000
Surface Water	Arroyo Valle	7,300	7,300	10,300	10,300
Purchased or Imported Water	California WaterFix	N/A	N/A	8,000	8,000
Other New Water Supplies	May include desalination and/or potable reuse	N/A	10,000	10,000	10,000
Supply from Storage	Groundwater	9,200	9,200	9,200	9,200
Supply from Storage	State Water Project Carryover	10,000	10,000	10,000	10,000
	<b>Total</b>	<b>78,645</b>	<b>88,645</b>	<b>99,500</b>	<b>99,500</b>

Additional detail on Zone 7's water supplies is available in the 2016 Annual Sustainability Report and the 2015 Urban Water Management Plan; both are available on Zone 7's website at [www.zone7water.com](http://www.zone7water.com).

### ***Delta Impacts on Water Supplies***

Livermore Municipal Water relies on Zone 7 for 100 percent of the water it sells to its customers while California Water Service Company relies on Zone 7 for about 60 to 70 percent of the water it sells to its customers. Much of the treated surface water delivered to the eastern parts of Livermore is from the Zone 7 Patterson Pass Water Treatment Plant. All of the raw water treated at the Patterson Pass plant is Delta water from the State Water Project. Zone 7 receives State Water Project water via the South Bay Aqueduct. Water from the Delta is pumped into the South Bay Aqueduct by pumps operated by the State Department of Water Resources at its Harvey O. Banks Pumping Station.

Since late 2006, there has been increasing attention placed on the decline in numbers of endangered Delta smelt, with part of the blame placed on the pumps in the Harvey O. Banks Pumping Station. Fishing and environmental groups have alleged that alarming numbers of juvenile smelt are being entrained and killed as water is sucked into the Harvey O. Banks pumps. In June 2007, the State Department of Water Resources temporarily altered the operation of the pumps while smelt migrated to cooler western Delta waters. Except to maintain health and safety, the pumps were shut down for several weeks to prevent any further "take" of the threatened Delta smelt. This resulted in a substantial decrease in water available to Zone 7's Patterson Pass Water Treatment Plant, and therefore, a decrease in the amount of treated surface water available to Livermore. While the California Water Service Company owns wells

from which it can pump groundwater to supplement a loss in the treated surface water supply, Livermore Municipal Water does not have an alternate water supply to meet its customers' needs.

Zone 7 uses groundwater from the local Livermore-Amador Valley Groundwater Basin to make up for reductions in surface water supplies. For example, when the Harvey O. Banks pumps were shut down in June 2007, Zone 7 increased pumping of groundwater to meet water demands.

In late August 2007, a federal court ruling reduced water deliveries from the Delta up to 30 percent for a year while state and federal agencies complete a long-term plan to protect endangered Delta smelt. In an average rainfall year, this translates to a cut to Zone 7's water supply of about 4 billion gallons, equivalent to the water supply to about 24,000 households for one year. In a dry year, the cuts would be between 6.5 and 9 billion gallons, equivalent to the water supply to between 40,000 and 56,000 households for one year. The 2011 State Water Project Final Delivery Reliability Report, issued in June 2012, estimates that the long-term reliability of Zone 7's Table A water is 60 percent, which reduced Zone 7's expected water supplies by 12,900 acre-feet. Zone 7 has indicated that it will rely on local reserve supplies stored in the Livermore Amador Groundwater Basin and system improvements brought about by the Altamont Pipeline project completion of a new reach in Livermore to help offset short-term cutbacks in State Water Project supplies. However, reserve supplies are not a long-term solution as water that is used from these supplies would need to be replaced; Zone 7 uses SWP water to recharge the groundwater basin.

Thus far, Zone 7 and the Tri-Valley's four water retailers, including Livermore Municipal Water and California Water Service Company, are collaborating on valley-wide water conservation to support the Water Conservation Act of 2009 (i.e., SBX 7-7).

On December 16, 2010, a federal judge struck down the biological opinion of the U.S. Fish and Wildlife Service that restricted water delivery to the area. Despite this favorable ruling for California water supplies, legal battles over water exports from the Delta are likely to continue. The impact of litigation surrounding the endangered Delta smelt is just one piece of the State Water Project/Delta water supply puzzle. Additional litigation, such as lawsuits brought alleging Delta water exports' adverse impacts to salmon and steelhead, also have the potential to affect the amount of water available from the State Water Project.

## ***Drought***

Due to the ongoing Delta water supply issues and the recent drought, long-term water supply is a potential growth-limiting factor; however, the City currently does have the capacity to achieve General Plan buildout. This determination is based on the City having a Water Efficient Landscape Ordinance in place for several years and which will apply to all new residential development; making reclaimed water available for landscape irrigation in much of the west end of the City including the Las Positas Golf Course; and working with our partner agencies in establishing appropriate conservation measures.

## ***Zone 7 Master Plans***

In 2011, Zone 7 completed the Water Supply Evaluation that employed risk-based analysis to evaluate its long-term water supply conditions, providing key data input for Zone 7's 2010 Urban Water Management Plan (UWMP) and other agency planning efforts. This report was updated in 2016 (Water Supply Evaluation Update) to document Zone 7's most current water supplies based on new information and experience gained over the recent drought. The update served as the foundation for Zone 7's 2015 Urban Water Management Plan.

In 2006, Zone 7 adopted the Bay Area Integrated Regional Water Management Plan, which addresses the regional water supply, flood control and groundwater management needs of the region. This and all Integrated Regional Water Management Plans are now part of the State Water Plan. Funding is available from the State and distributed to the regions through the Integrated Regional Water Management Programs.

Focused on flood management, the 2006 Stream Management Master Plan (SMMP) identifies multi-objective projects needed within the upper Alameda Creek Watershed in Livermore and throughout the Tri-Valley. Identifying SMMP multi-objective projects that can meet regional goals requires new and innovative collaboration between multiple agencies to meet the multiple objectives necessary to compete for and receive funding for integrated water management. An update to the SMMP will be completed by Zone 7 in 2017.

Zone 7 typically updates its Ten-Year Water and Five-Year Flood Capital Improvement Program (CIP) every two years; the most recent comprehensive CIP update was completed in October 2014 (Fiscal Year 2015/16 Capital Improvement Program: Ten-Year Water System Plan and Five-Year Flood Protection Plan [FY 15/16 CIP]), and Zone 7 is currently working on its next update. The purpose of this document is to present to the Zone 7 Board of Directors, its employees and the public the cost, schedule, and priorities of its capital improvement program for both its water and flood control systems. Findings from recently completed planning documents such as the Water Supply Evaluation Update, 2015 Urban Water Management Plan, and the forthcoming SMMP Update will be incorporated into the CIP update.

## ***Zone 7 Near-Term Improvements and Expansion Projects***

Zone 7 has several planned capital improvement projects, which will renew, replace, improve, or expand Zone 7's existing flood protection and water supply system. These projects are driven by Zone 7's Mission Statement and by Zone 7's Board-approved policies. According to their mission statement Zone 7 Water Agency is committed to providing a reliable supply of high quality water and an effective flood control system to the Livermore-Amador Valley. To fulfill their present and future commitments to the community, they plan to develop and manage the water resources in a fiscally responsible, innovative, proactive, and environmentally sensitive way.

### ***Water System Improvements and Expansion Projects***

Zone 7 will be making major improvements to the water treatment plants in the next few years. Ultrafiltration membranes at Patterson Pass WTP will be replaced with

conventional filters, expanding plant capacity to 24 MGD. A new clearwell at Patterson Pass WTP will provide additional storage and reliability, and ozonation facilities will be added to improve plant reliability and delivered water quality. Ozonation facilities will also be added to the Del Valle WTP, and filters will be rehabilitated.

Zone 7 is also pursuing a number of projects in parallel to secure long-term water supply reliability for the Tri-Valley. These projects include the California WaterFix and other water supply and storage options. A number of such projects are in the conceptual or early planning stages, and decisions on which options to pursue for implementation will be made at a later time; these include Los Vaqueros Reservoir Expansion, Sites Reservoir, Potable Reuse, Lake Del Valle Storage Expansion, and the Bay Area Regional Desalination Project. The Reliability Intertie, which will facilitate the conveyance of new supplies during normal and emergency/drought conditions, has been included in Zone 7's CIP. Zone 7 also continues to invest in the Chain of Lakes and new wells, which play a critical role in long-term supply reliability.

### ***Flood Control System Improvements and Expansion Projects***

Zone 7 plans and designs flood protection and stormwater drainage facilities that enhance the management and control of stormwater runoff and drainage in the Livermore-Amador Valley. The agency conducts capital improvement activities that protect life and property from damage caused by stormwater runoff and drainage generated during large rainfall events. Zone 7's capital improvements include renewal/replacement and repair of existing facilities to maintain the integrity of the existing flood protection system, system-wide improvements that integrate local stormwater channels into one regional flood protection system, and developing capital projects to accommodate new impervious surface areas caused by new development. In the FY 15/16 CIP, Zone 7 projected \$56 million in capital expenditures over the next five years to support these programs; this estimate will be updated in the forthcoming CIP update.

In the CIP for Fiscal Year 2015-16, Zone 7 staff identified nine key maintenance and flood protection Capital Improvement Projects to be conducted over the next five years:

1. El Charro Phase 2: construct remaining elements not completed in an earlier phase store floodwaters in the Chain of Lakes to provide 100-year flood protection for the Livermore-Amador Valley.
2. Renewal/Replacement Activities: rehabilitating maintenance roads, removing excess sediment, installing and repairing fences, landscaping and hydroseeding channel embankments, and fixing slope failures along 37 miles of engineered channels owned by Zone 7.
3. Arroyo Mocho Floodplain and Riparian Forest: create a natural floodplain along Arroyo Mocho that will provide flood control benefits as well as promote a more natural hydrograph that mimics historical conditions.
4. Arroyo Las Positas Treatment Wetland: create a new floodplain to reduce flooding downstream, as well as provide riparian habitat and sediment management opportunities.
5. Chain of Lakes Facilities – Flood: fencing, access roads, slope re-grading, and landscaping to allow Zone 7 to use Lake H and Cope Lake for water management after dedication.

6. Slope Stability Study: provide comprehensive slope stability analysis necessary to properly protect Zone 7's existing earthen channels in a cost effective manner.
7. Stream Management Master Plan Update: incorporate newly developed area-wide models and innovate flood protection techniques.
8. Living Arroyos Program: engage the local community and improve the suburban streams and streamside habitats of the Livermore-Amador Valley.
9. Flood Warning System Development and Implementation: develop and implement an early flood warning system to enhance Zone 7's ability to protect the health and safety of the Livermore-Amador Valley during a 100-year storm event.

These projects will be updated in Zone 7's forthcoming CIP update.

### ***Zone 7 Water Quality***

Monitoring and maintaining water quality in the Livermore-Amador Valley is a round-the-clock job at Zone 7 and has been since 1962. As new and more stringent regulations are approved, Zone 7 must make the appropriate adjustments in and the necessary improvements to their treatment facilities in order to meet these regulations. This response in turn affects the ratepayers. To be proactive, Zone 7 adopted a water quality policy that also calls for improving the aesthetic quality of its water, such as taste and odor, by implementing several projects. For example, Zone 7 completed its first wellhead demineralization plant in 2009 that lowers the hardness of potable water delivered to Zone 7's customers by blending demineralized water with existing groundwater supplies. As noted above, Zone 7 also plans to install ozonation facilities at its two water treatment plants, making these plants better able to maintain their treatment capacities under a wider range of raw water quality conditions.

### ***Zone 7 Source Water Assessment***

Zone 7 has extensive groundwater monitoring and management programs to ensure that its local groundwater basin remains a potable and uncontaminated water source. Zone 7 has completed source water assessment on all active drinking water wells in accordance with the requirements of the California Department of Public Health (now the Division of Drinking Water). In addition, Zone 7 has participated with other State Water Project contractors in conducting sanitary surveys of its local and imported surface water sources. The latest sanitary survey for the Delta and the State Water Project was published in June 2012 (California State Water Project Watershed Sanitary Survey 2011 Update), and the next one is expected to be completed in mid-2017.

## **California Water Service Company**

California Water Service Company (CWS), Livermore District, was established in 1927 with the purchase of the water system from Pacific Gas and Electric Company. The CWS Livermore District service area is approximately 7,400 acres (about 11.5 square miles) and is bounded by the service area of LMW on the northwest and northeast, and to the southwest by the City of Pleasanton. The service area encompasses approximately 60 percent of the area incorporated in the City of Livermore. The Cal Water Livermore District provides retail water service to that portion of the City of Livermore not served by the LMW.

The CWS Livermore District's water system currently serves approximately 17,900 customers (service connections). CWS also serves 25 customer connections under contract with the Crane Ridge Mutual Water Company. A total of sixteen Cal Water employees operate the Livermore system.

The CWS Livermore District currently obtains its water supply from two sources: treated water supplies from Zone 7 Water Agency (Zone 7) and local groundwater pumped from Cal Water District wells. Supply sources include 12 wells and nine Zone 7 turnouts.

Cal Water has 24 stations located throughout the Livermore District distribution system. CWS has 23 water tanks, totaling 10.9 MG and seven hydro-pneumatic tanks, provide peak demand and fire flow storage. The system is divided into seven pressure zones.

There are approximately 207 miles of pipeline in the CWS Livermore Districts service area. Pipelines in Cal Water's distribution system range from 1 to 16 inches in diameter.

In 2015, water supply to the Cal Water service area 6,824 AF. Approximately 70 percent of the water supplied by Cal Water came from Zone 7 surface water, while the remaining 30 percent comes from wells that Cal Water owns and operates. Fire flow availability and system design are based on consumer demand, as well as the Livermore Pleasanton Fire Department's requirements.

Cal Water proactively maintains and upgrades its facilities to ensure a reliable, high quality supply of drinking water. Some of the most recent system upgrades include new water main installations, pump station upgrades, installation of emergency generators at critical facilities and the installation of Chloramine treatment facilities at several groundwater wells.

Cal Water does not anticipate any growth limiting factors that would preclude continued residential growth at this time.

## **City and County of San Francisco's Hetch Hetchy Water Supply System**

The Lawrence Livermore National Laboratory and Sandia Laboratory are served directly from the Hetch Hetchy Water Supply System. It is anticipated that the Lawrence Livermore National Laboratory and the Sandia Laboratory will continue to be served by the Hetch Hetchy system. LMW has four emergency connections with Lawrence Livermore National Laboratory. The Laboratory also has a supply connection with Zone 7 that is used when the Hetch Hetchy System is down for maintenance.

## **Livermore Municipal Water Distribution System**

Livermore Municipal Water (LMW) is the water retailer in the northwest, northeast, and east portions of the City and was established in 1962. LMW's service area encompasses approximately 40 percent of the incorporated area of the City of Livermore and provides service to the portion of the City not in the Cal Water area. LMW receives its water from Zone 7 through nine permanent turn-outs. The turn-outs are located off Zone 7's Cross Valley Pipeline, which traverses the City from east to west. As of 2013, the Livermore Municipal Water system contains five pump stations,

four reservoirs with a total 13 million gallons of storage capacity, 156 miles of pipelines, and provides service to more than 32,000 customers through 9,982 service connections.

As shown in Figure 1, the LMW water distribution system is divided into three pressure zones. LMW serves the more recently developed portions of the City. A large percentage of today's infrastructure has been installed since 1970. The average age of the total water infrastructure is around twenty years old compared to an average service life of fifty or more years. The water infrastructure is generally in very good condition.

The Livermore Municipal Water utility is self-supporting through enterprise funds. User fees are structured to provide revenue to meet operating and renewal/replacement budget needs. Water user rate studies are updated on an as needed basis to ensure revenues continue to meet budget needs. User fee revenue requirements include an annual allotment for maintenance activities, replacement reserves, and operating reserves. Capacity improvements are funded by Water Connection fees charged to new development.

Livermore's Community Development Department Engineering Division completed the hydraulic evaluation of the water distribution system based on build-out land uses approved in the 2003 to 2025 General Plan. The Water Master Plan was updated in 2004 based on the estimated General Plan build-out demand. The City's Water Connection Fee Study and Capital Improvement Plan have also been updated to provide a funding source for \$22.4 million worth of capacity improvements.

The City completed construction in 2008 of a new 3 million gallon storage reservoir, and connecting pipelines for the pressure zone (Zone 1) on the northwest side of the City. This reservoir will provide emergency and fire storage for the Triad Business Park and Las Positas College area north of I-580; the Livermore Airport area and Oaks Business Park south of I-580; and the El Charro (Outlet Center) area to the west.

The major improvements identified in City's updated 2010 Water Connection Fee Study include an additional 12.5 million gallons of reservoir storage on the eastern side of the City as demand increases due to new development. Existing pipelines are sized adequately for future demands with the exception of pipelines near Southfront Road and Vasco Road that need to be replaced and upsized to supply required residual pressures. With the completion of the Airway Pump Station in 2007 and subsequent improvements to the Altamont Pump Station, the existing pumping capacity is adequately sized for ultimate demands.

### ***Water Recycling Facilities***

Livermore Municipal Water also delivers high quality recycled water for irrigation and fire protection to various customers including the Las Positas Golf Course, Las Positas Junior College, and commercial and office business customers in the northwest and western portion of the City. The City is continuing to seek new methods to utilize recycled water and conserve potable water. The Oaks Business Park Development, west of Isabel, was the first development to use recycled water for urinal and toilet flushing. Las Positas College is using recycled water for urinal and toilet flushing next to the new swimming pool complex and their Performing Arts Facility which was completed in 2012.

Recycled water has been produced at the Livermore Water Reclamation Plant for over forty years. Treatment facilities include recently rehabilitated and updated effluent filters and the ultra-violet disinfection system. The recycled water system contains over 23 miles of pipelines, a pump station, and two reservoirs with a total capacity of 3.768 million gallons.

A Recycled Water Master Plan was completed in 2004, which identifies improvements that will be necessary to supply recycled water for ultimate General Plan land uses within the recycled water area. Overall, the existing system is sized well for ultimate build-out. Future improvements include a wastewater irrigation incentive program that provides funding for the development of recycled water or other untreated sources of irrigation water for vineyard and other cultivated agriculture.

The major project identified in the 2004 Recycled Water Master Plan, filter and pumping improvements at the Water Reclamation Plant and construction of a new 1.88 million gallon storage reservoir, was completed in 2009. With the completion of the infrastructure for the new Outlet Center, recycled water is now being sold to the City of Pleasanton for outdoor irrigation projects.

## **City of Livermore Flood Protection and Stormwater Management System**

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

### ***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 overlies the northern portion of the Alameda Creek watershed, which includes three major tributary arroyos: 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.

## ***Regional Flood Protection***

The Zone 7 Water Agency is responsible for regional flood protection for 427 square miles of eastern Alameda County, and currently owns and maintains approximately 37-miles of natural streams and flood control channels, plus potential use of former quarries within the Chain of Lakes area. Zone 7 owns and maintains approximately one-third of the creeks in the Livermore-Amador Valley. This includes portions of the 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. Many of these creeks were obtained by Zone 7 through Special Drainage Area agreements. These agreements provided for the transfer of ownership of creeks and engineered channels after they were improved to Zone 7 standards. Responsibility for maintaining unimproved arroyos to the centerline of the arroyo falls to the underlying property owner. The City of Livermore owns and maintains approximately one-third of the channels and arroyos within the City boundaries. The remaining one-third of the creeks are owned by other agencies, districts and private owners.

Of the City-owned creeks, approximately one third are improved concrete-lined or engineered earth channels with little or no vegetation. The remaining City-owned creeks are natural arroyos with shallow banks and dense vegetation or are incised, sparsely vegetated with steep banks.

Zone 7's Development Impact Fee (DIF) Program, which is funded by developer fees, provides a portion of the revenue necessary for improvements to the existing system to accommodate growth. Zone 7 flood control maintenance activities include both routine maintenance and emergency repairs. Funding for flood control maintenance comes from local property taxes.

The City of Livermore is the local land use authority responsible for Floodplain Management within the City of Livermore. The City regulates development in the floodplain through zoning restrictions, requiring residential and commercial structures to be raised or constructed on engineered fill, and map revisions filed with the Federal Emergency Management Agency (FEMA). Commercial Structures are allowed to be flood proofed with the proper certifications and ongoing operation and maintenance requirements. The City adopted floodplain regulations in accordance with the National Flood Insurance Program (NFIP) and began administering the floodplain regulations in accordance with this program on December 1, 1972 when Livermore entered the program as part of the Emergency Program. On July 5, 1977 Livermore entered the Regular Program when the City's initial Flood Insurance Rate Maps (FIRMS) were issued. As part of the NFIP there is a mandatory flood insurance purchase requirement for all homes in the floodplain with federally backed loans. As a result, the City floodplain administrator maintains elevation certificates for all homes in the floodplain so that these certificates are available to insurance agents to rate homes for flood insurance.

In September 2014 the city entered the Community Rating System (CRS) to implement flood protection and community awareness activities for a Class 9 rating in exchange for a 5 percent discount on flood insurance policies purchased through the National Flood Insurance Program. The city provides information annually for recertification of

this rating and is currently in good standing. Up until this year the city has had no paid losses and has no structures on the repetitive loss list. The city maintains the digital map data layer on its GIS and prints showing the floodplain relationship to homes and property on an aerial background are made available to the public

In July 2012, the U.S. Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12) which calls on the Federal Emergency Management Agency (FEMA), and other agencies, to make a number of changes to the way the National Flood Insurance Program (NFIP) is run. Some of these changes already have occurred, and others will be implemented in the coming months. Key provisions of the legislation will require the NFIP to raise rates to reflect true flood risk, make the program more financially stable, and change how Flood Insurance Rate Map (FIRM) updates impact policyholders. The changes will mean premium rate increases for some—but not all—policyholders over time. Homeowners and business owners are being encouraged to learn their flood risk and talk to their insurance agent to determine if their policy will be affected by BW-12. This legislation affects residential policy holders and those without policies. With these changes in the legislation and FEMA's movement to Flood Risk maps, depicting a graduated level of risk, it is becoming necessary for every structure to have an elevation certificate regardless of whether or not it is in the floodplain, so that insurance agents can rate properties correctly.

The City partnered with Zone 7 to implement the first phase of their regional stormwater detention project, as identified in their SMMP, with the construction of the flood control improvements for the El Charro Specific Plan (ECSP), which helped address flooding near the Las Positas Golf Course. This first phase of the ECSP was completed in November of 2012.

The City's partnership with Zone 7 will continue to implement the second and third phase of their regional diversion project. Revenue sources to desilt the Arroyo Las Positas between Isabel Avenue and Airway Boulevard remains a top priority for funding so construction can be completed within the next five to ten years to fulfill commitments to the FAA to provide flood protection to the Airport.

A major cost of maintaining, restoring and improving the capacity of the creeks and arroyos are the environmental assessments, documents, permitting process, and follow-up mitigation and monitoring required by the environmental resource agencies. The City developed a Stream Maintenance Program (SMP) to allow for ease of permitting annual maintenance projects. The City has finalized the SMP and has obtained permits from the California Department of Fish and Wildlife and RWQCB and expects a regional general permit from US Army Corps of Engineers later this year. At the same time the city is implementing the SMP by submitting an annual notification in April for maintenance projects to be done in the summer.

Major capital expenditures in the Capital Improvement Plan over the fiscal years 2017-2019 are identified to remove debris and repair the 2017 storm damage to trails on the banks of the Arroyo Mocho, Arroyo Las Positas and along Collier Canyon Road and to resolve the flooding along the Arroyo Las Positas within the Golf Course and along Airway Blvd.

The City is requesting federal funding for projects that will clean-up debris and silt, repair the 2017 storm damage and help prevent future flooding. This includes repairs

to trails on the banks of Arroyo Mocho, Arroyo Las Positas and Collier Canyon as well as restoration and improvements to the basins adjacent to Collier Canyon Road.

## ***Storm Drain Collection System***

The City of Livermore's Public Works Department Water Resource Division operates and maintains the storm drain system within the City of Livermore. The storm drain system covers an area of approximately 26 square miles and contains over 207 miles of storm drain pipe and three storm drain pump stations. The storm drain pipes are generally concrete, with some corrugated metal pipes. The average age of the storm drain pipelines is around 40 years compared to an estimated service life of 100 years. Overall, storm drain pipes are fairly new and in good condition. 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 completed the hydraulic evaluation of the storm drain system during a ten-year storm event based on build-out land uses approved in the 2003 to 2025 General Plan. The analysis is provided in the 2004 Storm Drain Master Plan, which identifies existing and future storm drain deficiencies and the October 2009 Storm Drain Master Plan Addendum. New development after 2010 will increase impervious area by an estimated 894 acres by build out in year 2040. Funding for required storm drain system expansion projects is outlined in the 2010 Storm Drain Connection Fee Study. The Fee Study identifies \$12.4 million worth of storm drain expansion projects. Major projects include upsized storm drains near Second Street, Village Drive, Brisa Street, and Southfront Road; upsized culverts along the Arroyo Las Positas, Arroyo Seco, and Altamont Creek. The Connection Fee Study assumed that these projects would be constructed in the future once fees are collected to fund their construction. If these projects need to be constructed sooner than anticipated, funds may need to be borrowed to fund their construction. The Storm Drain Connection Fee Study was completed in 2010; however, due to the downturn in the economy, fees were not increased to reflect updated development revenue projections and incorporate required debt service. In 2017, this subsidy was removed.

The City completed an 100-year flood capacity evaluation of all creek culverts under public roadways in 2009. Improvements are recommended for the Arroyo Seco culvert at Lucille, five culverts along the Las Positas in Springtown, three culverts along the Altamont Creek in Springtown, and for the Arroyo Las Positas Culverts at Airway. The total cost of all of the recommended culvert improvements is \$10 million (2009\$). Approximately 55% of these improvements are required for existing deficiencies and 45% are required to handle increased flows from new development. Since the report was completed, the Arroyo Las Positas culverts at the Springtown Golf Course have been replaced with a box culvert designed for the 100 year storm.

Further evaluation of the following storm drains may show that growth is limited on properties draining into these storm drains listed below and shown in Figures 3 and 4.

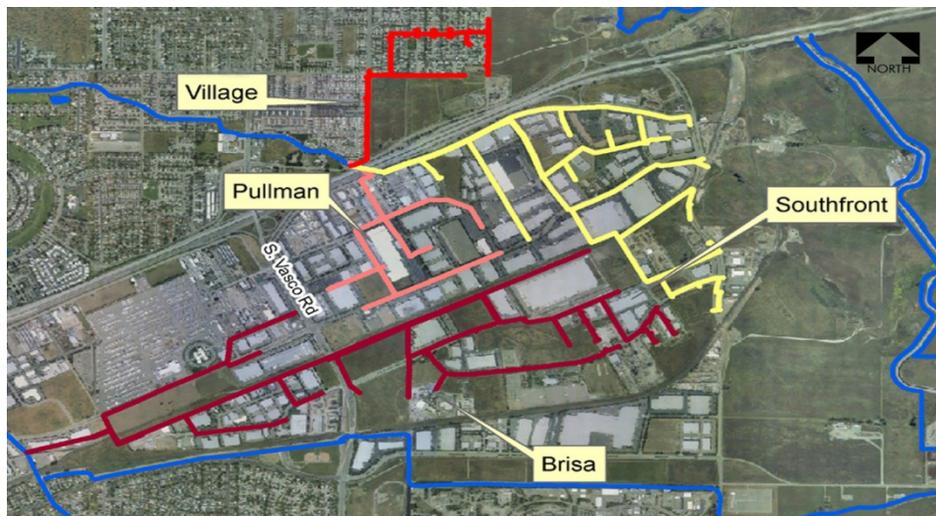
- Second Street Storm Drain
- Village Drive Storm Drain
- Southfront Road Storm Drain
- Pullman Storm Drain
- Brisa Storm Drain

Please note that improvements were made to the Brisa storm drainage system in 2014 and additional improvements will be completed in the next five years to accommodate flows from future development. Also, the Portola Meadows storm drain system was reevaluated in 2009 and found to be adequate.



Deficient Stormdrains for further study

Figure - 3



Deficient Stormdrains for further study

Figure - 4

Until funds can be secured for the required improvements and construction can be accomplished growth may be limited on properties draining into the affected storm drainage facilities without project-provided mitigation. Properties that want to develop prior to the construction of the required improvements will be required to either construct the required improvements or construct on-site storm and floodwater detention facilities to limit drainage into the storm drain and creek system to pre-project flows. The City has been and will continue working with Developers to remedy existing growth-limiting as well as development generated storm drain deficiencies. Therefore storm drain facility status in various locations is not growth limiting since development as it occurs will provide infrastructure as needed.

The hydraulic model also identifies an additional \$58.7 million (2004 \$) worth of improvements necessary to fix existing deficiencies. Some of these deficiencies have been documented—such as flooding in the Springtown area. Projects to correct documented existing deficiencies are listed as high priority projects in the Master Plan. Many of the identified improvements, however, are in areas with limited historical flooding. Improvements in areas of limited historical flooding are listed as low priority projects in the Master Plan and will be analyzed further and monitored in the field during major storm events before they are funded in the Capital Improvement Program.

There are currently no operating reserve or replacement reserve funds for the storm drain system. There is also no current funding for the existing deficiency capital improvement projects identified in the 2004 Storm Drain Master Plan. Increases in the stormwater enterprise fund rate beyond annual cost of living adjustments would require a public vote under Proposition 218. There are, however, on-going efforts in the California Legislature to exempt stormwater fees from Proposition 218. This would reduce the potential for rejection of critical flood control and stormwater management projects by voters thereby causing or increasing flooding, property damage, and threats to public safety. Zone 7 has recently installed flow monitoring equipment at Altamont Creek, Arroyo Las Positas and Arroyo Mocho. The City is planning to update the existing hydraulic model with Zone 7's updated model flows and install flow monitoring equipment at projected flood locations to calibrate the storm drain hydraulic model and refine the 10-year flooding projections. This information will be used to confirm the Zone7 floodplain analysis and to prioritize existing storm drain deficiency projects and develop an implementation plan with phased construction costs. The City may then have to put a measure on the ballot to fund projects to remedy the existing storm drain deficiencies and establish storm drain replacement and operation reserves.

The City of Livermore also has an ongoing maintenance program, which includes catch basin cleaning, line repairs, and maintenance of two pump-stations. The maintenance program is funded under the City's Stormwater Management and Control Program by a utility fee charged to businesses and residents on their property taxes. 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.

## 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) guidelines, and by establishing non-point source pollution control measures as required by federal and State law. The City is a co-permittee under the Alameda Countywide Clean Water Program with 17 other cities and local agencies. As a part of this program, the City implements a commercial and industrial business inspection program requiring local businesses to implement Best Management Practices (BMPs) to minimize stormwater pollution. The City also conducts public information and outreach events, manages an adopt-a creek-spot program to manage trash and partners with Zone 7, LARPD and Pleasanton to run the Living Arroyos Program to protect and improve urban creeks and raise awareness about the beneficial functions of creeks and stormwater pollution. Stormwater pollution prevention measures, such as bioswales, retention ponds, and erosion and sedimentation controls, are incorporated in the planning, design, construction, and operation of all new development projects.

As a part of the planning process, the City and Developers take into account stormwater treatment devices incorporated into a project prior to its evaluation under the California Environmental Quality Act (CEQA). Stricter controls are adhered to during construction and maintenance. Even the chlorine from any amount of potable water is removed prior to entering the storm drain system.

Livermore staff has been proactive in requiring stormwater treatment controls on new development projects. Over the past several years, permit requirements by the State of California have reduced the threshold size for projects which must install stormwater treatment controls. This threshold has been reduced from 5 acres, to 1 acre, and from 1 acre to 10,000 square feet. Now the threshold is 5,000 square feet for automotive repair and other special uses. Virtually all projects are now required to install controls to provide some treatment to reduce stormwater pollution.

In addition, the permit now requires the City to implement Low Impact Development (LID) requirements and to place conditions on projects to limit the volume of stormwater runoff from development projects to reduce potential impacts on creeks. To meet these requirements, City staff requires single family residences and all development projects greater than 5,000 square feet to implement LID requirements limiting the impervious surface and maximizing infiltration and stormwater reuse.

The City's Municipal Regional Stormwater Permit (MRP 2) was reissued by the Regional Water Quality Control Board in November 2015. Section C.10 of the permit requires the City to reduce trash discharges from its municipal stormwater system. From 2009 baseline levels, the City needs to reduce trash discharges 70% by July 2017 and 100% by July 2022. 179 drainage inlet screens were installed in 2014. The City is completing a report that identifies what additional infrastructure needs to be constructed to meet these requirements. Initial estimates are that it could cost \$5.4 million to achieve 70% reduction and an additional \$2 million to achieve 100%. The proposed trash capture devices include 15 large trash interceptors and around 83 small drainage inlet filters.

Section C.3.j of the permit requires the City to reduce pollutant discharges from its municipal system by managing stormwater using vegetation, soils, and natural processes (Green Infrastructure). The concept is to filter stormwater through bioretention basins, flow-through planters, tree well filters, and other low impact drainage infrastructure to remove pollutants before discharging into the local creeks and San Francisco Bay. The Permit requires the City to develop a Green Infrastructure Plan that identifies what infrastructure needs to be constructed to achieve the required pollutant reductions. The plan needs to be completed and approved by Council before July 2019. It could cost up to \$170 million to construct the infrastructure required to meet the 2040 requirements. The City will evaluate more cost effective alternatives as it goes forward with the program and develops the Green Infrastructure Plan.

The City and Developers are also subject to the State Department of Water Resources General Construction permit which regulates construction sites disturbing one acre or more. This permit which became effective July 1, 2010 requires stricter controls and added certification and monitoring requirements. In response to these new requirements, City Staff responsible for oversight have obtained certificates as Qualified Stormwater Pollution Prevention Plan (SWPPP) Developers and Practitioners (QSD/QSP).

## Conclusion

Zone 7 expects to meet the anticipated treated water demands of the Livermore-Amador Valley through the implementation of projects identified in their Capital Improvement Program. Furthermore, Zone 7 reviews the demands and funding requirements regularly through various planning, projection, and funding documents.

Zone 7 supplies water to four major retailers: City of Livermore Municipal Water, Cal Water, City of Pleasanton, and Dublin San Ramon Services District. All of the retailers periodically estimate future demands and provide the information to Zone 7. The additional water demand due to the Housing Implementation Program is included in Livermore's future demands that are provided to Zone 7. Zone 7 incorporates these forecasts into their Urban Water Management Plan. Zone 7 most recently updated their Urban Water Management Plan in 2015. The report includes a water supply reliability assessment for ultimate water demands in the Tri Valley. The report states that "with existing and planned water supplies, Zone 7 does not anticipate any difficulty in meeting projected water demands".

In 2015 Zone 7 supplied around 9,000 acre-ft of treated water to Livermore and a total of 24,300 acre-ft of treated water to all of its retailers. The total treated water demand for all retailers is expected to increase to around 47,600 acre-ft in 2035 due to a rebound in existing demand during normal weather years and projected growth. Assuming the Housing Implementation Program adds 2,000 residential units in the next three years, the total increased water demand will be approximately 670 acre-ft/year. This additional water demand is included in the Zone 7 treated retailer demand projections. Total Zone 7 demands are projected to increase to 92,800 acre-ft per year in 2025 and include agricultural irrigation, groundwater recharge, groundwater banking, and system losses in addition to treated retailer demands. Zone 7 "Normal Year" water supply in 2035 is estimated at 99,500 acre-ft per year. Droughts could decrease total supplies in 2035 to 78,200, but mandatory conservation and reductions in groundwater storage and banking could reduce demands to around 50,000 acre-ft per year. Overall,

Zone 7 policy is to have a system that is able to supply 100% of treated retailer demands 90% of the time and 85% of treated retailer demand 99% of the time. The 2015 Urban Water Management Plan states that the supply analysis is consistent with this policy.

More information about Zone 7's plans to meet water demands in the area through 2035 can be found in Zone 7's 2015 Urban Water Management Plan (available at [http://www.zone7water.com/images/pdf\\_docs/water\\_supply/uwmp\\_2015.pdf](http://www.zone7water.com/images/pdf_docs/water_supply/uwmp_2015.pdf)). Cal Water and Livermore Municipal Water have programs in place to fund distribution system improvements required to meet build-out demand in the General Plan.

Hydraulic analysis indicates that creek and storm drain flooding will occur during a 10-year storm event. The Storm Drain Connection Fee Study was last updated in 2010 to fund development-driven storm drain improvements. The study assumed that these storm drain projects would be constructed in the future once fees are collected to fund their construction.

Storm drain improvements in the vicinity of Second Street, Village Drive, and Southfront Road remain high priority areas identified in the Master Plan and were found to have growth limiting deficiencies. Improvements to these areas will be required due to increased flows anticipated from potential new development. Until these studies are completed, the City will continue requiring developers to evaluate each new site in these areas to determine if on-site mitigation (e.g., detention of the 100-year flows) is needed. These flow-handling projects may also need to be constructed sooner than anticipated and funds may have to be borrowed to fund their construction. Although the Storm Drain Connection Fee Study was updated in 2010, recommended increases to the storm drain connection fee were not approved due to the struggling economy. These increased costs will need to be incorporated into the next Storm Drain Connection Fee Study. Currently no funds are budgeted to construct improvements to remedy the existing storm drain and creek deficiencies absent on-site development project mitigation. Ongoing maintenance of creek outfalls and sediment management are overdue, yet funding has not been budgeted for this purpose. Continuing and ongoing partnership efforts and creative collaborations are needed to secure funding to address this need.

# WASTEWATER



## Wastewater

The City's wastewater facilities consist of the collection system, treatment plant, and disposal system. During 2016, the average dry weather flow into the wastewater treatment plant was 5.5 million gallons per day (MGD).

The City conducts periodic hydraulic evaluations of the wastewater collection, treatment and disposal systems based on the build-out land uses approved in the 2003 to 2025 General Plan and subsequent updates. The Sewer Master Plan, which estimates wastewater flow volumes at build-out of the General Plan and identifies needed sewer collection system improvements, was published in 2004 and is currently in the process of being updated with results due mid-2017. The Water Reclamation Plant Master Plan, which describes the facilities necessary to treat the flows expected from build-out of the City, was updated in 2013 to ensure the appropriate facilities are planned to meet the expected flows, as well as any anticipated regulatory changes. Treated wastewater disposal facilities were evaluated in the 2006 Wastewater Disposal Master Plan. The City's Sanitary Sewer Connection Fee Study and Capital Improvement Plan (CIP) are both periodically updated to provide a funding source and on-going implementation plan for needed improvements. Major improvements identified in previous master plan updates have been completed or are currently under design and construction.

In 2016, the City completed Asset Management Plans for the sewer collection system and the wastewater treatment plant. An Asset Management Plan is a risk-based approach to determine the optimal operations and replacement strategy for City-owned assets. The Asset Management Plan identifies the probability and consequences of failure of various collection system assets, allowing staff to implement timely rehabilitation or replacement of assets at the lowest life-cycle cost while maintaining the desired level of service.

## Wastewater Collection System

As of 2016, there were approximately 300 miles of public sewer, 6,400 manholes and clean-outs, and just under 30,000 sewer service connections. There are also four lift stations, two siphons, and 3 miles of force-main. As part of the recent Isabel Interchange Project, the Las Positas College lift station was relocated and a third, smaller lift station was constructed. A fourth sewer lift station was constructed to serve development in the El Charro area.

The Livermore sewer collection system is predominantly made up of vitrified clay pipe (VCP) with cement mortar or mechanical joints. Polyvinyl Chloride (PVC) is the other

dominant material. VCP and PVC pipes comprise over 90 percent of the sewer system. The typical mainline sewer pipe is 8-inches in diameter, which is the standard minimum pipe size for new sewer installations and comprises about 75 percent of the total length of City-owned sewer lines.

In 2012, the City completed a Pilot Collection System Asset Management Plan (Asset Management Plan) to guide sewer system maintenance and replacement decisions; the plan was updated in 2016. The 2016 Collection System Asset Management Plan estimated the value of the Livermore collection system at approximately \$536 million. The Asset Management Plan also developed an Asset Consumption Profile for the collection system, and found that 45 percent of the City's sewer pipes by length (or 50 percent by pipe segments) are within the 5 to 30 percent consumed range. This indicates that much of the sewer system is relatively new and in good condition. However, the analysis did show some of the individual assets were at or nearing 100 percent consumed and in need of replacement. As a follow-up to the Asset Management Plan, City staff will be physically inspecting the assets identified as at or near the end of their useful life to confirm if replacement is necessary.

The City has implemented an active sewer system management program for over 20 years. More recently, the City has developed a Sanitary Sewer Management Plan to guide collection system operations and maintenance. As a result of this program, the City experiences very few line stoppages or sanitary sewer overflows as compared to similar sized systems. Aggressive line cleaning, continuous video inspection, and dedicated funding for repairs have resulted in a minimum of service interruptions within the system. Overall, the wastewater collection system is in good condition and has low infiltration compared to other Bay Area cities.

The City last updated its Sewer Master Plan in 2004. Currently, the existing sewer system is sized well and will accommodate the sewage flows at build-out of the City's General Plan with completion of identified expansion projects. The Sanitary Sewer Connection Fee Study was last updated in 2010 to provide a funding source for the improvements identified in the Master Plan. The 2010 Sanitary Sewer Connection Fee Study identified \$6.2 million in collection system expansion projects. Both the Sewer Master Plan and Sanitary Sewer Connection Fee Study are currently being updated with results due mid-2017.

## **Wastewater Treatment**

The Livermore Water Reclamation Plant 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 last major expansion in 1991 increased the rated plant capacity to 8.5 MGD average dry weather flow. One final plant expansion is planned to meet projected build-out flows.

A Water Reclamation Plant Master Plan Update was completed in 2006 to reflect changes to build-out land uses in the City's 2003 to 2025 General Plan. At build-out, the average dry weather flow is projected to be 9.47 MGD. The Water Reclamation Plant Master Plan Update identified additional plant facilities needed to treat the build-

out flows. Funding for the required wastewater treatment expansion projects identified in the 2006 Master Plan Update was provided in the 2010 Sanitary Sewer Connection Fee Study.

An Asset Management Plan was completed for the Water Reclamation Plant in 2016, which estimated the overall value of the plant at \$134 million. The Asset Consumption Profile found that many of the assets have used approximately 50 to 70 percent of their useful lives, meaning they are in good condition. However, some assets have used 100 percent of their expected useful lives and may need replacement in the near future. As a follow-up to the Asset Management Plan, City staff will be physically inspecting the assets identified as at or near the end of their useful life to confirm if replacement is necessary.

Results of the 2013 Water Reclamation Plant Master Plan Update indicate that some of the solids handling improvements identified in the 2006 Master Plan may not be necessary, resulting in significant cost savings. However, the update includes additional projects to meet potential regulatory requirements that were not included in the 2006 study. These additional projects will offset some or all cost savings from projects eliminated from the previous Master Plan. These results, along with updated Sewer Master Plan results, will be incorporated in the updated Sanitary Sewer Connection Fee Study.

According to the 2010 Sanitary Sewer Connection Fee Study, \$27.3 million in additional treatment facilities were required to treat the build-out wastewater flow based on the 2006 Water Reclamation Plant Master Plan Update. Most of the required improvements involved expanding the solids handling facilities at the Water Reclamation Plant. Recent projects completed to expand solids handling facilities include the construction of new gravity belt thickeners and an upgrade of the existing solids holding tank. As noted above, the 2013 Water Reclamation Plant Master Plan Update resulted in the removal of some planned projects and the addition of newly identified projects. Two high priority projects identified in the 2013 Water Reclamation Plant Master Plan, electrical switchgear upgrades and aeration tank improvements, were completed between 2014 and 2017.

## **Wastewater Disposal**

Wastewater treated at the Livermore Water Reclamation Plant is either discharged to the Livermore Amador Valley Water Management Agency (LAVWMA) pipeline and pump station for disposal, or further treated to meet recycled water regulations and used for landscape irrigation or other uses. Treated wastewater from Livermore flows to the LAVWMA disposal facility in Pleasanton, where it is combined with treated wastewater from the Dublin San Ramon Services District and is pumped 16 miles to the San Francisco Bay.

The City's allocated peak wet weather capacity in the LAVWMA system increased from 8.728 MGD to 12.4 MGD in 2005 after Livermore voters approved participation in the LAVWMA expansion project. Since then, LAVWMA has completed major expansion projects, including a wastewater pump station at the Livermore Water Reclamation Plant and construction of a new export pipeline between the Pleasanton

pump station and the San Francisco Bay. With the expanded capacity, the City has adequate wastewater disposal capacity to meet the build-out sewer flow of the current General Plan.

## **Conclusion**

Proactive planning, aggressive line cleaning, continuous video inspection, proactive treatment plant operations and maintenance, and dedicated funding for repairs have resulted in a minimum of service interruptions within the Livermore wastewater collection, treatment, and disposal systems. The existing sewer collection system and wastewater treatment plant are capable of meeting current demands, and with the completion of system expansion projects identified in the CIP, will accommodate the sewage flows at build-out of the City's General Plan. The City has adequate wastewater disposal capacity to meet the build-out sewer flow of the current General Plan.

# FIRE SERVICE



## General Information

The Livermore-Pleasanton Fire Department (LPFD) provides fire protection and emergency medical services in Livermore. In 1996 the Livermore and Pleasanton Fire Departments consolidated into the LPFD to provide more efficient and effective service to the two communities. Continued development in the employment sectors continues to maintain the high demand on the City's ability to provide fire and related emergency services to Livermore residents, workers, visitors, and properties. The Fire Department provides services necessary to accommodate shifts in new business growth; tenant improvement demand, and continued new construction of commercial and residential uses. Occupancy classification or construction changes are performed at an aggressive pace to ensure low production losses to existing order of business. To respond to these changes in demand, the LPFD and the Livermore City Council established specific performance standards that are to be met or exceeded for existing development as the City grows and develops.

## Policies and Programs

The City of Livermore and LPFD policies for providing fire services are:

- Provide an adequate level of fire equipment, personnel, and Emergency Medical Services (EMS) to protect the community via the following measures:
- Fire Department total response time (911 receipt to on-scene) should place a first-due unit on-scene within seven minutes time (one minute to dispatch the call, one minute for firefighters to don protective equipment and five minutes to drive to the incident), for 90 percent of fire and medical incidents.
- Fire Department units shall be located and staffed such that an effective response force of four units (three engines and one truck, plus one battalion chief) with fourteen personnel minimum shall be available to all areas of the City within a maximum of ten minutes total response time, for 90 percent of all structure fires.
- Maintain or improve the City's existing ISO (Insurance Services Organization) fire protection rating of class three (3). Begin self-assessment services outlined by The Center for Public Safety Excellence to improve daily tasks and services and to help provide the long-term goal of fire department accreditation.

- Upgrade the level of fire resistance in all new and remodeled structures based on the most current International Codes and newly accepted International Residential Code with State and local amendments.
- Require fire mitigation measures in new developments, including passive and active fire protection systems in all occupancies, including residential as well as require additional mitigation for those developments outside the five-minute drive time response zone and urban interface areas.
- Require the appropriate fire resistive exterior construction measures along with critical measures supporting the Standard Operating Procedures (SOP's) of the LPFD in housing areas adjoining grasslands or riparian areas, such as boxed-in eaves, exterior stucco walls, Class A roofing, providing minimum access roads, and minimum fire protection infrastructure based on the expected fire flow requirement.

## **Consolidation of Fire Services with the City of Pleasanton**

The merger of the Livermore and Pleasanton Fire Departments in December 1996 significantly improved fire services in both cities. The consolidation doubled the number of trained and managed fire companies available to both cities. The combined department fields ten fire companies daily with 36 on-duty firefighters. In addition, the consolidation provided both cities with a large enough Command and Prevention team to adequately provide design services in both cities. The LPFD also shares a modern training tower and headquarters in southeast Pleasanton.

The combined Fire Prevention Bureau has a staff of nine personnel, which is dedicated to handle Fire Code issues and new growth in both cities. Partially due to consolidation, the California Environmental Protection Agency awarded the joint department "CUPA" status in July 1997. A CUPA, or Certified Unified Program Agency, handles six environmental permit programs for local businesses to work through the local Fire Department instead of other local, county, and state agencies. This regulatory streamlining not only improves the local business climate, but also increases environmental safety as Fire Department inspectors integrate these programs with existing Fire and Building Codes implementation. Three full-time Fire Prevention Bureau inspection staff, with degrees in chemistry, work on this program. With this important program, the community can be assured that new high-tech businesses do not pose an environmental or fire risk to the community in new construction and maintenance, waste and operation of facilities. In addition, the LPFD has hazardous materials response teams that can respond to environmental threats due to the accidental or intentional release of hazardous materials.

## **Services Overview**

The Insurance Service Organization (ISO) Public Protection Classification Program rates Fire Departments to establish fire insurance premiums. These ratings are on a scale of 1 to 10 for urban areas, with 1 being the highest possible protection rating

and 10 being the lowest. Livermore's ISO Fire Protection Rating of Class 3 serves as one basis for assessing the Fire Department's overall level of service.

In 2016, the LPFD provided Livermore with five fire companies per day staffed with a total of 16 personnel, including an assigned paramedic. The Alameda County EMS system deploys one paramedic ambulance full time in Livermore at Station 7. LPFD personnel continue to be funded through the City's General Fund.

The LPFD has seen a steady increase in the number of calls for service over the past 10 years. This increase has paralleled the City's residential and commercial growth. The LPFD continues to evaluate and monitor each development project for its impact on service delivery benchmarks such as response time, effective response force and availability of the first due units. Other factors that influence these service delivery benchmarks include the increasing volume of traffic on regional freeways and surface streets, along with the increase in both freight and commuter traffic on regional rail lines.

What can be noted is that as population in an area increases, including business park employees and travelers passing through on the freeway, fire department calls for service increase.

## **Conclusion**

Fire service is not considered to be a primary growth limiting factor. The existing water distribution infrastructure is an integral part of maintaining adequate fire service in the City including the intensification of development in downtown. As part of the Downtown Specific Plan, water infrastructure has been improved to meet the needs of current and proposed construction, including the Bankhead Theater, Livermore Cinema, First Street and Railroad Commercial Projects, and the forecasted residential and commercial projects within the area.

Historically, the City has been able to plan citywide fire services commensurate with growth in the community. This success is due, in part, to the involvement of the LPFD in the entitlement review stages of every land development proposal. This early consultation ensures individual projects provide adequate access and fire protection systems design measures. The City has professional staff, and continues to support the department consolidation, which today provides adequate fire and emergency medical services for the current and near term community needs. As the community continues to grow, fire service is one of the essential public services that must continue to be supported by the City General Fund to maintain the quality of life and public safety Livermore residents have come to expect.

# TRAFFIC



## Introduction

Many factors affect the City's transportation system, including residential and nonresidential growth, the economy and unemployment rates, impacts of regional traffic, and timing of transportation improvement projects. This chapter discusses both the regional traffic facilities through the City (I-580 and Route 84) and the local roadway network.

The 2014 Community Services and Infrastructure Report identified traffic congestion in and around Livermore related mostly to congested conditions on I-580 during commute periods and its spillover effect on local streets, including queuing at on-ramp intersections and cut through traffic using local streets. In the three years since the last Community Services and Infrastructure Report, several factors have resulted in varied traffic conditions in the Livermore area both locally and on regional facilities:

- The booming Bay Area economy has increased traffic volumes during commute periods;
- New residential and nonresidential development activity in the Bay Area and Central Valley has resulted in moderate population growth and the resulting increased traffic generation;
- Completed regional transportation improvements, including eastbound and westbound Express Lanes on I-580 through the Tri-Valley has reduced traffic congestion on I-580, although there are still congested segments;
- Completed local transportation improvements, Isabel Avenue widening from Jack London Boulevard to Stanley Boulevard, and the Jack London Boulevard extension to El Charro Road; and
- Construction of various new multi-use trails.

In 2008, I-580 through the Tri-Valley was ranked by the California Department of Transportation (Caltrans) and the Metropolitan Transportation Commission (MTC) as the third (eastbound PM) and sixth (westbound AM) most congested freeway segments in the Bay Area, with segments operating at level-of-service F, reflecting highly congested or stop and go traffic conditions. In 2010, the I-580 eastbound HOV lane opened to traffic. In 2013, I-580 ranked as the sixth (westbound AM) and 39<sup>th</sup> (eastbound PM) most congested freeway segments. The eastbound HOV lane ranking demonstrated a significant reduction in overall traffic delay. In 2015, congestion on I-580 was further reduced, due to the end of most of the construction activity. At that time, I-580 was ranked as the 17<sup>th</sup> (westbound AM) and 24<sup>th</sup> (eastbound PM) most congested freeway segments. In February 2016, the

westbound HOV lane opened, and both eastbound and westbound HOV lanes were changed to express lanes, which allow solo drivers to use the lane for a fee.

Segments of Route 84 between Livermore and Sunol also operate at level-of-service F during the peak hours.

With the exception of the planned BART extension to Livermore and improvements to the I-580/I-680 interchange, I-580 is now built out. BART is completing a project-level Environmental Impact Report on a 5-mile extension to a new station east of Isabel Avenue, which would relocate the freeway lanes to make room for BART in the freeway median. The City's General Plan calls for a second phase BART extension to Greenville Road. BART to Isabel Avenue, if approved, will not be operational until around 2026 or later.

There are additional planned improvements to Route 84 including:

- Widening from Jack London Boulevard to Ruby Hills Drive (under construction)
- Widening from Pigeon Pass to I-680 (environmental studies underway)

These improvements will reduce traffic congestion on I-580 and Route 84. However, additional improvements that are not fully funded including the I-580/I-680 westbound to southbound flyover, and Route 84 widening from Pigeon Pass to I-680 are needed to fully mitigate level-of-service F conditions on I-580 and Route 84 within the Tri-Valley. In addition, the Dublin Boulevard-North Canyons Parkway extension is an important local arterial connection that will help relieve freeway congestion by providing an alternative route for local trips within the Tri-Valley.

## **Level-of-Service**

Level-of-service (LOS) 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 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.).

LOS 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. Freeway LOS is determined by measuring the average vehicular density per lane per mile. On arterial roadways, signalized intersections typically represent the most critical locations of bottlenecks and congestion since the right-of-way must be shared by opposing traffic. Table 1 outlines the LOS concept for signalized intersections.

**Table 1: 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 <i>and</i> 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 <i>and</i> 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* <i>and</i> less than or equal to 55 **"Mid-D" = 45
E	Vehicles frequently wait more than one signal cycle.	Greater than 55 <i>and</i> 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.

The City's General Plan contains the following policies relating to traffic LOS standards:

*CIR-4.1.P1 For the purposes of development associated traffic studies, road improvement design, and capital improvement priorities, the upper limit of acceptable service at signalized intersections shall be mid-level D, except in the Downtown Area and near I-580 interchanges.*

*CIR-4.1.P2 There shall be no level of service standard for the Downtown Area (see General Plan Land Use Map for Downtown Area location).*

*CIR-4.1.P3 The upper limit of acceptable level of service at selected intersections near I-580 interchanges shall be LOS E.*

*CIR-4.1.P4 The City accepts the need to balance competing objectives, including providing a system for safe, efficient and convenient movement of traffic (Goal CIR-2); minimizing cut-through traffic (Obj. CIR-1.2) and preventing or minimizing physical or environmental constraints (Obj. CIR-5.2), and therefore recognizes that certain intersections, located at freeway ramps and along east/west major streets carrying a high percentage of regional cut-through traffic, may exceed the established LOS standard. These intersections include:*

- (1) *First Street/N. Mines Road*
- (2) *Isabel Avenue/Airway Boulevard*
- (3) *Isabel Avenue/Jack London Boulevard*
- (4) *Vasco Road/Northfront Road*
- (5) *Vasco Road/I-580 Eastbound Ramps*
- (6) *Concannon Boulevard/S. Livermore Avenue*
- (7) *Holmes Street/Fourth Street*
- (8) *Stanley Boulevard/Murrieta Boulevard*

## Existing Traffic Conditions

The Alameda County Congestion Management Agency annually monitors the LOS on freeways and highways in the county. The 2016 Level-of-Service Monitoring Report shows that some sections of I-580 through the Tri-Valley were operating at LOS F during the AM and PM peak hours. When the freeway is congested, some motorists use City streets to bypass the congested areas. The report also showed sections of Route 84 south of Ruby Hills Drive (AM) and near I-680 (PM) operating at LOS F. While commute volumes have increased in recent years due to the economy, traffic conditions on I-580 have improved, because of completion of improvements, including eastbound and westbound express lanes, additional auxiliary lanes, and truck climbing lanes over the Altamont Pass. Traffic congestion on Route 84 has gotten worse over this same period.

Local traffic conditions are generally measured at the signalized intersections, where the roadway capacity is reduced. Table 2 shows the most recent measurement of LOS at these locations.

**Table 2: Existing Traffic Conditions**

No.	SIGNALIZED INTERSECTION	Existing Conditions (2010, 2014*, 2016**)			
		AM Peak		PM Peak	
		LOS	Average Control Delay/Vehicle (in seconds)	LOS	Average Control Delay/Vehicle (in seconds)
1	Airway Blvd/ I-580 EB Ramp**	D	35	D	36
2	Airway Blvd/ I-580 WB Ramp**	A	3	A	5
3	Airway Blvd/ Isabel**	C	28	C	23

No.	SIGNALIZED INTERSECTION	Existing Conditions (2010, 2014*, 2016**)			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
4	Concannon Blvd/ Arroyo Road	C	28	C	28
5	Bluebell Drive/ Springtown Blvd*	B	20	B	19
6	Concannon Blvd/ S. Livermore*	B	13	C	21
7	Concannon Blvd/ Murdell Lane	B	15	B	10
8	East Ave/ Charlotte Way	C	26	B	18
9	East Ave/ Dolores Street	B	14	B	18
10	East Ave/ Hillcrest Ave	B	17	B	12
11	East Ave/ Loyola Way	A	6	A	7
12	East Ave/ Maple Street	B	11	B	11
13	East Ave/ Mines Street	B	19	B	14
14	Fourth Street/ South Livermore to East Ave	C	30	C	34
15	East Stanley Blvd/ Fenton Street**	A	8	B	16
16	East Stanley Blvd/ Isabel Connector Ramp**	C	33	B	18
17	East Stanley Blvd/ Murdell Lane**	B	14	B	13
18	East Stanley Blvd/ Murrieta Blvd**	<b>E</b>	<b>55</b>	<b>D</b>	<b>48</b>
19	East Stanley Blvd/ Wall Street**	C	22	B	11
20	East Stanley Blvd-Railroad Ave/ South S Street**	B	16	C	26
21	First Street/ I-580 EB Ramps**	B	15	C	25
22	First Street/ I-580 WB Ramps**	B	15	A	9
23	First Street/ Inman Street**	C	25	C	24
24	First Street/ Las Positas Rd**	C	24	C	24
25	First Street/ North Mines Rd**	D	39	D	44
26	First Street/ Old First Street**	B	19	B	17

No.	SIGNALIZED INTERSECTION	Existing Conditions (2010, 2014*, 2016**)			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
27	First Street/ Portola Ave**	B	12	C	25
28	First Street/ Railroad Ave- Maple Street**	C	23	C	31
29	First Street/ South L Street	B	19	C	20
30	First Street/ South Livermore Avenue**	C	27	C	30
31	First Street/ South P Street	B	19	C	21
32	First Street/ Southfront Street**	B	14	B	15
33	Fourth Street/ South P Street	B	10	B	11
34	Fourth Street/ Inman Street	C	24	B	12
35	Fourth Street/ Maple Street	C	21	B	12
36	Las Positas Rd/ Greenville Rd	A	9	A	10
37	National Drive/ Greenville Rd	A	4	A	8
38	Southfront Road/ Greenville Rd**	B	11	B	14
39	Catalina Drive/ Holmes Street*	C	20	C	22
40	Concannon Blvd/ Holmes Street*	C	34	C	34
41	First Street/ Holmes Street	A	10	B	15
42	Fourth Street/ Holmes Street*	C	31	C	31
43	Mocho Street/ Holmes Street	B	10	A	7
44	Vancouver Way- El Caminito/ Holmes Street	C	26	B	17
45	Concannon Blvd/ Isabel Ave	C	20	C	25
46	Stanley Connector Ramp/ Isabel Ave**	<b>D</b>	<b>47</b>	C	35
47	East Vineyard Avenue/ Isabel Ave	B	12	C	21
48	East Jack London Blvd/ Isabel Ave**	<b>F</b>	<b>94</b>	D	45
49	Audry Street- Charlotte Way/ North Mines Rd	C	31	C	27

No.	SIGNALIZED INTERSECTION	Existing Conditions (2010, 2014*, 2016**)			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
50	Patterson Pass Rd/ North Mines Rd	C	28	C	25
51	Murrieta Blvd/ Fenton Street	A	7	A	9
52	Jack London Blvd/ Murrieta Blvd**	D	36	D	34
53	Olivina Avenue/ Murrieta Blvd	C	28	C	24
54	North Canyons Parkway/ Airway Blvd**	A	7	B	16
55	North Canyons Parkway/ Collier Canyon Rd **	C	23	C	26
56	Chestnut Street/ North Livermore Ave*	B	14	B	13
57	Cromwell Way/ North Livermore Ave**	A	6	A	7
58	North Livermore Ave/ I-580 EB Ramp**	B	16	<b>E</b>	<b>58</b>
59	North Livermore Ave/ I-580 WB Ramp*	B	13	B	18
60	Las Positas Rd/ North Livermore Ave**	C	25	D	39
61	Portola Ave/ North Livermore Ave**	D	36	D	32
62	Railroad Ave/ North Livermore Ave**	C	30	D	36
63	Olivina Avenue- Chestnut Street/ North P Street	C	22	C	23
64	Portola Ave/ North L Street**	B	15	B	19
65	Portola Ave/ Murrieta Blvd**	B	15	C	29
66	Railroad Ave/ North L Street**	B	16	C	25
67	Railroad Ave/ North P Street**	C	24	C	28
68	Fourth Street/ South L Street*	B	15	C	25
69	Second Street/ South L Street	B	14	B	16
70	Vallecitos Road/ Isabel Avenue*	D	43	D	19
71	Brisa Street/ South Vasco Rd**	C	27	C	23
72	East Ave/ South Vasco Rd**	B	16	<b>E</b>	<b>77</b>

No.	SIGNALIZED INTERSECTION	Existing Conditions (2010, 2014*, 2016**)			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
73	Garaventa Ranch Rd/ North Vasco Rd**	D	38	C	26
74	Industrial Drive/ South Vasco Rd**	A	9	B	12
75	Las Positas Rd/ South Vasco Rd**	C	22	D	36
76	Daphne/ South Vasco Rd**	C	27	C	25
77	Northfront Rd/ North Vasco Rd**	F	88	C	35
78	Patterson Pass Rd/ South Vasco Rd**	C	24	C	31
79	Scenic Ave/ North Vasco Rd**	C	29	B	20

## Proposed Improvements

When a proposed development project generates over 100 peak hour trips (each single-family residential unit produces about one PM peak hour trip), a traffic study is generally required to assess the impact of the project. If the traffic study identifies roadway or intersection improvements are required, the developer is generally required to complete those improvements as a condition of approval for the project. If the improvements are part of the traffic impact fee program, the developer is reimbursed or credited the value of the improvements against the project's traffic impact fees. Smaller developments that do not typically require a traffic study simply pay their traffic impact fees, which are used by the City to fund transportation improvements in the Capital Improvement Program. The City updates its Capital Improvement Program every two years. During the biannual update, the City prioritizes the transportation improvement needs and budgets projected traffic impact fee revenue to those projects.

The General Plan identifies a number of transportation improvement projects that will be needed as the City develops toward build-out. These include improvements to I-580 and Route 84, major street widening and extensions, intersection improvements, and signalization improvements. These proposed improvements form the project list in the traffic impact fee program. Figure 1 shows the locations of future roadway improvements. Some notable roadway improvements include:

- Upgrading the I-580 interchanges at Vasco Rd, Greenville Rd, First St, and Isabel Avenue (Phase 2)
- Widening of Route 84 to four lanes between Stanley Boulevard and Ruby Hills Drive (under construction);

- Widening of Route 84 from Pigeon Pass to I-680; and
- Connecting North Canyons Parkway and Dublin Boulevard.

The California Department of Transportation (Caltrans) is the lead agency for improvements to Route 84. The ultimate improvements to Route 84 will provide a four-lane expressway from I-680 to Stanley Boulevard and six lanes from Stanley Boulevard to I-580. However, widening Route 84 south of Livermore is not fully funded, and may take decades to complete.

Locally, the City's Capital Improvement Program includes funding to widen the intersection at Jack London Boulevard/Isabel Avenue, which is expected to be completed by early 2018.

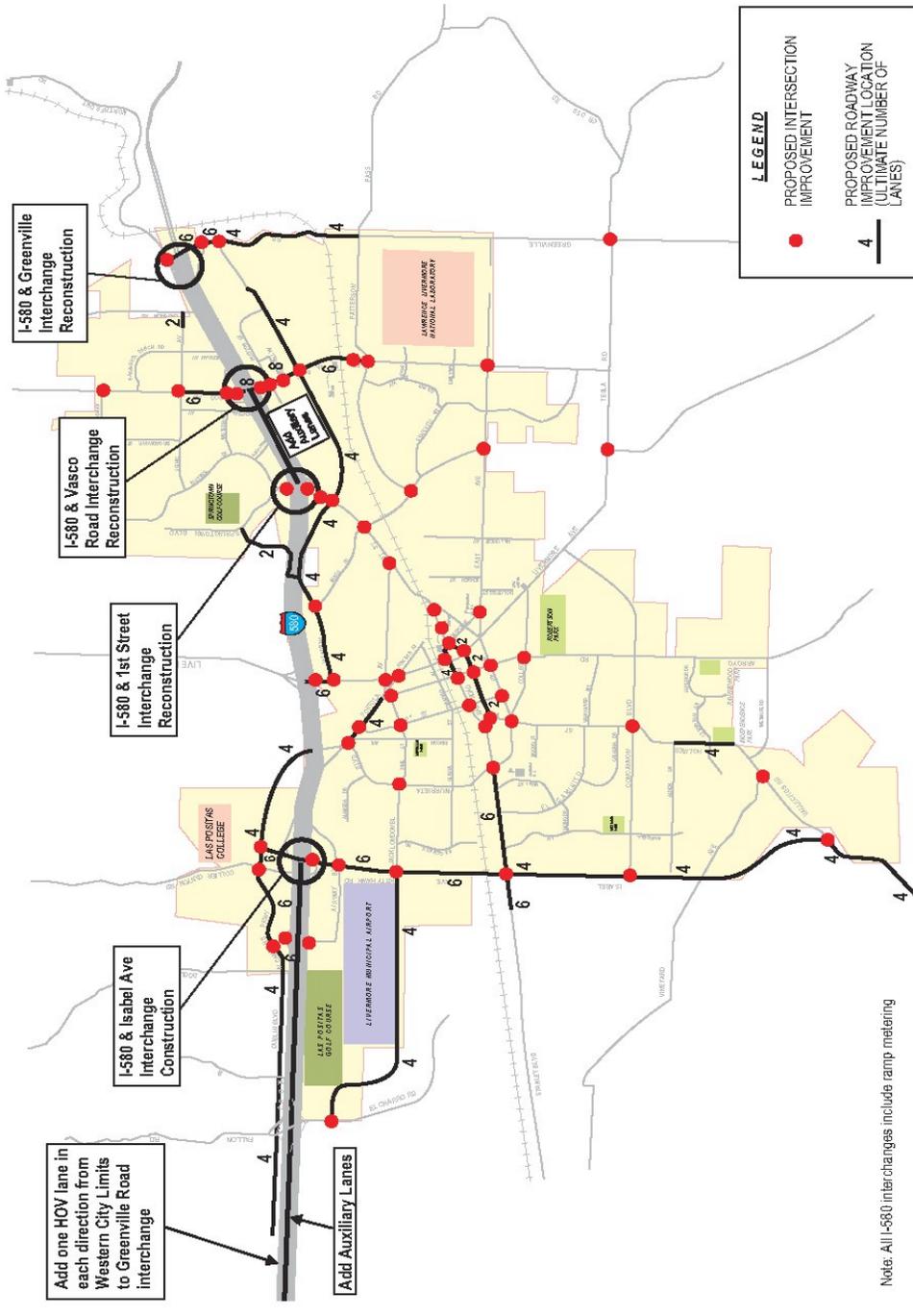
## **Bicycle/Pedestrian Plans**

In December 2001, the City adopted the existing Livermore Bikeways and Trails Master Plan (Master Plan). Over the past 15 years, the City has used this document to prioritize, fund, and implement bikeway and multi-use trail projects. In May 2015, the City Council authorized funding to update and replace the Master Plan with the Livermore Bicycle, Pedestrian, and Trails Active Transportation Plan (Active Transportation Plan). With assistance from a Citizens Advisory Committee appointed by the City Council, the City is developing the Active Transportation Plan to guide future improvements for all non-motorized transportation methods including walking, running, bicycling, strollers, mobility assistance devices, and horseback riding. The Active Transportation Plan will build upon the existing Master Plan and leverage Livermore's well-connected bicycle, pedestrian, and trail network. With significant public outreach, the Active Transportation Plan will analyze existing and future conditions and needs, identify network and program recommendations, and develop an implementation and financial plan for projects. The Active Transportation Plan will propose projects, programs, and policies to improve the active transportation network over the next ten years. The Draft Plan is scheduled for public review late Fall 2017 with Planning Commission and City Council consideration in early 2018.

## **Bicycle/Pedestrian Safety**

The California Office of Traffic Safety coordinates California highway safety programs and gathers traffic safety data, including pedestrian safety. In terms of pedestrian safety, the most recent statistics (2014) ranked Livermore 101 out of 105 cities of similar size, with 105 being the safest. That means that there were 100 cities that were less safe for pedestrians in California and only four that were safer. For bicycle safety, Livermore was ranked 96 out of 105 making Livermore one of the ten safest. Statistics show Livermore as one of the safest cities of its size in the Bay Area for pedestrians and bicyclists.

Figure 1



## General Plan Build-Out Traffic Conditions

As a part of the 2003 General Plan Update, the traffic impacts of the proposed future land use and transportation improvements were analyzed with the help of a computerized traffic demand model. This model predicted future traffic volumes on the freeway, highway, major and collector roads in the City. The model predicts congested conditions during the AM and PM peak hours on I-580 and on the major roadways in the City near the freeway interchanges. In general, the existing traffic congestion on I-580 is expected to get worse in the future, even with the planned improvements of carpool lanes, auxiliary lanes and ramp metering. Therefore, regional cut-through traffic is expected to have a greater impact on the City's transportation system in the future.

Using the future traffic volumes from the model, intersection LOS were calculated at signalized intersections throughout the City as shown in Table 3. The build-out LOS values shown assumes that all of the transportation improvement projects discussed in the previous section have been completed.

**Table 3: General Plan Build-out Traffic Conditions**

No.	SIGNALIZED INTERSECTION	Future with General Plan Buildout and Roadway Improvements			
		AM Peak		PM Peak	
		LOS	Average Control Delay/Vehicle (in seconds)	LOS	Average Control Delay/Vehicle (in seconds)
1	Airway Blvd/ I-580 EB Ramp	D	39	E	75
2	Airway Blvd/ I-580 WB Ramp	D	53	B	13
3	Airway Blvd/ Kitty Hawk Road	A	9	D	39
4	Concannon Blvd/ Arroyo Road	C	24	C	31
5	Bluebell Drive/ Springtown Blvd	C	24	C	35
6	Concannon Blvd/ S. Livermore	B	18	D	51
7	Concannon Blvd/ Murdell Lane	A	7	A	4
8	East Ave/ Charlotte Way	B	16	B	12
9	East Ave/ Dolores Street	B	12	C	22
10	East Ave/ Hillcrest Ave	B	20	D	36
11	East Ave/ Loyola Way	A	5	A	10
12	East Ave/ Maple Street	B	13	B	20

No.	SIGNALIZED INTERSECTION	Future with General Plan Buildout and Roadway Improvements			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
13	East Ave/ Mines Street	C	21	D	38
14	Fourth Street/ South Livermore to East Ave	E	60	F	116
15	East Stanley Blvd/ Fenton Street	A	7	A	7
16	East Stanley Blvd/ Isabel Connector Ramp	B	12	B	17
17	East Stanley Blvd/ Murdell Lane	A	9	A	8
18	East Stanley Blvd/ Murrieta Blvd	D	36	D	41
19	East Stanley Blvd/ Wall Street	B	16	B	17
20	East Stanley Blvd-Railroad Ave/ South S Street	C	22	D	38
21	First Street/ I-580 EB Ramps	D	37	C	28
22	First Street/ I-580 WB Ramps	D	47	B	14
23	First Street/ Inman Street	B	17	C	32
24	First Street/ Las Positas Rd	D	53	D	53
25	First Street/ North Mines Rd	<b>E</b>	<b>68</b>	<b>E</b>	<b>56</b>
26	First Street/ Old First Street	C	23	C	33
27	First Street/ Portola Ave	D	40	C	27
28	First Street/ Railroad Ave- Maple Street	F	162	F	191
29	First Street/ South L Street	C	33	E	65
30	First Street/ South Livermore Avenue	C	32	F	87
31	First Street/ South P Street	C	23	D	36
32	First Street/ Southfront Street	E	69	E	67
33	Fourth Street/ South P Street	A	5	A	7
34	Fourth Street/ Inman Street	C	20	B	15
35	Fourth Street/ Maple Street	B	13	B	17

No.	SIGNALIZED INTERSECTION	Future with General Plan Buildout and Roadway Improvements			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
36	Las Positas Rd/ Greenville Rd	B	15	C	29
37	National Drive/ Greenville Rd	A	8	B	12
38	Southfront Road/ Greenville Rd <sup>1</sup>	A	9	C	34
39	Catalina Drive/ Holmes Street	A	9	B	10
40	Concannon Blvd/ Holmes Street	C	23	D	39
41	First Street/ Holmes Street	A	5	B	12
42	Fourth Street/ Holmes Street	D	41	D	48
43	Mocho Street/ Holmes Street	A	7	A	6
44	Vancouver Way- El Caminito/ Holmes Street	B	11	A	9
45	Concannon Blvd/ Isabel Ave	D	43	B	18
46	Stanley Connector Ramp/ Isabel Ave	C	31	C	21
47	East Vineyard Avenue/ Isabel Ave	B	14	B	15
48	East Jack London Blvd/ Isabel Ave	<b>D</b>	<b>50</b>	<b>D</b>	<b>49</b>
49	Audry Street- Charlotte Way/ North Mines Rd	C	23	C	22
50	Patterson Pass Rd/ North Mines Rd	B	13	B	16
51	Murrieta Blvd/ Fenton Street	A	7	A	5
52	Jack London Blvd/ Murrieta Blvd	D	37	B	19
53	Olivina Avenue/ Murrieta Blvd	C	32	D	44
54	North Canyons Parkway/ Airway Blvd	C	23	D	41
55	North Canyons Parkway/ Collier Canyon Rd	C	35	D	45
56	Chestnut Street/ North Livermore Ave	C	27	C	35
57	Cromwell Way/ North Livermore Ave	A	6	A	10
58	North Livermore Ave/ I-580 EB Ramp	B	13	B	16

No.	SIGNALIZED INTERSECTION	Future with General Plan Buildout and Roadway Improvements			
		AM Peak		PM Peak	
		L O S	Average Control Delay/Vehicle (in seconds)	L O S	Average Control Delay/Vehicle (in seconds)
59	North Livermore Ave/ I-580 WB Ramp	B	14	B	11
60	Las Positas Rd/ North Livermore Ave	B	18	C	24
61	Portola Ave/ North Livermore Ave	D	36	D	36
62	Railroad Ave/ North Livermore Ave	F	172	F	84
63	Olivina Avenue- Chestnut Street/ North P Street	C	20	C	26
64	Portola Ave/ North L Street	B	16	C	32
65	Portola Ave/ Murrieta Blvd	C	23	D	44
66	Railroad Ave/ North L Street	D	36	F	114
67	Railroad Ave/ North P Street	B	20	D	52
68	Fourth Street/ South L Street	B	18	D	36
69	Second Street/ South L Street	A	7	A	9
70	Vallecitos Road/ Isabel Avenue	D	36	B	15
71	Brisa Street/ South Vasco Rd	B	12	D	40
72	East Ave/ South Vasco Rd	C	21	C	32
73	Garaventa Ranch Rd/ North Vasco Rd	B	11	C	22
74	Industrial Drive/ South Vasco Rd	B	12	C	30
75	Las Positas Rd/ South Vasco Rd	C	32	D	43
76	Mesquite Way- Emily Way/ South Vasco Rd	A	4	A	3
77	Northfront Rd/ North Vasco Rd	E	78	<b>F</b>	<b>83</b>
78	Patterson Pass Rd/ South Vasco Rd	D	43	D	42
79	Scenic Ave/ North Vasco Rd	D	38	B	17
80	Isabel/ Airway	D	45	<b>F</b>	<b>126</b>
81	Isabel/ I-580 EB Ramps	A	8	B	14

No.	SIGNALIZED INTERSECTION	Future with General Plan Buildout and Roadway Improvements			
		AM Peak		PM Peak	
		LOS	Average Control Delay/Vehicle (in seconds)	LOS	Average Control Delay/Vehicle (in seconds)
82	Isabel/ I-580 WB Ramps	B	11	A	9
83	Isabel/ Portola Extension	B	14	B	13
84	Greenville Road / I-580 EB Ramps <sup>1</sup>	B	18	B	17
85	Greenville Road / I-580 WB Ramps <sup>1</sup>	C	25	A	9
86	Vasco Road/ Preston	C	20	E	79
87	Vasco Road/ WB Ramps	B	19	C	31
88	Vasco Road/ EB Ramps	D	45	<b>F</b>	<b>149</b>

## Impacts of Residential Growth Rate

Table 4 compares the amount of traffic expected to be generated by the low and high ends of the range of residential growth rates with traffic generated by estimated nonresidential development. The amount of annual nonresidential development is based on the three-year average for commercial and industrial development based on building permits issued in the years 2014, 2015, and 2016. For residential growth, the data is presented for both single-family and multi-family scenarios, which represent the high and low extremes. The actual development pattern will be a mix of single and multi-family units and, therefore, would likely generate traffic volumes in between the values shown.

The traffic generation data suggests that at the highest residential growth rate of 700 units annually and all of the units being single-family detached units, the traffic generated by residential growth is roughly 50 percent of the total new daily trips added by all development. About 50 percent of the new traffic is due to nonresidential development. If the impact of regional cut-through traffic is included in the totals, then the percentage attributed to residential growth would be even less.

As discussed previously, most of the transportation improvements are financed through traffic impact fees. Traffic impact fees that would be collected annually from residential and nonresidential development based on the current fee rates.

**Table 4: Residential and Non-residential Traffic Generation**

Land use type	Annual average development (units or sf)	Traffic generation rates			Traffic generation		
		daily	am	pm	daily	am	pm
Single-family residential	140	9.57	0.75	1.01	1,340	105	141
	700	9.57	0.75	1.01	6,699	525	707
Multi-family residential	140	6.63	0.51	0.62	928	71	87
	700	6.63	0.51	0.62	4,641	357	434
Total annual increase in residential traffic volume					928-6,699	71-525	87-707
Office	5,000	11.01	1.56	1.49	55	8	7
Retail	86,000	42.92	1.03	3.74	3,691	89	321
Industrial	43,000	6.97	0.92	0.98	300	40	42
Manufacturing/Warehouse	775,000	3.56	0.30	0.32	2,759	232	248
Total annual increase in non-residential traffic volume					7,205	369	618

## Conclusion

Traffic is not a growth-limiting factor for residential development over the next three years. Traffic congestion is a regional problem that cannot be completely eliminated through independent action of the City. Regionally, LOS F conditions still exist on segments of I-580 and Route 84 in the Tri-Valley.

Locally, traffic congestion at signalized intersections, which are usually the bottlenecks on major streets, has been fairly stable over the past five plus years, with a few exceptions:

- Jack London Boulevard/Isabel Avenue (AM)
- Vasco Road/Northfront Road (AM)
- Vasco Road/East Avenue (PM)
- Livermore Avenue/I-580 eastbound ramps (PM)

The following conclusions can be drawn from an analysis of various residential growth rates:

- A higher residential growth rate will add additional traffic to the City's transportation system faster than with a lower residential growth rate. This will impact roadways and intersections that are already congested, such as I-580 and Route 84 south of Livermore. Improvements to Route 84 south of Livermore are planned.
- A higher residential growth rate will not necessarily impact roadways and intersections that are not currently congested. A project specific traffic study would be necessary to determine specific impacts and mitigations on a project by project basis.

- Additional daily traffic from residential development would range from about 11 percent (at 140 multifamily units) to about 50 percent (at 700 single family units) of the traffic expected to be added from all development combined. Traffic volumes will increase due to nonresidential development and growth in regional traffic.
- Improvements to the City's transportation system are partially funded by traffic impact fees. A higher residential growth rate would generate traffic impact fee revenue faster and could help deliver improvement projects sooner.
- Local traffic can be reduced through smart growth, including transit-based housing such as that planned and constructed in Downtown and the Brisa Neighborhood Plan, and maintaining a desirable jobs-housing balance and jobs-housing match (see Chapters 11 and 12).

# POLICE SERVICE

*"Service with Honor, Protection with Purpose"*



## General Information

The Livermore Police Department (LPD) has 90 sworn officers, with an additional four unfilled officer positions, and 45 professional staff personnel serving the City's 2016 population of 88,138. The LPD police station consists of 43,400 square feet and is located in the Civic Center Campus on South Livermore Avenue. The LPD vehicle fleet consists of 34 marked patrol vehicles, 22 unmarked vehicles, 5 police motorcycles, a Community Outreach Vehicle, a Rescue Vehicle, a 1954 Chevrolet vintage police sedan, and 10 multi-use vehicles for Community Service Specialists, Police Cadets, Crime Technicians, and Police Volunteers.

The City's approximate 26.44 square miles is divided into three geographical policing areas using the Area Command Policing model. The Area Policing model is often utilized by public safety agencies that wish to expand their community policing efforts. Area Policing requires the alignment of organizational management, structure, personnel, and information systems to support community partnerships and proactive problem solving. Agencies who adopt this model typically divide the city into distinct geographic areas that are larger than the traditional police beat area. Patrol personnel are then assigned to one of the geographic areas known as "Area Commands" for an extended period of time so that they can build longer lasting and more effective relationships with the community and respond proactively to the unique issues within each area.

A Command level officer known as an Area Commander is typically assigned to each area and is responsible for developing key relationships and understanding the issues and concerns unique to their service area. This includes being accountable to develop strategies and direct resources to solve problems in their assigned area.

Benefits of the Area Command service delivery model include:

- Increased police/citizen engagement and a strengthening of relationships with the community
- Increased autonomy and professional responsibility for staff
- Increased accountability for management
- Improved quality of life for residents

In addition to normal police areas, LPD deploys one officer each day to patrol the San Francisco Premium Outlets on the western edge of the City due to an increase in calls for service. Four additional officers are deployed on Friday and Saturday evenings to the downtown area to address alcohol related violations, disturbances, and large crowds in order to maintain a safe environment.

To assist the Patrol Bureau, the Traffic Unit, with oversight from one Lieutenant, is staffed with three motor officers, and one Community Service Specialist. The three motor officers have the primary responsibility of traffic enforcement. In addition to traffic duties, the Traffic Unit conducts training and education throughout the county and state. The Community Service Specialists assist the Traffic Unit with collision investigations and abandoned vehicle abatements.

Additional police staffing includes personnel assigned to the Investigations Bureau, the Special Operations Unit, Intelligence Unit, the School Resource Officer Program, and Crime Prevention. Currently, the LPD also utilizes three K9 working dogs.



Three Community Service Specialists and two Police Cadets are assigned to assist the Patrol Bureau with basic criminal investigations, evidence collection, and other patrol support duties. For more complex cases involving Forensic Analysis, LPD has one Police Identification Technician. One additional Community Service Specialist and a Property Supervisor work in the Property Unit keeping track and processing approximately 45,000 pieces of evidence and property.

Additional Professional Staff include 18 Public Safety Dispatchers who are responsible for receiving all emergency and non-emergency calls for the LPD. Two Public Safety Dispatch Supervisors supervise the Public Safety Dispatchers. The Records Division consists of one supervisor and six police clerks who process all the police reports, permits, and numerous clerical requests from other cities and the courts. One Support Service Manager manages the Dispatch Center, Record's Unit, and Property Unit.

Horizons Youth and Family Services is a division of the LPD. Since its inception in 1973, Horizons Youth works directly with the LPD and has expanded to offer a variety of services to Tri-Valley families and their children, including family counseling, case management, and parent training.

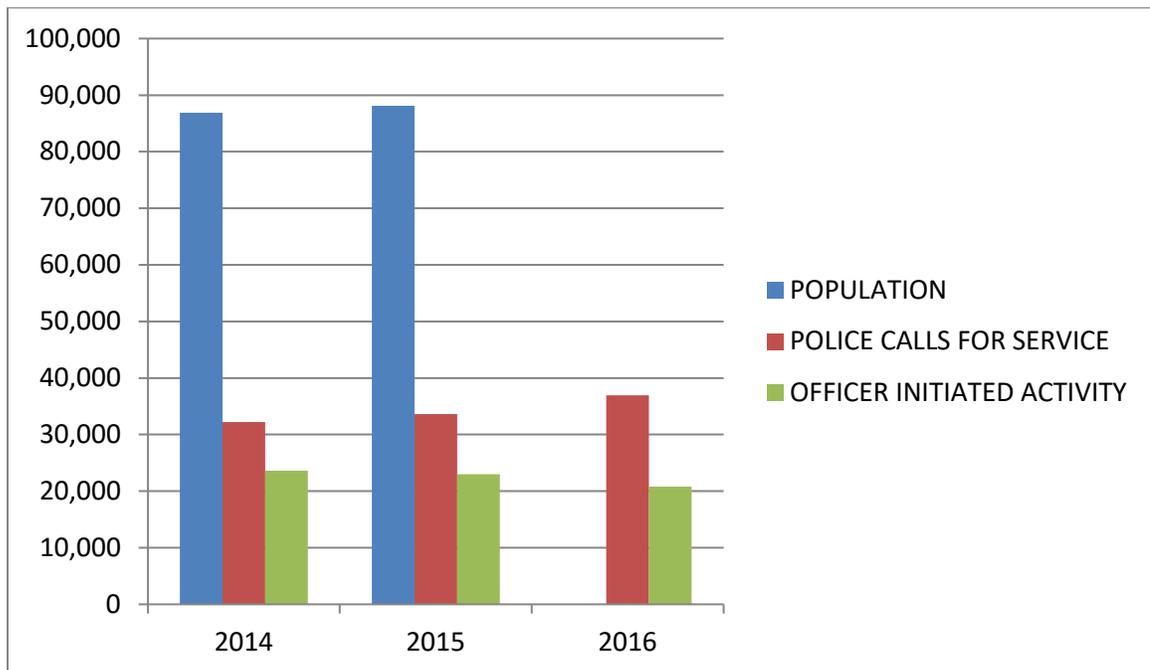
The Business Services Manager manages all financial matters in the LPD. One manager and two IT Specialists coordinate the IT Department.

Currently, 200 volunteers help with numerous public events, walking patrols, assisting patrol officers, and performing various clerical functions within the LPD. In addition to the volunteers, the LPD has 5 volunteer Reserve Police Officers who also assist the Patrol Bureau with patrol duties and special events. Both the volunteer group and Reserve Officers supplement the weekend downtown patrol deployment that assists the officers with observing and reporting alcohol and dangerous offenses.



## **STATISTICS**

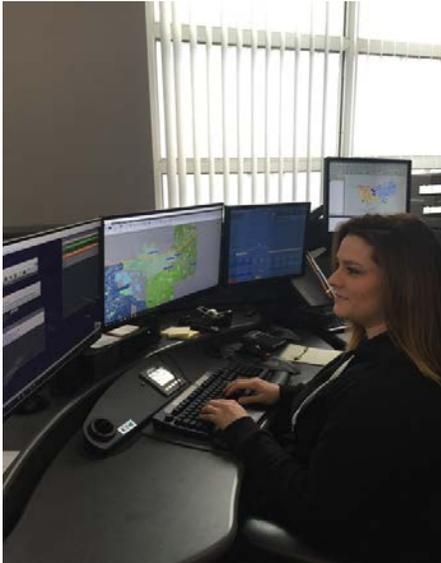
The figure and table below show the City population, the number of police calls for service, and the number of officer initiated activity between 2014 and 2016. When police calls for service are required, patrol units respond to the calls according to a priority. Easily defined, Priority 1 calls are emergencies where a felony is in progress and life or property is in immediate danger. Priority 2 calls are those where there is potential for danger or a disturbance, and Priority 3 calls are routine calls where there is no immediate danger. Officer initiated activity include traffic stops, pedestrian stops and other on-view activity. As shown in the figure and table, the City's population increased 3.63 percent between 2014 and 2016. From 2014 to 2016, Police calls for service have increased by 4,728 calls (14.68%) and officer initiated activity has decreased by 2,818 stops (11.92%).



	2014	2015	2016
POPULATION	85,049	86,368	88,138
POLICE CALLS FOR SERVICE	32,208	33,629	36,936
OFFICER INITIATED ACTIVITY	23,626	23,015	20,808

The increase in Police Calls for Service is due to the increase in population and the success of the Area Command Policing model in conjunction with regular meetings with the community to encourage the calling of police when citizens see something suspicious in their neighborhoods. The decrease in Officer Initiated Activity is due in part to staffing reduction resulting from long-term officer injuries.

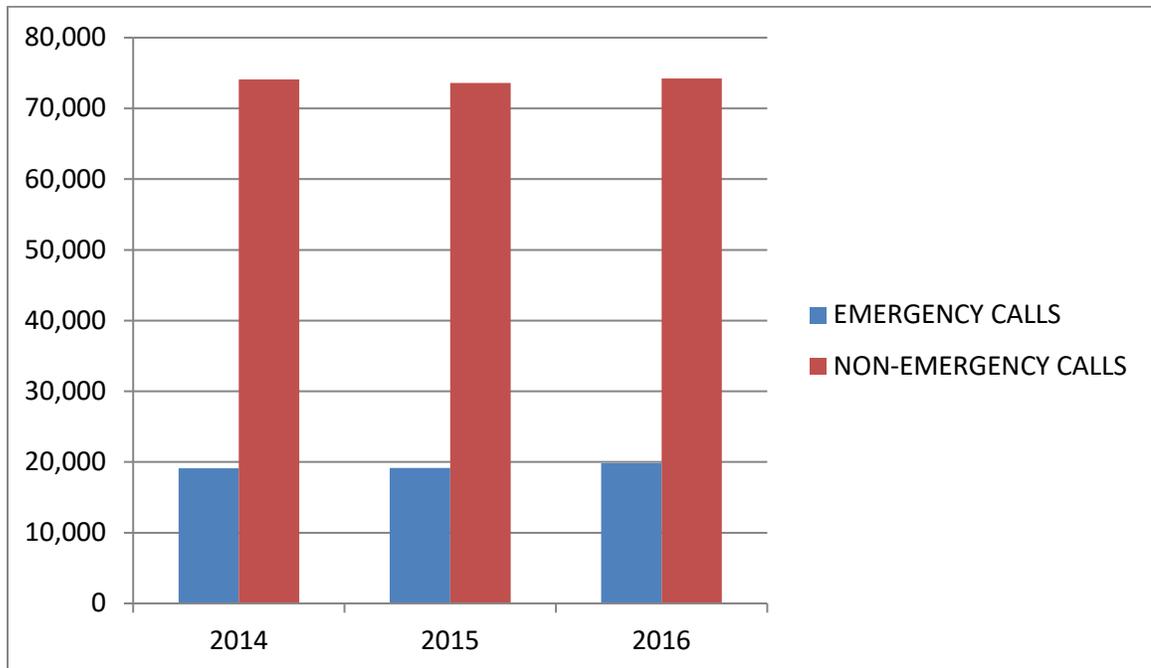
## POLICE DISPATCH



Between 2014 and 2016, the Livermore Police Dispatch center logged and entered over 280,000 police calls for service.

Emergency calls include crimes in progress, serious traffic accidents, medical emergencies and other types of calls for which the presence of police is needed as quickly as possible.

Non-emergency calls include less serious crimes such as minor disturbances, trespassing, loitering, suspicious vehicles or cold reports.

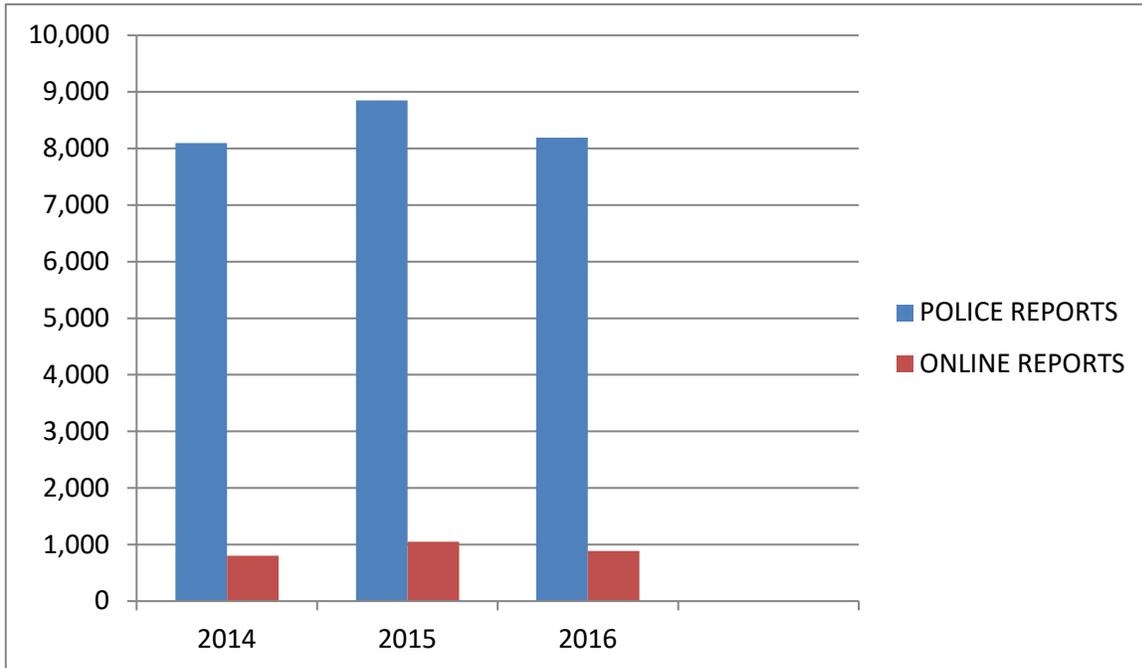


	2014	2015	2016
EMERGENCY CALLS	19,117	19,163	19,816
NON-EMERGENCY CALLS	74,090	73,608	74,235

## **POLICE REPORTS AND ONLINE REPORTS**

Online reports provide citizens with the option to file a property crime or non-criminal incident online. These reports can be filed at:

[http://www.cityoflivermore.net/citygov/police/records\\_and\\_reporting/reporting](http://www.cityoflivermore.net/citygov/police/records_and_reporting/reporting)



	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>POLICE REPORTS</b>	8,098	8,850	8,195
<b>ONLINE REPORTS</b>	804	1,051	886

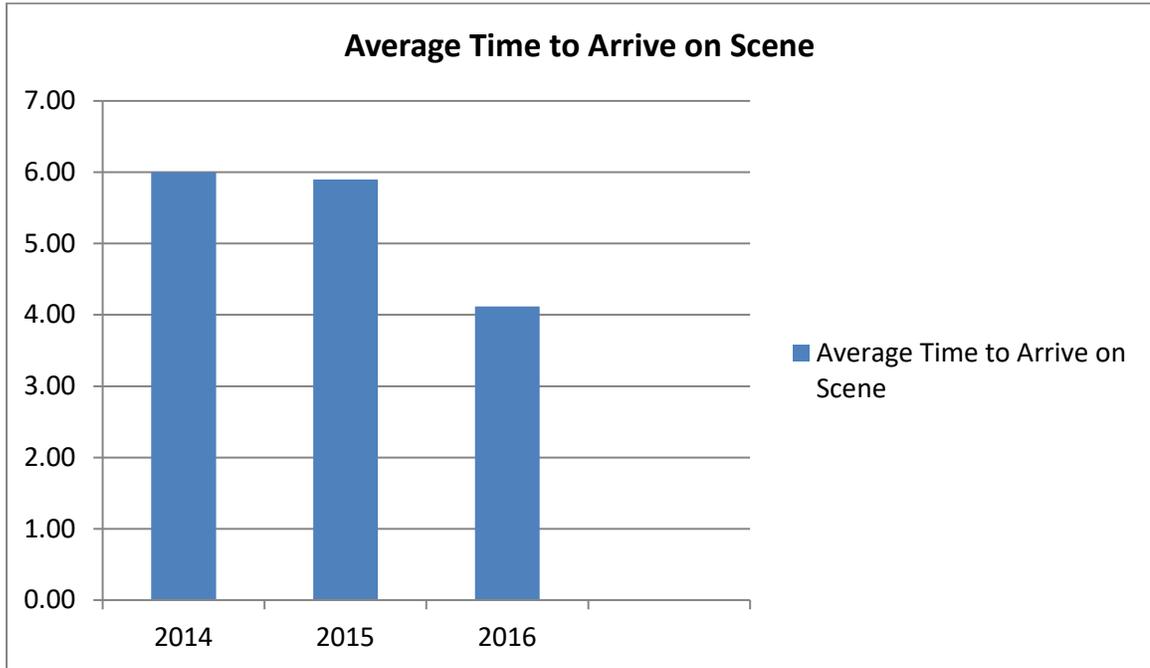
In summary, the population, number of businesses and amount of traffic in Livermore has increased and officer submitted reports from 2014 to 2016 have decreased.

The department's online reporting numbers have consistently averaged 913 reports each year. Each police report submitted by the officer or online is reviewed and approved by a Police Sergeant or the Watch Commander.

# DISPATCH & RESPONSE TIMES

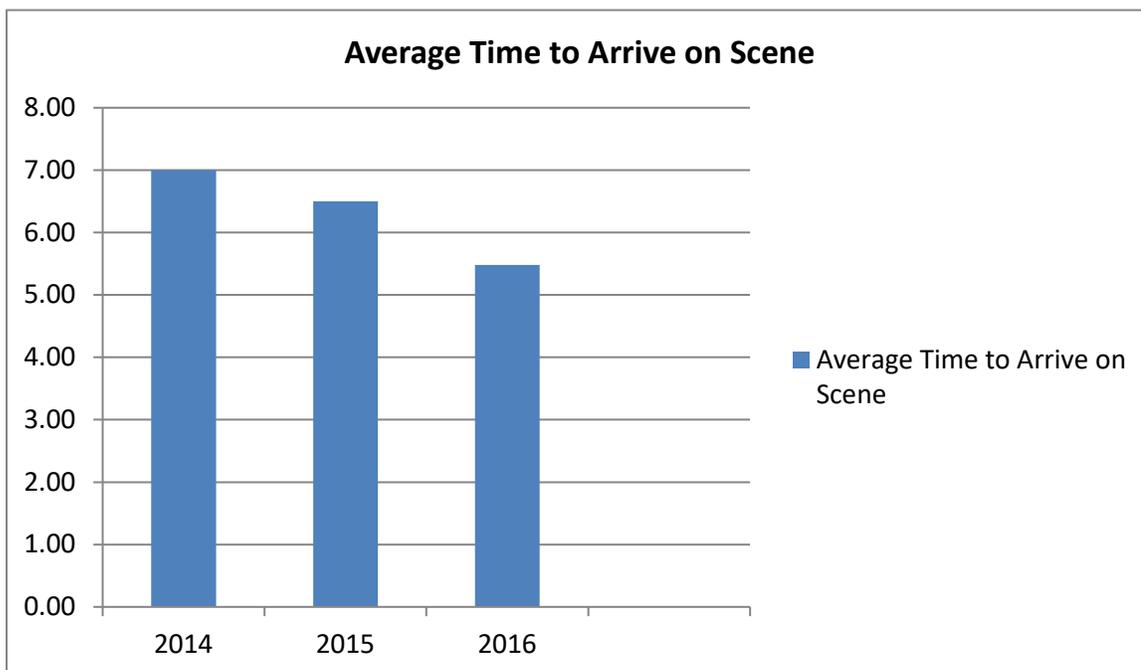
## 2014 to 2016 Priority 1 Response Times

Priority 1 calls are emergencies where a felony is in progress and life or property is in immediate danger.



**All Times in Minutes:** Times include when the call is dispatched to when the first police unit arrives on scene.

## 2014 to 2016 Priority 2 Response Times

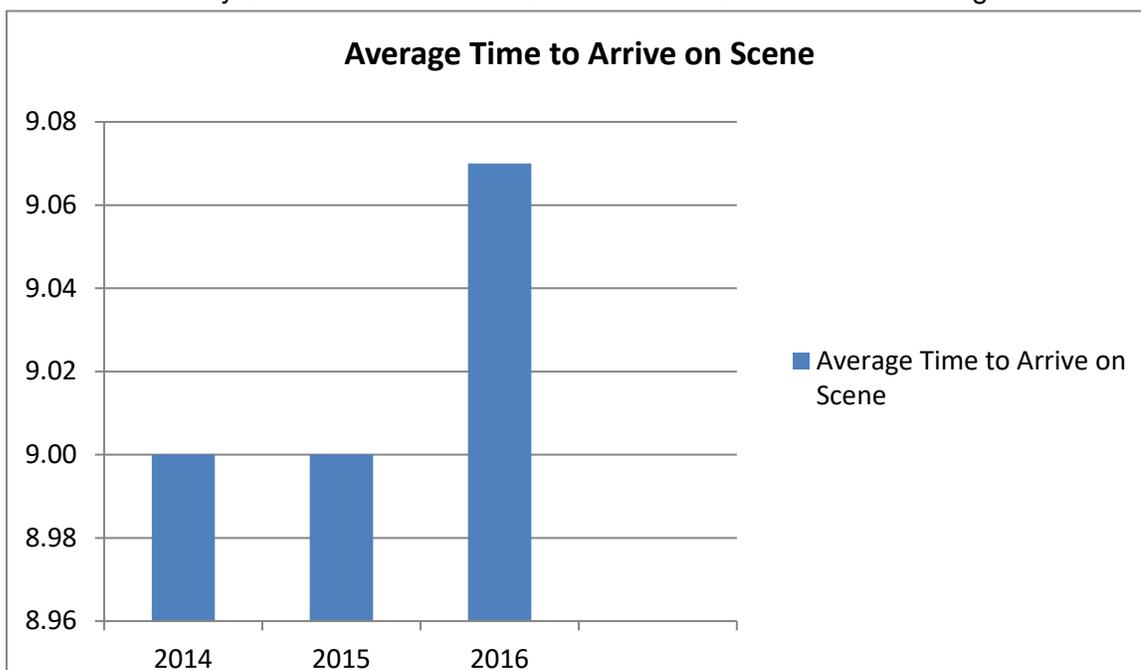


Priority 2 calls are those where there is potential for danger or a disturbance.

**All Times in Minutes:** Times include when the call is dispatched to when the first police unit arrives on scene.

## 2014 to 2016 Priority 3 Response Times

Priority 3 calls are routine calls where there is no immediate danger



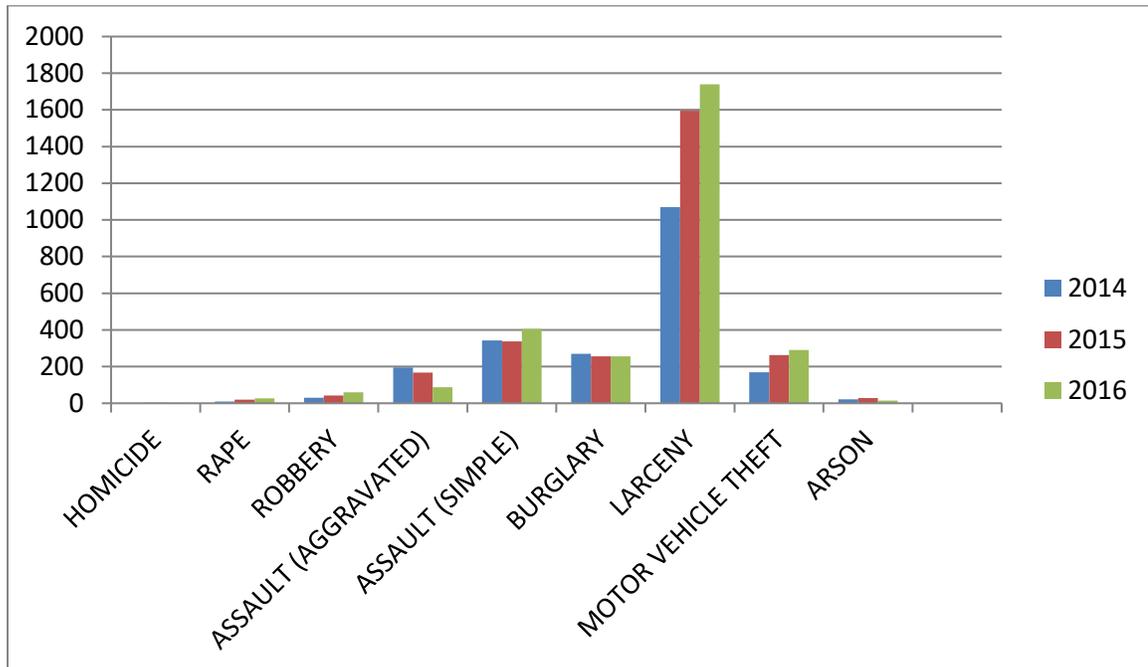
**All Times in Minutes:** Times include when the call is dispatched to when the first police unit arrives on scene.

For Priority 1 and 2 calls, response times have improved due to a reconfiguration of the traditional “Police Beat” structure and implementation of office deployment in larger geographical areas and adjusting staffing levels to more adequately respond to calls for service based on time of day. There was an increase in response times for Priority 3 calls in 2016 that can be associated with the increase in property crimes that are discovered after they have occurred and there is no further threat to persons or property.

## **CRIME STATISTICS**

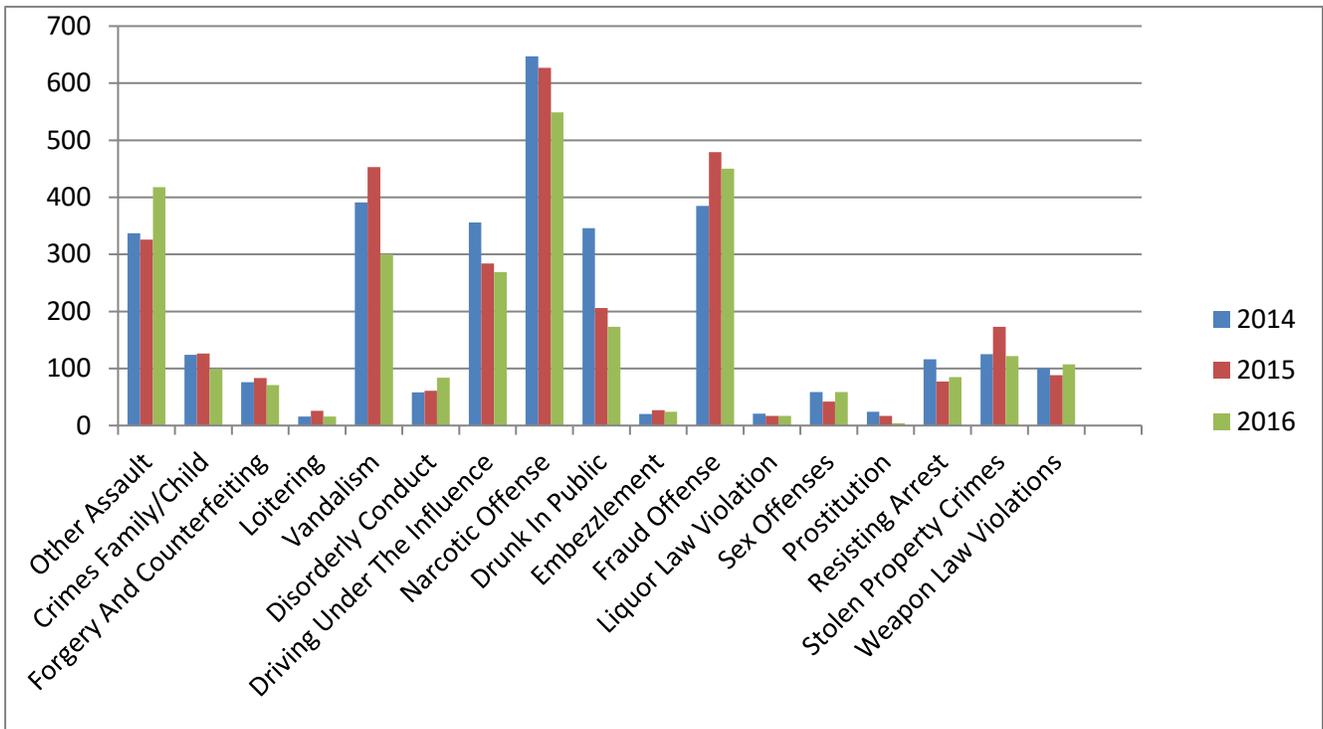
### **PART 1 CRIMES COMPARISON FOR 2014 TO 2016**

	<b>2014</b>	<b>2015</b>	<b>2016</b>
Homicide	0	3	1
Rape	10	20	26
Robbery	31	43	59
Assault (Aggravated)	195	167	88
Assault (Simple)	343	338	405
Burglary	269	255	255
Larceny	1063	1596	1739
Motor Vehicle Theft	169	262	290
Arson	21	28	14



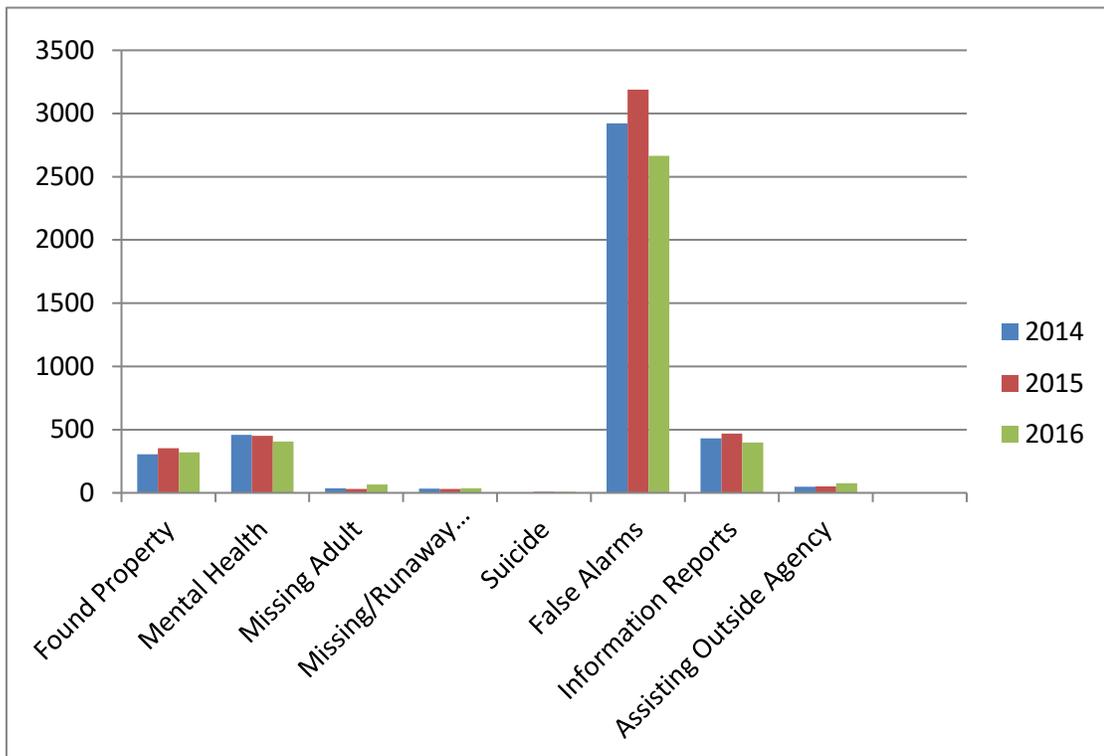
## PART 2 CRIMES COMPARISON 2014 TO 2016

	2014	2015	2016
Other Assault	337	326	418
Offenses Against Family And Children	124	126	99
Forgery and Counterfeiting	76	83	71
Loitering	16	26	16
Vandalism	391	453	300
Disorderly Conduct	58	61	84
Driving Under the Influence	356	284	269
Narcotic Offense	647	627	549
Drunk in Public	346	206	173
Embezzlement	20	27	24
Fraud Offense	385	479	450
Liquor Law Violation	21	17	17
Sex Offenses	59	42	59
Prostitution	24	17	4
Resisting Arrest	116	77	85
Stolen Property Crimes	125	173	122
Weapon Law Violations	100	88	107



### PART 3 CRIMES COMPARISON 2014 TO 2016

	2014	2015	2016
Found Property	306	352	319
Mental Health Evaluation	458	450	405
Missing Adult	37	32	65
Missing/Runaway Juveniles	34	32	37
Suicide	4	7	7
False Alarms	2921	3189	2665
Information Reports	432	469	399
Assisting Outside Agency	49	51	76



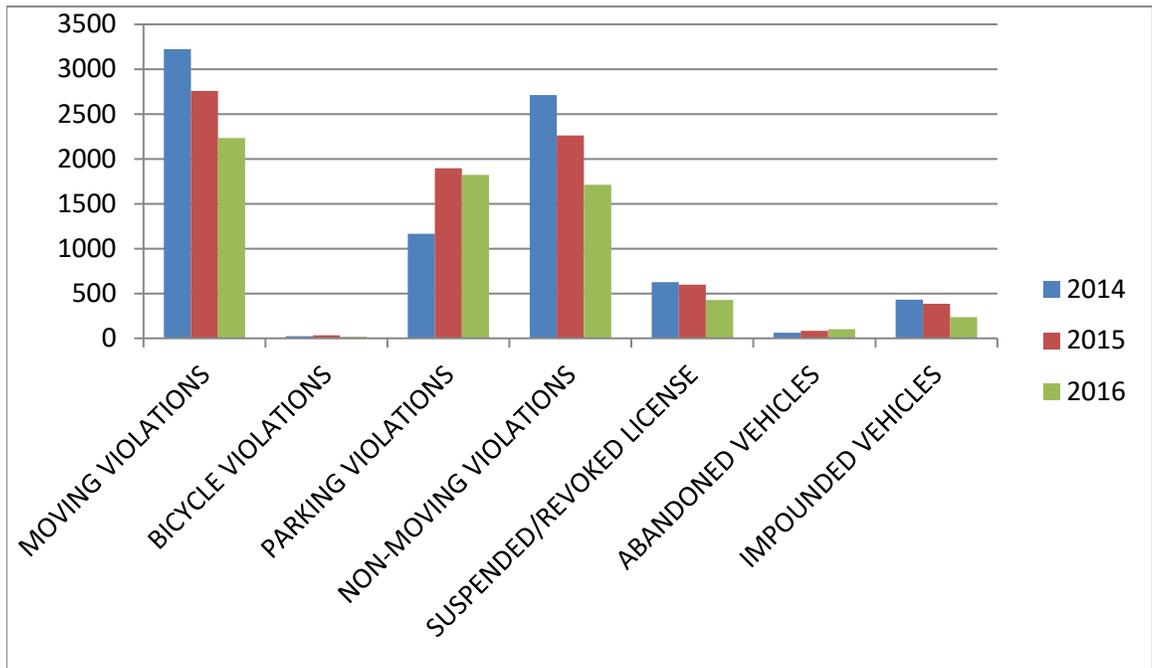
Property crimes through the County and State have been increasing. The City's numbers are comparable to State averages of similar cities. Increase in crime has been attributed to lowering penalties on many crimes that were previously felonies and now are misdemeanors for which the criminals are given citations with court dates in lieu of jail time.

## TRAFFIC DATA

### TRAFFIC ENFORCEMENT

	2014	2015	2016
Moving Violations	3,222	2,759	2,233
Bicycle Violations	24	35	16
Parking Violations	1,165	1,896	1,821
Non-Moving Violations	2,711	2,262	1,710
Suspended/Revoked License	626	599	426
Abandoned Vehicles	61	82	100
Impound Vehicles	430	386	235
DUI Drivers	304	232	126

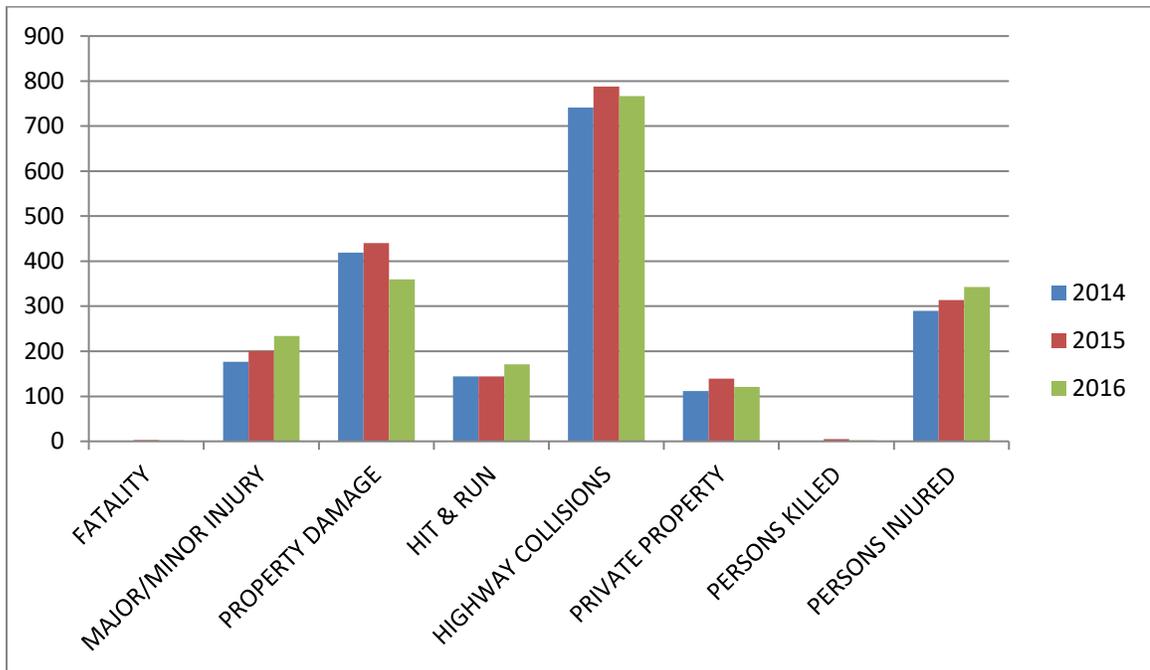
### TRAFFIC ENFORCEMENT 2014 TO 2016 COMPARISON



## TRAFFIC ACCIDENTS

	2014	2015	2016
Fatality	1	3	2
Major/Minor Injury	177	201	234
Property Damage	419	440	360
Hit & Run	144	144	171
Highway Collisions	741	788	767
Private Property	112	139	121
Persons Killed	1	5	2
Persons Injured	290	314	343
DUI Collisions	69	81	53

## TRAFFIC ACCIDENT 2014 TO 2016 COMPARISON





Considerable efforts and resources are being committed to increase traffic circulation and safety. For example, the LPD provides an aggressive educational campaign in conjunction with enforcement strategies as a multi-faceted approach to traffic issues. Since 2014, DUI collisions have fluctuated year to year from a high of 81 in 2015 to 53 in 2016. Overall, traffic statistics have decreased in many areas 2014 to 2016.

The decreased number of moving violations and drunk driving investigations from 2014 to 2016 may in part be due to the redeployment of two Traffic Unit officers from the Traffic Division to the Patrol Division due to staffing issues. Also, the downsizing of the Traffic Division caused fewer drunk driver checkpoints and officers dedicated to traffic enforcement and education.

## **Conclusion**

The City of Livermore recognizes the importance of public safety and is committed to maintaining a high quality of life for those who live and visit the community, which is reflected in a low violent crime rate. In addition to maintaining low rates of violent crime, there are other public safety challenges which include state-wide legislative changes, an increase in police calls for service, an increase in property related crime, such as larceny, burglary and vehicle theft, as well as an increase in traffic related injury collisions.

Over the last 5 years, the amount of collisions in Livermore has fluctuated from year to year; however, collisions increased from a low of 741 in 2014 to a high of 788 in 2015. During this same time, the number of moving violation citations issued decreased from a high of 3,222 in 2014 to 2,233 in 2016. While there are many variables that affect collision rates, proactive enforcement is important. Proactive traffic enforcement is the main focus

of the LPD Traffic Unit which has seen staff reductions in recent years. This is reflected in the reduced number of citations issued.

Property crimes include the categories of burglary, larceny and auto theft. Since 2014, Livermore's property crime has increased. As of 2016, Livermore was slightly below the state and US average.

Two statewide legislative changes have arguably made an impact on increasing crime rates:

- AB109 or "Realignment" - Realignment went into effect at the end of 2011. The basic idea behind realignment is to punish low-level felony offenders with local jail or out-of-custody supervision by county probation instead of with state prison time, followed by parole terms supervised by state parole agents.
- Proposition 47 – This law went into effect in January 2014 and reduced the level of certain crimes from felonies to misdemeanors. This change made many drug and some property crimes citable, meaning the suspects do not go to jail when they are arrested but are released on a citation. In cases where Proposition 47 suspects are taken to jail, they are usually released from custody as soon as they complete the booking process and are issued a court date.

Not all agree that these two changes have had a negative impact on the crime rate; however, some argue that because fewer criminals are in custody it allows them the opportunity to continue to commit crime.

Existing demands, staffing, and future growth will require continued analysis in the Department's efforts to achieve a proper baseline of policing. In addition, continued use and expansion of technology throughout the City will allow a more comprehensive approach to maintaining a high quality of life for Livermore's residents, businesses, and visitors.

# PARKS AND OPEN SPACE



## General Information

The extensive network of Livermore parks ranges from large regional parks covering several hundred acres to small neighborhood parks. The Livermore Area Recreation and Park District (LARPD) and East Bay Regional Park District (EBRPD), two separate agencies, are responsible for the development and maintenance of the non-City-owned and maintained parks and public open space in the Livermore area. Generally, LARPD is responsible for neighborhood, community, and special use parks of which a number are built on city owned property. EBRPD is responsible for regional parks and also coordinates with LARPD and the City on regional trail facilities. The City of Livermore owns and operates several smaller parks in the community. 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. Figure 1 shows existing Livermore parks as of 2016.

## Livermore Area Recreation and Park District

The Livermore Area Recreation and Park District (LARPD) is responsible for developing and operating parks, trails, recreation facilities, and programs serving the Livermore area. LARPD's jurisdiction stretches to the Contra Costa County border to the north, San Joaquin County to the east, Santa Clara County to the south, and the cities of Pleasanton and Dublin to the west. The total area for which LARPD is responsible is 241 square miles, 10 percent of which encompasses the City of Livermore. The policies and goals of LARPD, as outlined in its Master Plan, are endorsed by the City through the Livermore General Plan.

In its 2016 Parks, Recreation and Trails Master Plan, the District lists its standards for Neighborhood, Special Use, Community, and Open Space Parks and Trails parks per 1,000 residents. LARPD standards as well as a description of the various types of parks are in Table 1. The District owns and or operates 37 local parks totaling 428.2 acres plus five Open Space Parks totaling 1,949.23 acres. The City of Livermore also maintains a nominal number of "mini" parks in addition to Government grounds. These mini parks typically average an acre or less in size and together total approximately 11 acres.

## The East Bay Regional Park District

The East Bay Regional Park District (EBRPD) provides and manages regional parks for Alameda and Contra Costa Counties, a 1,745-square-mile area. The Regional Park system includes 66 parks, recreation areas, wilderness, shorelines, preserves

and land bank areas, and 1,250 miles of trails. In Alameda County, EBRPD manages over 58,000 acres. Ninety percent of EBRPD's lands are protected and operated as natural parklands. Park areas managed by EBRPD and serving the Livermore area include Shadow Cliffs in Pleasanton (266 acres), Del Valle Regional Park in Livermore (4,395 acres), the Sunol and Ohlone Regional Wilderness Areas (16,595 acres total), and Brushy Peak Regional Preserve (1,979 acres).

## **Funding and Acquisition**

EBRPD receives a major portion of its financial support through property tax revenues. Approximately 84 percent of its funding is generated from property taxes and assessments levied in Alameda and Contra Costa Counties. The remaining 16 percent of funds are generated by fees and charges for services, rents and leases, interest, and miscellaneous. In addition, EBRPD also works closely with the Regional Parks Foundation, a separate non-profit corporation helping to raise funds to support the agency.

LARPD receives 50 percent of its funding through property and special taxes with the balance of the budget funded through earned income (fees and charges). Facility maintenance is funded through property taxes and a special park maintenance and operations tax passed in 1997. Programs are funded through fees, charges, and grants. Capital development funds are acquired through governmental capital funding sources such as bonding and leasing, capital grants and through development fees levied by the City of Livermore.

LARPD acquires land for parks and trails via direct purchase, donations, grants and the City's parkland dedication requirement (consistent with the Quimby Act, Government Code Section 66477), as well as the City's trail dedication requirements. The Quimby Act enables cities to require a dedication of parkland or payment of fees as a condition of approval for a final residential tract or parcel map. The amount of land dedicated (outlined in the City's Development Code, Section 10.06.070) must be proportionate to the amount necessary to provide five acres of park area per 1,000 persons residing in a subdivision.

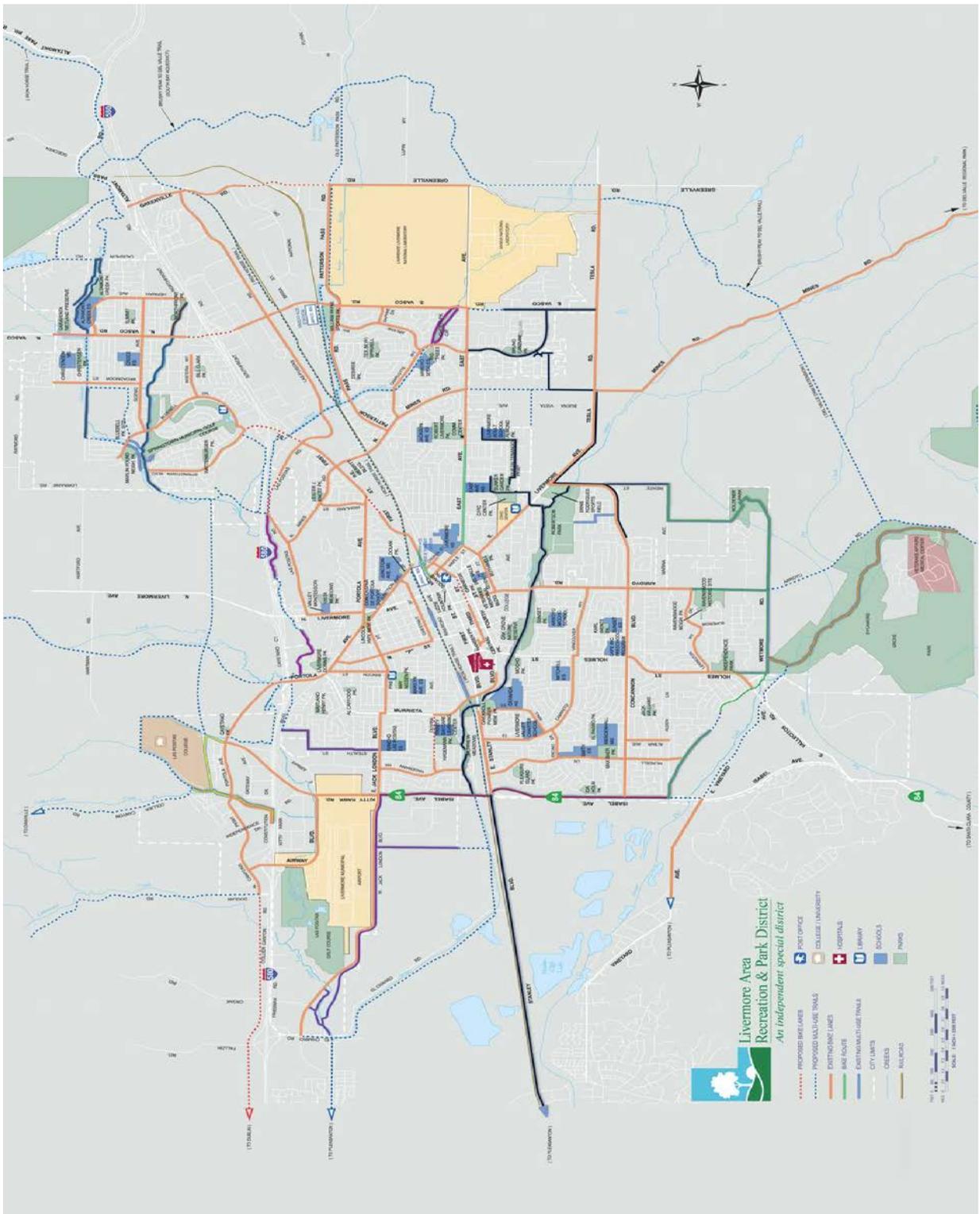
LARPD also receives funding from the City of Livermore through developer agreements, grants from the City's General Fund, and also via its park facilities fee requirement (consistent with the State's Mitigation Fee Act, Government Code Section 66600). In 2004, the City adopted this park facilities fee to expand the funding base for recreation facilities by applying a fee to all private development including new commercial, industrial, and residential development. The State Mitigation Fee Act (commonly referred to as AB1600) enables the City to apply this type of development fee to new development, so long as the funded facilities are directly related to the developing property.

Funds generated from this fee can be used not only for land for public parks, but also for capital improvements and renovations necessary to provide park and recreation services, including: typical park improvements such as landscaping, sports fields, courts, benches, play structures, etc., adjacent street improvement, special use facilities and structures such as restrooms and sports complexes, building

improvements, land for multi-use trails; and financing and administrative costs associated with the above improvements.

Since 1993 approximately half of LARPD's local property tax revenue has been diverted to the Educational Revenue Augmentation Fund (ERAF). According to LARPD, the resulting loss to the District and the Livermore community is now over \$7.9 million yearly and exceeds \$119 million in total.

Figure 1



# LARPD Park Standards

Table 1 lists LARPD park standards. These standards are used to determine the various amounts and types of parkland needed to serve Livermore Residents.

**Table 1**

Park Type	Description	LARPD Standard
Neighborhood	Size Range: 4- 10 acres. Target size is 10 acres. Service Area: 1/2-mile radius. These parks generally do not include lighting, restrooms or off-street parking.	2 acres/ 1000 persons
Community	Size Range: 30+ acres. Target size is 30 acres. Service Area: 2-mile radius. These parks may include sports fields with lighting where possible, permanent restrooms, off-street parking, tennis courts, aquatic facilities, large group picnic areas and/or other unique features.	2 acres/ 1000 persons
Open Space	Size Range: Varies. Target size is 150 acres. Service Area: variable. Minimal improvements, site should provide habitat for vegetation and wildlife, permanent restrooms when feasible. Examples include Sycamore Grove and Brushy Peak.	15 acres/ 1000 persons
Special Use	Size Range: no minimum. Service Area: may include the entire community and services may vary. These parks are typically focused on a single type of activity or facilities, such as equestrian/rodeos bicycle, soccer, softball, and historic.	2 acres/ 1000 persons

## Existing Parks

LARPD provides 153 acres of Neighborhood parks, consisting of 27 parks ranging from 2-12 acres in size; 152.4 acres in three Community parks (May Nissen, Robertson, and Robert Livermore parks) with such amenities as group picnic areas, a swim center, tennis courts, tot lot equipment, natural and synthetic sports fields, equestrian/rodeo facilities, and ball fields; Open Space parks including Brushy Peak Regional Preserve, Garaventa Wetlands Preserve, Holdener, Murrieta Meadows and Sycamore Grove Parks, totaling 1,444.5 acres; and 122.2 acres in eight Special Use parks.

The City of Livermore maintains several parks whose area is not included in the LARPD park inventory. The City maintains approximately 15 acres of park and open space area, most of which is contained in the special use category. The 15 acres is comprised of approximately 11 acres of mini-park area plus other open

spaces such as the (old Civic Center) library grove, City Hall grounds and the LVC Plaza in front of the Bankhead Theater. Privately maintained parks account for a very small percentage of citywide parkland and are not included in the inventories.

Increased population in Livermore will increase demand for parks and open space in and around the City. To meet the LARPD standards for various types of park land acres needed per 1,000 residents, new park land, specifically for community and special use parks, will need to be acquired.

Table 2 shows current and projected park acreages compared with adopted park standards. In 2016, special use parks exceed the standard, while additional land is needed for neighborhood parks (32.11 acres), community parks (33.01) and open space parks (13.61 acres).

**Table 2**

LARPD Park Standard	Neighborhood 2 acres/1000 residents	Community 2 acres/1000 residents	Open Space 15 acres/1000 residents	Special Use 3 acres/1000 residents	Total (acres)
<b>2016</b>					
Acres provided	153.3 acres	152.4 acres	1,360 acres	199.02 acres	1,864.73
Need at pop. 92,705 <sup>1</sup>	185.41 acres	185.41 acres	1,390.5 acres	185.41 acres	1,947.73
	32.11 acres needed	33.01 -acre needed	30.5 -acre needed	13.61 acres surplus	
<b>2035 Need Projections</b>					
Need at pop. 112,417 <sup>2</sup>	224.83 acres	224.83 acres	1,686 acres	224.83 acres	2,360.49 acres
	71.52 acres needed	72.43 acres needed	326-acre needed	25.81 acres needed	

<sup>1</sup> US Census, 2012

<sup>2</sup> ABAG July 2013 Bay Area Plan Household Growth Forecast for City of Livermore with adjustment to District level.

The 2016 Parks, Recreation and Trails Master Plan projects a need for 71.53 acres of neighborhood parks by 2035. The need for neighborhood parks has been met in the past through the creation of new parks paid for by the development of new residential projects. For example, Cayetano Park was developed in conjunction with the Shea Homes residential development on adjacent land. The amount of neighborhood park land is anticipated to increase commensurate with the increase in population.

## South Livermore

The South Livermore Specific Plan reserved an average of approximately 200 units per year with full allocation of all 1,553 units completed in 2004. The Specific Plan estimates a total of 3,340 new residents total for the project area. The South Livermore Specific Plan proposes approximately 15.5 acres of new neighborhood

parks (about 4 acres/1,000 persons) of which LARPD states approximately 12 acres meet their standards. The Specific Plan also includes 55 acres of open space (Holdener Park), which can function as passive recreational open space.

## **Downtown Specific Plan Area**

In 2004, the City adopted a new Downtown Specific Plan (DSP) implementing goals and policies of the 2003-2025 General Plan (also adopted in 2004). The Downtown Specific plan encourages mixed use residential as well as higher density residential development in support of the revitalization of the Downtown. The Specific Plan also recognizes the need for public open space areas and parks to support new residential development. However, the nature of higher density, more compact, vertical development in the Downtown, suggests the need for public open space areas less traditional in size and form. With limited space in the Downtown, larger community or neighborhood parks are not planned. For this reason, the Plan requires publicly accessible open space in the form of pocket parks, greens, squares, plazas, or widened sidewalks. The intent of the public open space requirements in the DSP is to create an interconnected web of smaller parks, plazas, and public pathways.

In 2005, the DSP was amended to allow a Public Open Space In-lieu fee. This fee allowed for smaller residential projects to meet their public open space requirements through the payment of an in-lieu fee rather than providing the space on site. This fee is only available for smaller projects, specifically projects 1.5 acres or less in the Downtown Core plan area; and projects 2 acres or less in the Neighborhood and Gateway plan areas. Funds collected through the in-lieu fee will be used to either purchase sites in the Downtown for public open space or to upgrade existing open space areas Downtown.

## **Conclusion**

Parks and recreation facilities provide an important amenity to the community, which affects the health and quality of life for its residents. Overall, LARPD needs to expand the total acreage of all parkland categories to meet established standards through 2035 as residential population increases.

## SOLID WASTE SERVICE



On July 1, 2010, a local company, Livermore Sanitation, began collecting garbage, recycling, and organics in the City of Livermore. The exclusive Franchise Agreement with Livermore Sanitation has a ten-year term, with the option for the City to extend it up to 42 months.

Livermore Sanitation Provides a number of services to the community. These services are outlined below.

### **Single-Family Residential Curbside Recycling and Organics Collection**

Livermore Sanitation began providing recycling and organics collection services on July 1, 2010. Recycling materials collected include paper, plastics, cans, bottles, and e-waste peripherals. Organics materials include yard trimmings, food waste, and food-contaminated paper.

Livermore Sanitation provides all single-family residents with wheeled garbage, recycling, and organics carts for weekly collection of materials. Residents are provided with individual food scrap pails for in-house collection of food scraps and are allowed to add food scraps to their organics carts.

Livermore Sanitation processes all recyclable materials collected from Livermore at the Alameda County Industries facility in San Leandro and all residential organics are processed and composted at Recology's Blossom Valley North facility in Vernalis.

### **Multi-Family Residential Recycling and Organics Services**

Since July 1, 2010, every multi-family complex has had access to recycling and organics collection. Livermore Sanitation provides educational materials for multi-family unit residents and offers a small recycling bag for each resident of multi-family units in Livermore to facilitate in-unit collection of recyclable materials. Educational materials, including move-in kits and posters, have been distributed to Multi-Family complexes to promote recycling and diversion.

The Alameda County Mandatory Recycling Ordinance, discussed below, now requires multi-family complexes to participate in recycling and organics programs.

## Commercial Recycling and Organics Services

Livermore Sanitation provides weekly collection of a 96-gallon recycling cart for all businesses at no extra charge as part of their garbage account subscription. Businesses can increase their recycling service level if needed for an additional charge. The recyclable materials collected from businesses include glass bottles and jars, aluminum cans, metal cans, milk containers, all narrow neck numbers 1 to 7 plastic containers, all plastic containers, aseptic packaging, and empty aerosol cans.

Livermore Sanitation also offers weekly collection of one 96-gallon organics cart with a subscription to garbage services. Business can subscribe to additional organics services for a 50 percent discount off of solid waste rates. Organics consist of food waste and food-contaminated paper, and all organics are processed at Recology's Blossom Valley North facility in Vernalis.

The Alameda County Mandatory Recycling Ordinance, discussed below, now requires all businesses to participate in recycling and organics programs.

## Vasco Road Landfill

Franchised solid waste is taken by Livermore Sanitation from Livermore to the Republic Services Vasco Road Landfill for disposal under a contract with the City that expires December 31, 2023<sup>1</sup>. The Vasco Road Landfill site is located on 435 acres of land and is currently permitted for use of 246 acres. A comparison of the tonnages of materials landfilled and diverted to recycling between Calendar Year 2014 and 2015 are presented below.

**Livermore Collection Comparison Calendar Year 2014 and 2015**

	2014	2015	Change	Change (percent)
Garbage taken to Landfill (Tons)	57,274	58,333	1,059	1.85%
Recyclable Materials (Tons)	17,210	19,243	2,033	12%
Organics (Tons)	18,007	19,108	1,101	6%
Population	84,852	85,990	1,138	1.34%
Per capita pounds of landfilled garbage per day	3.9	4.1	0.2	5.13%

<sup>1</sup> The City's agreement with the Vasco Road Landfill ends in 2023 as does the landfill's permitted life. The landfill may apply for an expansion beyond 2023. The Altamont Landfill has at least 50 years of life and is a potential future option.

## California Integrated Waste Management Act (AB 939)

In 1989, the California Legislature enacted the California Integrated Waste Management Act (AB 939) requiring diversion of waste materials from landfills in order to preserve decreasing landfill capacity and natural resources. AB939 required cities and counties in California to divert 25 percent of solid waste from landfill disposal by 1995 and 50 percent of solid waste by the year 2000.

In September of 2008, the Governor signed a modification to AB 939, known as the Solid Waste Disposal Measurement Act. Commonly known as SB 1016, this Act changed the way the California Department of Resources Recycling and Recovery (CalRecycle) measures cities' diversion rates. The changes outlined in SB 1016 became effective in 2007 and are designed to afford CalRecycle staff the time to help cities enhance their source reduction and recycling programs rather than spending time reviewing reports. In lieu of diversion rates, compliance with existing law is measured in "Pounds per Person, per Day". It should be noted that SB 1016 compliance focuses less on measuring diversion, and more on compliance with programmatic requirements.

Since the changes specified by SB 1016 apply to Livermore tonnages beginning in reporting year 2007, subsequent diversion rates should be considered estimates based on staff calculations. Livermore's diversion rates through 2015 are presented below.

YEAR	LIVERMORE DIVERSION RATE
1995	26%
1996	25%
1997	45%
1998	37%
1999	38%
2000	50%
2001	59%
2002	55%
2003	61%
2004	65%
2005	63%
2006	64%
2007*	60%
2008*	64%
2009*	71%

YEAR	LIVERMORE DIVERSION RATE
2010*	73%
2011*	74%
2012*	77%
2013*	77%
2014*	76%
2015*	75%

\*estimated

## California's Mandatory Commercial Recycling Law (AB 341)

Mandatory Commercial Recycling was one of the measures adopted in the Assembly Bill 32 Scoping Plan by the Air Resources Board (ARB) pursuant to the California Global Warming Solutions Act (Chapter 488, Statutes of 2006). The Mandatory Commercial Recycling Measure focuses on increased commercial waste diversion as a method to reduce GHG emissions. It is designed to achieve a reduction in GHG emissions of 5 million metric tons of carbon dioxide (CO<sub>2</sub>) equivalents. To achieve the measure's objective, an additional 2 to 3 million tons of materials annually will need to be recycled from the commercial sector by the year 2020 and beyond.

The regulation was adopted at CalRecycle's January 17, 2012 Monthly Public Meeting. This regulation reflects the statutory provisions of AB 341 (Chapter 476, Statutes of 2011 [Chesbro, AB 341]) and provides additional procedural clarifications. The regulation was approved by the Office of Administrative Law on May 7, 2012 and became effective immediately. On June 27, 2012 the Governor signed Senate Bill 1018 which included an amendment that requires a business that generates 4 cubic yards or more of commercial solid waste per week to arrange for recycling services. (<http://www.calrecycle.ca.gov/Recycle/Commercial/>).

## StopWaste and the Mandatory Recycling Ordinance

The Alameda County Waste Management Authority (Authority) is a public agency formed in 1976 by a Joint Exercise of Powers Agreement among the County of Alameda, each of the fourteen cities within the county, and two sanitary districts that provide refuse and recycling collection services. The Authority has a seventeen-member board composed of elected officials appointed by each member agency.

The Authority is responsible for preparation of the Alameda County Integrated Waste Management Plan and Alameda County Hazardous Waste Management Plan. It manages a long-range program for development of solid waste facilities and offers a

wide variety of other programs in the areas of source reduction and recycling, market development, technical assistance and public education. Funding is provided by per ton disposal and waste import mitigation fees.

The Alameda County Source Reduction and Recycling Board (Recycling Board) was created in 1990 by the voters of Alameda County through a ballot initiative, "Measure D". The eleven-member board includes six citizen experts appointed by the Alameda County Board of Supervisors and five elected officials from the Alameda County Waste Management Authority.

The Recycling Board is responsible for programs that promote source reduction, residential and commercial recycling, recycled product procurement and market development. Program funding is provided from a per ton disposal surcharge at the Altamont and Vasco Road landfills.

In January 2012, the Alameda County Waste Management Authority passed a Mandatory Recycling Ordinance to help achieve the StopWaste Strategic Plan goal of 90 percent diversion of readily recyclable and compostable materials for recovery.

In February of 2012, the Livermore City Council chose to participate in Phase 1 of the Mandatory Recycling Ordinance beginning July 1, 2012. In addition, on October 14, 2013, the Livermore City Council chose to participate in Phase 2 which requires all Alameda County multi-family properties and businesses to segregate organic materials for recovery beginning July 1, 2014.

For the City of Livermore, the Mandatory Recycling Ordinance increased diversion to maintain the City Council goal of 75 percent of waste diverted from landfill by 2015 and may prevent backsliding as the economy recovers and consumption increases. The Mandatory Recycling Ordinance is also expected to aid Livermore in complying with forthcoming State regulations.

## **Styrofoam Ban**

In 2010, the Livermore City Council approved an Ordinance banning the use of expanded polystyrene (EPS) foodservice ware. EPS, commonly known as Styrofoam™, is frequently used to make foodservice ware because of its low cost and heat insulation qualities. EPS foodservice ware presents a myriad of challenges for local jurisdictions because it often ends up as litter, creates blight, and contaminates storm drains.

The Ordinance took effect on July 1, 2011, and requires food vendors to only offer foodservice ware that is recyclable or compostable. The ordinance establishes a monitoring and enforcement mechanism for ordinance compliance, and allows food vendors to apply for an exemption under special circumstances.

## **Construction and Demolition Materials Recycling Program**

In 2013, the City Council City Council revised the Municipal Code to phase out the Permitted Hauler system for the collection of construction and demolition materials. Once the phase out is complete in June 2018, Livermore Sanitation will have exclusive rights to haul materials for compensation within the Livermore city limits. According to the franchise agreement, Livermore Sanitation must divert a minimum of 50 percent of construction and demolition debris collected.

The Republic Services Vasco Road Landfill and the Waste Management Altamont Landfill both accept construction and demolition materials for diversion. Materials generally accepted at both landfills include corrugated containers, concrete, asphalt, ferrous metals, non-ferrous metals, a combination of masonry, brick, ceramic and/or stone, wood/brush and trees, and gypsum (wallboard/sheet rock).

## **Christmas Tree Recycling**

Each year, Christmas trees are collected (for a nominal fee) by the Boy Scouts. Livermore Sanitation will also collect Christmas trees curbside from single-family residences at no extra cost and provide a debris box to multi-family complexes for Christmas tree drop off.

## **Household Hazardous Waste Management**

The Alameda County Household Hazardous Waste Collection Facility was opened in September 1993 in Livermore and is located at 5584 La Ribera Street. Livermore residents can drop off hazardous materials at the facility at no charge when the facility is open. There is no need for an appointment during the available drop off days.

The facility provides Livermore residents the opportunity to drop off household hazardous wastes at no charge and is intended to remove such products from the waste stream where they exacerbate contamination at landfill sites. Materials such as used paint, stain, varnish, thinner, adhesives, old vehicle fuel, motor oil, oil filters, batteries, anti-freeze, cleaners, pesticides and fertilizers are recycled.

Batteries, cell phones, and electronic waste peripherals (computer mice, keyboards, etc.) are now accepted in the curbside recycling program for single-family residents. Livermore Sanitation also collects used motor oil and filters from residents at no charge.

## **School Education and Recycling Programs**

Livermore Sanitation provides a minimum of 170 classroom presentations annually to public and private schools. Livermore Sanitation began providing solid waste, recycling, and organics collection to Livermore schools in July 2013.

## **Conclusion**

The City has planned for anticipated residential growth and expects to be able to accommodate the current and future solid waste disposal and recycling needs in the community to the year 2023, based on current growth estimates. However, the growth of Livermore and surrounding communities needs to be continuously evaluated. Projecting landfill space is based on current disposal estimates and growth. Bay Area landfills are closing, resulting in jurisdictions redirecting their waste. Both these factors affect the available space at the Republic Services Vasco Road Landfill. However, based on the current information, landfill space is not expected to be a limiting factor for the City of Livermore.

# AIR QUALITY



## Overview and Introduction

Air quality, due to its transient nature and regional importance, is subject to regulation at the Federal, State, and local levels. The Federal Environmental Protection Agency (EPA) sets the national standards within which states and local air districts operate. The California Air Resource Board (CARB) sets air quality standards for the state, which are generally more stringent than the national standards. Six air pollutants, referred to as “criteria pollutants,” are evaluated in terms of ambient concentrations of pollutant in the atmosphere. Areas that exceed established standards are designated as not being in attainment, or nonattainment. Areas that fail to attain the national standards risk the loss of federal highway funding. Nonattainment of state standards require regional air districts prepare plans to improve local air quality.

## Federal Clean Air Act

Federal Clean Air Act authorizes the EPA to set national ambient air quality standards (NAAQS) at a level to protect public health for six pollutants referred to as criteria pollutants (ground-level ozone, particulate matter, carbon monoxide, lead, sulfur dioxide and nitrogen dioxide). Standards are set based on scientific reports and recommendations put forward by the Clean Air Scientific Advisory Committee (CASAC), an independent air quality research entity that provides recommendations to the EPA Administrator on whether or not current air quality standards will protect human health. Once a standard is set, air basins within each state are designated as either attaining or not meeting a standard.

In 1997, the eight-hour national ambient air quality (NAAQS) ozone standard was 84 parts per billion (ppb). It was lowered to 75 ppb and 70 ppb in 2008 and 2015 by the EPA, respectively. The Bay Area has met the 84 ppb standard since 2005 and the 75 ppb standard since 2012. The Bay Area has yet to meet the 70 ppb ozone standard. Separate standards exist for ambient air quality standards for particulate matter. In December 2012, EPA strengthened the annual particulate matter (PM) 2.5 NAAQS from  $15.0 \mu\text{g}/\text{m}^3$  to  $12.0 \mu\text{g}/\text{m}^3$ . The primary 24-hour PM<sub>2.5</sub> standard was tightened to  $35 \mu\text{g}/\text{m}^3$  in 2006. Recent monitoring data indicates that the Bay Area violates the state annual PM<sub>2.5</sub> standard.

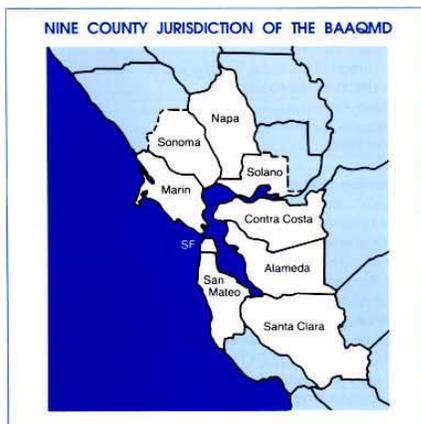
## State Clean Air Act

The State Clean Air Act calls for the California Air Resources Board (CARB) to establish state air quality standards. State standards are determined by CARB, based on input from the Office of Environmental Health Hazard Assessment (OEHHA). CARB requires regional air districts that do not attain the state standards to prepare plans and programs

to attain the standards. The Bay Area Air Quality Management District (BAAQMD or Air District) must develop a *Clean Air Plan* that outlines control measures and strategies the region will undertake to reduce pollution and meet health-based state air quality standards. The 1991 Clean Air Plan was the first plan in the Bay Area. Because the region did not meet the ozone standards, the plan was updated every three years since and again in 2005. In 2010, the District, in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), completed the Bay Area 2010 Clean Air Plan, a major revision of the 2005 Ozone Strategy. The 2010 Clean Air Plan is a multi-pollutant roadmap outlining how the region will continue its long-term progress toward attainment of the state ozone standard, reduce emissions of toxic air contaminants and move forward with goals to reduce greenhouse gas emissions to protect public health. The Air District is currently developing the 2017 Clean Air Plan (2017 Plan) to update and improve on the 2010 Clean Air Plan, as mandated by state air quality planning requirements.

In June 2002, CARB adopted a new annual health-based ambient air quality standard for PM<sub>2.5</sub> of 12  $\mu\text{g}/\text{m}^3$  and lowered the annual PM<sub>10</sub> standard from 30  $\mu\text{g}/\text{m}^3$  to 20  $\mu\text{g}/\text{m}^3$ . However the state has yet to adopt a 24-hour PM<sub>2.5</sub> standard. The Air District is classified as nonattainment for this standard for the annual PM<sub>10</sub> and annual PM<sub>2.5</sub> standards. To provide increased protection to groups of people who are more sensitive to air pollution such as the children and the elderly, in 2005 the State of California approved a new more stringent state eight-hour ozone standard of 0.070 parts per million (ppm) while retaining the existing one-hour standard of 0.09 ppm. The Bay Area Air District is classified as nonattainment for both of these standards.

## Bay Area Air Quality Management District



BAAQMD (Air District) is the Regional Agency that is responsible for regulating sources of air pollution in the Bay Area. The Air District was created by the California Legislature in 1955 and the District's jurisdiction encompasses Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa, and portions of two others; southwestern Solano and southern Sonoma.

The Air District is governed by a 24-member Board of Directors, made up of publicly elected officials apportioned according to the population of the represented counties. The Board has the authority to

develop and enforce regulations to control air pollution and improve air quality within its jurisdiction. The Air District uses an interactive approach to regulating air pollution, implementing many grass root programs and is one of the most responsive air quality programs in the nation.

## **Air Pollutants**

Specific air pollutants regulated by the Air District include: Particulate Matter, Organic Compounds, Nitrogen Oxides, Sulfur Dioxide/Oxides, Carbon Monoxide, Hydrogen Sulfide, Photochemical Smog (Ground Level Ozone), and Acid Deposition. The following is a brief description of these pollutants. The Air District is also undertaking several initiatives to address greenhouse gas emissions in the Bay Area.

### **Particulate Matter**

Particulate matter (PM) is often characterized on the basis of particle size. Fine PM consists of particles 2.5 microns or less in diameter. PM10 consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Fine particulate matter (PM2.5), a diverse mixture of suspended particles and liquid droplets (aerosols), is the air pollutant most harmful to the public health. Exposure to fine PM, on either a short-term or long-term basis, can cause a wide range of respiratory and cardiovascular health effects, including strokes, heart attacks and premature deaths. Combustion of fossil fuels and wood (primarily residential wood-burning) are the primary sources of PM2.5 in the Bay Area. Smoke, composed of carbon and other products of incomplete combustion, is the most obvious form of particulate pollution. Open fires, incinerators, petroleum refining, and fuel burning in vehicles and aircraft all produce these highly visible particulates. Industrial processes such as those used in refining crude oil and in manufacturing chemicals also contribute to particulate formation. Liquid aerosols and solid particles form photochemically in the atmosphere when sunlight reacts with waste gases. Industrial dust is formed by grinding or pulverizing materials, as in cement production. Earth-moving operations, especially farming and construction also cause large amounts of dust to enter the air. Some particulate emissions are considered more toxic than others. Highly toxic substances such as cadmium, beryllium, and asbestos are associated with specific industries and can have adverse local public health concerns. The California Air Resources Board has identified diesel PM as a toxic air contaminant. Diesel particulate poses the greatest health risk of any identified toxic air contaminant. Diesel emissions account for roughly one-sixth of total emissions of PM2.5 in the Bay Area.

### **Organic Compounds**

Organic gases, or hydrocarbons, are released when fuels or organic waste materials are burned. These materials are the result of incomplete combustion and range in complexity from methane, a simple organic gas, to much more complex molecules containing carbon, hydrogen, and oxygen in varying proportions. Organic compounds are also emitted by consumer products such as aerosol sprays and by paints, inks, solvents, and gasoline when they evaporate.

Organic compounds are significant air pollutants because they react with oxides of nitrogen in the presence of sunlight to produce photochemical smog, or ozone. The Air District has adopted 52 rules to directly control organic compounds from numerous operations such as: semiconductor manufacturing; petroleum production, refining, and marketing; and various coating operations. In addition to this industrial pollution,

automobiles produce two organic compounds (exhaust-benzene and 1, 3-butadiene), which account for over 50 percent of toxic air containments exposed to the public.

## **Nitrogen Oxides**

Air is comprised of about 80 percent nitrogen. Whenever anything burns at high enough temperatures, a certain amount of nitrogen in the air burns as well. Burning, also known as oxidation, occurs when material combines with oxygen in such a way as to release energy in the form of light and heat. The resulting compounds containing nitrogen are primarily nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). Together these two compounds are known as oxides of nitrogen, and they are involved in photochemical reactions that produce ozone. At concentrations experienced in the Bay Area, nitrogen dioxide can be seen as a brown haze. On days with otherwise good visibility, the coloration effects will be noticeable. At higher concentrations, damage has been noticed in sensitive crops such as beans and tomatoes, and pulmonary changes have been observed in laboratory animals. The Environmental Protection Agency (EPA), California's Air Resources Board (CARB) and the Air District have all adopted measures to curtail emissions of nitrogen oxides. The Air District directly controls power plants, boilers, stationary turbines, and stationary engines that are sources of these pollutants, and indirectly controls vehicular sources of NO<sub>x</sub> by working to change people's driving habits.

## **Sulfur Oxides**

Heating and burning fossil fuels, such as coal and oil, release the sulfur present in these materials. In areas where large quantities of fossil fuels are used, sulfur oxides can be a major air pollution problem. The largest fraction of sulfur oxides is sulfur dioxide (SO<sub>2</sub>). This substance often further oxidizes to form sulfur trioxide (SO<sub>3</sub>), which in the presence of moisture can form sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>). These contaminants can damage vegetation and affect the health of both humans and animals.

In the past, sulfur oxides were a problem in the Bay Area, especially in the vicinity of the large oil refineries and chemical plants in Contra Costa County. The Air District has been controlling emissions from these sources since 1961, however, and no state or federal excesses have been recorded at Air District monitoring stations since 1976.

## **Carbon Monoxide**

This is an odorless, invisible gas, which affects the health of people exposed to high concentrations. Carbon monoxide is especially dangerous indoors, when ventilation is inadequate.

Almost 70 percent of the Bay Area's carbon monoxide comes from motor vehicles. A substantial amount also comes from burning wood in fireplaces and woodstoves. State and Federal controls on new cars, use of reformulated fuels and voluntary efforts to reduce wood burning have been implemented to prevent carbon monoxide from reaching adverse levels. The Bay Area has not exceeded the national or state standard for carbon monoxide for several years and is now formally recognized as an attainment area for CO.

## Hydrogen Sulfide

A colorless gas with a strong "rotten egg" odor, hydrogen sulfide (H<sub>2</sub>S) can be smelled at very low concentrations. It discolors paints and tarnishes many metals. This gas is produced largely at sewage treatment plants and at oil refineries as a by-product in refining crude oil. Concentrations of H<sub>2</sub>S are limited by Air District regulations.

## Photochemical Smog – Ozone

Photochemical air pollution—or photochemical smog—results from a chemical reaction of precursor chemicals known as reactive organic compounds and oxides of nitrogen in the presences of sunlight. Weather conditions have a strong impact on ozone formation. Due to variations in weather, ozone levels can vary dramatically day to day and from one summer to the next. As the air temperature rises, ground-level ozone forms at an accelerated rate. Ozone levels are usually highest on hot, windless summer afternoons, especially in inland valleys. Exceedances of state or national ozone standards in the Bay Area typically occur on hot, relatively stagnant days. Exposure to ozone can damage the lungs and aggravate respiratory conditions such as asthma, bronchitis and emphysema.

Motor vehicles and industrial sources are the largest sources of ozone precursors in the Bay Area. Emissions of ozone precursors have been greatly reduced in recent decades due to the Air District's Smog Check Inspection Program and California's stringent emission standards for new vehicles engines.

The number of days where Livermore exceeded the level of the national eight-hour ozone standard decreased 90 percent from 1969 to 2016. The design value concentrations for this standard decreased 50 percent over this same period. Despite this progress, the Bay Area does not yet fully attain state and national ozone standards. This is partly due to the tightened national ozone standard. Therefore, we need to further reduce emissions of ozone precursors.

## Acid Deposition

"Acid rain" has come to be recognized as a major environmental problem. The precipitation of acidic water as rain, snow, and dew is related to air pollution because the sulfuric and nitric acids that contaminate atmospheric moisture are generated from the combustion of fossil fuels.

Complex chemical changes take place when sulfur oxides (emitted from sources such as power plants) and nitrogen oxides are transported in the air many miles from their points of origin. Over a period of three to five days, the materials are converted to their acid forms and precipitated from the atmosphere. In Canada and Scandinavia, it has been shown that acidic rainfall has resulted in "aquatic death" for many small lakes.

Since the emission of sulfur oxides is considerably lower in California than in other parts of the world, the primary source of acid rainfall is nitric acid resulting from automobile emissions. Measurements in California have shown periods of acidic rain in the initial stages of storms, but thus far, no significant long-range transport to the vulnerable mountain lakes has been observed.

## Greenhouse Gases

Greenhouse gases that cause climate change are an entirely different type of pollutant than criteria pollutants or air toxics. Climate change and atmospheric warming are global in scale, both in terms of causes and effects. The scientific consensus is clear that climate change poses enormous risks on a worldwide basis. Climate change is expected to have profound impacts on both the natural and man-made systems that sustain us. The range of potential impacts includes reduction in agricultural and forestry productivity, changes in human demographics and migration, reduced water supply, acidification of oceans, changes in natural habitat, extinction of species and loss of biodiversity, more powerful or more frequent hurricanes and cyclones, etc. Within the Bay Area, anticipated impacts of climate change include sea level rise, reduced Sierra snowpack, increased wildfires, and higher levels of air pollution.

There are dozens of greenhouse gases (GHGs), but a handful of these gases are the primary agents of climate change. Carbon Dioxide (CO<sub>2</sub>) is the most prevalent greenhouse gas and is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned. Methane (CH<sub>4</sub>) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock. Nitrous oxide (N<sub>2</sub>O) is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>), are generated in a variety of industrial processes. Although these gases are small in terms of their absolute mass, they are potent agents of climate change as expressed by their global warming potential.

Each greenhouse gas differs in its ability to absorb heat in the atmosphere; this is often referred to by the term global warming potential (GWP). The table below summarizes the GWP of the primary greenhouse gasses. Greenhouse gas emissions are often expressed in terms of carbon dioxide equivalents (CO<sub>2</sub>e), in which each gas is weighted by its GWP.

### Global Warming Potentials (GWPs) for Greenhouse Gases

Greenhouse Gas	Global Warming Potential
CO <sub>2</sub>	1
Methane (CH <sub>4</sub> )	21
N <sub>2</sub> O	310
HFCs/PFCs	90-11,700
SF <sub>6</sub>	23,900

In November 2006, the Air District became the first air basin in the nation to develop a detailed GHG emissions inventory. The Bay Area GHG inventory was updated in December 2008; minor revisions were also made in January 2010. The Air District's greenhouse gas inventory only includes GHGs that are emitted within the Bay Area, as well as GHGs emitted in the production of electricity that is imported to the region. CO<sub>2</sub> emissions dominate the Bay Area GHG inventory, accounting for 92 percent of total GHGs on a GWP-weighted basis.

## Bay Area Air Quality Attainment

The Bay Area attains all national and state standards for four of the six criteria pollutants: lead, carbon monoxide, sulfur dioxide, and nitrogen dioxide. As shown by the design values in Table 2-1, Bay Area concentrations are well below (i.e., much cleaner than) current standards for these four pollutants. However, the Bay Area does not yet attain standards for ozone and PM. State and national ozone standards have become progressively more stringent in recent decades. In 1997, the eight-hour national ambient air quality (NAAQS) ozone standard was 84 parts per billion (ppb). It was lowered to 75 ppb and 70 ppb in 2008 and 2015 by the EPA, respectively. The Bay Area has met the 84 ppb standard since 2005 and the 75 ppb standard since 2012. The Bay Area has yet to meet the 70 ppb national ozone standard and is classified nonattainment for the State eight-hour ozone standard. US EPA tightened the national 24-hour PM<sub>2.5</sub> standard from 65 to 35 µg/m<sup>3</sup> in 2006. Based on air quality data showing the Bay Area air basin maintained attainment of the 24-hour PM<sub>2.5</sub> standard during the 2009- 2011 monitoring period, in January 2013 EPA issued a final rule that the Bay Area meets the 24-hour PM<sub>2.5</sub> national standard. This EPA rule suspends key State Implementation Plan (SIP) requirements as long as monitoring data continues to show that the Bay Area attains the standard. Irrespective of this EPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour PM<sub>2.5</sub> standard until such time as the Air District submits a redesignation request and a maintenance plan to EPA, and EPA approves the proposed redesignation.

The following table provides information on the attainment status for the Bay Area, listed by pollutants, as of February 2017. Along with attainment status, the table also presents side-by-side comparison of California and National Air Quality Standards. As shown below the Bay Area is currently in nonattainment status for exceeding the State and Federal eight-hour standards for ozone; and in nonattainment status for the State's annual particulate matter standards.

**Table 2-1. Standards for Criteria Pollutants, Attainment Status, and Design Values<sup>a</sup>**

Pollutant	Averaging Time	California Standard <sup>b</sup>	Attainment Status	National Standard	Attainment Status	Design Value <sup>c</sup> (2015)
Ozone	1-hour	0.09 ppm	N			0.10 (Calif)
Ozone	8-hour	0.070 ppm	N	0.070 ppm – 3 year average of 4th highest value	N <sup>d</sup>	0.073 ppm
CO	1-hour	20 ppm	A	35 ppm – not to be exceeded > once per year	A	3.8 ppm
CO	8-hour	9 ppm	A	9 ppm – not to be exceeded > once per year	A	2.0 ppm
PM <sub>2.5</sub>	24-hour			35 µg/m <sup>3</sup> – 3 year average of 98th percentile	N <sup>e</sup>	30 µg/m <sup>3</sup>
PM <sub>2.5</sub> <sup>g</sup>	Annual	12 µg/m <sup>3</sup> – 3-year max	N	12 µg/m <sup>3</sup> – 3 year average	A	10.2 µg/m <sup>3</sup>
PM <sub>10</sub>	24-hour	50 µg/m <sup>3</sup>	N	150 µg/m <sup>3</sup> <sup>f</sup>	U	58 µg/m <sup>3</sup> (Calif)
PM <sub>10</sub>	Annual	20 µg/m <sup>3</sup>	N			22 µg/m <sup>3</sup> (Calif)
SO <sub>2</sub> <sup>h</sup>	1-hour	0.25 ppm	A	75 ppb – 3 year 99th percentile		14 ppb
SO <sub>2</sub>	24-hour	0.04 ppm	A	0.14 ppm – not to be exceeded > once per year	A	<0.01 ppm
NO <sub>2</sub>	Annual	0.030 ppm	A	0.053 ppm	A	0.018 ppm
NO <sub>2</sub> <sup>i</sup>	1-hour	0.18 ppm	A	100 ppb – 3 year average of 98th percentile		57 ppb
Lead	3-month rolling avg.			0.15 µg/m <sup>3</sup>	A	0.22 µg/m <sup>3</sup>

\* A = Attainment N = Non-Attainment U = Unclassified

<sup>a</sup> The design value is a statistic based on the monitored concentrations that can be compared with the corresponding standard. The standard is violated if the design value exceeds the standard. Design values are computed on a site-by-site basis. District design value is the highest design value at any individual monitoring site.

<sup>b</sup> California standards are nominally "not to be exceeded," but, other than for annual standards, in practice allow approximately 1 exceedance per year.

<sup>c</sup> Design values relative to the NAAQS are shown unless indicated as (California).

<sup>d</sup> US EPA lowered the national 8-hour ozone standard from 0.075 to 0.070 PPM (or 70 ppb) in October 2015.

<sup>e</sup> US EPA tightened the national 24-hour PM<sub>2.5</sub> standard from 65 to 35 µg/m<sup>3</sup> in 2006. On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour PM<sub>2.5</sub> national standard. This EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this EPA action, the Bay Area will continue to be designated as "non-attainment" for the national 24-hour PM<sub>2.5</sub> standard until such time as the Air District submits a "redesignation request" and a "maintenance plan" to EPA, and EPA approves the proposed redesignation.

<sup>f</sup> The national 24-hour PM<sub>10</sub> standard allows one exceedance per year over 3 years with every-day sampling. Because PM<sub>10</sub> is sampled on a 1-in-6 day schedule, this means that, in practice, any exceedance would violate the standard.

<sup>g</sup> On January 15, 2013, EPA revised the annual PM<sub>2.5</sub> standard from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup>.

## Livermore Air Quality

Livermore is located within Livermore Valley, an east-west oriented inland valley between the San Francisco Bay and the Central Valley. Air Pollutants, especially ozone, travel with weather patterns and tend to collect in inland valleys where heat can intensify their effect, causing Livermore to have one of the highest exceedance levels in the Bay Area. This high level of pollution in Livermore is due in large part to our location downwind of major source areas such as Oakland and San Francisco.

The geography in the Livermore Valley makes the air pollution potential very high for photochemical pollutants. Due in a large part to this unique physical geography, Livermore has had difficulty attaining the national eight-hour ozone standard. Depending upon the meteorology of a particular summer or fall, the frequency of elevated ozone levels at the Livermore Air Quality measuring station can be quite significant. The Livermore Valley not only traps locally generated pollutants, but also receives ozone and ozone precursors from San Francisco, Alameda, Contra Costa, and Santa Clara counties. This can happen near the end of an ozone episode or when the sea breeze regains its strength and carries these pollutants inland. On days when the wind flow is from the northeast, not uncommon in the early fall, the ozone pollutants may be transported from the San Joaquin Valley to the Livermore Valley.

## Tri- Valley Activities to Achieve Attainment and Improve Air Quality

- *Clean Air Plan* - Supervisor Haggerty and his staff in conjunction with consultant Ellen Garvey developed a Tri-Valley Clean Air Plan for Valley communities. The Plan includes voluntary measures that can be adopted by city governments to assist in reducing harmful emissions and the environmental conditions that contribute to air pollution in the Valley. Measures include environmentally friendly building codes and school education programs [http://www.acgov.org/board/district1/clean\\_air.htm](http://www.acgov.org/board/district1/clean_air.htm)
- *The Tri-Valley Clean Air Resource Team* is a collaboration of volunteers from local government, business, and business related organizations. Funded by the Air District, the team selects and works on projects that promote voluntary measures that help reduce air-polluting activities in the Valley. Past projects include, promoting Spare the Air program, developing transit maps for the Valley, promoting the Employee Transit Tax Benefit program, and assisting with the planning and coordinating the Family Day Transit Fair in Livermore. The group also develops regular press releases to promote various transit programs.

## Local Air Quality Statistics

The Air District maintains and operates a network of air monitoring stations throughout its jurisdiction. The stations gather air pollutant data as required under the California State and Federal Clean Air Acts. Livermore Valley Stations are located in Livermore on Rincon Avenue and San Ramon on Alcosta Boulevard.

Livermore has had the highest rates of days exceeding the eight-hour National Ozone Standard when compared to other cities in the Bay Area. According to the most recent three years of monitoring data (2014-2016), Livermore exceeded the national eight-hour

ozone standard 0.70 ppm 17 days compared with 150 days in the earliest three years of monitoring (1969-1971). Livermore does not meet the nation eight-hour ozone standards, but there has been tremendous progress in the number of days people are exposed to ozone. ARB standards for motor vehicle engines and fuels have great impact in reducing emissions of ozone precursors and other pollutants in the Bay Area. Additionally, ARB's Low Emission Vehicle (LEV) program has greatly reduced emissions of ROG and NO<sub>x</sub> throughout the state.

Number of days exceeding the 8-hour 70 ppb national ozone standard 1969-1971 and 1999-2016

Site	1969	1970	1971	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
Berkeley																						0	0	0						0		
Bethel Island				10	9	9	11	8	15	20	3	20	15	9	9	13	12	9	5	2	14	4	10	6	7	4	1	1	1	2		
Bodega Bay																														0		
Concord	30	17	19	6	6	5	7	8	13	14	4	16	14	6	11	10	11	6	2	14	4	8	5	4	5	3	0	2	2	2		
East Oakland				0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	2	0	
Fairfield				4	5	4	6	5	13	11	2	12	11	2	3	8	5	3	2	8	0	2	5	3	3	2	1	0	1	0	0	
Fremont	33	21	14	3	2	4	5	3	8	4	2	2	3	2	2	1	2	1	1	3	0	3	2	2	1							
Gilroy				10	7	17	12	6	16	22	2	11	5		6	10	9	2	0	8	0	4	4	7	1	2	0	4	3	0		
Hayward				0	2	2	1	0	7	2	3	2	9	1	1	0	3	1	0	1	0	3	4		0	0	1	4	2	0		
Livermore	88	40	22	8	16	15	10	8	21	24	5	22	19	6	13	14	13	6	7	15	3	8	8	6	8	4	2	6	7	4		
Los Gatos				5	7	7	9	4	14	11	2	8	5	1	4	6	9	5	3	12	0	6	8	3	1	1	1	2	4	0		
Mountain View				0	2	2	2	0	1	6	1	0	4																			
Napa				1	3	1	5	3	8	3	1	3	6	0	1	2	3	3	0	2	0	2	3	2	0	0	2	0	0	0		
Patterson Pass				19				21	26	51	16													16	16	8	8	5	15			
Pittsburg	12	18	9	6	0	8	11	6	11	12	0	5	5	5	9	12	9	2	2	10	2	2										
Redwood City	8	6	4	0	0	0	1	0	5	0	1	0	0	0	0	0	3	1	0	0	0	0	0	1	0	0	1	0	1	0		
San Francisco	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
San Jose	24	26	5	4	3	4	3	2	10	5	0	3	3	0	1	0	3	0	1	5	0	3	0	3	0	0	1	0	2	0		
San Martin				6	22	21	7	17	19	4	17	11	9	8	14	11	6	3	11	4	5	6	8	1	3	1	4	4	1			
Richmond/ San Pablo	3	3	2	0	0	0	2	0	2	0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0		
San Rafael	4	3	3	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
San Ramon																										3	0	4	6	1		
Santa Rosa	0	1	0	0	1	0	0	0	2	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sebastopol																														0	0	0
SJ - East				3	4	4	4	2	15	6	1	2	3	0	0	0	1	1	1													
Sonoma				1	4	1	0	1	0	1																						
Vallejo				1	1	0	3	3	5	5	1	2	4	0	0	1	4	0	0	0	0	0	3	1	2	0	0	0	0	1		
West Oakland																									0	0	0	0	0	0		



## BAY AREA AIR POLLUTION SUMMARY – 2014

MONITORING STATIONS	OZONE			CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM <sub>10</sub>			PM <sub>2.5</sub>			
	Max 1-Hr	Cal 1-Hr	Days	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat Days	Max 1-Hr	Max 24-Hr	Nat Days	Ann Avg	Max 24-Hr	Nat Days	Ann Avg	Max 24-Hr	Nat Days	Ann Avg
	(ppb)	(ppb)		(ppm)			(ppb)			(ppb)			(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )		(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )		
North Counties	74	0	66	0	58	0	46	8	0	0	-	-	15.8	39	0	0	29.9	0	12.0
Napa*	88	0	68	0	56	0	62	11	0	0	-	-	14.1	41	0	0	38.1	1	22
San Rafael	67	0	61	0	0	*	44	4	0	0	-	-	-	-	-	-	26.2	0	7.7
Sebastopol*	77	0	68	0	0	58	50	8	0	0	23.9	2.4	0	-	-	-	39.6	1	9.9
Vallejo																			
Coast & Central Bay	-	-	-	-	-	-	65	17	0	0	-	-	-	-	-	-	26.0	0	8.4
Laney College Freeway*	83	0	68	0	47	0	82	12	0	0	-	-	-	-	-	-	37.6	1	24
Oakland	72	0	59	0	47	0	56	14	0	0	16.5	3.3	0	-	-	-	38.8	1	9.5
Oakland-West*	-	-	-	-	-	-	19.2	5.0	0	0	-	-	-	-	-	-	-	-	-
Richmond	79	0	69	0	47	0	84	12	0	0	-	-	-	-	-	-	33.2	0	23
San Francisco	75	0	60	0	52	0	52	9	0	0	15.3	5.8	0	17.0	36	0	38.2	1	7.7
San Pablo*														16.4	46	0			10.5
Eastern District	92	0	71	0	67	0	33	5	0	0	10.5	3.4	0	16.7	61	0	-	-	-
Bethel Island	95	1	80	2	64	0	48	8	0	0	29.1	4.5	0	14.2	43	0	30.6	0	6.6
Concord	-	-	-	-	-	-	-	-	-	-	25.7	5.4	0	-	-	-	-	-	-
Crockett	81	0	70	0	63	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Fairfield	93	0	80	4	72	0	49	10	0	0	-	-	-	-	-	-	42.9	1	27
Livermore	-	-	-	-	-	-	21.2	4.6	0	0	-	-	-	-	-	-	-	-	-
Martinez	-	-	-	-	-	-	21	3	0	0	-	-	-	-	-	-	-	-	-
Patterson Pass	-	-	-	-	-	-	37	6	0	0	-	-	-	-	-	-	-	-	-
San Ramon	86	0	77	3	67	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay	96	1	75	0	61	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Hayward	86	0	65	0	56	0	55	11	0	0	-	-	-	-	-	-	35.0	0	23
Redwood City																			
Santa Clara Valley	84	0	74	0	66	0	-	-	-	-	-	-	-	-	-	-	25.7	0	18
Gilroy	90	0	77	1	64	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Los Gatos	89	0	66	0	60	0	58	13	0	0	3.0	0.9	0	19.9	55	0	60.4	2	30
San Jose	-	-	-	-	-	-	65	*	0	0	-	-	-	-	-	-	24.3	0	8.4
San Jose Freeway*	97	1	78	3	70	0	-	-	-	-	-	-	-	-	-	-	-	-	*
San Martin																			
Total Bay Area	3		5		10		0		0	0	0	0	0	0	0	0	0	2	3
Days over Standard																			

\*See NOTES on second page.  
Dash (-) indicates pollutant is not monitored at the site.

## BAY AREA AIR POLLUTION SUMMARY – 2015

MONITORING STATIONS	OZONE			CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM <sub>10</sub>			PM <sub>2.5</sub>							
	Max 1-Hr (ppb)	Nat 8-Hr Days	Cal 8-Hr Days	Max 1-Hr (ppm)	Max 8-Hr Days	Nat/Cal Days	Max 1-Hr (ppb)	Ann Avg 1-Hr (ppb)	Nat 1-Hr Days	Cal 1-Hr Days	Max 1-Hr (ppb)	Max 24-Hr Days	Nat 24-Hr Days	Cal 24-Hr Days	Ann Avg (µg/m <sup>3</sup> )	Max 24-Hr (µg/m <sup>3</sup> )	Nat 24-Hr Days	Cal 24-Hr Days	Ann Avg (µg/m <sup>3</sup> )				
North Counties																							
Napa	79	0	0	3.3	1.6	0	43	8	0	0	-	-	-	-	18.6	50	0	0	38.2	1	27	10.6	11.4
San Rafael	81	0	0	1.4	0.9	0	44	11	0	0	-	-	-	-	16.1	42	0	0	36.3	2	26	8.6	10.0
Sebastopol*	68	0	0	1.3	0.9	0	37	5	0	0	-	-	-	-	-	-	-	-	29.9	0	*	6.8	*
Vallejo	85	0	0	2.4	1.9	0	44	8	0	0	5.0	1.7	0	0	-	-	-	-	41.4	3	29	9.6	9.8
Coast & Central Bay																							
Laney College Freeway*	-	-	-	2.7	1.6	0	106	18	1	0	-	-	-	-	-	-	-	-	37.2	1	*	10.0	*
Oakland	94	0	2	2.4	1.4	0	48	11	0	0	-	-	-	-	-	-	-	-	44.7	1	25	8.3	9.1
Oakland-West	91	0	0	4.7	2.6	0	57	14	0	0	21.6	3.9	0	0	-	-	-	-	38.7	3	29	10.2	10.8
Richmond	-	-	-	-	-	-	-	-	-	-	12.0	2.8	0	0	-	-	-	-	-	-	-	-	-
San Francisco	85	0	0	1.8	1.3	0	71	12	0	0	-	-	-	-	19.2	47	0	0	35.4	0	25	7.6	8.4
San Pablo	84	0	0	2.0	1.1	0	46	9	0	0	10.7	2.4	0	0	18.6	43	0	0	33.3	0	27	8.9	10.5
Eastern District																							
Bethel Island	80	0	2	1.1	0.9	0	29	5	0	0	8.8	1.9	0	0	13.6	33	0	0	-	-	-	-	-
Concord	88	0	2	1.4	1.3	0	33	7	0	0	6.7	2.0	0	0	13.1	24	0	0	30	0	23	8.8	7.7
Crockett	-	-	-	-	-	-	-	-	-	-	20.5	3.7	0	0	-	-	-	-	-	-	-	-	-
Fairfield	84	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	105	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Martinez	-	-	-	-	-	-	-	-	-	-	50	10	0	0	-	-	-	-	31.1	0	28	8.8	8.2
Patterson Pass*	99	4	5	-	-	-	19	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ramon	106	1	6	-	-	-	37	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																							
Hayward	103	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	86	0	1	3.4	1.6	0	48	11	0	0	-	-	-	-	-	-	-	-	34.6	0	24	-	7.8
Santa Clara Valley																							
Gilroy	95	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Los Gatos	100	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	94	0	2	2.4	1.8	0	49	13	0	0	3.1	1.1	0	0	22.0	58	0	1	49.4	2	30	10.0	10.2
San Jose Freeway*	-	-	-	2.7	2.0	0	61	18	0	0	-	-	-	-	-	-	-	-	46.9	1	*	8.4	*
San Martin	98	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Martin	98	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area	7		12			0			1	0			0	0			0	1			9		
Days over Standard																							

\*See NOTES on second page.  
Dash (-) indicates pollutant is not monitored at the site.

## Rules and Compliance

The Air District develops rules and regulations, which set limits on the amount of pollutants that can be emitted by numerous types of source in the region. The Rules and Compliance Division of the Air District routinely conducts inspections and audits various facilities to ensure compliance with applicable federal, state and district regulations. Source categories include refineries, chemical plants, semiconductor manufacturing facilities, dry cleaners, ink and coating operations, gasoline dispensing facilities, as well as asbestos demolition and renovation. The Air District also investigates residents' complaints about air pollution. Inspectors determine whether the pollutant source is operating in compliance with rules and applicable regulations.

## Air Quality Education Programs

The Air District's goal is to increase public awareness and understanding of air pollution and the roles that the Air District, the public, and industry play in controlling it. Emphasis is placed on positive contributions individuals can make to help improve air quality. Below are a few examples of outreach programs the Air District sponsors:

- *Lawn Mower Exchange Program* - The Air District along with several other waste management agencies sponsored a program to reduce the number of gas powered lawn mowers used in the Bay Area. This program is similar to the low-flow toilet rebate program residents turn in old gas powered mowers for a new electric mower or push mower. Participants pay either no or only a minimum fee depending on the model selected.
- *Spare the Air* - The Air District started Spare the Air (STA) to alert the public on days when air pollution reached unhealthy levels and to teach Bay Area residents about air pollution. The program has two components the Summer Spare the Air which runs from (April through October) when ground-level ozone or smog days increase, and the wintertime STA Program.
  - Summer STA program requires that residents reduce pollution by making clean air alternatives, including walking, biking, taking transit, carpooling, driving less and reducing energy consumption at home and making other choices that improve air quality on a daily basis.
  - Winter STA outreach focuses on reducing PM 2.5 or soot from residential wood smoke from fireplaces and wood stoves. On days when air quality is poor, the public is asked to defer wood burning, drive less, and trip link. During wintertime STA (November through February) it is illegal to burn wood, manufactured fire logs, pellets, or any other solid fuels in a residential fireplace, woodstove, or outdoor fire pit. Spare the Air Youth – A new regional program design in partnership with

MTC as part of a Climate Initiatives Program to engage, educate and inspire youth and families to walk, bike, carpool and take public transit in an effort to reduce greenhouse gas emissions.

- *Smoking Vehicle Program* - A program that enables Bay Area residents to report vehicles with excessive tailpipe emissions.
- *Clean Air Champions* - An annual competition to honor individuals who exemplify the clean air ethic. The program is co-sponsored by KCBS All News Radio, KPIX-TV, the American Lung Association, EPA, and RIDES for Bay Area Commuters.

## **SB 375**

Recognizing the importance of integrating land use, transportation, and climate protection planning, the State of California adopted Senate Bill 375 in fall 2008. SB 375 calls for major metropolitan areas throughout California to develop and implement integrated land use and transportation plans, known as “Sustainable Communities Strategies” or SCS, to achieve greenhouse gas reduction targets established by the California Air Resources Board (CARB). The Metropolitan Transportation Agency (MTC) in conjunction with the Association of Bay Area Governments (ABAG) must prepare an SCS as part of the Regional Transportation Plan (RTP). The first Bay Area SCS, known as Plan Bay Area, was adopted in July 2013 as the region’s RTP/SCS through 2040. An update to Plan Bay Area has been released for public review with adoption anticipated in summer 2017.

## **Smart Growth**

Promoting high-density mixed use new development in areas that are well served by transit and provide good access to jobs and services is an essential strategy to reduce motor vehicle travel, attain national and State air quality standards and meeting regional climate protection goals. However, locating new development near major sources of air pollution could result in increased local exposure to unhealthy levels of air pollutants, unless steps are taken to minimize exposure and reduce emissions. To assist local governments in addressing and minimizing potential air quality issues, the Air District released a guidance document in May 2016 entitled *Planning Healthy Places*. This document provides recommended best practices that can be implemented to reduce emissions of, and population exposure to, local air pollutants. *Planning Healthy Places* includes a web-based mapping tool that shows locations throughout the region with elevated levels of air pollution (based on conservative screening-level modeling), where the Air District recommends implementing best practices to address air quality. The purpose of *Planning Healthy Places* is to ensure that we protect public health while promoting and facilitating infill development that will reduce motor vehicle travel. For more information, see [www.baaqmd/planninghealthy.places](http://www.baaqmd/planninghealthy.places)

# Climate Action

Since establishing a formal climate protection program in June 2005, the Air District has worked to integrate climate protection into all its core functions and initiated innovative climate protection programs. Some of the Air District's key climate protection activities and programs are summarized below.

- Investing approximately \$240 million to reduce greenhouse gas (GHG) and air pollutants through mobile source grants and incentives.
- Awarding \$3 million in grants to 53 local projects to reduce GHG emissions. The innovative grant program funded the development of local climate action plans, and also provided seed funding for municipal energy officers, renewable energy programs and youth-based projects. With this grant program the Air District became one of the largest climate protection funders in the nation to date.
- Launching the Greenhouse Gas Reduction Grant Program in 2009, using \$4.4 million in funds generated by a settlement between the California Attorney General's Office and ConocoPhillips, for projects that reduce GHG emissions in the communities nearest the ConocoPhillips refinery: Rodeo, Crockett, Hercules and Pinole. The proceeds from the settlement were used to fund energy efficiency, cool roofs and onsite renewable energy projects at public facilities.
- Providing seed funding to jump-start initiatives including the first Community Choice Energy (CCE) program in California,
- Marin Clean Energy; and the first Property- Assessed Clean Energy (PACE) program Berkeley First.
- Greenhouse Gas Fee Evaluate the idea of adopting a GHG fee on stationary sources to provide energy efficiency and reduce GHG emissions.
- Energy Efficiency Regulation – Include energy efficiency review and standards in Air District permitting
- Update CEQA Guidelines and Thresholds and Enhanced CEQA Review by quantifying estimated reductions in emissions of criteria pollutants, air toxics, and GHGs from the CEQA program.
- The Air District created and implemented a 4<sup>th</sup>/5<sup>th</sup> grade curriculum on climate protection. The *Protect Your Climate* Curriculum Program contains 16 lessons that address the science and causes of climate change and ways for students to take action. Through various activities, students learn how to reduce greenhouse gas emissions from energy, waste, and transportation uses in their daily lives. Since the curriculum was first piloted

in 2007-2008, over 40 classrooms and 1,000 students across the nine Bay Area counties have participated in the program.

- The Air District developed a web portal, in conjunction with the Institute for Local Government, to share information and facilitate local government action regarding best practices to reduce GHGs:  
[www.baaqmd.gov/climateplanning](http://www.baaqmd.gov/climateplanning).
- Air District staff has proposed to establish significance thresholds for GHG emissions in its update of the District's CEQA Guidelines.
- In addition, the Air District works closely with its regional agency partners – the Metropolitan Transportation Commission (MTC), the Association of Bay Area Governments (ABAG), the Bay Conservation and Development Commission (BCDC) – along with the local governments, business groups, community organizations, and other stakeholders to develop new ways to reduce emissions of GHGs in the Bay Area and protect the climate.

## Conclusion

Air quality continues to be a concern but it is not a growth-limiting factor. Air quality is a regional issue that is worsened by land use decisions which emphasize the use of the automobile, thereby increasing air pollutant emissions within the Bay Area. However, due to Livermore's geographic location, regional population growth and the dependence on the automobile, air quality will continue to be an issue for local residents. Though much of pollution begins outside the Tri-Valley, responsible land use decisions such as transit-oriented development, green building standards, and participation in climate protection activities within Livermore and the region can reduce the local contribution to this regional problem.

# EMPLOYMENT



## Overview

The Association of Bay Area Governments (ABAG)<sup>1</sup> projects a total of 47,860 jobs in Livermore in 2025, compared to 87,960 jobs projected in the General Plan. (The General Plan jobs projection assumes full build-out, which explains the difference with the ABAG projection. Although it is unlikely that nonresidential land will be built out by 2025, the assumption of full build-out is useful in analyzing General Plan land use policies.) Based on ABAG jobs projections, in 2025 the estimated jobs-to-housing ratio will be 1.4 and the jobs-to-employed-residents ratio would be 1.0.

From 2010 to 2025, ABAG projects steady job growth in Alameda County, including Livermore. An increase in the total number of jobs of nearly 24 percent between 2010 and 2025 is projected in Livermore, compared to 22 percent for all of Alameda County in the same period.

Please see the additional discussion of the Jobs/Housing Balance in the next chapter.

## Job Sectors

The following table provides projections on the types and number of jobs in Livermore. While the numbers show a steady growth in jobs through 2025, the percentage breakdown among the job classifications remains stable. As a comparison, the table also shows Census information on employed residents by job classification. In 2010 and 2015 there were more employed residents than jobs in Livermore, indicating a need for out-commuting for employed residents particularly in the financial/professional service and health/education/ recreational service employment sectors.

<sup>1</sup> ABAG Projections 2013

**Table 1: Employment by Job Classifications – ABAG Projections 2010-2025 and U.S. Census Data for Employed Residents by Job Classification**

	ABAG PROJECTIONS 2013 EMPLOYMENT PROJECTIONS BY JOB CLASSIFICATION				US CENSUS EMPLOYED RESIDENTS BY JOB CLASSIFICATION	
	2010	2015	2020	2025	2010	2015
<b>FINANCIAL AND PROFESSIONAL SERVICE</b>	6,480 (17%)	7,420 (18%)	8,510 (18%)	8,910 (19%)	10,325 (25%)	11,344 (25%)
<b>HEALTH, EDUCATION AND RECREATIONAL SERVICE</b>	7,660 (20%)	8,620 (20%)	9,700 (21%)	10,190 (21%)	10,428 (26%)	12,312 (27%)
<b>RETAIL</b>	4,560 (12%)	4,880 (12%)	5,210 (11%)	5,250 (11%)	4,524 (11%)	4,874 (11%)
<b>AGRICULTURAL &amp; NATURAL RESOURCES</b>	30 (<1%)	30 (<1%)	30 (<1%)	30 (<1%)	126 (<1%)	297 (<1%)
<b>MANUFACTURING, WHOLESALE, TRANSPORTATION</b>	8,440 (22%)	8,850 (21%)	9,920 (20%)	9,240 (19%)	7,344 (18%)	8180 (18%)
<b>OTHER</b>	11,280 (29%)	12,480 (30%)	13,810 (30%)	14,240 (30%)	7,801 (19%)	8,017 (18%)
<b>TOTAL JOBS IN LIVERMORE</b>	38,450 (100%)	42,280 (100%)	46,550 (100%)	47,860 (100%)	40,548 (100%)	45,024 (100%)

Source: ABAG Projections 2013 and US Census 2010 and American Community Survey 2011-2015

According to ABAG projections in Table 1 jobs in Livermore between 2010-2015 and 2015-2020 are projected to increase 9.9 percent and 10 percent respectively indicating a continuing recovery from the economic downturn. However, jobs growth is projected to slow between 2015 and 2020 to about 2.8 percent reflective of historic trends before the downturn.

For the next decade, ABAG projections show employment growth in Alameda County on a percentage basis will be in the following three industries: Construction; Financial/Leasing; and Professional/Management Services. In absolute numbers, the following three industries are projected to add the greatest number of jobs: Health & Educational Services; Arts, Recreation and Other Services; and Professional & Managerial Services.

Matching the jobs available in the city with the occupations of its residents provides opportunities for residents to work in the city in which they reside. This has the potential for several positive effects on reducing regional traffic congestion, improving air quality

and increasing the quality of life for residents. The matching of jobs with employed residents will be a primary challenge in the future, especially in the context of reducing carbon emissions from commuting. In the past ten years, reducing carbon emissions has grown in importance as a regional and State-wide goal, and the City has adopted a Climate Action Plan in 2012. It will be important to create more high-paying jobs in the city to match the occupations of employed residents, as well as having affordable housing.

To improve the jobs/housing balance and reduce in- and out-commuting, many communities are pursuing policy options such as increased initiatives to provide workforce housing related to local jobs (increase housing supply), and/or economic development strategies to locally attract higher wage jobs that are typically held by Livermore residents working elsewhere.

To assist in drawing the types of jobs that would match the existing housing stock, the 2003 General Plan provides economic development policies to promote the types of companies that would require a skilled, technologically advanced workforce. These policies support businesses that have a positive effect on Livermore's jobs-housing match.

With the City's collaborative participation in the i-Gate with the national labs and business community, the City is contributing to creating a network that will enable increasing opportunities for new businesses through technological innovation.

The nonprofit National Energy Systems Technology (NEST) incubator, which is part of the i-GATE innovation hub (iHub) program as designated by the State of California, provides an array of business development services, technical assistance, facility-based services, seminars, and networking events to support small technology companies. The City's participation and support for the NEST helps companies ranging from "pre-incubation" support and development for fledgling startup companies to networking and growth capital for growing small businesses.

The Livermore Valley Open Campus (LVOC) was established at the national labs in 2011 as a space for open, collaborative work in areas such as bioscience, cyber security, detection technologies, and hydrogen applications. Collaborators can visit LVOC facilities for hours, days, weeks, or even months to work side by side with researchers at the national laboratories.

The job/housing match as well as efforts to increase housing affordability, are discussed further in the following chapter on housing.

## **Conclusion**

Employment will not be a growth-limiting factor. Although Table 1 shows employed residents in Livermore exceeds current jobs in Livermore, it is anticipated that employment will grow at a steady pace over the next 10 years. Economic development activities will help to provide opportunities for Livermore job-holders who work outside the city to reduce their commute. Most of the job growth will be in the managerial, professional, and service sectors which are generally higher paying and also in the

health, education and recreational service sector which generally provide moderate income jobs. Several actions can help balance the types of jobs held by employed residents with the employment opportunities and affordable housing in Livermore. First, increase the number of higher paying service sector jobs in the city. Second, provide more affordable housing for all residents including those not in high-income occupations (e.g., through implementation of infill development and inclusionary housing requirements).

These issues are recognized and addressed in the General Plan, 2003-2025. Implementing the General Plan will improve the jobs/housing match by providing lower cost ownership housing and promoting the types of companies that would require a skilled, technologically-advanced workforce. Thus the 2003 to 2025 General Plan contains policies that attempt to provide more opportunities for residential development and, thereby, more jobs/housing balance.

# HOUSING

## Overview



Since the inception of the Housing Implementation Program in 1987, the City of Livermore's population has grown at a steady pace. It has increased from a population of 56,741 residents in 1990 to 73,464 residents in 2000, 80,968 in 2010, and 88,207 in 2016 according to the Department of Finance. Since 1990, Livermore has experienced a population growth rate that has averaged just over 1.7 percent annually (compounded). The average annual growth rate was approximately 0.5 percent from 2006 to 2010, but approximately 1.3 percent from 2010 to 2016 indicating a resumption of growth.

It was originally estimated that General Plan policies and land use designations would allow an estimated 40,160 units at build-out. For planning purposes, build-out (or development of all vacant and underutilized properties in the city within the allowable density range) was expected to occur by 2035. Actual development has occurred at the lower end of the density range for most projects and has occurred at a slower pace than predicted. ABAG estimates that Livermore will reach 37,270 households (or about 39,231 housing units assuming a 5 percent vacancy rate) around 2035. ABAG projections are based on historic and current economic and demographic trends at the regional level, with input from local jurisdictions.

The Growth Management policies contained in the General Plan, described further below, allow for improvement and expansion of utilities and services only to a degree necessary to serve planned growth under the General Plan.

## Growth Management Policies

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, by establishing a growth management program to remain within an established growth rate.

During 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 an annual residential growth rate between 1.5 and 3.5 percent, depending on a number of factors such as regional population growth, housing demand, and employment growth. In 2004, the City adopted a comprehensively revised General Plan, which further amended growth management policy from an annual percentage rate to a number of annual allocations that can be set between 140 and 700 dwelling units per year. General Plan growth management policy also allows the City to guarantee annual housing allocations through approved Specific Plans (such as the

Downtown Specific Plan) and for projects participating in the Transferable Development Credits (TDC) Program.

Since 1987, the City of Livermore has operated a Housing Implementation Program (HIP) as the regulatory means of pacing residential growth. The HIP is based on the City's General Plan Residential Growth Management policies and allocates an annual number of housing units in three-year HIP cycles.

The allocation of units has historically been a competitive process and all proposed residential developments are subject to the competitive HIP, with some exceptions. Residential developments that are guaranteed allocations because they are either in the Downtown Specific Plan area or are participating in the Transferable Development Credits (TDC) program do not need to participate in the competitive HIP process, but are still factored into the growth allocation. Developments that propose between 35 percent and 50 percent of units for very-low income residents are also exempt from HIP competition but count towards the growth rate. Projects exempt from growth management include developments of four or fewer units and skilled nursing / assisted living developments with no more than 30 percent of their units designated as independent living. Since the 2011-2013 HIP cycle, residential HIP allocations have been awarded on a first-come, first-serve basis with no actual competition, in recognition of the lack of residential subdivision applications during the economic downturn.

## **Regional Housing Needs Allocation**

As part of each city's state mandated Housing Element of the General Plan, State housing law requires that each city include information that demonstrates they are meeting (or have the potential to meet through adequate sites and zoning) their designated share of the "Regional Housing Need Allocation" (RHNA). The State Department of Housing and Community Development (HCD) is responsible for determining the regional housing need based upon anticipated growth statewide. The HCD generates housing need numbers for all regions in the State and then distributes them to the various local Councils of Governments (COGs). The COG for the Bay Area is the Association of Bay Area Governments (ABAG). ABAG takes these regional allocations, or regional housing need determinations, and in turn develops a methodology for distributing the numbers among counties and local jurisdictions. The RHNA is further divided by income categories or levels. Housing units are allocated in four income categories: extremely and very low-, low-, moderate-, and above moderate-income.

A major goal of the RHNA is to assure a fair distribution of housing among cities, subregions, and counties, so the quantity and mix of newly built housing affordable to low and moderate-income households is equitably shared and located in proximity to jobs. The housing targets are not one-for-one building requirements. They are intended to assure that adequate sites and zoning exist in each city to address anticipated housing demand during the planning period and that market forces are not inhibited in addressing the housing needs of all economic segments of a community. Breaking down development barriers is a major goal of State law.

It should be noted that Housing Element law allows jurisdictions to meet their RHNA not only through the number of units constructed within the planning period, but also

through the identification of adequate sites (i.e. appropriately designated and zoned) that can accommodate the RHNA at the various income levels. If a portion of the RHNA is not built in the current Housing Element cycle, then these same potential units may be identified again as a production goal for the next Housing Element cycle. The income level of potential units is determined by residential density, income level restrictions, or estimated sales prices for units already constructed.

Livermore's RHNA for the 2015-2022 Housing Element planning cycle is 2,729 residential units. Of this total, 839 units must be available to very low-income households, 474 units to low-income households, 496 units to moderate-income households, and 920 units to above moderate-income households.

Livermore's 2015 - 2022 Housing Element continues to be certified by the State Housing and Community Development Department as being consistent with State Housing Legislation. This enables Livermore to qualify for many State and Federal Housing grants that are used to fund a variety of Housing and Neighborhood Preservation programs, as well as regional transportation funds, and to qualify for streamlined or shortened review of future Housing Element cycles.

## **Relationship of Jobs to Housing**

### **Jobs/Housing Balance**

A jobs/housing balance is a measure of the number of local jobs available in a specific area in comparison to the number of housing units in the same area (or more precisely the number of employed residents). The relationship between jobs and housing or employed residents is a key factor in development patterns. If workers can find housing near their jobs, they can avoid lengthy commutes to work, thereby lessening congestion and improving air quality as well as quality of life.

A one-to-one ratio of jobs to employed residents means there are enough jobs for the community's residents, and the need for in- and out-commuting is minimized. In Table 1 in 2000, the jobs to housing ratio was about 1.6 and the jobs to employed resident ratio was 1.07 providing a fairly healthy jobs/housing balance<sup>1</sup>. By 2010, following the recession's impact on employment, the jobs to housing ratio had decreased from 1.6 to 1.27, and the jobs to employed residents ratio had also decreased from 1.07 to 0.99.

While Alameda County jobs decreased by 7.8 percent from 2006 to 2010, they have bounced back, increasing 15.4 percent from 2010 through 2015 according to the California Economic Development Department. As general economic conditions have improved since 2010 and are expected to continue improving, job counts in Livermore are expected to improve and keep pace with residential growth in Livermore, to swing the jobs to employed residents ratio back closer to the more ideal 1 for the near term. In the longer term the ratio of jobs to employed residents will increase closer to 1.5 job per employed resident assuming the city's economic development maximizes under the best-case economic development buildout scenario. This imbalance scenario would result in in-commuting and/or reduction of I-580 westbound commutes in Livermore, reducing regional congestion west of Livermore. Continued residential

<sup>1</sup> Livermore General Plan Master Environmental Assessment, Table 4-10

growth will help maintain a healthy balance wherein housing available numbers can keep up with jobs available numbers.

**Table 1: Jobs to Housing Comparison**

	2000	2010	2015
Jobs in Livermore	41,500	38,450	42,280
Employed Residents	38,525	38,230	42,010
Housing Units	26,123	30,342	31,042
Jobs/Housing	1.59	1.27	1.36
Jobs/Employed Residents	1.07	0.99	1.01

Source: 2003 General Plan Master Environmental Assessment, 2003 General Plan EIR, US Census 2008-2012 American Community Survey, Department of Finance Estimates; ABAG Projections 2013

In 2007, the City adopted two residential Neighborhood Plans—the Brisa and Arroyo Vista Neighborhood Plans—on sites previously designated for industrial uses. These plans will allow development of up to approximately 1000 residential units and require a mix of housing types and densities as well (The Brisa site was recently entitled for a total of 465 dwelling units and is currently under construction. There is an active application for 435 units at the Arroyo Vista site).

In addition, the City is preparing the Isabel Neighborhood Plan to guide development of the area around the proposed BART station in the I-580 median just east of the Isabel Avenue interchange. This planning process complements BART’s efforts on the BART to Livermore extension project. The Draft Plan calls for a mix of housing, office, retail, and open space uses and pedestrian-oriented design, with the goal of creating a vibrant, walkable, complete neighborhood. Based on the Preferred Land Use Scenario, build-out of the Plan would add about 4,290 new dwelling units and 8,900 net new jobs. It would allow a range of attached housing types to provide relatively affordable options for a variety of income levels, age groups, and household sizes.

## **Jobs/Housing Match**

The jobs to housing and employed residents’ ratio that is discussed above does not take into consideration the *match* between the types of jobs (e.g., service, professional, retail etc.) and salaries in relation to the affordability or cost of local housing. Jobs/housing match is a measure of the relationship between the wages earned by people holding local jobs, the resulting household incomes, and the cost of housing in the same area. 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. A match in housing costs, jobs, occupations, and wages is important to mitigate potential traffic congestion and other growth impacts.

In 1990, only 15 percent of employed Livermore residents worked in Livermore. More than a quarter of employed residents commuted elsewhere in the Tri-Valley, and over 50 percent commuted elsewhere in the commute region<sup>1</sup>. More recent U. S. Census estimates in Table 2, below, compares Livermore commute patterns to Alameda County as a whole. The Table indicates that while the percentage of Livermore employed residents working in Livermore has risen to approximately 36 percent, nearly two-thirds of Livermore residents (64 percent) still work outside of their place of residence<sup>2</sup>. This indicates that jobs available in Livermore may not match the skill levels or preferences of employed residents.

**Table 2: Place of Work, 2005, 2010, 2015**

	Livermore			Alameda County		
	2005	2010	2015	2005	2010	2015
Worked in county of residence	76.9%	76.8%	72.2%	67.5%	68.2%	63.3%
Worked outside county of residence	22.9%	23.0%	27.7%	32.5%	31.8%	36.7%
Worked in place of residence	31.9%	32.5%	36.0%	30.4%	31.0%	29.2%
Worked outside place of residence	68.1%	67.5%	64.0%	69.6%	69.0%	71.8%

Source: U.S. Census Bureau American Community Survey, 2005, 2010, 2015

The cost of housing in Livermore may also impact the ability of Livermore workers to find housing near to their workplace that is affordable based on their income level, and could necessitate out-commuting to higher paying jobs.

## Special Needs Population

The jobs/housing match analysis considers people working in Livermore jobs, but does not account for needed affordable housing for the non-working residents or special needs population of Livermore. In 2015 Livermore was home to approximately 1,500 unemployed persons<sup>3</sup>, 6,515 disabled persons<sup>4</sup>, and 5,761 households with residents over 65<sup>5</sup>. These populations represent non-working Livermore residents as well as residents with special needs who may have difficulty finding employment paying adequately to cover housing costs.

To accommodate the residential population with special needs such as the elderly and disabled, the City utilizes a variety of mechanisms to encourage the provision of affordable housing such as inclusionary affordable housing requirements for new residential development, targeting or “emphasizing” certain types of housing through

<sup>1</sup> General Plan Master Environmental Assessment, 2003

<sup>2</sup> 2015 American Community Survey, U.S Census Bureau

<sup>3</sup> California Economic Development Department Labor Force Data Annual Average 2015

<sup>4</sup> US Census Bureau 2015 American Community Survey

<sup>5</sup> Ibid.

the HIP process, General Plan density incentives for senior and very low-income housing, HIP exemptions for affordable housing, and streamlining the permit process for granny flats or secondary units. Since 2013, the City has focused on acquisition and rehabilitation of existing housing to create units for special needs populations. The City also provided resources to MidPen Housing for the development of two affordable housing projects entitled in early 2017: Chestnut Square and Sunflower Hill. Chestnut Square will provide 114 units for lower-income families and seniors. Sunflower Hill will provide 45 units for lower-income people with developmental disabilities. MidPen Housing will build and manage these projects, as well as provide on-site supportive services to residents.

## Household Income

Household income influences the choices and opportunities Livermore residents have as well as decisions they will make regarding housing type, tenure, and location. Table 3 below shows U. S. Census estimates for Livermore’s median household income since 2000 in comparison to other Tri-Valley cities and Alameda County.

**Table 3: Median Household Income: 2000 to 2015**

	2000	2005	2010	2015
Livermore	\$75,322	\$96,632	\$93,988	\$100,992
Dublin	\$77,283	N/A	\$107,754	\$118,773
Pleasanton	\$90,859	\$101,022	\$115,188	\$124,759
Alameda County	\$55,946	\$61,014	\$69,384	\$75,619
Source: 2000, 2010 U.S. Census Bureau; 2005, 2015 U.S. Census American Community Survey				

While Livermore’s median household income is less than neighboring Tri-Valley communities, it is still consistently 35 to 50 percent higher than the County median. The higher median income in Livermore is consistent with U. S. Census data that show a high percentage of Livermore residents with management and professional occupations as well as a higher percentage of residents with associate or bachelor degrees<sup>1</sup>.

The State Housing and Community Development Department (HCD) requires each jurisdiction to address its Regional Housing Needs Determination using the following income categories:

- Extremely low-income – defined as annual household incomes of 30 percent or less of the Area Median Income (AMI).
- Very low-income – defined as annual household incomes of 31 to 50 percent or lower of AMI.
- Low-income – defined as annual household incomes of 51 to 80 percent of AMI.

<sup>1</sup> 2015 Livermore Housing Element, Table 2-7

- Moderate-income – defined as annual household incomes 81 to 120 percent of AMI.
- Above moderate-income – defined as annual household incomes above 120 percent of AMI.

The City, as well as State and Federal housing departments use these categories to establish housing policy and qualifications by income level for funding and housing subsidies and assistance.

## Housing Costs and Affordability

The cost of housing relative to the income of residents in a given area serves as an indicator of the extent of housing issues in a given community.

The 2015-2022 Housing Element analyzed housing affordability in Livermore in relation to household income levels. Since 2008, housing sale prices and rents have steadily increased. Median sales prices have increased from \$513,000 in 2008, to \$522,000 in 2010 and \$622,000 in 2014. Rental housing has experienced similar upward trends in prices. In 2014, the average rent in Livermore for a 1 bedroom unit was \$1,230 and \$2,725 for a 4 bedroom unit. In general lower income households have difficulty affording market rental or owner-occupied housing. Although Livermore is more affordable than the Tri-Valley as a whole, only above moderate-income households can afford the typical median price for a home in Livermore<sup>1</sup>.

## Housing Types

Livermore’s single family detached homes as a percent of its housing stock was 70.8 percent in 2010 and 70.0 percent in 2016, according to California Department of Finance estimates. (Table 4 below).

Although historically there has been a preponderance of single-family residences being built in the City, recent entitlements and construction of housing has trended to more attached residential units which includes both for sale units and rentals. This trend should continue, with future residential development concentrated in the Downtown Specific Plan area and the two Neighborhood Plan areas, which consist substantially of multi-family residential units. Despite the increase in multi-family housing development, the predominant housing type in Livermore still remains detached single-family residences.

**Table 4: Housing Units in Tri-Valley and Alameda County, 2016**

	Livermore	Dublin	Pleasanton	Tri Valley	Alameda County
Housing Units	31,473	20,095	26,980	78,548	593,662
Percent single family detached	70.0%	54.4%	63.1%	63.8%	52.9%
Source: California Department of Finance Housing Estimates 1/1/2016					

<sup>1</sup> 2015-2022 Livermore Housing Element

Building permit activity tracked by the Building Division shows that since 2002, the percentage of single-family units developed each year has decreased and resulted in a 15-year average of 62.4 percent which is closer to the Tri-Valley average (Table 5 below).

**Table 5: Construction Activity for Residential Units, 2002-2016**

Year	Single-family Units	Duplex/Multi-family Units	Total Units	% of Single-family
2016	136	276	412	33.0
2015	227	150	377	60.2
2014	71	9	80	88.7
2013	95	66	161	59.0
2012	94	134	228	41.2
2011	56	46	102	54.9
2010	78	17	95	82.1
2009	36	73	109	33.0
2008	54	16	70	77.1
2007	99	92	191	51.8
2006	85	66	151	56.3
2005	246	194	440	55.9
2004	326	236	562	58.0
2003	324	107	431	75.2
2002	552	14	566	97.5
<b>TOTAL</b>	2,479	1,496	3,975	62.4

Source: City of Livermore Building Division

The implementation of the Downtown Specific Plan and the two Neighborhood Plans will contribute significantly to the City’s stock of multi-family residential dwellings units, as well as the Isabel Neighborhood Plan if adopted. The 2013 changes to residential densities to allow an average of 30 dwellings per acre on approximately 33 additional acres will also provide for additional multi-family residential units at densities high enough to facilitate more affordable multi-family rental units.

Multi-family housing is generally more affordable than the traditional detached single-family house. For example, the present trend toward the construction of more multi-family housing will increase affordable housing options for Livermore residents and workers.

## Location of Affordable Housing

The cost of housing near major areas of employment is beyond the reach of many Bay Area households. As a consequence, many workers are seeking more affordable housing at increasingly farther distances from their jobs, such as in the Central Valley. As a result, commute to work distances and time have increased as well as traffic congestion on regional roadways like I-580. As a consequence air quality and residents’ quality of life suffer from the longer commutes. As discussed above, the

current trend, which is expected to continue, has been the increase of multi-family residential units as the share of new housing developed in the City. This provides a more diverse, affordable housing stock compared to the traditional single-family residences built in the past.

However, even multi-family residential units are not affordable to many households. In recognition of this situation, the City has had an Inclusionary Housing Ordinance since 1980, requiring residential developers to make a portion of their development affordable to low- and moderate-income households. The Ordinance was amended in 2005, increasing the required minimum number of affordable units from 10 to 15 percent of the total number of units in a new residential development (except in the Downtown Specific Plan area where the requirement remains at 10 percent).

Over the last 10 years concerns over vehicle emissions and their impact on air quality and climate change have generated new legislation (Assembly Bill 32 and Senate Bill 375) mandating a reduction in vehicle emissions statewide and implementation of policies and strategies to achieve a reduction of vehicle miles traveled (VMT). Strategies to reduce vehicle miles traveled include higher density housing near transit as well as mixed use developments. Emphasis on these strategies and the location of future higher density housing near transit and areas of employment will also encourage the provision of varied types of housing that is affordable to varied income levels as well. These state mandates and regional strategies for smart growth are also consistent with Livermore General Plan goals and policies to preserve open space by reducing greenfield development and focusing new development within city limits near to existing infrastructure and services.

## Conclusion

Since the adoption of the previous Community Services and Infrastructure Report (2014), there have been positive developments that address the housing needs identified in the previous report. These developments are guided by the policies adopted in the 2003 General Plan Update and in the City's Housing Element. Cumulatively, these developments work toward providing a better jobs/housing balance, increasing the amount of affordable housing, serving special populations such as seniors, and addressing regional problems such as traffic, air quality, and climate change. Some key developments include:

- Continued implementation of the Transferable Development Credit program to preserve open space and promote infill development near existing infrastructure and services. These units have been reserved / guaranteed housing allocations by General Plan policy and exempted from HIP competition to facilitate development.
- Continued implementation of the Downtown Specific Plan, which allows and facilitates development of higher density residential including multi-family projects on infill sites in the Downtown Specific Plan Area. These units have been reserved / guaranteed housing allocations and exempted from HIP competition to facilitate development. Residential Projects constructed or planned in the Downtown include:
  - Approval of Chestnut Square, which includes 44 for-sale, market-rate townhomes, 72 affordable rental units for seniors, and 42 affordable

- rental units for families on a five-acre City-owned site acquired for the purposed of affordable housing development.
  - Approval and development of the “Brighton” development of 132 detached 3-story homes north of First Street east of Livermore Avenue
  - Future development of the Downtown catalyst Livermore Village Mixed Use Site
  - Future development of Groth Brothers Site on South L Street – which is currently planned for mixed use commercial/residential development.
- Approval of the Brisa and the Arroyo Vista Neighborhood Plans – which will allow development of up to approximately 1,000 residential units and require a mix of housing types and densities near the existing ACE Train Station. The Brisa site is currently under construction with 465 units of a variety of unit types. There is an active application for 435 units spread among four product types at the Arroyo Vista site.
- The Development Code Density Bonus provisions provide for increased residential densities for projects that guarantee that a portion of the housing units will be affordable to very low-, low-, or moderate-income households, senior citizens, or include child care facilities. The Chestnut Square project utilized a density bonus, which allowed an increase in the affordable housing units and building height and a reduction in the amount of senior parking to match actual demand, while retaining consistency with development standards on open space and design.
- In early 2014, the Affordable Housing In-lieu Fee for residential development was re-established on a per-square-foot basis instead of a per-unit basis as a more equitable method of assessing the fee in relationship to the impact of the market-rate unit on the demand for affordable housing.
- In 2016, the Livermore City Council authorized an increase for the Affordable Housing In-lieu Fee from \$11.65 per square foot to \$19.95 per square foot. The increased fee will reduce the incentive for a developer to pay the In-Lieu Fee, thereby promoting inclusionary housing.