2019

LIVERMORE
CALIFORNIA

Community Services and Infrastructure Report

CITY OF LIVERMORE

2019 COMMUNITY SERVICES AND INFRASTRUCTURE REPORT

ADOPTED: **, 2020

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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.

However, Senate Bill (SB) 330, the Housing Crisis Act of 2019, was signed into law by the Governor in October of 2019, and became effective on January 1, 2020. The bill establishes a statewide housing emergency to be in effect until January 1, 2025. SB 330 aims to increase certainty in the development process, speed the review of new housing development projects, preserve affordable housing and prevent certain actions that reduce the availability of housing. It amends the state Housing Accountability Act, Permit Streamlining Act, and Planning and Zoning Law all under Title 7 of the Government Code.

As it relates to growth management, SB 330 prohibits a city or county from establishing or implementing any provision that limits the number of land use approvals or permits necessary for the construction of housing or acts as a cap on the number of housing units that can be approved or constructed either annually or for some other period. The provisions of SB 330 thus suspend implementation of the city's growth management program through January 1, 2025.

Report Highlights

The 2019 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 2019 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.

A federal court order in August 2007 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 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.

Stormwater System. The 2004 Storm Drain Master Plan identified existing and future storm drain deficiencies based on build-out land uses in the General Plan. The plan was updated with the 2009 Storm Drain Master Plan Addendum. New development after 2010 will increase impervious area by an estimated 894 acres by year 2040. Funding for required storm drain system expansion projects is outlined in the 2010 Storm Drain Connection Fee Study. The fee study assumes that improvement projects would be constructed in the future once fees are collected to fund their construction. Due to the downturn in the economy, fees were not increased to reflect updated development revenue projections and incorporate required debt service. However, in 2017, this subsidy was removed.

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. Beginning in October 2020, after obtaining additional credit for zoning and floodplain management regulations, the Tri-Valley Hazard Mitigation Plan and social media outreach, this rating will improve to a Class 6 with a corresponding 20 percent discount on flood insurance policies.

School Services. In June 2016, Livermore voters approved Measure J which will provide $110 million over a 10-year period 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. Although not a growth-limiting factor, the ongoing inequity of State funding of Livermore schools based on a formula still considering Livermore a "rural community" remains an inequitable circumstance when compared with the funding formula for other Tri Valley cities and serious concern for the general welfare of the community.

Traffic. Traffic conditions have not changed significantly in the past three years, considering the low rate of residential growth and employment. Mainly, traffic impacts are a regional problem that cannot be eliminated through independent action of the City. Additional residential growth will add traffic to the City's roadways but will also generate traffic impact fee revenue that could help deliver improvement projects. Additional traffic from residential development is less than 30 percent of the traffic expected to be added from all development. Traffic volumes will increase mainly 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. The Livermore Area Recreation and Park District (LARPD) updated its Master Plan in 2016. LARPD has generally been able to maintain enough community and open space park land for the growing population. However, there is a current shortfall in neighborhood and special use park acreage. As the city's population increases, the demand for additional park land continues to grow. The City will need to work with LARPD to address the deficiency of neighborhood and special use park land.

Employment and Housing

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. While the wages and employment number continue to improve since 2008, home prices and rents also continue to rise and at a greater pace than household incomes. 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, multi-family units have accounted for a greater percentage of new residential units built. Multi-family units are typically more affordable than 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 building more affordable housing in the City: The approval/construction of 100 percent affordable projects Chestnut Square on Railroad Avenue (construction nearly complete) and Avance on First Street (starting construction soon). But it will remain a challenge for the City in the coming years to build affordable housing, although new state legislation will help to facilitate such construction.

BACKGROUND AND HISTORY

Background

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 include 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 Growth Programs 1959 to 2019

Year	History	Growth Rate Cap[1]	Targeted Housing
2017-2019	3-year HIP.	450 units/ year[2]	Transfer of Development Credit program
2014-2016	3-year HIP. Approved 33 units through HIP.	450 units/ year	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-feet or more)
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)

[1] Growth rate cap includes all programs (e.g., in recent years includes HIP, DSP and TDC units)

[2] Approximate percent is 1.5% when 450 units per year is the growth rate.

Year	History	Growth Rate Cap[1]	Targeted Housing
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.		

Year	History	Growth Rate Cap[1]	Targeted Housing
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.		
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.

Housing Crises Act of 2019 (Senate Bill 330)

In October 2019, the Governor signed Senate Bill 330, the Housing Crisis Act of 2019. The purpose of the legislation is to address the critical housing shortage in the state. While there are multiple causes of this crisis, the lack of effective policy reforms to significantly enhance approval and supply of housing affordable to all income levels is a key factor. By removing real and perceived obstacles to residential development, it is the intent of the legislation to support and promote residential development affordable to lower and moderate-income households. To accomplish this, the legislation includes a variety of provisions to promote housing development including an expedited housing applicant review process and restrictions on changes to residential development standards. The provisions of the legislation are in effect until January 1, 2025.

Provisions of the legislation also address local growth management programs. Affected cities and counties are prohibited from establishing or implementing any provision that "limits the number of land use approvals or permits necessary for approval and construction of housing that will be issued or allocated within all or a portion of the affected county or affected city." Affected cities and counties are also prohibited from implementing any provision that "acts as a cap on the number of housing units that can be approved or constructed either annually or for some other time period." Because of SB 330, the City is suspending its growth management policies and, therefore, not preparing a HIP for the next three years.

SCHOOL SERVICE

Introduction

This Chapter is based on information from the Livermore Valley Joint Unified School District (District) in Winter 2019. The District is financially stable with a three 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 has provided ongoing support of a parcel tax and supported 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 21st century careers
- International Baccalaureate Programmes that span primary, middle and high school years, offering students the 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 127-year tradition of agricultural education that merges with 21st 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 2019-20, 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, a continuation high school serving students in grades ten through twelve, and an alternative school that includes a 1-8 program and a 9-12 program. Table 2.1 lists these schools with 2019-20 school year data for enrollment.

Table 2.1: Livermore Valley Joint Unified School District Schools

School	Location	2019-20 Enrollment
Altamont Creek Elementary	6500 Garaventa Ranch Road	592
Arroyo Seco Elementary	5280 Irene Way	670
Croce Elementary	5650 Scenic Avenue	614
Jackson Elementary	554 Jackson Avenue	532
Lawrence Elementary	2451 Portola Avenue	370
Marylin Avenue Elementary	800 Marylin Avenue	420
Joe Michell K-8 School	1001 Elaine Avenue	783
Rancho Las Positas Elementary	401 East Jack London Blvd	594
Emma C. Smith Elementary	391 Ontario Drive	682
Sunset Elementary	1040 Florence Road	758
Christensen Middle School	5757 Haggin Oaks Avenue	681
East Avenue Middle School	3951 East Avenue	658
Junction Avenue K-8 School	298 Junction Avenue	985
Mendenhall Middle School	1707 El Padro Drive	960
Granada High School	400 Wall Street	2251
Livermore High School	600 Maple Street	1879
Del Valle Continuation High School	2253 Fifth Street	133
Vineyard Alternative 1-12 School	1401 Almond Avenue	103

The current total school capacity within the District is 16,150 students as follows: TK-5 -8,250 students; 6-8 - 3,400 students; and 9-12 - 4,500 students. According to District demographic reports (September 2019), 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 like 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.org.

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[1], 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 must 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, after 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.

[1] 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 if 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.

In June 2016, the citizens of Livermore approved Measure J, which has provided $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 way 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 slow enrollment growth over the next decade 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. A study conducted in 2019 supported those yield factors.

Additional Facilities

The District will meet the demand of additional students from the existing housing stock, previously approved residential projects and future projects, 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 in 2005.

The District's passage of Measure J will provide additional funding for renovation and expansion. The Board of Trustees prioritized the facilities needs that will be met through Measure J funds. In addition to development mitigation fees required under AB 2926, the District will require additional mitigation to meet the school facilities needs resulting from future residential projects 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 enough 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 2019 Developer Fee Justification Study (Livermore Valley Joint Unified School District).

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.

The Local Control Funding Formula (LCFF) was enacted in 2013–14, and it replaced the previous kindergarten through grade 12 (K–12) finance system which had been in existence for roughly 40 years. For school districts and charter schools, the LCFF establishes base, supplemental, and concentration grants in place of the myriad of previously existing K–12 funding streams, including revenue limits, general purpose block grants, and most of the 50-plus state categorical programs that existed at the time. For county offices of education (COEs), the LCFF establishes separate funding streams for oversight activities and instructional programs. The Department of Finance estimated it would take eight years to fully phase in the new funding formula for school districts and charter schools, and it would take two years to fully phase in the new formula for COEs. As of 2018, school districts and charter schools are receiving on average 97 percent of their LCFF targets.

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 (2019) 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.

CHAPTER 3

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 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

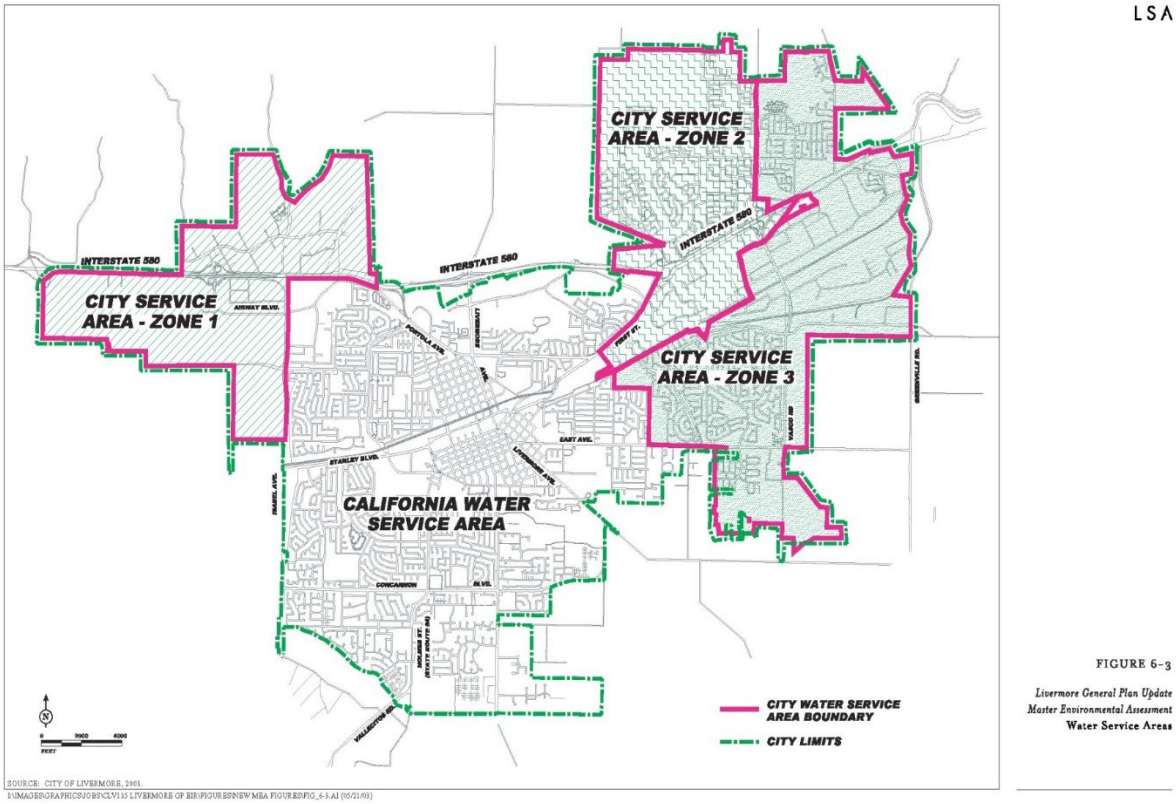
owners and operators to reclaim the existing and future quarry pits creating the Chain of Lakes for groundwater recharge, water storage and flood control purposes.

Every five years, Zone 7 publishes an Urban Water Management Plan (UWMP) in accordance with State requirements, which serves as the primary and formal communication of the agency's water supply operations and plans to the public and other stakeholders. The most recent UWMP update ("2015 UWMP") was released in 2016, and the next update is planned for 2021. The following information is largely derived from the 2015 UWMP[1].

Treated water is supplied to both LMW and Cal Water by Zone 7. Zone 7 serves a population of approximately 260,000 in a service area mostly comprised of approximately 425 square miles in eastern Alameda County. Currently, Zone 7 serves the Livermore population of 91,039[2] and with ongoing collaborative conservation efforts with the City and other water service partners will have enough capacity to serve the projected build-out of approximately 101,091[3] 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.

Figure 1: Flood Control and Water Service Areas



[1] 2015 Urban Water Management Plan, Zone 7 Water Agency, March 31, 2016.
[2] California Department of Finance, January 1, 2019
[3] 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

Zone 7 Water Agency - System Background

As shown in Figure 2, Zone 7 provides water to the Valley from imported surface water and a local water right permit. Approximately 90 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).

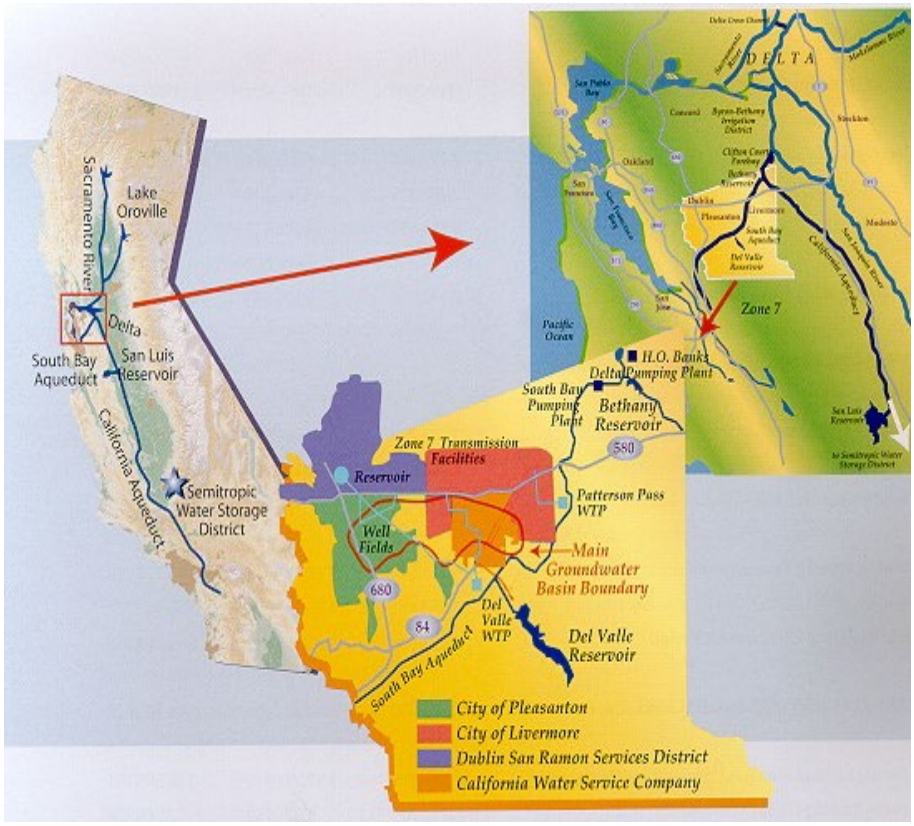
Zone 7 operates the Del Valle and Patterson Pass Water Treatment Plants (WTPs). These plants treat water from the SWP and other surface water supplies before distribution throughout the Valley. The Del Valle WTP, located south of Livermore, has an average hydraulic capacity of 36 million gallons per day (MGD), but this capacity is occasionally limited by treatment challenges associated with poor source water quality. The Patterson Pass WTP, east of Livermore, has a nominal design capacity of 12 MGD. and plans to expand Patterson Pass WTP‘s capacity to 24 MGD using conventional filtration will be carried out 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. Ultimately, Zone 7 will manage the Chain of Lakes 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[1], 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-feet)

Year	Delivery Acre-feet
2012	6,598
2013	6,731
2014	5,064
2015	4,556
2016	4,818
2017	5,325
2018	5,909
2019	5,930

1 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.

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

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-feet)

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.

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). According to the 2015 UWMP, 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. The 2015 UWMP assumes 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. Recently, Governor Gavin Newsom issued statements refining the plans for California WaterFix as a modified Delta conveyance project. The details of the new plan are still emerging; any changing assumptions with Delta conveyance or other projects affecting Zone 7's projected water supplies will be characterized in Zone 7's 2020 UWMP.

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

Water Supply	Detail	2020	2025	2030	2035
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
	Total	**78,645**	**88,645**	**99,500**	**99,500**

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.

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 non-local storage in groundwater banks in Kern County 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 and fill the Kern groundwater banks.

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) as well as the more recent Long-Term Conservation Framework developed under Governor Jerry Brown and the continuing roll-out of its implementation.

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 and incorporate new information and experience gained over the recent drought. The update served as the foundation for Zone 7's 2015 Urban Water Management Plan. A 2019 Water Supply Evaluation Update was recently completed, and its latest information and analysis will be incorporated into Zone 7's 2020 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 is proposed to be completed by Zone 7 in 2020.

Zone 7 typically updates its Ten-Year Water and Five-Year Flood Capital Improvement Program (CIP) every two years; the last comprehensive CIP update encompassing both the water system and flood control 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]). The most recent drought prompted the acceleration, deferral, and addition of certain water supply capital projects, and so an update for FY 18-19 specifically for water supply was delayed by one year and completed in October 2017. Meanwhile, heavy storms in early 2017 caused major flood

damage, and a CIP update for the flood system was delayed until a time when repair operations can stabilize. Zone 7 is currently working on the next update to the water system CIP to be completed by the end of 2019.

The purpose of the CIP 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 new Delta conveyance project (formerly California WaterFix), and other water supply and storage options. Several such projects are in the conceptual or early planning stages, and decisions on which options to pursue for implementation will be made later; these include Los Vaqueros Reservoir Expansion, Sites Reservoir, Potable Reuse, 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 State Water Project was published in June 2017 (California State Water Project Watershed Sanitary Survey 2016 Update).

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.

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 7-1 reimbursement agreements. These agreements provided reimbursement to Developers that improved a creek section to Zone 7 standards and transferred ownership of the improved section of creek to Zone 7. Responsibility for maintaining unimproved arroyos 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 new 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. Beginning in October 2020, after obtaining additional credit for zoning and floodplain management regulations, the Tri-Valley Hazard Mitigation Plan and social media outreach, this rating will improve to a Class 6 with a corresponding 20 percent discount 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 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 original 2006 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 finalized the SMP and obtained permits from the California Department of Fish and Wildlife and RWQCB in 2016 and received a regional general permit from US Army Corps of Engineers in 2017. The city is implementing the SMP by submitting an annual notification in April for maintenance projects to be done in the summer. In February 2017, winter rains inundated hillsides and creek banks causing landslides and undercutting banks. Ten-year frequency flows undercut banks causing $10 million in damage to trails and storm drain infrastructure. In addition, $10 million in commercial property damage to structures not in the floodplain also occurred.

On April 1, 2016, the President declared a disaster for many cities in the Bay Area, including Livermore. The City received FEMA Public Assistance funds to repair damages. To date, the City has received $1 million for repairs and will continue the permanent repairs in 2020. The City also partnered with other Tri-Valley agencies to prepare the Tri-Valley Hazard Mitigation Plan (TVHMP). With the adoption of the TVHMP in 2018, the City was eligible to apply for FEMA Hazard Mitigation Grant funds and was awarded $3 million for two projects that will provide flood control for the Livermore Municipal Airport and nearby businesses and also prevent future flooding of previously damaged commercial structures not located in the floodplain. The City has one year to complete the permanent repairs to the creeks damaged in 2017 and 3 years to complete the hazard mitigation projects funded by FEMA Hazard Mitigation Grant funds.

Major capital expenditures in the 2017-2019 Capital Improvement Plan include debris removal and repair of the 2017 storm damage to trails on the banks of the Arroyo Mocho, Arroyo Las Positas and along Collier Canyon Road. Major capital expenditures in the 2019-2021 budget will stabilize Cottonwood Creek and resolve the flooding along the Arroyo Las Positas within the Springtown and Las Positas Golf Courses and along Airway Blvd.

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.

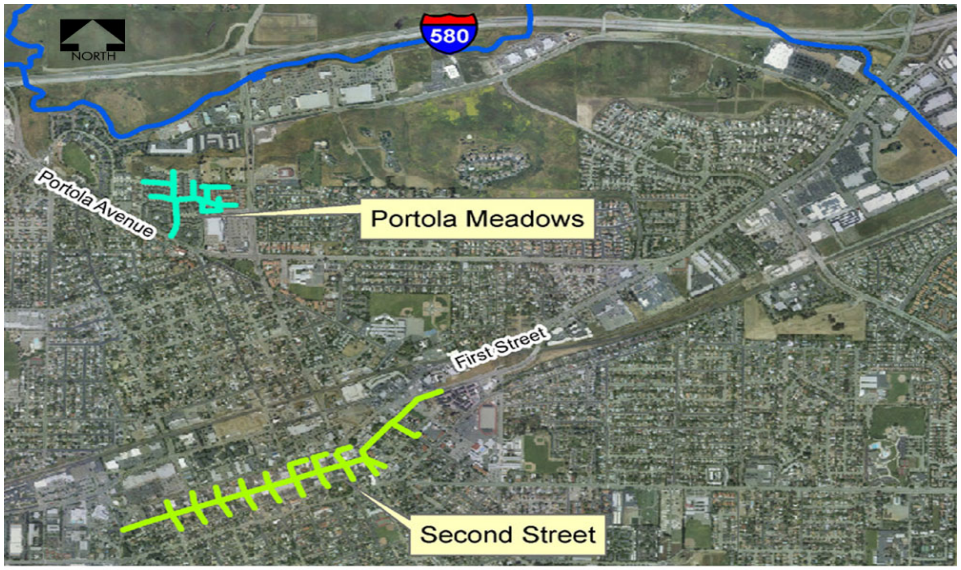
The City completed the hydraulic evaluation of the storm drain system during a ten-year storm event based on build-out land uses approved in the 2003 to 2025 General Plan. The analysis is provided in the 2004 Storm Drain Master Plan, which identifies existing and future storm drain deficiencies and the 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 a 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 percent of these improvements are required for existing deficiencies and 45 percent 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.

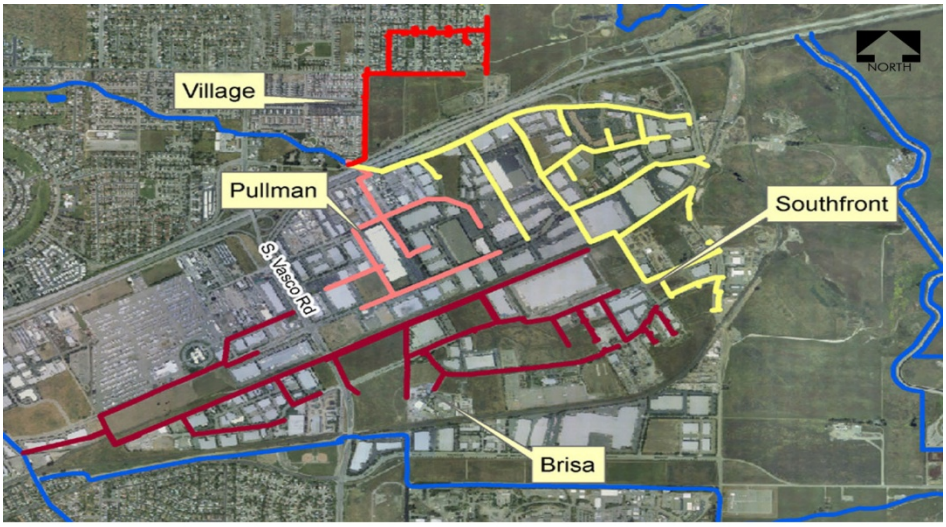
Further evaluation of the following storm drains may show that growth is limited on properties draining into these storm drains listed below and shown in Figures 3 and 4.

- 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 currently has streamflow monitoring equipment installed at Altamont Creek, Arroyo Las Positas and Arroyo Mocho. A new streamflow monitoring station is proposed along Arroyo Seco at First St and will likely be installed in the summer of 2019. 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 Zone 7 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 for stormdrain pipes and inlets, which includes catch basin cleaning, line repairs, and maintenance of two pump-stations. Staff does their best to clear catchbasins and pipes when needed, but with the limited funding, much of the needed maintenance has been deferred and maintenance that is done is generally reactive rather than proactive. The documentation of routine inspections and creek maintenance are being formalized as part of the City's asset management program. The maintenance program is partially funded through the City's Stormwater Management and Control Program by a utility fee charged to businesses and residents on their property taxes. The remainder of the maintenance is funded by the general fund. After the Stream Maintenance Program received permits in 2017 more of the deferred maintenance was accomplished such as clearing of storm drain outfalls and re-establishing a low flow channel in the Arroyo Las Positas between Heather Lane and Bluebell Drive. In light of the funding constraints, City staff report that, overall, the system is functioning. Dedicated funding is needed to restore the flood protection and natural and beneficial functions. Although the Living Arroyos Program has provided the public with hands-on opportunities to restore creeks in Livermore additional public information efforts are needed to inform and engage the community regarding the needed maintenance and corresponding funding to restore the flood protection and natural and beneficial functions of the creeks.

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 reduced trash discharges 80 percent in July 2017 and has targeted a reduction of 100 percent by July 2022. In 2014,179 drainage inlet screens were in installed. The City installed three regional trash capture devices at a cost of $657,000 and 160 inlet filters at a cost of $215,000 to meet these requirements. Initial estimates are that it could cost an additional $4.2 million to achieve 100 percent trash reduction. The additional trash capture devices include large trash interceptors and 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 was completed and approved by Council in September 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 percent of treated retailer demands 90 percent of the time and 85 percent of treated retailer demand 99 percent 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)
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 2018, the average dry weather flow into the wastewater treatment plant was 5.4 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 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, 7,000 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 Isabel Interchange Project, the Las Positas Community 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. In 2018 the Division's Asset Management Program estimated the replacement value of the Livermore collection system at approximately $652 million. The Asset Management Program also developed an Asset Consumption Profile for the collection system, and found that 43 percent of the City's sewer pipes by length (or 52 percent by pipe segments) are within the 0 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 function of the Asset Management Program, 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 2017. 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 2017 Sewer Master Plan identified $5.3 million in collection system expansion projects. Funding for the expansion projects will be included in the updated Sanitary Sewer Connection Fee Study.

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 2013 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 2013 Master Plan Update will be included in the updated Sanitary Sewer Connection Fee Study.

In 2018 the Division's Asset Management program estimated the overall replacement value of the treatment plant at $168 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 part of the Division's Asset Management Program, 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 2013 Water Reclamation Plant Master Plan Update, $21.1 million in additional treatment facilities will be required to treat the build-out wastewater flow. Funding for the additional treatment facilities will be included in the Sanitary Sewer Connection Fee Study. Recent projects identified in the 2010 Sanitary Sewer Connection Fee Study including the electrical distribution system upgrades and recycled water system improvements were completed between 2016 and 2018. 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, standby electrical generator installation and aeration tank improvements, are planned for 2020.

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 commercial development creates high demand on the City 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 little or no production loss to existing businesses. 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 three on-duty firefighters each. 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. Two full-time Fire Prevention Bureau inspection staff, with degrees in science, 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 2019, the LPFD provided Livermore with five fire companies per day staffed with a total of 16 personnel, including an assigned paramedic. 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. 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 2017 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 39th (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 17th (westbound AM) and 24th (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.

Except for the planned Valley Link Rail Project and improvements to the interchanges at Vasco Road, Greenville Road, Isabel Avenue (Phase 2 improvements) and First Street, I-580 is now built out. The Valley Link Rail Project will extend initially from the planned ACE North Lathrop Station in the San Joaquin Valley through the Altamont Pass, then to the Dublin/Pleasanton BART terminus station in the Tri-Valley, with two stations in Livermore, Greenville Rd/I-580 and Isabel Ave/I-580.

The project is currently in the preliminary engineering and environmental assessment phase, and has about one third of the estimated $1.8 billion cost. If full funding is secured, Valley Link could be operational by 2027.

Route 84 was identified as congested (LOS F) between Ruby Hills Drive to Culvert Road in the Alameda County 2016 Level of Service Monitoring Report. The Route 84 widening project, completed in 2018, improved the LOS to E. There are additional planned improvements to Route 84 including widening from Pigeon Pass to I-680.

These improvements will help reduce traffic congestion on I-580 and Route 84. In addition, the planned 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. There is not yet a construction timeline for this project.

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 several 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. It should be noted that the City will start utilizing Vehicle Miles Traveled (VMT) in 2020 as a tool to measure traffic, air quality and greenhouse gas impacts in addition to LOS. 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 *and* less than or equal to 20
C	A significant number of vehicles stop. A few vehicles must wait more than one signal cycle.	Greater than 20 *and* less than or equal to 35
D	Most vehicles stop. A noticeable number of vehicles must wait more than one signal cycle.	Greater than 35* *and* less than or equal to 55 *"Mid-D" = 45
E	Vehicles frequently wait more than one signal cycle.	Greater than 55 *and* less than or equal to 80
F	Extreme delays potentially affecting other traffic movements in the intersection.	Greater than 80
Source: *Highway Capacity Manual* 2000; and City of Livermore, 2002.		

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 2018 Level-of-Service Monitoring Report shows that some sections of I-580 through the Tri-Valley were operating at LOS F during the PM peak hours. When the freeway is congested, some motorists use City streets to bypass the congested areas. The report also showed the LOS improved on segments of Route 84 near the Livermore area due to the recent completion of the Route 84 widening project in this area. The segments between I-580 and Ruby Hills are operating at LOS D or better except the segment between Vineyard and Vallecitos. Between Vineyard and Vallecitos, southbound Route 84 is operating at LOS E during the heavy AM commute but LOS A during the PM.

With the LOS generally improving along the Route 84 segments in the Livermore area, intersection delays nearby also improved. For example, the delay at Concannon/Holmes intersection in 2017 was 34 seconds during both AM and PM peak. In 2019, the AM peak and PM peak delays were reduced to 30 seconds and 26 seconds, respectively.

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. Nearly all the signalized intersection in the City currently meet the City's LOS targets.

Table 2: Existing Traffic Conditions

No.	Intersection Name	Existing Traffic Conditions (2016*, 2018**, 2019)			
		AM Peak Hour		PM Peak Hour	
		LOS	Average Control Delay/ Vehicle (in seconds)	LOS	Average Control Delay/ Vehicle (in seconds)
1	Airway Blvd/I-580 EB Ramp	E	**58.6**	D	43.4
2	Airway Blvd/I-580 WB Ramp	A	4.8	A	6.1
3	Airway Blvd/Isabel Ave	C	29.3	C	26.0
4	Concannon Blvd/Arroyo Rd	C	30.6	D	42.9
5	Bluebell Dr/Springtown Blvd	B	12.7	B	17.0
6	Concannon Blvd/South Livermore Ave	B	17.3	B	18.3
7	Concannon Blvd/Murdell Ln	B	13.1	A	8.7
8	East Ave/Charlotte Wy	B	14.2	B	11.7
9	East Ave/Dolores St	B	13.0	B	13.1
10	East Ave/Hillcrest Ave	B	18.9	B	13.7
11	East Ave/Loyola Way	A	5.6	A	7.6
12	East Ave/Maple St	A	5.5	A	6.0
13	East Ave/Mines St	B	14.1	B	17.4
14	Fourth St/South Livermore Ave	B	14.9	**D**	**45.6**
	South Livermore Ave/East Ave	B	12.7	B	13.5
15	East Stanley Blvd/Fenton St *	A	7.5	B	17.6
16	East Stanley Blvd/Isabel Connector Ramp*	D	40.7	C	24.6
17	East Stanley Blvd/Murdell Ln *	B	14.2	B	12.9
18	East Stanley Blvd/Murrieta Blvd *	E	**56.3**	E	**72.4**
19	East Stanley Blvd/Wall St *	C	28.1	B	14.2
20	East Stanley Blvd-Railroad Ave/South S St *	B	14.0	C	24.5
21	First St/I-580 EB Ramps	B	12.5	C	22.1
22	First St/I-580 WB Ramps	A	8.8	A	7.4
23	First St/Inman St *	D	36.0	C	28.0
24	First St/Las Positas Rd *	C	22.8	C	25.3
25	First St/North Mines Rd *	D	42.9	D	45.0
26	First St/Old First St *	B	18.6	B	18.4
27	First St/Portola Ave *	B	12.6	C	30.0
28	First St/Railroad Ave-Maple St *	C	23.4	C	32.3
29	First St/South L St	C	20.4	C	25.1
30	First St/South Livermore Ave	B	18.7	B	18.2

No.	Intersection Name	Existing Traffic Conditions (2016*, 2018**, 2019)			
		AM Peak Hour		PM Peak Hour	
		LOS	Average Control Delay/ Vehicle (in seconds)	LOS	Average Control Delay/ Vehicle (in seconds)
31	First St/South P St	B	12.4	B	12.5
32	First St/Southfront St *	B	14.4	B	17.1
33	Fourth St/South P St	A	5.8	A	6.2
34	Fourth St/Inman St	C	17.4	B	14.3
35	Fourth St/Maple St	C	18.6	B	11.8
36	Las Positas Rd/Greenville Rd	A	7.5	B	12.9
37	National Dr/Greenville Rd **	B	11.0	B	12.6
38	Southfront Rd/Greenville Rd **	B	10.6	B	11.1
39	Catalina Dr/Holmes St	A	8.8	A	8.7
40	Concannon Blvd/Holmes St	C	30.0	C	26.6
41	First St/Holmes St	A	3.5	A	6.3
42	Fourth St/Holmes St	C	34.8	D	36.9
43	Mocho St/Holmes St	B	16.9	A	6.9
44	Vancouver Wy/Holmes St	A	9.0	A	6.4
	El Caminito/Holmes St	A	8.7	A	6.8
45	Concannon Blvd/Isabel Ave	B	15.6	B	17.3
46	Stanley Connector Ramp/Isabel Ave	B	16.0	B	14.6
47	East Vineyard Ave/Isabel Ave	C	29.0	C	33.8
48	East Jack London Blvd/Isabel Ave	D	44.4	C	28.6
49	Charlotte Wy/North Mines Rd	A	7.3	A	8.3
50	Patterson Pass Rd/North Mines Rd	B	15.5	B	17.9
51	Murrieta Blvd/Fenton St	A	2.8	A	4.1
52	Jack London Blvd/Murrieta Blvd	C	30.5	C	23.2
53	Olivina Ave/Murrieta Blvd	C	32.7	C	26.3
54	North Canyons Pkwy/Airway Blvd	B	12.0	B	19.9
55	North Canyons Pkwy/Collier Canyon Rd	B	16.6	C	21.2
56	Chestnut St/North Livermore Ave	B	11.8	C	25.6
57	Cromwell Wy/North Livermore Ave *	A	6.4	A	7.2
58	North Livermore Ave/I-580 EB Ramp	D	44.6	B	16.4
59	North Livermore Ave/I-580 WB Ramp	B	13.9	B	15.7
60	Las Positas Rd/North Livermore Ave *	C	26.9	D	44.1
61	Portola Ave/North Livermore Ave *	D	36.5	C	32.4
62	Railroad Ave/North Livermore Ave	C	28.5	C	34.9
63	Olivina Ave-Chestnut St/North P St	C	22.0	C	22.2
64	Portola Ave/North L St *	B	16.5	C	22.3
65	Portola Ave/Murrieta Blvd *	B	16.7	C	32.4

No.	Intersection Name	Existing Traffic Conditions (2016*, 2018**, 2019)			
		AM Peak Hour		PM Peak Hour	
		LOS	Average Control Delay/ Vehicle (in seconds)	LOS	Average Control Delay/ Vehicle (in seconds)
66	Railroad Ave/North L St *	B	16.3	C	23.9
67	Railroad Ave/North P St *	C	24.9	C	31.7
68	Fourth St/South L St	A	8.0	A	8.7
69	Second St/South L St	A	4.6	A	5.6
70	Vallecitos Rd/Isabel Ave	B	11.9	B	10.0
71	Brisa St/South Vasco Rd**	C	27.8	C	25.2
72	East Ave/South Vasco Rd	C	25.6	C	33.1
73	Garaventa Ranch Rd/North Vasco Rd *	D	37.1	D	37.6
74	Industrial Dr/South Vasco Rd *	A	8.9	C	21.4
75	Las Positas Rd/South Vasco Rd *	C	23.3	C	32.5
76	Daphne-Westgate/South Vasco Rd *	C	34.3	C	30.4
77	Northfront Rd/North Vasco Rd *	*F*	***87.8***	D	36.3
78	Patterson Pass Rd/South Vasco Rd *	C	27.8	C	31.4
79	Scenic Ave/ North Vasco Rd *	C	29.2	C	22.0
80	Isabel Ave/I-580 EB Ramps	D	37.7	C	33.8
81	Isabel Ave/I-580 WB Ramps	B	11.5	B	11.5
82	Isabel Ave/Portola Extension	C	24.5	C	22.9
83	Vasco Rd/Dalton Ave*	D	41.9	**E**	**59.2**
84	Greenville Rd/Patterson Pass (2-way stop)	**F**	**>50**	**F**	**>50**
85	W Jack London Blvd/Livermore Outlets Dr	A	4.9	A	7.2
86	Stanley Blvd/El Caminito	B	17.5	A	3.8
87	Railroad Ave/Parking Structure	A	8.0	B	11.5
88	Livermore Ave/Arroyo Plaza	A	6.6	A	6.1
89	Portola Ave/P St *	A	9.7	A	8.9
	Portola Ave/Paseo Laguna Seco *	B	19.7	B	12.7
90	Livermore Ave/Junction Ave *	B	19.0	B	16.3
Source: City of Livermore, November 2019					

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 several 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 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. The Route 84 Expressway has been constructed in phases. All phases have been completed except for Pigeon Pass to I-680. This segment is fully funded, has environmental clearance, and is currently under final design. Construction is expected to occur from 2021 to 2023. The other regional projects listed above are not fully funded at this time, and therefore, have longer timelines for implementation.

Local improvements being implemented in the 2019-2021 Capital Improvement Program include:

- Widening Vasco Road north and south of Dalton Avenue
- Installing a traffic signal at Greenville Road/Patterson Pass Road.

These improvements should be completed in the next two to three years.

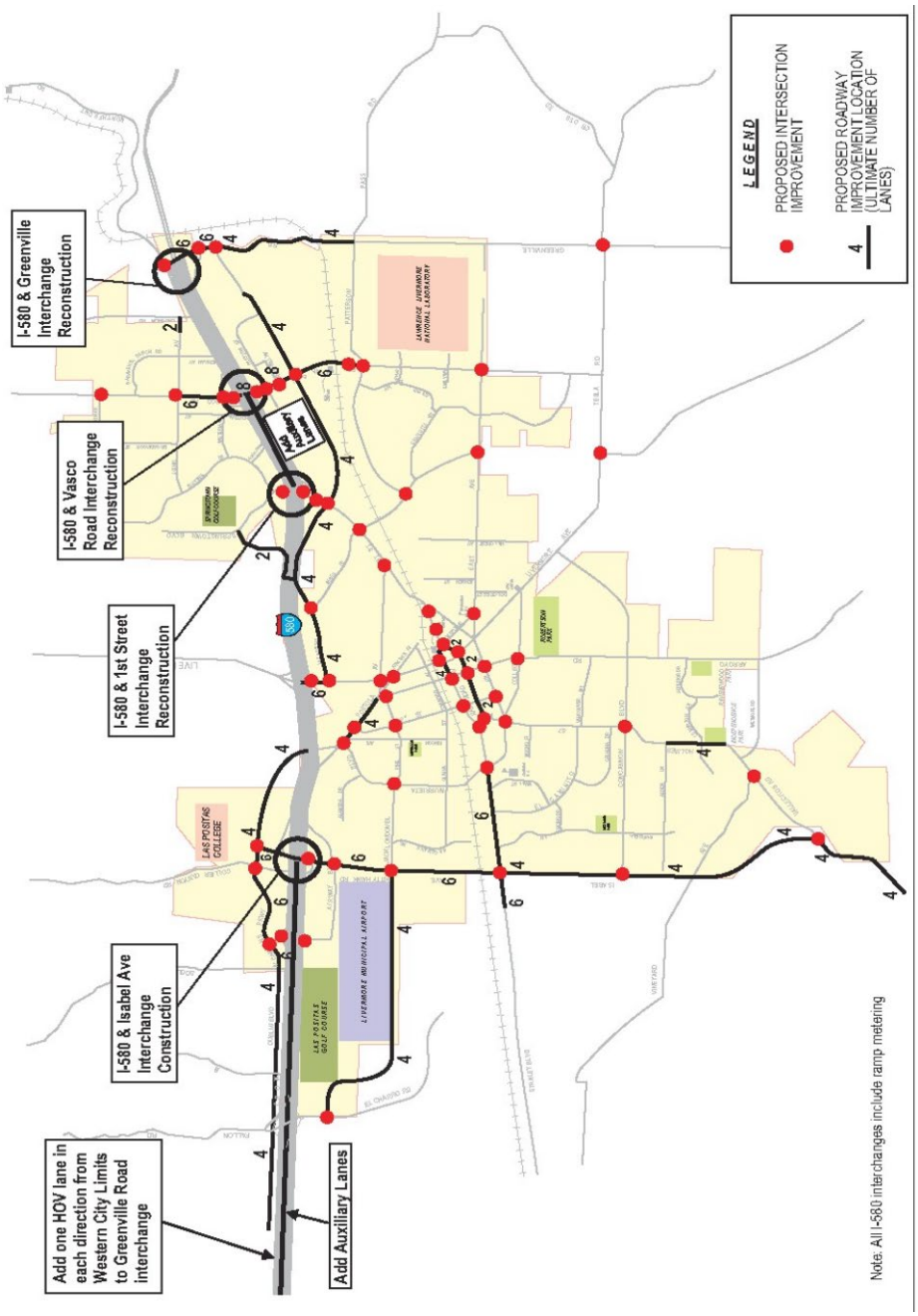
Bicycle/Pedestrian Plans

In December 2001, the City adopted the Livermore Bikeways and Trails Master Plan (Master Plan). Until recently, 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 developed 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. In June 2018, the Active Transportation Plan was adopted replacing the 2001 Master Plan. The Active Transportation Plan was built upon the Master Plan and leverage Livermore's well-connected bicycle, pedestrian, and trail network. With significant public outreach, the Active Transportation Plan analyzed existing and future conditions and needs, identified network and program recommendations, and developed an implementation and financial plan for projects. The Active Transportation Plan is the roadmap for future projects, programs, and policies to improve the active transportation network over the next ten years.

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 (2016) ranked Livermore 97 out of 104 cities of similar size, with 104 being the safest. That means that there were 96 cities that were less safe for pedestrians in California and only seven that were safer making Livermore one of the ten safest in pedestrian safety. For bicycle safety, Livermore was ranked 86 out of 104. 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 General Plan build-out LOS values shown assumes that all 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
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 St	C	22	D	38

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)
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	**E**	**68**	**E**	**56**
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
36	Las Positas Rd/ Greenville Rd	B	15	C	29
37	National Drive/ Greenville Rd	A	8	B	12
38	Southfront Road/ Greenville Rd[1]	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	**D**	**50**	**D**	**49**
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

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)
57	Cromwell Way/ North Livermore Ave	A	6	A	10
58	North Livermore Ave/ I-580 EB Ramp	B	13	B	16
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 Ave- Chestnut St/ North P St	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	**F**	**83**
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	**F**	**126**
81	Isabel/ I-580 EB Ramps	A	8	B	14
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[1]	B	18	B	17
85	Greenville Road / I-580 WB Ramps[1]	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	**F**	**149**

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 avg 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 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.

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.

- 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 94 sworn police officer positions, and 45 professional staff personnel serving the City's 2018 population of 91,411. The LPD police station consists of 43,400 square feet and is in the Civic Center Campus on South Livermore Avenue.

The LPD vehicle fleet consists of 35 marked patrol vehicles, 22 unmarked vehicles, 6 police motorcycles, a Community Outreach Vehicle, an Armored Rescue Vehicle, a 1954 Chevrolet vintage police sedan, 10 multi-use vehicles for Professional Staff and Police Volunteers, 2 Animal Services trucks, 3 radar trailers, 4 Traffic trailers, 1 Traffic message board, and 2 Traffic light towers.

The City's approximate 26.44 square miles is divided into three geographical policing areas using the Area Command Policing Model: Northwest Area, Northeast Area, and the South Area. The Area Policing Model is often utilized by public safety agencies 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 areas. Patrol personnel are then assigned to each of the geographic areas known as "Area Commands." This allows the building of longer lasting and more effective relationships with the community and respond proactively to the unique issues within each area.

The Chief of Police is the Commander of the police department, which is comprised of two divisions: The Operation Division and the Support Services Division. One Police Captain is the Commander of the Operations Division, which manages the Patrol Bureau, the Traffic Bureau, the Criminal Investigation Bureau, and the Tactical Team. The other Police Captain is the Commander of the Support Services Division, which manages the Records Unit, the Dispatch Center, the Property Unit, Horizons Youth and Family Services, the Professional Staff managers, and the volunteers.

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 at the San Francisco Premium Outlets on the western edge of the City to address their specific calls for service and issues. Four additional officers are deployed on Friday and Saturday evenings to the downtown area to address alcohol related violations, disturbances, and large crowds to maintain a safe environment.

To assist the Patrol Division, 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 public 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, a Crime Prevention Officer, and three K9 working dogs.

In 2018, a new specialized unit was created to address homeless related calls. The two Homeless Liaison Officers (HLOs) dedicate their assignment to helping the homeless. The HLOs work with other city, county, and private organizations to provide resources to the homeless community members.

Three Community Service Specialists and four Police Cadets are assigned to assist the Patrol Division with basic criminal investigations, evidence collection, and other patrol support duties. LPD has one Police Identification Technician for more complex cases involving forensic analysis. Two Property Technicians work in the Property Unit keeping track and processing approximately 45,000 pieces of evidence and property.

Additional Professional Staff include 15 Public Safety Dispatchers (PSD) and three Senior 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 and Senior PSDs.

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 has worked 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 Police IT Manager is the liaison to the two City IT Specialists assigned to the department.

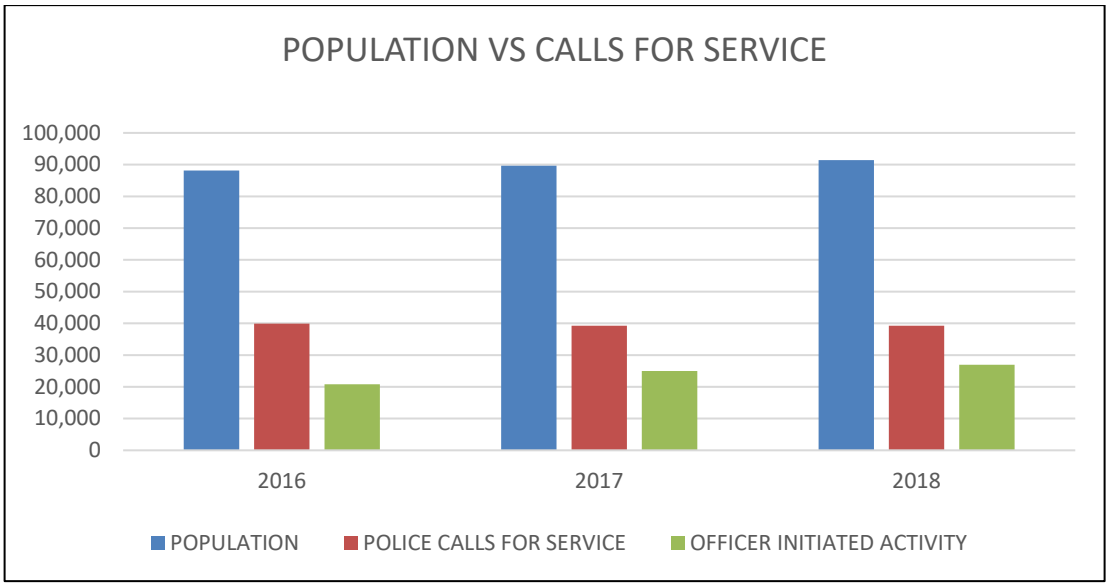
Currently, 200 volunteers help with numerous public events, city events, walking patrols, assisting patrol officers, and performing various clerical functions within the LPD. In addition to the volunteers, the LPD has five volunteer Reserve Police Officers who also assist the Patrol Bureau with patrol 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 reflects the City's population, the number of police calls for service, and the number of officer-initiated activity between 2016 and 2018. 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.

Officer initiated activities include traffic stops, pedestrian stops and other officer on-view enforcement actions. As shown in the figure and table, the City's population increased 3.71 percent between 2016 and 2018. From 2016 to 2018, police calls for service have decreased by 697 calls (1.75 %) and officer-initiated activity has increased by 6,166 stops (29.6%).

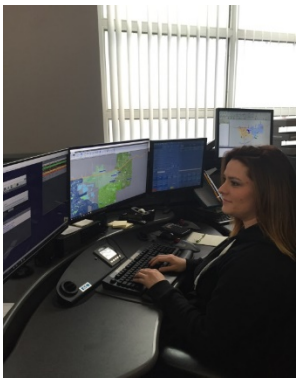


	2016	2017	2018
Population	88,138	89,648	91,411
Police Calls for Service	39,937	39,257	39,240
Officer Initiated Activity	20,808	24,997	26,974

The decrease in Police Calls for Service and increase in Officer Initiated Activities is associated with the Area Command Policing Model, public education, and regular meetings with the community to encourage the calling of police when citizens see something suspicious in their neighborhoods.

In addition, our Homeless Liaison Officers proactively contact the homeless population to provide help and services.

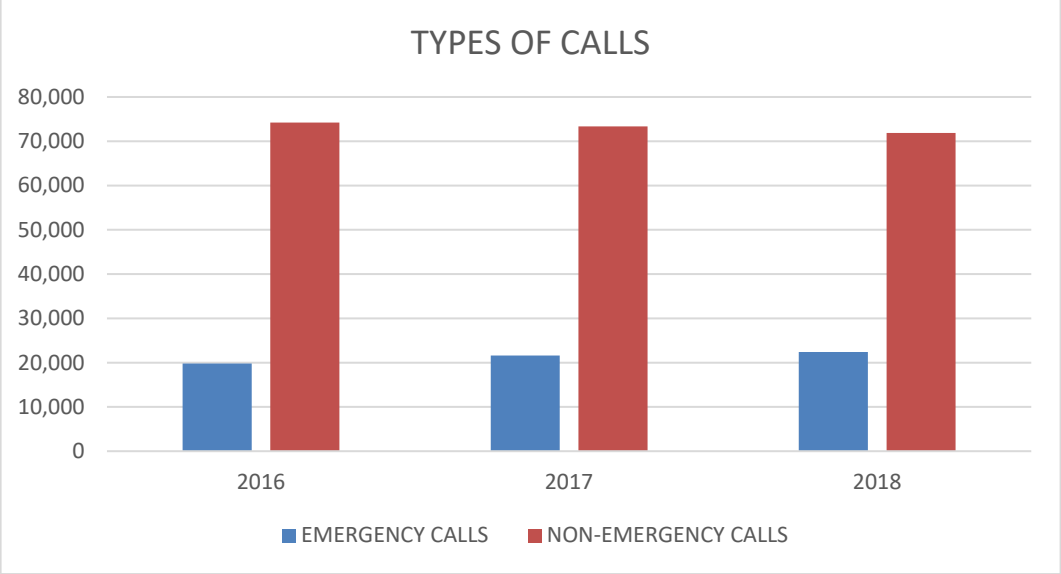
Police Dispatch



Between 2016 and 2018, 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.

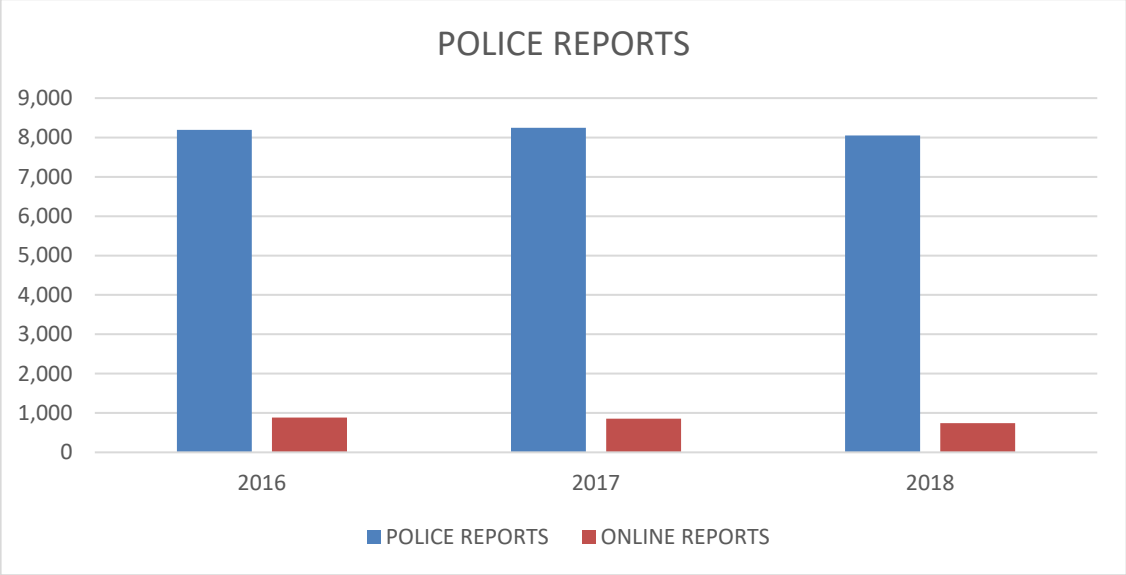
Non-emergency calls include less serious crimes such as minor disturbances, trespassing, loitering, suspicious vehicles or cold reports.



	2016	2017	2018
Emergency Calls	19,816	21,622	22,396
Non-Emergency Calls	74,235	73,339	71,872

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



	2016	2017	2018
Police Reports	8,195	8,246	8,050
Online Reports	886	854	740

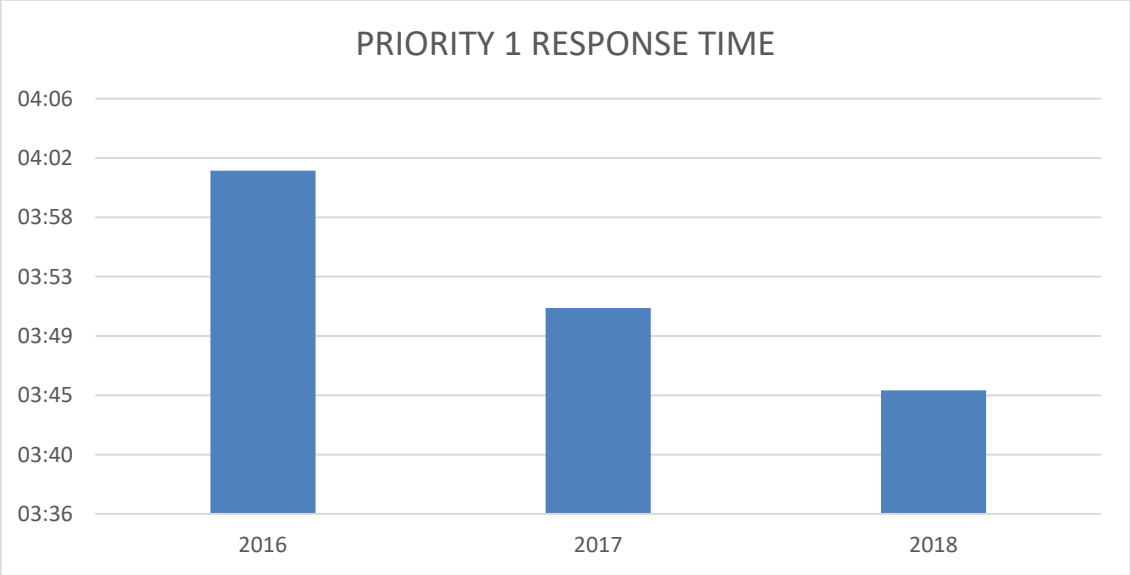
In summary, the population, number of businesses and the amount of traffic in Livermore has increased and officer submitted reports from 2016 to 2018 have decreased. This decrease in police reports is attributed to the 2015 transition to a new Computer Aided Dispatch (CAD) system incorporated throughout all Divisions and Units in the police department. The CAD system streamlines police reports and allows incidents to be closed out in the system without generating an actual report number.

The department's online reporting numbers have consistently averaged 827 reports each year. Each police report submitted by an employee is reviewed and approved by a Police Sergeant or the Watch Commander and then routed to the Record's Unit for processing.

Dispatch and Patrol Response Times

Priority 1 Response Times

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

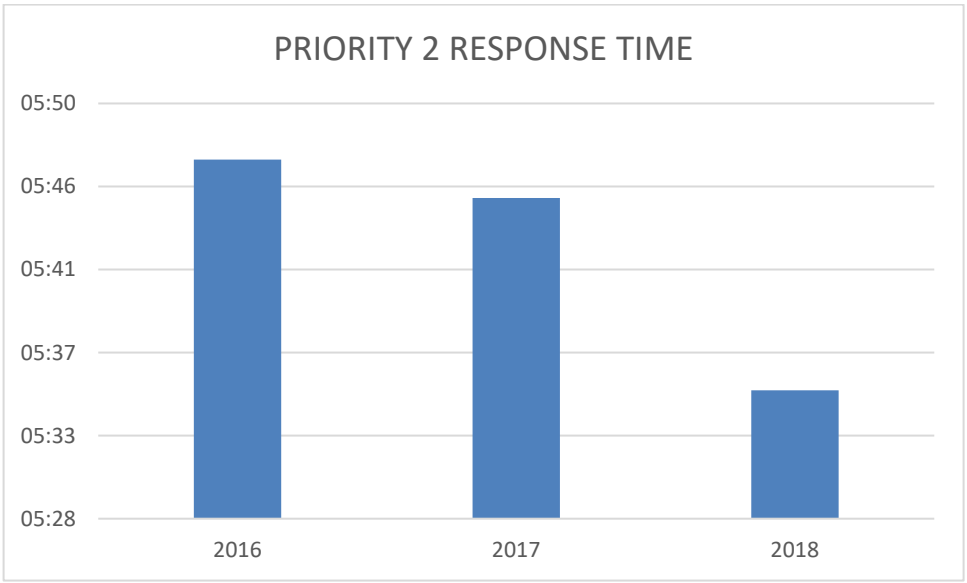


All times are in minutes and include when the call is dispatched to when the first police unit arrives on scene.

	2016	2017	2018
Priority 1 Response Time	04:01	03:51	03:45

Priority 2 Response Times

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



All times are in minutes and include when the call is dispatched to when the first police unit arrives on scene.

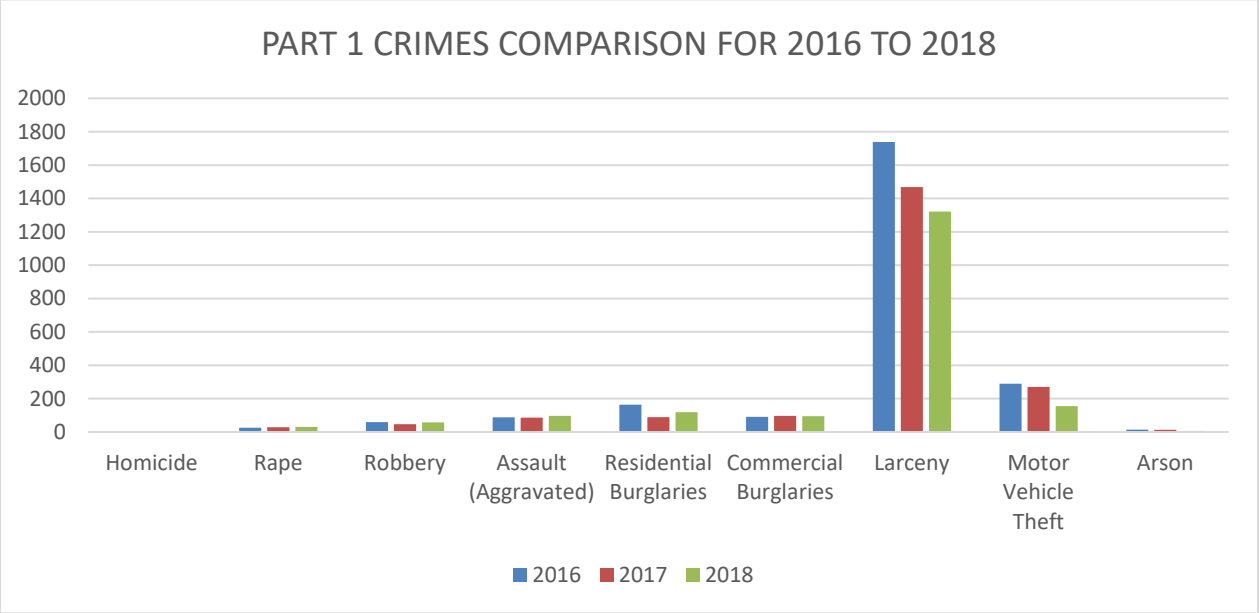
	2016	2017	2018
Priority 2 Response Time	05:47	05:45	05:35

Priority 1 and 2 call response times have improved because of the “Area Command Policing Model” which reconfigures the traditional “Police Beat” structure. Officers are deployed in larger geographical areas and staffing levels are adjusted to adequately respond to calls for service based on time of day.

Crime Statistics

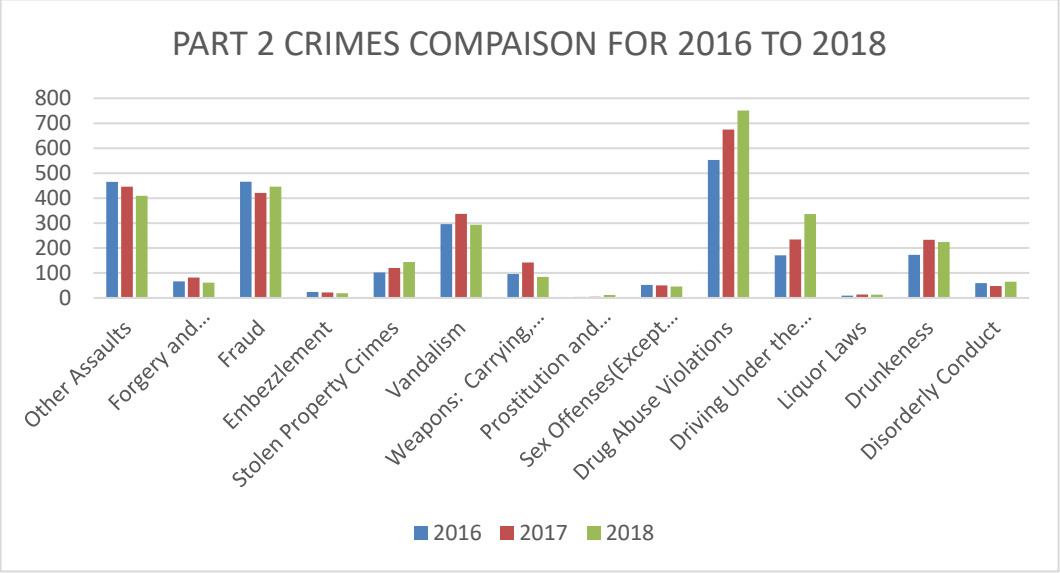
Part 1 Crimes

	2016	2017	2018
Homicide	1	0	0
Rape	26	29	31
Robbery	59	47	57
Assault (Aggravated)	88	86	97
Residential Burglaries	164	89	119
Commercial Burglaries	91	97	95
Larceny	1,739	1,468	1,322
Motor Vehicle Theft	290	270	155
Arson	14	13	7



Part 2 Crimes

	2016	2017	2018
Other Assaults	465	446	409
Forgery and Counterfeiting	66	82	61
Fraud	466	421	446
Embezzlement	24	22	19
Stolen Property Crimes	102	120	144
Vandalism	296	337	293
Weapons: Carrying, Possessing, Etc.	96	142	84
Prostitution and Commercialized Vice	4	5	12
Sex Offenses (Except Forcible Rape and Prostitution)	52	50	46
Drug Abuse Violations	553	675	751
Driving Under the Influence	171	234	336
Liquor Laws	9	14	13
Drunkenness	173	233	224
Disorderly Conduct	59	48	65



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

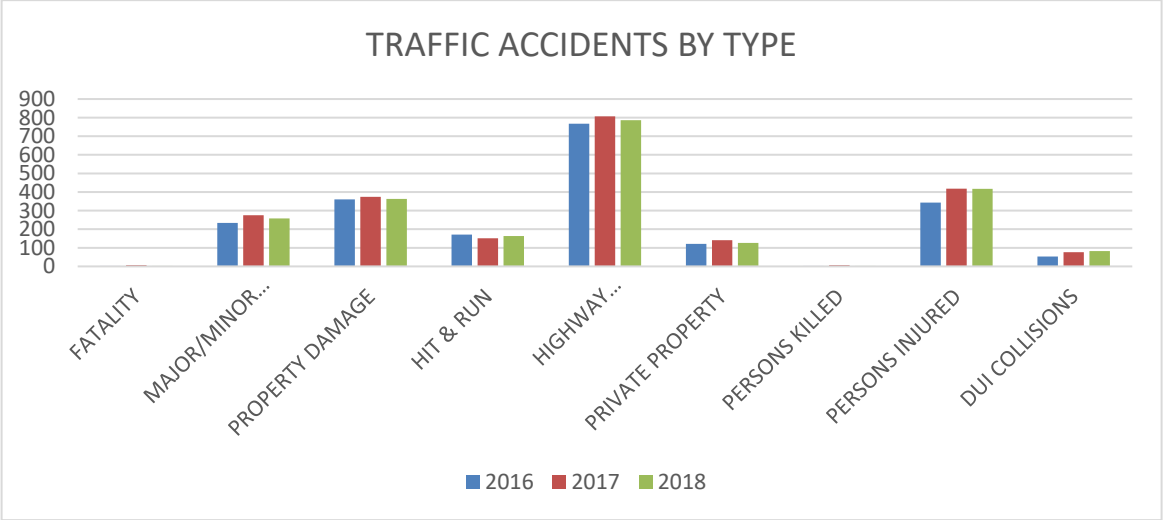
Traffic

Vehicle Accident Data

Considerable efforts and resources are committed by the City and LPD 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. Though there was a sharper increase in DUI collisions between 2016 and 2017, comparing 2017 to 2018 the increase was under 8 percent.

	2016	2017	2018
Fatality	2	7	2
Major/Minor Injury	234	275	258
Property Damage	360	374	363
Hit & Run	171	151	163
Highway Collisions	767	807	786
Private Property	121	141	126
Persons Killed	2	7	2
Persons Injured	343	418	417
DUI Collisions	53	76	82

Traffic Accidents

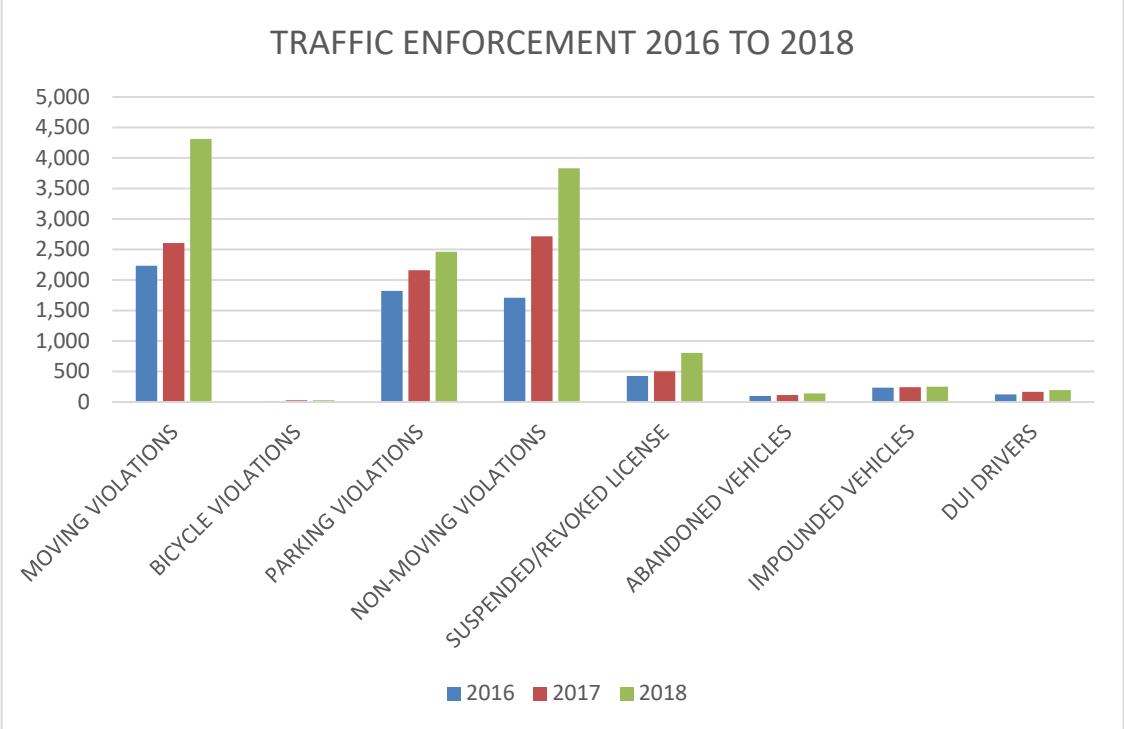


Several factors contributed to the 2016 to 2017 DUI collisions increase to include; throughout 2017, the department experienced a usual number of officers unable to work in their full capacity due to injuries. At one point in 2017, nearly 15 percent of the sworn staff was either unable to work or worked in a modified capacity. This caused a redeployment of officers from the Traffic Unit to patrol responsibilities and limited the number of grant funded DUI education programs and check points.

Moving Violations

Because of the overall increase in traffic accidents from 2016 to 2017, in 2018 staffing allowed the Traffic Unit to work their mission of traffic enforcement, education and prevention. These efforts resulted in an increase in the issuance of moving citations by 93 percent between 2016 and 2018, an 89 percent increase in stopping suspended and unlicensed drivers, and a 56 percent increase in DUI arrests.

	2016	2017	2018
Moving Violations	2,233	2,607	4,310
Bicycle Violations	16	27	29
Parking Violations	1,821	2,160	2,462
Non-Moving Violations	1,710	2,717	3,830
Suspended/Revoked License	426	502	805
Abandoned Vehicles	100	116	141
Impounded Vehicles	235	242	250
DUI Drivers	126	166	196



Conclusion

The City of Livermore recognizes the importance of public safety and the LPD is committed to maintaining a high quality of life for those who live and visit the community, which is reflected in an overall 6 percent decrease in Part 1 Crimes (felonies involving immediate danger to life or property).

Over the last 3 years, the amount of collisions in Livermore has fluctuated from year to year. However, collisions increased from 1,956 in 2016 to a high of 2,117 in 2018. During this same time, the number of moving violation citations issued increased from 2,233 to 4,310. While there are many variables that affect collision rates, a proactive enforcement and education focus by the Traffic Unit is addressing these issues.

In addition to maintaining lower rates of crime, there are other public safety challenges that affect crime rates and activity. Statewide legislative changes, an increase in police calls for service, an increase in burglary related crime, and an increase in traffic related injury collisions.

AB109 or “Realignment” - Realignment went into effect at the end of 2011 and still affects law enforcement. The realignment sentences low-level felony offenders with local jail or out-of-custody supervision by county probation or parole officers instead of serving state prison time.

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 did 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.

In moving forward, the police department is reviewing policies and procedures in relation to two pieces of new legislation, signed by Governor Brown in September 2018, to promote transparency in the law enforcement community.

Senate Bill 1421 and Assembly Bill 748 change the way law enforcement agencies respond to requests from the public for police officer’s personnel records.

SB 1421 generally requires the disclosure of records and information relating to the discharge of a firearm at a person, use of force resulting in death or great bodily injury, sustained findings of a police officer engaged in the sexual assault involving a member of the public or sustained findings of dishonesty.

AB 748 requires agencies to produce the video and audio recordings of critical incidents involving the discharge of a firearm at a person or an incident in which the use of force results in death or great bodily injury.

One challenge with these two new laws is the extensive staff time that is needed to redact private and personal information contained in the reports and uninvolved citizens or juveniles captured on officer’s body worn cameras.

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 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 several community facilities, including three public library branches, a senior center, and several spaces available for public events and community group activities.

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 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/Undeveloped Areas (Brushy Peak, Garaventa Wetlands Preserve, Holdener Park, Murrieta Meadows and Sycamore Grove Park) totaling 1,444.50 acres. The City of Livermore also maintains a nominal number of "mini" parks in addition to public property. These mini parks typically average an acre or less in size and together total approximately 11 acres.

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 73 parks, recreation areas, wilderness, shorelines, preserves and land bank areas, 1,330 miles of trails within parklands, and 200 miles of inter-park regional 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 89 percent of its funding is generated from property taxes and assessments levied in Alameda and Contra Costa Counties. The remaining 11 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 $9.9 million yearly and now, life-to-date, exceeds $154 million in total.

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, cricket, 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, off-leash dog parks, 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. For more information, please see the LARPD 2016 Parks, Recreation and Trails Master Plan at:
https://www.larpd.org/media/Policies/LARPD_PRTMP_Final_Document_Adopted_June_29_2016%20(1).pdf

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) and community parks (33.01).

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
2016					
Acres provided	153.3	152.4	1,444.50	199.02	1,864.73
Acres need at pop. 92,705[1]	185.41	185.41	1,390.5	185.41	1,947.73
	32.11 needed	33.01 needed	54 surplus	13.61 surplus	
2035 Need Projections					
Acres need at pop. 112,417[2]	224.83	224.83	1,686	224.83	2,360.49
	71.52 needed	72.43 needed	241.5 needed	25.81 needed	

[1] US Census, 2012

[2] 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 allocation of 1,553 units completed in 2004 (development of about 45 units left to reach build out). The South Livermore Specific Plan facilitated construction of approximately 15.5 acres of new neighborhood parks (about 4 acres/1,000 persons) which exceeds LARPD standard of approximately 12 acres. The Specific Plan also includes 55 acres of open space (Holdener Park), which can function as passive recreational open space. 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. In November 2019, the City and Livermore Sanitation agreed to a one-year extension of the current franchise agreement to June 2021 allow time to negotiate a new agreement.

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. Recyclable 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. Upon request, food pails are provided to collect food scraps and multi-family residents are allowed to add food scraps to their organics carts or bins. 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 discount off 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[1]. 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 2017 and 2018 are presented below.

Livermore Collection Comparison Calendar Year 2016 and 2017

	2016	2017	Change	Change (percent)
Garbage taken to Landfill (Tons)	42,510	44,297	1,786	4.03%
Recyclable Materials (Tons)	17,677	16,332	-1,345	-8.23%
Organics (Tons)	21,856	21,869	13	0.06%
Population	87,976	89,517	1,541	1.75%
Per capita pounds of landfilled garbage per day	4.1	4.4	.3	7.3%

[1] 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 2018 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%
2010*	73%
2011*	74%
2012*	77%
2013*	77%
2014*	76%
2015*	75%
2016*	76%
2017*	73%
2018	72%
*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 (CO2) 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/).

Short-Lived Climate Pollutants: Organic Waste Methane Emissions Reductions (SB 1383)

In September 2016, Governor Brown signed into law SB 1383 (Lara, Chapter 395, Statutes of 2016), establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP) in various sectors of California's economy.

Methane emissions resulting from the decomposition of organic waste in landfills are a significant source of greenhouse gas (GHG) emissions contributing to global climate change. SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025.

Organic materials--including waste that can be readily prevented, recycled, or composted--account for a significant portion of California's overall waste stream. Increasing food waste prevention, encouraging edible food rescue, and expanding the composting and in-vessel digestion of organic waste throughout the state will help reduce methane emissions from organic waste disposed in California's landfills. Food rescue has the added benefit of assisting Californians who are unable to secure adequate, healthy food by diverting edible food to food banks and pantries.

CalRecycle is currently in the process of developing SB 1383 implementation regulations which should be finalized by the end of 2019.

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.

The Mandatory Recycling Ordinance is expected to help increase diversion and 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. As of June 2018, Livermore Sanitation has the 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. Some Bay Area landfills have closed, which results 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, which can be harmful to human health and the environment, 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 Resources 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. Geographic 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 infrastructure funding. Nonattainment of state standards require regional air districts to prepare plans outlining how areas will improve local air quality.

Federal Clean Air Act

The Federal Clean Air Act is intended to control air pollution in the United States. It requires the Environmental Protection Agency (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 (O3), particulate matter (PM10 and PM 2.5), carbon monoxide (CO), lead (Pb), sulfur dioxide (SO2) and nitrogen dioxide (NO2). Standards are set based on scientific reports and policy assessments 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). In 2008 and 2015, the EPA implemented more stringent national 8-hour ozone protection and the standard was lowered to 75 ppb and 70 ppb 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 PM2.5 NAAQS from 15.0 $\mu g/m^3$ to 12.0$\mu g/m^3$. The primary 24-hour PM2.5 standard was tightened to 35 $\mu g/m^3$ in 2006. Recent monitoring data indicates that the Bay Area violates the state annual PM2.5 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 achieve attainment. The Bay Area Air Quality Management District (BAAQMD or Air District) must develop a *Clean Air Plan* that

outlines how the Air District will achieve and maintain healthy air quality conditions in the Bay Area. The Plan includes 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 plan 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. In 2017 the Air District adopted the 2017 Clean Air Plan: Spare the Air, Cool the Climate (2017 Plan). The 2017 Plan focuses on health and protecting the climate. It provides a blueprint for clean air and climate protection in the Bay Area and identifies regional control measures to bring the Bay Area air basin into compliance with Federal and State air quality standards and the State's long-term 2030 and 2050 greenhouse gas climate stabilization goals.

In June 2002, CARB adopted a new annual health-based ambient air quality standard for PM2.5 of 12 $\mu g/m^3$ and lowered the annual PM_{10} standard from 30 $\mu g/m^3$ to 20 $\mu g/m^3$. However, the state has yet to adopt a 24-hour PM2.5 standard. The Air District is classified as nonattainment for this standard for the annual PM10 and annual PM2.5 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. the Air 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 rules and 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 (PM 2.5), 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 photo chemically 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 PM 2.5 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, too 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 (NO2). 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 NOx 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 (SO2). This substance often further oxidizes to form sulfur trioxide (SO3), which in the presence of moisture can form sulfuric acid mist (H2SO4). 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 (H2S) 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 H2S 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 2018. 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 (CO2) 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 (CH4) 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 (N2O) 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 (SF6), 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 (CO2e), in which each gas is weighted by its GWP.

Global Warming Potentials (GWPs) for Greenhouse Gases

Greenhouse Gas	Global Warming Potential
CO2	1
Methane (CH4)	21
N2O	310
HFCs/PFCs	90-11,700
SF6	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. CO2 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.

U.S. EPA tightened the national 24-hour $PM_{2.5}$ standard from 65 to 35 $\mu g/m^3$ in 2006. Based on air quality data showing the Bay Area air basin maintained attainment of the 24-hour PM 2.5 standard during the 2009- 2011 monitoring period, in January 2013 EPA issued a final rule that the Bay Area meets the 24-hour $PM_{2.5}$ 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 $PM_{2.5}$ 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 May 2019. 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[a]

Pollutant	Averaging Time	California Standard[b]	Attainment Status	National Standard	Attainment Status	Design Value[c] (2017 h)
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[d]	0.075 ppm
CO	1-hour	20 ppm	A	35 ppm – not to be exceeded > once per year	A	4.8 ppm
CO	8-hour	9 ppm	A	9 ppm – not to be exceeded > once per year	A	3.4 ppm
PM2.5	24-hour			35 μg/m3 – 3 year average of 98th percentile	N[e]	35μg/m3
PM2.5 [g]	Annual	12 $\mu g/m^3$ – 3-year max	N	12 $\mu g/m^3$ – 3 year average	A	10.9 $\mu g/m^3$
PM10	24-hour	50 $\mu g/m^3$	N	150 $\mu g/m^3$ [f]	U	22 $\mu g/m^3$ (Calif)
PM10	Annual	20 $\mu g/m^3$	N			14 $\mu g/m^3$ (Calif)
SO2	1-hour	0.25 ppm	A	75 ppb – 3 year 99th percentile		14 ppb
SO2	24-hour	0.04 ppm	A	0.14 ppm – not to be exceeded > once per year	A	<0.01 ppm

Pollutant	Averaging Time	California Standard[b]	Attainment Status	National Standard	Attainment Status	Design Value[c] (2017 h)
NO2	Annual	0.030 ppm	A	0.053 ppm	A	0.017 ppm
NO2	1-hour	0.18 ppm	A	100 ppb – 3 year average of 98th percentile		54 ppb
Lead	3-month rolling avg.			0.15 μg/m^3	A	0.10 μg/m^3

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

[a] 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.

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

[c] Design values relative to the NAAQS are shown unless indicated as (California).

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

[e] US EPA tightened the national 24-hour $PM_{2.5}$ standard from 65 to 35 μg/m^3 in 2006. On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ 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 $PM_{2.5}$ standard until such time as the Air District submits a “redesignation request” and a “maintenance plan” to EPA, and EPA approves the proposed redesignation.

[f] The national 24-hour PM_{10} standard allows one exceedance per year over 3 years with every-day sampling. Because PM_{10} is sampled on a 1-in-6 day schedule, this means that, in practice, any exceedance would violate the standard.

[g] On January 15, 2013, EPA revised the annual $PM_{2.5}$ standard from 15 μg/m^3 to 12 μg/m^3.

[h] 2018 design values estimates are unavailable at this time due to exceptional events i.e., wildfires in the Bay Area.

Livermore Air Quality

Livermore is located within Livermore Valley, situated east-west inland it is surrounded by mountain ranges between the San Francisco Bay and the Central Valley. Given the mountainous landscape, the potential for high pollution levels increase when stagnant air combined with temperature inversions trap pollutants and lead to elevated levels of ozone formation throughout the valley, 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

The Tri-Valley Clean Air Resource Team is a collaboration of volunteers from local government, business, and community organizations. Funded by the Air District, the team develops and implements projects that promote voluntary measures that help reduce air polluting activities in the Tri-Valley. Projects include, Walk and Roll to School, a month long campaign at elementary schools to encourage walking and biking to school Extreme Makeover: Commute Edition, a project to help businesses with their employee commute programs and Idle Free Tri-Valley, a program to reduce greenhouse gases emissions by encouraging motorist to pledge to eliminating discretionary idling to help create cleaner air in the Tri Valley area. Past projects include, promoting Spare the Air program, developing transit maps for the Valley, marketing the Clean Air Commute Solutions and Idle Free Tri-Valley events in Pleasanton. 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 two years of monitoring data (2016-2018), Livermore exceeded the national eight-hour ozone standard 0.70 ppm 13 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 considerable 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 NOx throughout the state.

Number of days exceeding the 8-hour 70 ppb national ozone standard 1969-1971 and 1999-2018

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	2017	2018
Berkeley																						0	0	0							0	0
Bethel Island				10	9	9	11	8	15	20	**3**	20	15	9	13	12	9	**5**	2	14	4	10	6	7	4	4	1	1	1	2	1	1
Bodega Bay																																
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	0	0
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	2	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	0
Fremont	33	21	14	3	2	4	5	3	8	4	2	2	**3**	2	2	1	2	2	**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	1	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	3	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	6	3
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	3	6
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	2	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	2	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	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	4	0
San Martin				6	0	8	11	6	11	12	0	5	5	5	9	12	9	2	2	10	2	2										
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	2	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	0	0
San Ramon																										3	0	4	6	1	2	2
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	1	0
Sebastopol																									0	0	0	0	0	0	1	0
SJ-East				3		4	4	2	15	6	1	2	3	0	0	0	1	1	1									0	0	0		
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	3	1	2	0	0	0	0	0	1	2	0
West Oakland																									0	0	0	0	0	0	0	0

Bay Area Air Pollution Summary [Source: BAAQMD] tables show the number of times each Bay Area monitoring station recorded pollutant levels over the federal and state air quality standards. The tables below show the number of days the California one-hour ozone standard was exceeded by monitoring stations from 2016-2018. Livermore has had the highest rates of days exceeding the eight-hour National Ozone Standard when compared to other cities in the Bay Area.

BAY AREA AIR POLLUTION SUMMARY – 2016

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM_{10}				$PM_{2.5}$				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat 8-Hr Days	Cal 8-Hr Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-yr Avg	Ann Avg	3-yr Avg
North Counties	(ppb)		(ppb)				(ppm)			(ppb)				(ppb)				($\mu g/m^3$)				($\mu g/m^3$)			($\mu g/m^3$)	
Napa	80	0	67	0	0	62	2.2	1.5	0	39	7	0	0	-	-	-	-	16.6	33	0	0	24.3	0	25	8.5	10.4
San Rafael	88	0	67	0	0	61	1.4	1.0	0	46	9	0	0	-	-	-	-	13.8	27	0	0	15.6	0	22	6.4	8.6
Sebastopol	73	0	64	0	0	52	1.6	1.0	0	32	4	0	0	-	-	-	-	-	-	-	-	18.7	0	18	4.6	6.4
Vallejo	97	1	72	1	1	63	2.1	1.8	0	43	7	0	0	10.1	1.9	0	0	-	-	-	-	23.0	0	25	7.4	9.0
Coast & Central Bay																										
Berkeley Aquatic Park*	52	0	41	0	0	*	1.6	1.4	0	50	*	0	0	-	-	-	-	-	-	-	-	17.3	0	*	*	*
Laney College Freeway	-	-	-	-	-	-	1.6	1.1	0	54	17	0	0	-	-	-	-	-	-	-	-	20.2	0	22	8.7	9.1
Oakland	82	0	57	0	0	55	2.6	1.0	0	59	10	0	0	-	-	-	-	-	-	-	-	15.5	0	21	6.1	7.6
Oakland-West	65	0	52	0	0	49	2.5	2.2	0	49	12	0	0	26.4	3.1	0	0	-	-	-	-	23.9	0	25	8.7	9.5
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	-	29.9	4.4	0	0	-	-	-	-	-	-	-	-	-
San Francisco	70	0	57	0	0	49	1.7	1.1	0	58	11	0	0	-	-	-	-	17.0	29	0	0	19.6	0	22	7.5	7.6
San Pablo	94	0	61	0	0	54	1.7	1.0	0	39	8	0	0	12.2	2.9	0	0	15.2	34	0	0	19.5	0	23	8.1	9.2
Eastern District																										
Bethel Island	89	0	80	2	2	68	2.0	1.0	0	32	5	0	0	4.7	3.0	0	0	14.4	26	0	0	-	-	-	-	-
Concord	95	1	74	2	2	67	1.2	1.0	0	34	6	0	0	11.1	2.4	0	0	11.5	19	0	0	20.7	0	22	5.9	7.1
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	14.1	4.8	0	0	-	-	-	-	-	-	-	-	-
Fairfield	81	0	67	0	0	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	102	2	85	4	6	74	-	-	-	41	9	0	0	-	-	-	-	-	-	-	-	22.3	0	23	7.5	7.9
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	4.7	0	0	-	-	-	-	-	-	-	-	-
Patterson Pass*	109	5	87	15	15	*	-	-	-	24	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ramon	101	1	83	1	2	69	-	-	-	27	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	83	0	64	0	0	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	75	0	60	0	0	59	2.2	1.1	0	46	9	0	0	-	-	-	-	-	-	-	-	19.5	0	20	8.3	7.0
Santa Clara Valley																										
Gilroy	79	0	70	0	0	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	0	16	5.6	6.5
Los Gatos	91	0	65	0	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	87	0	66	0	0	63	2.0	1.4	0	51	11	0	0	1.8	0.8	0	0	18.5	41	0	0	22.6	0	24	8.4	8.9
San Jose Freeway*	-	-	-	-	-	-	2.5	1.6	0	52	16	0	0	-	-	-	-	-	-	-	-	26.5	0	*	9.1	*
San Martin	96	1	71	1	1	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area Days over Standard		6		15	15				0			0	0			0	0			0	0		0			

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

BAY AREA AIR POLLUTION SUMMARY – 2017

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM_{10}				$PM_{2.5}$				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat 8-Hr Days	Cal 8-Hr Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-yr Avg	Ann Avg	3-yr Avg
North Counties	(ppb)		(ppb)				(ppm)			(ppb)				(ppb)				($\mu g/m^3$)				($\mu g/m^3$)			($\mu g/m^3$)	
Napa	98	1	84	2	2	63	5.6	4.7	0	53	7	0	0	-	-	-	-	-	-	-	-	199.1	13	35	13.7	10.9
San Rafael	88	0	63	0	0	58	2.6	1.6	0	53	10	0	0	-	-	-	-	17.7	94	0	2	74.7	8	27	9.7	8.2
Sebastopol	87	0	71	1	1	53	2.1	1.6	0	35	5	0	0	-	-	-	-	-	-	-	-	81.8	4	21	8.1	6.5
Vallejo	105	1	88	2	2	61	3.1	2.1	0	49	8	0	0	5.9	2.1	0	0	-	-	-	-	101.9	9	30	11.6	9.5
Coast & Central Bay																										
Berkeley Aquatic Park*	58	0	49	0	0	*	2.2	1.7	0	123	16	1	0	-	-	-	-	-	-	-	-	52.0	7	*	9.1	*
Laney College Freeway	-	-	-	-	-	-	1.9	1.3	0	68	17	0	0	-	-	-	-	-	-	-	-	70.8	8	27	11.6	10.1
Oakland	136	2	100	2	2	54	3.2	2.2	0	65	10	0	0	-	-	-	-	-	-	-	-	70.2	7	24	9.4	7.9
Oakland-West	87	0	68	0	0	48	6.0	2.1	0	52	13	0	0	16.9	2.2	0	0	-	-	-	-	56.0	7	28	12.8	10.6
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	2.9	0	0	-	-	-	-	-	-	-	-	-
San Francisco	87	0	54	0	0	47	2.5	1.4	0	73	11	0	0	-	-	-	-	22.0	77	0	2	49.9	7	27	9.7	8.3
San Pablo	104	3	80	2	2	52	2.5	1.9	0	48	8	0	0	8.3	2.7	0	0	20.3	95	0	4	71.2	9	30	10.8	9.3
Eastern District																										
Bethel Island	90	0	71	1	2	68	1.6	1.0	0	34	5	0	0	5.3	3.5	0	0	16.3	52	0	1	-	-	-	-	-
Concord	82	0	70	0	0	66	1.7	1.3	0	41	7	0	0	13.2	2.6	0	0	13.3	41	0	0	89.4	6	26	12.0	8.9
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	23.5	5.6	0	0	-	-	-	-	-	-	-	-	-
Fairfield	80	0	62	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	109	5	86	6	6	75	-	-	-	45	9	0	0	-	-	-	-	-	-	-	-	41.5	2	25	8.5	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	15.9	3.1	0	0	-	-	-	-	-	-	-	-	-
San Ramon	92	0	75	2	2	68	-	-	-	31	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	139	2	110	3	4	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	115	2	86	2	2	56	2.8	1.4	0	67	11	0	0	-	-	-	-	-	-	-	-	60.8	6	23	9.1	7.7
Santa Clara Valley																										
Gilroy	96	1	84	1	1	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.4	2	18	5.5	6.1
Los Gatos	93	0	75	3	3	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	121	3	98	4	4	67	2.1	1.8	0	68	12	0	0	3.6	1.1	0	0	21.6	70	0	6	49.7	6	27	9.5	9.3
San Jose Freeway	-	-	-	-	-	-	2.6	1.8	0	77	17	0	0	-	-	-	-	-	-	-	-	48.4	8	28	10.8	9.4
San Martin	96	1	86	3	3	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area Days over Standard		6		6	6				0			1	0			0	0			0	6		18			

*See NOTES on second page.

Dash (-) indicates pollutant is not monitored at the site.

BAY AREA AIR POLLUTION SUMMARY – 2018

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM_{10}				$PM_{2.5}$				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat 8-Hr Days	Cal 8-Hr Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-yr Avg	Ann Avg	3-yr Avg
North Counties	(ppb)		(ppb)			(ppb)	(ppm)			(ppb)				(ppb)				($\mu g/m^3$)				($\mu g/m^3$)			($\mu g/m^3$)	
Napa*	47	0	42	0	0	*	1.6	1.1	0	39	*	0	0	-	-	-	-	-	-	-	-	30.2	0	*	*	*
Napa Valley College*	83	0	68	0	0	*	1.4	1.1	0	43	*	0	0	-	-	-	-	*	26	0	0	117.9	12	*	*	*
San Rafael	72	0	53	0	0	54	2.0	1.6	0	55	9	0	0	-	-	-	-	19.0	166	1	2	167.6	13	42	11.1	9.1
Sebastopol	71	0	53	0	0	51	1.4	1.3	0	65	4	0	0	-	-	-	-	-	-	-	-	175.3	13	34	8.3	7.0
Vallejo	70	0	55	0	0	56	2.8	2.4	0	57	8	0	0	6.7	1.8	0	0	-	-	-	-	197.2	13	48	13.3	10.8
Coast & Central Bay																										
Berkeley Aquatic Park*	59	0	49	0	0	*	2.6	2.2	0	73	15	0	0	-	-	-	-	-	-	-	-	165.5	13	*	11.9	*
Laney College Freeway	-	-	-	-	-	-	2.1	1.6	0	73	17	0	0	-	-	-	-	-	-	-	-	168.2	14	45	14.4	11.6
Oakland	61	0	52	0	0	51	3.3	2.4	0	73	10	0	0	-	-	-	-	-	-	-	-	172.1	13	43	11.8	9.1
Oakland-West	63	0	50	0	0	46	3.6	3.1	0	76	12	0	0	11.9	2.5	0	0	-	-	-	-	169.2	14	45	14.4	12.0
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	-	24.3	6.3	0	0	-	-	-	-	-	-	-	-	-
San Francisco	65	0	49	0	0	47	1.9	1.6	0	69	11	0	0	-	-	-	-	20.1	43	0	0	177.4	14	44	11.7	9.6
San Pablo	61	0	52	0	0	49	1.9	1.7	0	60	8	0	0	10.2	2.1	0	0	21.4	200	1	2	195.4	14	44	12.7	10.5
Eastern District																										
Bethel Island	93	0	78	1	1	67	2.2	2.0	0	43	5	0	0	6.1	2.1	0	0	21.5	151	0	2	-	-	-	-	-
Concord	77	0	61	0	0	60	1.9	1.6	0	38	6	0	0	9.6	2.0	0	0	16.3	105	0	1	180.0	14	40	13.4	10.5
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	28.9	4.8	0	0	-	-	-	-	-	-	-	-	-
Fairfield	78	0	66	0	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	99	2	78	3	3	73	-	-	-	56	9	0	0	-	-	-	-	-	-	-	-	172.6	14	40	11.3	9.1
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	24.8	4.4	0	0	-	-	-	-	-	-	-	-	-
Pleasanton*	-	-	-	-	-	-	2.3	2.0	0	64	*	0	0	-	-	-	-	-	-	-	-	164.7	13	*	*	*
San Ramon	86	0	76	2	2	65	-	-	-	45	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	75	0	66	0	0	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	67	0	49	0	0	53	2.5	1.7	0	77	11	0	0	-	-	-	-	-	-	-	-	120.9	13	36	10.3	9.3
Santa Clara Valley																										
Gilroy	97	1	65	0	0	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97.5	12	28	7.7	6.3
Los Gatos	82	0	67	0	0	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	78	0	61	0	0	63	2.5	2.1	0	86	13	0	0	6.9	1.1	0	0	23.1	122	0	4	133.9	15	42	12.8	10.2
San Jose Freeway	-	-	-	-	-	-	2.8	2.3	0	88	17	0	0	-	-	-	-	-	-	-	-	138.4	15	42	12.3	10.7
San Martin	92	0	80	1	1	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area Days over Standard		2		3	3				0			0	0			0	0			1	6		18			

*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. Residents turn in old gas powered mowers for a new electric mower or push mower. Participants payed 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 unhealthful 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 2040 was adopted July 2017. This is the updated RTP/SCS for the nine county Bay Area. It examines how the Bay Area will grow in terms of housing transportation and infrastructure needs over the next two decades, and identifies ways to manage that growth by supporting more housing, and transportation choices and ways to reduce pollution caused by cars and trucks.

Smart Growth

Promoting high-density mixed use new development in areas that are well served by transit and providing good access to jobs and services is an essential strategy to reduce motor vehicle travel, attain national and state air quality standards and meet 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

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.

- Since 2011, annual average investing of $69 million to reduce emissions of greenhouse gas (GHG) and criteria pollutants through mobile source grants and incentives.

- Awarding $7.5 million in grants to 70 local projects to reduce GHG emissions. Initial grant program funds provided seed funding for municipal energy officers, funded the development of local climate action plans, renewable energy programs and youth-based projects. Most recently awarded grant funds will target greenhouse gas emission reductions from existing buildings including single and multi-family residential buildings, commercial buildings, data

centers, community colleges and short-lived climate pollutants. 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.

Adopting a Greenhouse Gas Fee on stationary sources to recover costs of the Air District's climate protection programs. Established at $0.044 CO2e in 2008, the fee has now increased over time to $0.12 CO2e.

- Energy Efficiency Regulation – Include energy efficiency review and standards in Air District permitting

- Updating 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.

- Creating and implementing a $4^{th}/5^{th}$ 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.

- Developing 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.

- Working 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) and Bay Area Regional Collaborative (BARC) – 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.

Assembly Bill 617 Community Health Protection Program

The intent of the Assembly Bill 617, the Community Health Protection Program, is to reduce exposure to particulate matter and toxic air contaminants in disadvantaged communities most impacted by air pollution. Air District staff works closely with the California Air Resources Board, local government staff and communities exposed to high levels of air pollution from freeways, railways and industrial facilities to develop feasible alternatives to reduce adverse air impacts. Strategies such as tree planting, alternative truck routes and the installation of air filtration systems are effective way to minimize the potential harmful health effects to residents.

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. Due to Livermore's geographic location, regional population growth and the dependence on the automobile powered by fossil fuels, air quality will continue to be an issue for local residents. Although much of the 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. Adopting local polices or ordinances and implementing best practices to reduce emissions and exposure can minimize the potential adverse health effects of Livermore residents.

EMPLOYMENT

Overview

The Association of Bay Area Governments (ABAG)[1] 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.

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
Financial and Professional	6,480 (17%)	7,420 (18%)	8,510 (18%)	8,910 (19%)	10,325 (25%)	11,344 (25%)
Health, Education and Recreational	7,660 (20%)	8,620 (20%)	9,700 (21%)	10,190 (21%)	10,428 (26%)	12,312 (27%)
Retail	4,560 (12%)	4,880 (12%)	5,210 (11%)	5,250 (11%)	4,524 (11%)	4,874 (11%)

[1] ABAG Projections 2013

	ABAG Projections 2013 Employment Projections by Job Classification				US Census Employed Residents by Job Classification	
	2010	**2015**	**2020**	**2025**	**2010**	**2015**
Agricultural & Natural Resources	30 (<1%)	30 (<1%)	30 (<1%)	30 (<1%)	126 (<1%)	297 (<1%)
Manufacturing, Wholesale, Transportation	8,440 (22%)	8,850 (21%)	9,920 (20%)	9,240 (19%)	7,344 (18%)	8180 (18%)
Other	11,280 (29%)	12,480 (30%)	13,810 (30%)	14,240 (30%)	7,801 (19%)	8,017 (18%)
Total Jobs in Livermore	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 jobholders 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, 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 91,039 in 2019 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 a slower pace than predicted. ABAG estimates that Livermore will reach 37,850 housing units around 2035 and 40,400 housing units in 2040. 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.

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. Under recent changes to Housing Element law, the reuse of sites used in previous housing elements to meet RHNA obligations is restricted under certain conditions. If a vacant site was identified in two or more consecutive planning periods or if a non-vacant site was identified in a prior housing element and the site was not approved for housing development, the site cannot be used to fulfill the jurisdiction's obligation to accommodate lower-income housing need unless: 1) the site is or will be rezoned to the jurisdiction's default density (30 units per acre for Livermore); and 2) the zoning allows for residential development by right if at least 20 percent of the units are affordable to lower-income households. 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. From 2015 through 2018, the city issued building permits for 86 very low-income, 52 low-income, 450 moderate-income, and 981 above moderate-income units.

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 quality 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 is a key factor in development patterns. If workers can find housing near their jobs, they can avoid lengthy commutes to work, thereby lessoning 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 healthy jobs/housing balance[1]. 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 9.2 percent from 2007 to 2010, they have bounced back, increasing 22 percent from 2010 through 2018 according to the California Employment Development Department. As general economic conditions have improved since 2010 and are

[1] Livermore General Plan Master Environmental Assessment, Table 4-10

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 jobs 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., Continued residential 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 development of the Brisa site is complete with a total of 465 dwelling units Development of the Arroyo Vista site is pending.

In addition, the city is preparing an amendment to the 2018 Isabel Neighborhood Specific Plan to guide development of the area around the proposed Valley Link station in the I-580 median just east of the Isabel Avenue interchange. The Draft Specific 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. Build-out of the Plan would add about 4,095 new dwelling units and 9,100 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[1]. 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[2]. 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[3], 6,515 disabled persons[4], and 5,761 households with residents over 65[5]. 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 and General Plan density incentives for senior and very low-income housing, Since 2013, the city has focused on acquisition and rehabilitation of existing housing to create units for special needs populations. For example, the City provided resources to MidPen Housing for the development of two affordable

[1] General Plan Master Environmental Assessment, 2003
[2] 2015 American Community Survey, U.S Census Bureau
[3] California Economic Development Department Labor Force Data Annual Average 2015
[4] US Census Bureau 2015 American Community Survey
[5] Ibid.

housing projects entitled in early 2017: Chestnut Square and Sunflower Hill. Chestnut Square has been completed and provides 114 units for lower-income families and seniors. Sunflower Hill (Avance) is under construction and will provide 44 units for lower-income people with developmental disabilities. MidPen Housing manages these projects, as well as providing 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 2018

	2000	2005	2010	2015	2018
Livermore	$75,322	$96,632	$93,988	$100,992	$135,350
Dublin	$77,283	N/A	$107,754	$118,773	$144,564
Pleasanton	$90,859	$101,022	$115,188	$124,759	$148,852
Alameda County	$55,946	$61,014	$69,384	$75,619	$102,125
Source: 2000, 2010 U.S. Census Bureau; 2005, 2015, 2018 U.S. Census American Community Survey					

While Livermore's median household income is less than neighboring Tri-Valley communities, it is still consistently 32 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's degrees[1].

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.
- 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.

[1] 2015 Livermore Housing Element, Table 2-7

Housing Costs and Affordability

The cost of housing relative to the income of residents in each area serves as an indicator of the extent of housing issues in each 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, $622,000 in 2014, and $797,500 in 2018. Rental housing has experienced similar upward trends in prices. In January 2020, the average rent for a 1-bedroom apartment was $1,851, and $2,325 for a 2-bedroom apartment.[1] 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[2].

Housing Types

Livermore's single-family detached homes as a percent of its housing stock was 70.8 percent in 2010 and 69.2 percent in 2019, 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 Arroyo Vista Neighborhood Plan, and the Isabel Neighborhood Specific Plan Area which consist substantially of multi-family residential units. Despite the increase in multi-family housing development, the predominant housing type in Livermore remains detached single-family residences.

Table 4: Housing Units in Tri-Valley and Alameda County, 2019

	Livermore	Dublin	Pleasanton	Tri Valley	Alameda County
Housing Units	32,425	22,950	28,404	83,779	605,977
Single family detached	69.2%	53.6%	60.4%	61.9%	52.5%
Source: California Department of Finance Housing Estimates 1/1/2019					

Building permit activity tracked by the Building Division shows that since 2004, the percentage of single-family units developed each year in Livermore has decreased and resulted in a 15-year average of 45.9 percent.

[1] Rent Jungle, https://www.rentjungle.com/average-rent-in-livermore-rent-trends/
[2] 2015-2022 Livermore Housing Element

Table 5: Construction Activity for Residential Units, 2004-2018

Year	Single-family	Duplex/ Multi-family	Total	% of Single-family
2019	21	294	315	6.6%
2018	80	158	238	33.6%
2017	28	207	235	11.9%
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%
TOTAL	1,732	2,034	3,766	45.9%
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 Specific Plan if adopted. The 2013 General Plan text and map 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. Therefore, 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. Consequently, 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 adopted an Inclusionary Housing Ordinance in 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 (2017), 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 outside the city's urban growth boundary and promote infill development near existing infrastructure, services and public transit. 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. Residential Projects constructed or planned in the Downtown include:

    - Future development of the Downtown Core Plan which includes approximately 130 units of workforce housing.
    - Development of Groth Brothers Site on South L Street is underway and includes 222 market-rate apartments.

- 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 Neighborhood Plan, 465 total

units, is nearing completion of the final phase. of a variety of unit types. Development of the Arroyo Vista site is pending.

- 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 childcare 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 2019, the city updated the density bonus ordinance to be consistent with the latest state law amendment.

- 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. The city also updated its Inclusionary Housing Ordinance to include a “must-build” requirement unless a developer receives approval from the City Council to meet the standard with an alternative method, such as off-site development or in-lieu fees. Projects proposed for 2020 include: Update of the accessory dwelling unit (ADU) ordinance to be consistent with recent state law changes to streamline ADU review and approvals; development of 24 lower income units for formerly homeless persons with associated support services on-site; and designation of a portion of the City Hall campus to allow approximately 140 affordable units for seniors with a preference for veterans.