



LAWRENCE STATION AREA PLAN

City of Sunnyvale, California Updated 2021



City of Sunnyvale Community Development Department

Amended September 2021, Resolution 1083-21 Originally Adopted December 2016, Resolution 794-16

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The original preparation of this Plan was funded in large part by a station area planning grant from the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) as part of state and regional efforts to encourage planning for a sustainable future in the Bay Area region. The Plan is guided by the MTC's Resolution 3434 Transit-Oriented Development Policy (July 2005), which includes goals for transit ridership and related supporting land uses within a half-mile radius of rail transit stations throughout the Bay Area.





EXECUTIVE SUMMARY

BACKGROUND

This Lawrence Station Area Plan (LSAP or "the Plan") was adopted in 2016 and amended in 2021 to guide future development of the area surrounding the Lawrence Caltrain Station in Sunnyvale, California. The focus of this Plan is limited to approximately 229 acres (without roads) of already urbanized lands within the City of Sunnyvale, adjacent to the Station. It was part of a larger original Study Area, which was generally defined by a one-halfmile radius circle centered on Lawrence Station. Research indicates that this distance represents approximately a 10-minute walk for an average pedestrian, a threshold that pedestrians are generally willing to walk on a regular basis to access a transit station.

The larger original Study Area included portions of the City of Santa Clara, in order to ensure coordination of circulation systems and land uses between the two cities. However, the plans, policies, and guidelines of this Plan are limited to the jurisdictional area of the City of Sunnyvale, and the boundaries of the adopted Plan are different than the original Study Area. The City of Santa Clara also adopted their Lawrence Station Area Plan in 2016, which applies to their jurisdiction bounded by Kifer Road to the south, Lawrence Expressway to the west, Central Expressway to the north, and Calabazas Creek to the east. The original Sunnyvale LSAP Study Area also included existing residential properties south of the tracks in the City of Sunnyvale, but these properties are not in the adopted LSAP boundary, and therefore no changes are proposed.

Purpose of the Plan

Lawrence Station has historically been surrounded by uses that do not support transit ridership, as well as a circulation framework that makes access through the area for pedestrians, bicyclists and motor vehicles a challenge. In 2019, the station ranked 18th out of 29 stations in the Caltrain system for average mid-weekday boardings.

The purpose of this Plan is to promote greater use of this existing transit asset and guide the development of a diverse neighborhood of employment, residential, retail, other support services and open space. With a Plan horizon of 2040, the Plan includes goals, policies and guidelines to guide public and private investment in the area.

Original LSAP Planning Process and Community Outreach

On December 6, 2016, the City of Sunnyvale adopted the original LSAP and certified the Environmental Impact Report (EIR). The preparation of the original LSAP took place in two distinct phases, beginning in December 2010. The first phase included extensive research on existing conditions and the preparation of three conceptual alternative strategies for the future development of the area. The results of this first phase effort were summarized in the LSAP phase one report dated August 2011 and accepted by the Sunnyvale City Council on November 1, 2011.

During the second phase of the planning process, a 19-member Citizens Advisory Group (CAG) was appointed by the City Council to refine the goals and vision for the Plan area and recommend a preferred alternative. In February 2013, the Sunnyvale Planning Commission and City Council voted to accept the CAG's recommendation of a preferred plan for the area. The preferred plan accepted by the City Council provides the basis for the LSAP described in this document.

Throughout the two-phase process, extensive input was received in community-wide workshops, business and property owner meetings, specific focus groups, the Sunnyvale Planning Commission, the Sunnyvale City Council, and, during Phase II, the CAG.

Important input was also provided in regular meetings of a Technical Advisory Group (TAG) comprised of representatives from the City of Sunnyvale, City of Santa Clara, County of Santa Clara, SamTrans, Valley Transportation Authority (VTA), Bay Area Air Quality Management District, Caltrain, and representatives from the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

LSAP Update 2021

On September 14, 2021, the City of Sunnyvale adopted amendments to the Plan, including: 1) revisions to housing densities and expanding areas where housing may be considered that would result in an estimated likely development of 3,612 additional housing units (for a total buildout of 5,935 units); 2) an expansion of the west boundary to include three additional non-residential properties; and, 3) the Lawrence Station Sense of Place Plan. The City of Sunnyvale also certified a Subsequent EIR for the amendments. At the time of the LSAP adoption in 2016, the Council directed staff to return with a plan to study additional housing opportunities within the plan area, and to develop a sense of place plan for the area. The City Council subsequently selected a preferred land use alternative on June 26, 2018. On August 14, 2018, the City Council authorized a study to include three Kifer Road properties in the LSAP boundaries, and directed staff to include the boundary expansion in the housing study.

PLAN VISION

The Plan is based on a set of seven guiding principles that establish the overall Vision for the Lawrence Station area and serve as the basis for all elements of the Plan and its implementing policies.

1 | LAND USE DIVERSITY: Promote a diversity of land uses and densities that will support transit usage and neighborhood services.

Mixed-Use

Nine different zoning districts are used in the Plan area. Five of these are Mixed-Use districts that allow a mix of office/research and development (R&D), industrial, residential and retail uses. Four of these districts are new land use categories. Amendments to land use designations in the Zoning Code and rezoning of sites are coordinated as part of plan adoption.

Protect Existing Neighborhoods and Businesses

Existing legal uses in the Plan area will be allowed to remain as legal, conforming uses with the ability to grow and expand. The Plan discourages these uses from using hazardous materials in their operation, especially when located adjacent to residential uses.

Base Maximum Development Densities

A key goal of the Plan is to ensure that future new development is of a type and at a sufficient density to create a diverse area that can support a mix of employment and residential uses, support transit use, and can provide necessary amenities and support services, such as open space and neighborhood retail. Therefore, base maximum development densities are established. New residential development will not be allowed at densities less than 85 percent of these base maximum densities.

Higher Densities Achieved through the LSAP Incentive Program and State Density Bonus

The LSAP is an incentive-based plan. Development incentives (in the form of density bonuses) will allow property owners to develop their properties beyond the base maximum densities in residential development and base maximum floor area ratios in office/R&D/industrial development in exchange for providing community benefits such as mixed-use development, connectivity enhancements, access easements, public open space, additional affordable housing, financial contributions, and other features that advance the goals of the Plan. In residential development, community benefits are assigned a defined amount of dwelling units per acre points. Development Agreements, subject to adoption by the City Council, are required for office/R&D/industrial projects requesting access to higher floor area ratios (FAR) through the incentives program. Development agreements are not required for projects consistent with the additional FAR allowed through participation in the City's Green Building Program. Developers are not required to build with incentives. Rather they will have the option to choose which incentives best suit their business plans and economic goals.

For projects with residential uses that propose to include affordable units pursuant to State Density Bonus Law, the bonus percentage that must be provided under state law is added to the highest density obtained with incentive points for the particular project, or to the base maximum density if the project applicant does not propose to utilize incentive points through the LSAP Incentive Program.

Estimated Likely Development

Development of the Plan Area was estimated for purposes of environmental impact analysis and determining infrastructure needs. The "estimated likely development" is based on a set of assumptions about the likelihood of certain buildout scenarios, instead of being based on the absolute maximum allowable buildout. At the time of the original LSAP study, it was assumed that 50% of the maximum allowable development (with incentives) would occur, and that 50% of the already-existing industrial/office/R&D space would remain. These assumptions resulted in a total build-out of the original study area of approximately 3,500 residential units, 3.6 million square feet of office/R&D development, 220,000 square feet of retail space, and 26,500 square feet of industrial space. Buildout projections included all pre-existing residential development in the original study area that would remain and be protected. The City Council ultimately adopted the LSAP in 2016 with an

Land Use Plan





LOW DENSITY RESIDENTIAL LOW-MEDIUM DENSITY RESIDENTIAL

•••• STUDY AREA BOUNDARY EL CAMINO STORM DRAIN CHANNEL / CALABAZAS CREEK

INDUSTRIAL & SERVICE

MEDIUM DENSITY RESIDENTIAL EXISTING PUBLIC PARKS

EXISTING SCHOOLS AND OTHER CIVIC USES

SUNNYVALE LSAP LAND USE



SANTA CLARA EXISTING & GENERAL PLAN LAND USE

MEDIUM DENSITY RESIDENTIAL HIGH DENSITY RESIDENTIAL REGIONAL MIXED USE LOW INTENSITY OFFICE/R&D LOW DENSITY RESIDENTIAL

Station Area Development Standards

		Office/R&D/Industrial		Retail	Residential		Height (feet)
Land Use color	Land Use/Zoning	Base Maximum FAR	Maximum FAR with incentives ³	Minimum FAR	Base maximum density (du/ac) ^{1, 2}	Total du/ac incentive points available	Maximum residential and non-residential height
	Flexible Mixed-Use I (MXD-I)	35%	150%	N/A	45	35	100
	Flexible Mixed-Use I/Sonora Court (MXD-I/S)	35%	150%	N/A	54	26	100
	Flexible Mixed-Use II (MXD-II)	35%	150%	N/A	36	32	100
	Flexible Mixed-Use III (MXD-III)	35%	100%	N/A	28	17	55
	Flexible Mixed-Use IV (MXD-IV)	35%	50%	25%	28	17	55
	High-density Residential (R5)	N/A	N/A	N/A	Based on lot area per SMC Table 19.30.040	N/A	55
	LSAP Industrial and Service (M-S/LSAP)	35%	150%	25%	N/A	N/A	85
	LSAP Industrial and Service 60% (M-S/LSAP 60% FAR)	35%	60%	N/A	N/A	N/A	85
	LSAP Industrial and Service 120% (M-S/LSAP 120% FAR)	35%	120%	N/A	N/A	N/A	85

1 New residential development in the LSAP is required to build to at least 85 percent of the zoning district's base maximum zoning density.

2 Additional densities may be achieved above the base maximum density or density obtained through the City's Green Building Program and/or the LSAP Incentives Program by providing affordable housing consistent with State Density Bonus Law. Additional densities above the base maximum density are calculated in the following order: apply the density bonus percentage through the City's Green Building Program, add the incentive points gained through the LSAP Development Incentives Program, then apply the State Density Bonus percentage achieved by the project.

3 A Development Agreement is required for additional FAR above the base maximum through the LSAP Incentives Program. Development agreements are not required for projects consistent with the additional FAR allowed through participation in the City's Green Building Program.

allowance for 2,323 net new housing units and 1.2 million square feet of net new office/R&D development.

Under the 2021 LSAP Amendment, for purposes of environmental impact analysis, the estimated likely development was increased from 2,323 to 5,935 net new residential units (including units entitled or built from the original 2,323), an increase of 3,612 units. The 1.2 million square feet of net new office/R&D/industrial development did not change.

Development Capacity and Growth Monitoring Program

In order to ensure that long-term development does not exceed the carrying capacity of infrastructure systems and the environment, a growth monitoring program with a development capacity was established with adoption of the original LSAP. The original LSAP anticipated and studied a development capacity of 2,323 net new residential units and 1.2 million square feet of net new office/ R&D, consistent with the findings of the Environmental Impact Report (EIR) that was conducted as part of the planning process. The housing capacity is raised from 2,323 to 5,935 units as part of the 2021 LSAP Amendment. If this development capacity is reached, subsequent development proposals would need to conduct additional environmental analysis per the California Environmental Quality Act (CEQA).

2 | DENSE STATION AREA DEVELOPMENT: Locate highest intensity development closest to the Lawrence Station.

Because of the abundant transportation options that are available, close proximity and access to Lawrence Station is a key determinant of the pattern of allowable densities in the Plan area. The highest development intensities are allowed north of the Caltrain tracks. The area north of the tracks is generally within walking distance to the station and would benefit from the direct access to the station with the new loop road and path/pathway improvements identified in this Plan. There are also no existing lower density residential neighborhoods directly adjacent to the properties north of the tracks. The Caltrain tracks buffer the Plan area from the existing lower density residential neighborhood in the City of Santa Clara (east of Lawrence Expressway) and existing multi-family neighborhood in Sunnyvale (west of Lawrence Expressway).

The area south of the tracks is also within walking distance to the station, but at a lower density due to compatibility with existing low and medium density residential uses near the LSAP boundary.

Retail uses, both north and south of the tracks, are also allowed and encouraged as part of mixed-use projects in order to create a critical mass of successful local-serving retail activity; auto-oriented retail is not considered a preferred use, notwithstanding the existing big-box retail use at 150 Lawrence Station Road. Depending on location, uses may be configured as vertical mixed-use, such as with retail under several floors or residential or office, or as single use buildings.

3 CONNECTIVITY: Improve connectivity for all modes of travel.

A New Framework of the Loop Road and Shared-Use Paths

In order to provide improved access throughout the Plan area in general, and to Lawrence Station in particular, a framework of a publicly-accessible central loop road and pedestrian/bicycle shared-use paths will be established. In the residential areas south of the Caltrain tracks, the existing framework of streets and blocks will be retained. Minor improvements to provide safer street crossings and access improvements for pedestrians, bicycles and transit users will be provided. Refer to the Lawrence Station Sense of Place Plan under separate cover for more detail.

In the area north of the Caltrain tracks, a new loop road with direct access to Lawrence Station will emerge over time as individual properties are redeveloped by individual property owners. New primary pedestrian/ bicycle paths and trails, known as "shared-use paths" or "Class I shared-use paths" are also proposed within the Plan area. In the area north of the Caltrain tracks, primary Class I shared-use paths are included at the east and west ends of the Plan boundaries. As individual properties redevelop over time, the shared-use paths will eventually connect to the station. Developer incentives to construct these new corridors will be available for the northern properties when they redevelop.

Improved North-South Connectivity through the Area

East-west connections throughout the Plan area are relatively good. However, north-south linkages are poor. This is particularly true north of the Caltrain tracks, due to the barrier presented by the tracks and the historical large-lot industrial development of the area. Therefore, a primary goal of the planned new loop road is to provide improved north-south access throughout the Plan area.

The Plan includes three key features to achieve this goal: 1) The new loop road on the north side of the tracks, 2) Improvements to Willow Avenue

on the south side of the tracks, 3) two potential new pedestrian/bicycle crossings as envisioned in the original LSAP, either over or under the tracks.

Secondary Pathway Network

In order to create a finer grained street-and-block framework the Plan includes a secondary network of new pedestrian and/or bicycle pathways, depending on site conditions, that will provide enhanced local access and shortened travel paths to the station and commercial areas both within the Lawrence Station Area neighborhood and to and from nearby areas.

Parking Management

Currently, there is an overabundance of on- and off-street parking in the Plan area, which is a costly, inefficient use of resources and contributes to higher auto usage and lower transit ridership. The Plan therefore outlines strategies to manage the future parking supply so that it promotes and supports transit and more closely relates to the needs of employers and residents of the area.

Make Lawrence Expressway a Better Neighbor

Lawrence Expressway is a key element of the circulation infrastructure of the City. It presents, however, a great challenge to the integration of the neighborhoods in the Plan area, and, despite its transportation function, actually presents an obstacle to the ultimate success of the LSAP. In September 2014, the County of Santa Clara released a study (partially funded by the cities of Sunnyvale and Santa Clara) titled the "Lawrence Expressway Grade Separation Study", with the goals of a) reducing traffic congestion on local intersections, b) reducing the barrier to east-west movement created by the existing design of the Expressway, c) better balancing vehicle access to Lawrence Station, while minimizing conflicts with pedestrians, d) providing direct vertical access to Lawrence Station, and e) improving through-capacity of the Expressway itself. 4 NEIGHBORHOOD CHARACTER: Ensure the area has a character that is unique to its location while being compatible with the overall character of Sunnyvale and sensitive to existing environmental assets.

The Plan area contains a variety of neighborhoods, districts and places with differences in scale and character and varying opportunities for development. In the area south of the Caltrain tracks, the overall scale of development will change very little, with the exception of two areas. Policies to protect and enhance the character and quality of existing residential neighborhoods will require new development to propose lower heights and building massing along existing neighborhood edges. The two areas anticipated for change are: 1) the 17-acre site between Aster Avenue and the railroad tracks (former Calstone/Peninsula Building Materials site) anticipated a 3-7 story mixed-use residential and retail development; and, 2) the commercial center bounded by Willow Avenue, Reed Avenue, and Lawrence Expressway.

North of the Caltrain tracks, the LSAP envisions a future that is a departure from the existing pattern of low scale, large footprint buildings and parking lots. Reflecting the overall trend toward higher density developments for office and R&D in Silicon Valley and increasing land values, this area will be allowed and encouraged to naturally transition to a more dense urban scale. Over time, the area north of the Caltrain tracks will thus become a defined and unique regional and local urban hub, job center, and new neighborhood for urban living, served by a diverse multi-modal circulation system.

The increased development of the northern area will have little impact on the existing residential neighborhoods to the south of the railroad tracks adjacent to the Plan area, due to the separation created by the tracks. In addition, Design Guidelines that are a part of the LSAP will allow property owners to make design decisions while assuring that new development meets certain standards to ensure compatibility with the city and the environment. 5 | COMMUNITY IDENTITY: Create a strong sense of place and neighborhood identity with the development of a vibrant neighborhood center.

New Neighborhood Center

An identifiable sense of place and identity within the City and the area will be established with the development of a new neighborhood center focused around Lawrence Station and streets that serve it. A diverse, high-density mix of land uses in a central location allows for increased community interactions between residents, employees, and visitors.

6 | FLEXIBILITY: Allow the area to redevelop over time through a flexible system that is responsive to the goals, schedule and needs of individual business and property owners, developers, and residents.

The LSAP is designed to accommodate development according to the timing and needs of property owners and the marketplace. All land use changes in the Plan area will be undertaken at the initiative and schedule of private landowners. The City of Sunnyvale has no intent to purchase land for redevelopment or force private landowners and businesses to change land uses in order to meet the objectives of the Plan. Existing legal uses will continue to be allowed and will not be adversely impacted by the implementation of the Plan. The Plan focuses primarily on guiding the future of new development.

Implementation of the LSAP will, however, require the coordinated efforts of both the public and private sector working cooperatively to achieve a common goal. This will be achieved through the coordinated application of four general types of public and private actions:

- 1. Public policy and regulatory actions;
- 2. Impact fees;
- 3. Grant funding; and
- 4. Public administrative actions

Chapter 7: Plan Implementation lists the key improvements that will be needed to achieve the goals of the Plan and the range of implementation methods and potential responsibilities that can be used to complete these improvements.

7 | SUSTAINABILITY: Redevelop the area in a manner that is environmentally, economically, and socially sustainable.

The LSAP embraces a commitment to sustainability where land use and transportation diversity is the key to the long-term sustainable development of the Plan area. The Plan area provides a mix of land uses to allow people to live, work, shop, and relax in the area without needing an automobile for access. Diversity of transportation options will provide feasible long-term alternatives in response to climate change and other unforeseen challenges.

INTRODUCTION

The purpose of the Lawrence Station Area Plan is to establish a framework for the future development of the area, in order to improve the relationship between transit availability and land use for the long-term development of an economically, environmentally and socially vibrant mixed-use district in Sunnyvale.



INTRODUCTION

This Lawrence Station Area Plan (the Plan) was adopted in order to guide future development of a 229-acre area (without roads) surrounding the Lawrence Caltrain Station in Sunnyvale, California. The original plan was funded in large part by a station area planning grant from the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) as part of state and regional efforts to encourage planning for a sustainable future in the Bay Area region. The Plan is guided by the MTC's Resolution 3434 Transit-Oriented Development Policy (July 2005), which includes goals for transit ridership and related supporting land uses within a half-mile radius of rail transit stations throughout the Bay Area.

"The Policy aims to capitalize on investments in new transit corridors in the region by promoting the development of vibrant, mixeduse neighborhoods around new stations. It aims to stimulate the construction of at least 42,000 new housing units along the region's major new transit corridors, helping to ease the Bay Area's chronic housing shortage and preserve regional open space, while at the same time improving the cost-effectiveness of regional investments in new transit expansions."

- MTC's Resolution 3434 Policy (July 2005)

PURPOSE OF THE PLAN

There is a growing awareness of the important role that land use plays in the success of public transportation systems. Anecdotal and empirical data indicates that without a sufficient population living and working in close proximity and easy access of a transit station, the use of the station is limited, resulting in low ridership on the overall system. Without adequate ridership, the transit system cannot achieve adequate farebox revenue, placing an unsustainably heavy burden on public subsidies to support ongoing investments in capital improvements, operations and maintenance.

Lawrence Station is a good example of this problem. Historically surrounded by uses that do not support transit ridership, as well as a circulation framework that makes access for pedestrians, bicyclists and motor vehicles a challenge, the station ranked 18th out of 31 stations in the Caltrain system for average mid-weekday boardings, comprising only 1.6 percent of the system-wide total, according to the Caltrain 2019 Ridership Report.

Conversely, economic studies in the Bay Area in recent years indicate that proximity to an active and viable public transit facility is good for land values, the local economy and the environment. A diversity of employment and housing uses at a range of densities not only supports transit, it also supports the provision of desired retail, open space and other support uses and can encourage a lively, 24-hour community that is less dependent on the use of the automobile for daily needs.

This, then, is the Purpose of the LSAP: To establish a framework for the future development of the area, facilitated by a partnership between local residents, businesses, property owners and the City, in order to improve the relationship between transit availability and land use for the long-term development of an economically, environmentally and socially vibrant mixed-use district in Sunnyvale.

LOCATIONAL CONTEXT

The LSAP is situated at the eastern edge of the City of Sunnyvale, in the heart of Silicon Valley and the County of Santa Clara, approximately 42 miles south of San Francisco. It lies in relatively close proximity to major transportation hubs and corridors, including US Highway 101, Interstate 280, and State Route 82 (El Camino Real), San Jose International Airport (7 miles away), freight and commuter rail corridors, Santa Clara Valley Transportation Authority (VTA) bus routes and other transportation corridors. Important nearby regional centers include Downtown Sunnyvale (approximately 2 miles), Downtown Santa Clara (4 miles), and Downtown San Jose (9 miles).

Lawrence Station is about 2.0 miles east of the downtown Sunnyvale Caltrain Station and about 3.6 miles west of the Santa Clara Caltrain and Altamont Commuter Express Station (serving downtown Santa Clara and Santa Clara University). Lawrence Station sits below an overpass of Lawrence Expressway. Lawrence Expressway bisects the Plan area north-south, while the Caltrain right-of-way bisects the area east-west.

The original study area was generally defined by a one-half-mile radius circle centered on Lawrence Station. Research indicates that this distance represents approximately a 10-minute walk for an average pedestrian, a threshold that pedestrians are generally willing to walk on a regular basis to access a transit station. This distance is widely recognized as a typical unit of measurement for station area planning. The one-half-mile radius contains lands in both Sunnyvale and Santa Clara with city boundaries that interlock with one another. The original study area included portions of the City of Santa Clara in order to ensure coordination of circulation systems and land uses between the two cities. The original study area also deviated from a symmetrical circle in order to correspond to the city boundaries north of the station and to encompass a remnant agricultural parcel (former Corn Palace) in the south.

INTRODUCTION

Figure 1.1: Regional Location

Figure 1.3: Plan Area Boundary



Figure 1.2: Local Context





At the time of the LSAP adoption in 2016, the boundaries were limited to parcels that were envisioned for potential redevelopment and did not include existing low density residential areas in the southwest portion of the original study area, including the former 20-acre farm commonly called the Corn Palace at the southern edge. The western boundary was expanded in 2021 to include three properties at 932, 950, and 945-955 Kifer Road. The boundary was expanded to support growth of an existing business campus and to comprehensively plan for the Kifer Road corridor.

The current plan area north of the railroad tracks is bounded by 932 and 945-955 Kifer Road (near Commercial Street) to the west; Uranium Drive and the City of Santa Clara Border to the east; and Kifer Road, 945-955 Kifer Road, and the City of Santa Clara border to the north. The plan area south of the railroad tracks is located west of Lawrence Expressway, north of Reed Avenue, and includes the site at 1155-1175 Aster Avenue (formerly Calstone/ Peninsula Building Materials), a townhouse development on Buttercup Terrace, a commercial property at 1159 Willow Avenue, and four commercial properties at the northeast corner of Willow Avenue and Reed Avenue.

PLAN AREA DEVELOPMENT HISTORY

The Caltrain railroad line that currently runs from San Francisco to San Jose was built by the San Francisco and San Jose Railroad in 1863. Known as the Peninsula Commute, it was a private, for-profit commuter railroad operated by the San Francisco and San Jose Railroad, which ran between the two cities. In 1870, the rails were purchased by Southern Pacific Railroad, which continued to operate the commuter train service. Due to operating losses, the Southern Pacific Railroad petitioned to discontinue the commuter rail service in 1977. In 1980, subsidies were provided by the California Department of Transportation (CalTrans) to continue the rail service, and it was renamed Caltrain. In 1987, the Peninsula Corridor Joint Powers Board (PCJPB) formed an authority comprising the three counties of Santa Clara, San Mateo and San Francisco and their transit agencies. In 1991, the PCJPB purchased the tracks from Southern Pacific and in 1992, the PCJPB signed a contract with Amtrak as the contract operator for the Caltrain rail service.

Exactly when Lawrence Station was built as a station is unclear; however, maps dating from 1908 show Lawrence as a station on the Southern Pacific line. Lawrence Station was most recently renovated by Caltrain in 2004.

Sunnyvale was founded at the end of the 1800s as one of several new communities that developed along the Southern Pacific line. Along with other communities in the area, Sunnyvale was once dominated by orchards and farms. As technology businesses flourished in the last half of the 20th century, the orchards gave way to industrial and business parks and residential subdivisions. Until recently, these uses have been configured almost exclusively in large, single-use districts or neighborhoods.

As shown in Figure 1.4, the majority of development in and around the Lawrence Caltrain station occurred forty or more years ago. Most of the residential neighborhoods that lie to the south of the rail line date from the 1970s or earlier. New residential development in the Plan area since the 1970s includes townhouses fronting Aster Avenue and Willow Avenue; 741 townhome, condominium, and apartment units at 1155-1175 Aster Avenue (formerly Calstone/Peninsula Building Materials), and 520 apartment units on Kifer Road at Santa Vittoria Terrace.

INTRODUCTION

Figure 1.4: Development History



LEGEND

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PLAN AREA BOUNDARY
CITY BOUNDARY

------ EL CAMINO STORM DRAIN CHANNEL / CALABAZAS CREEK

> LAWRENCE CALTRAIN STATION (EXISTING PEDESTRIAN / BICYCLE UNDERCROSSING)





1.5

EXISTING CONDITIONS

Today, the area north of the railroad tracks is dominated by industrial and commercial uses on large parcels. Many of these date from the early years of Silicon Valley growth and consist of one-story structures. Recent development has occurred throughout the plan area, including new apartments, townhomes, and office and R&D uses. Parking is typically in large surface lots. Roadways are wide and pedestrian and bicycle facilities are generally lacking.

South of the rail line, the Plan area consists primarily of medium-density residential developments and commercial properties at Willow Avenue and Reed Avenue.

The Plan area contains few distinguishing natural physical characteristics and is generally flat, with elevation relief provided only by the overpass of Lawrence Expressway at the Caltrain tracks. Calabazas Creek, which flows south-to-north to the San Francisco Bay, runs in a concrete channel near the eastern edge of the Plan area. It has little to no vegetation within its approximately 65-foot right-of-way. The El Camino Storm Drain Channel borders the LSAP and runs through the residential neighborhoods south of the station and along the south edge of the rail tracks in the City of Santa Clara before draining into Calabazas Creek. This channel, though mostly concrete, has stretches of grass and earthen banks along its 40 to 45 foot right-of-way.

The entire Plan area has no publicly dedicated parks or open space and very little natural vegetation. There are two private parks with public access, one at Kifer Road and Santa Vittoria Terrace and the other in the 1100 block of Aster Avenue. Additionally, the streets and gardens of some of the industrial areas contain an abundance of mature planted street trees and ornamental plantings, including a dramatic stand of Redwood and Cedar trees along Sonora Court one block north of the station.

RELATION TO OTHER REGULATORY AND POLICY DOCUMENTS

The vision and policy recommendations contained in this plan have been coordinated with preparation of other Sunnyvale planning efforts including the Land Use and Transportation Element (LUTE) of the Sunnyvale General Plan (adopted in 2017), Active Transportation Plan (adopted in 2020), Vision Zero Plan (adopted in 2019), and revisions to other regulatory documents.

SUSTAINABILITY IN THE LAWRENCE STATION AREA PLAN

Sustainable Development is generally defined as that which meets the needs of the present without compromising the ability of future generations to meet their own needs. It has three major components: environmental (making the best use of our resources), social (improving the quality of life for residents), and economic (spurring economic growth).

The City currently has several policies and plans in place to address sustainability. A key document the City uses to address sustainability issues is the Climate Action Playbook (CAP) which was adopted in 2019. The CAP contains hundreds of current and future policies related to City facilities and infrastructure, development policies, and operational goals.

The City of Sunnyvale Consolidated General Plan also contains numerous goals and policies that address sustainability. These include goals and policies related to land use and transportation, community vision, housing, environmental management, air quality and solid waste.

In addition, the City adopted its first comprehensive Green Building Program for new development and alterations to existing buildings in 2009. The Green Building Program has been updated several times since its adoption, and continues Sunnyvale's commitment to being a leader in sustainable development. In 2020, the City adopted a phased Reach Codes program to reduce use of natural gas and promote electric vehicle (EV) infrastructure as actions to help lower greenhouse gas (GHG) emissions. The LSAP continues the City's commitment to sustainability. Environmental, social, and economic sustainability goals and policies are embedded throughout the Plan in all topical areas of this report: land use, circulation

and parking, utilities and public services, and urban design. A particular focus has been placed on environmental sustainability; these goals and policies are indicated with the following symbol.



You will see this symbol throughout this document. Where it occurs indicates a goal or policy that exhibits the City's commitment to environmental sustainability.

PLANNING PROCESS AND COMMUNITY INVOLVEMENT

The preparation of the 2016 Lawrence Station Area Plan (LSAP) took place in two distinct phases. Throughout the two-phase process, extensive input was received from the overall Sunnyvale community, business and property owners, specific focus groups, the Sunnyvale Planning Commission, Bicycle and Pedestrian Advisory Commission, Sustainability Commission, Housing and Human Services Commission, the Sunnyvale City Council, and, during Phase II, a Citizens Advisory Group (CAG).

Important input was also provided in regular meetings of a Technical Advisory Group (TAG) comprised of representatives from the City of Sunnyvale, City of Santa Clara, County of Santa Clara, SamTrans, Valley Transportation Authority (VTA), Caltrain, and representatives from the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The LSAP was updated in 2021 to include an increase in housing potential from 2,323 to 5,935 units, a boundary expansion to the west, and to adopt a Sense of Place Plan.

ORIGINAL LSAP PHASE I

The Sunnyvale City Council approved a feasibility study for the LSAP in May 2009, which subsequently led to receipt of the MTC/ABAG grant to prepare a Phase 1 study. This first phase of the Plan preparation process was initiated in December 2010.

Following early community outreach meetings, initial concepts were prepared for the future of the Plan area in an iterative process that included input and review from the TAG, Planning Commission, City staff and the Consultant Team.

ORIGINAL LSAP PHASE II

The second phase of the planning process refined the Preliminary Circulation Framework and Conceptual Land Use Alternatives and resulted in selection of a preferred plan, which was the basis of the plans, policies, and guidelines of the 2016 LSAP.

At the beginning of Phase II, in August, 2012 a Community Advisory Group (CAG) was established. The CAG, which was appointed by the City Council, included 19 members (and 3 alternates), and represented a broad spectrum of the Sunnyvale community, including neighborhood residents, business and property owners, and representatives from the Sustainability, Housing and Human Services, and Planning Commissions.

One of the first tasks the CAG undertook was to articulate four key goals which were intended to guide the selection of a preferred alternative and other details as the planning process moved forward:

- Goal 1: Increase transit ridership by adding more jobs and residents in the area.
- Goal 2: Improve circulation to the station and throughout the study area.
- Goal 3: Provide transit-oriented development.
- Goal 4: Ensure quality development.
- The CAG also articulated the following vision statement:

"The Lawrence Station Area will achieve its full potential as a local residential and employment center where people can live, work, shop and play in a vibrant, walkable environment that takes advantage of its proximity to transit. Towards this end, the plan will establish land use and parking policies, access and circulation, pedestrian/ bicycle and streetscape improvements, urban design guidelines, and infrastructure improvements through an extensive and inclusive public outreach and stakeholder process."

Subsequently, the CAG engaged in a process to select a preferred land use concept from the three alternatives prepared during Phase I. After reviewing the three alternatives, the CAG selected Concept C: Mixed-use Development as the appropriate direction for the long-term evolution of the Plan area to meet their stated goals. The CAG further refined that concept by proposing

a "flexible" mixed-use designation. The intent is to allow a mix of uses throughout the Plan area rather than in specifically assigned areas.

The CAG noted the benefits associated with having a mix of uses – jobs, residential, and retail and service – in proximity to one another, so that no single use would dominate and the mix of uses would help to ensure neighborhood vitality and a critical mass of activity. The CAG also noted the current lack of services and amenities and the opportunity for new land uses in the study area to mitigate this problem. With this direction, various draft elements of the LSAP, such as design guidelines, cost analysis and implementation strategies were prepared.

In February 2013, the Sunnyvale Planning Commission and City Council voted to accept the CAG's recommendation of a flexible mixed-use plan for the area. Subsequently, at its meeting of June 19, 2013, the CAG recommended that a strong incentive-based program be established in order to implement the Plan.

Key priorities included the following:

- Mixed use. A mix of uses should not be required on any specific property or area, but it should be a high priority of the incentive program.
- The Loop Roadway. Prioritize the provision of incentives for property owners who provide right-of-way and improvements for this key roadway.
- Affordable Housing. Place a high priority on incentives for property owners who provide affordable housing beyond current minimum City and State requirements.

The Plan accepted by the City Council, together with the implementation recommendations of the CAG, provided the basis for the goals, policies and guidelines described in this document. In addition, the 2016 Plan was accompanied by a Program Environmental Impact report (EIR), prepared in accordance with the California Environmental Quality Act (CEQA), which evaluated potential environmental impacts of the plan and described potential mitigations that may be needed.

^{1.8} LAWRENCE STATION AREA PLAN

2021 LSAP UPDATE

At time of the LSAP adoption on December 6, 2016, the City Council directed staff to return with a plan to study additional housing opportunities within the LSAP area, in addition to the 2,323 net new residential units adopted in the plan area. There were no increases directed for the adopted 1.2 million net new square feet of office/R&D development potential. The City Council approved a budget supplement from the City's General Fund for the costs of the study. The Council subsequently selected a preferred land use alternative on June 26, 2018, which studied an increase in the incentive residential density allowance north of the railroad tracks, and expanded the area where housing may be considered to include the commercial properties at Willow Avenue and Reed Avenue and to industrial properties bounded by Calabazas Creek, Kifer Road, Uranium Drive, and the railroad tracks. This increase would result in the potential for an additional 3,612 residential units.

On August 14, 2018, the City Council authorized a study to include properties owned by a major Lawrence Station Area company (Intuitive Inc.) at 932, 950, and 945-955 Kifer Road in the LSAP boundaries, and directed staff to include these amendments in the LSAP Housing Study. This would expand the original LSAP boundary to the west, on both sides of Kifer Road in the City of Sunnyvale. The Council also directed staff to study a pedestrian/bicycle route from the subject properties to Lawrence Station and analyze methods to retain trees and open space within the 945-955 Kifer Road property.

The Lawrence Station Sense of Place Plan was also developed along with the housing study and boundary expansion update. A Subsequent EIR per CEQA was prepared to analyze the environmental impacts of the plan updates.

Several community and board/commission meetings, as well as study sessions with the Planning Commission and City Council were held during the update process to solicit feedback. The housing increase of 3,612 units, boundary expansion, and Sense of Place Plan were adopted by the City Council on September 14, 2021.



The vision for the Lawrence Station Area Plan evolved through extensive public outreach and a dedicated Citizens Advisory Group. The four key goals are to: increase transit ridership, improve circulation, provide transit-oriented development and ensure quality development. Other guiding principles are discussed throughout the plan.





VISION FOR THE STATION AREA

"The Lawrence Station Area will achieve its full potential as a local residential and employment center where people can live, work, shop and play in a vibrant, walkable environment that takes advantage of its proximity to transit. Towards this end, the plan will establish land use and parking policies, access and circulation, pedestrian/ bicycle and streetscape improvements, urban design guidelines, and infrastructure improvements through an extensive and inclusive public outreach and stakeholder process."

- Lawrence Station Area Plan Citizens Advisory Group (CAG)

The Vision for the Lawrence Station Area Plan area was established based on the goals defined by the CAG and the TAG, as well as input from the public, City boards and commissions, and the City Council. The overall Vision serves as the basis for all elements of the Plan and its implementing policies. The seven major Vision goals follow.





V-1 LAND USE DIVERSITY

Promote a diversity of land uses and densities that will support transit usage and neighborhood services.

The Plan will guide the evolution of the area to become a new urban neighborhood in Sunnyvale with a mix of both employment and residential uses at a variety of densities. The mix of uses will allow people the opportunity to access their homes, jobs, recreational facilities and neighborhood goods and services within close proximity of one another, reducing their dependence on the automobile.

Densities will vary across the Plan area, with the higher-density residential and employment uses north of the railroad tracks. The range of densities will allow a full range of housing options at all levels of affordability. It will also allow variety in business and job opportunities and provide a sufficient population base to support transit as well as provide critical mass to support neighborhood services and amenities such as retail, open space and recreational facilities.





V-2 DENSE STATION AREA DEVELOPMENT Locate highest intensity development closest to Lawrence Station.

The higher employment and residential populations that will result from locating higher intensities of development near Lawrence Station will support transit ridership and energize station area public spaces. This will further regional goals for housing and employment while also capitalizing on Lawrence Station, an existing built asset that is currently underutilized. It will also lessen the need for increased expenditures on regional highways and associated increases in greenhouse gas emissions and other adverse environmental impacts related to heavy reliance on automobiles in the overall transportation system.

The higher populations will also support commercial establishments near the station, which will serve the needs of the new population and also help meet the needs of existing residents and workers in nearby neighborhoods.





V-3 CONNECTIVITY *Improve connectivity for all modes of travel.*

Over time, a new framework of the loop road and shared-use paths will be created that allows access throughout the Plan area for pedestrians, bicyclists, transit vehicles, automobiles and service vehicles. This new framework will be designed to facilitate easy access to retail goods and services, transit, and open space amenities for residents, workers and visitors with minimal need for use of the automobile. The Sense of Place Plan describes the details of this framework.

The new framework of the loop road and shared-use paths emphasizes improved north-south connectivity, both to provide access to Lawrence Station as well as to link the neighborhoods on both sides of the tracks together and to improve access to regional transportation facilities such as Central Expressway.





V-4 NEIGHBORHOOD CHARACTER

Ensure the area has a character that is unique to its location while being compatible with the overall character of Sunnyvale and sensitive to existing environmental assets.

The new framework of the loop road and shared-use paths will help ensure that future development of the Plan area is consistent with the development patterns of the surrounding neighborhoods and Sunnyvale as a whole. Additionally, unique existing physical features of the Plan area, such as the Redwood and Cedar street trees on Sonora Court and the Calabazas Creek channel will be protected and enhanced, thereby contributing to the unique character and fabric of this particular neighborhood.

New development will also be planned to make this area unique in the City by enhancing the quality and character of the neighborhood. While greater density and land use diversity is envisioned in new development areas, buffer zones, setbacks, building heights, landscape and open space and other physical design elements will be an essential ingredient of the design and review process, consistent with the guidelines established by this Plan.




V-5 COMMUNITY IDENTITY

Create a strong sense of place and community identity with the development of a vibrant neighborhood center.

With the development of a more intensive, mixed-use environment with added employment and households, there is a new opportunity to create a community with an identifiable sense of place and identity. The focus of this will be an active "main street" commercial area on the Santa Vittoria Terrace portion of the new loop road with a strong pedestrian orientation.

Lawrence Station and Downtown Sunnyvale are described as Transit Mixed-Use areas in the 2017 LUTE, which allow for a wide variety of uses and densities located in close proximity to rail stations. These areas will be the center of the community, providing an active, mixed-use zone where offices or residential uses may be found over ground-level shops or dining. Wide sidewalks, low vehicular travel speeds, on-street parking and proximity to the Caltrain station will allow access to all modes of travel. The Santa Vittoria Terrace portion of the new loop road in the center of the Plan area near Lawrence Station will be active throughout the day and evening, providing much needed goods and services as well as a focal point for the neighborhoods around the station.

V-6 FLEXIBILITY

Allow the area to redevelop over time through a flexible system that is responsive to the goals, schedule and needs of individual business and property owners, developers, and residents.

The Plan is a long-range vision for change over time. It will be implemented through the coordinated efforts of the City of Sunnyvale working in partnership with businesses, property owners, developers and residents. Change will occur according to the timing and needs of property owners and the marketplace. This flexible, market-based approach will help ensure a diversity of land uses and densities are developed while also making certain that the process is orderly and that appropriate uses are developed in appropriate locations and at densities that are appropriate to meet the goals of the City as a whole and the neighborhood in particular.

The key to the success of such a flexible planning and development approach will be the establishment of two new primary regulatory tools, which will encourage development according to the vision of the Plan: 1) establishment of base maximum densities, and 2) a system of development incentives and bonuses above base maximum densities that will reward property owners in specific target areas who choose to provide the mix of uses, amenities and infrastructure necessary to achieve the vision of the plan.

V-7 SUSTAINABILITY

Re-develop the area in a manner that is environmentally, economically, and socially sustainable.

The City currently has several policies and plans in place to address sustainability, including the General Plan, Climate Action Playbook, Green Stormwater Infrastructure Plan, the Green Building Program, and Reach Codes. The LSAP builds on this commitment to sustainability.

Diversity is the key to the long-term sustainable development of the Plan area. Diversity of land use will allow flexibility in response to varying market conditions over time as well as allowing access to a range of job and housing opportunities. Diversity of transportation options will reduce dependence on a single mode of transportation and provide feasible longterm alternatives in response to fuel shortages, climate change and other unforeseen challenges.

By its nature, the LSAP has its roots in sustainability, as its focus is to enhance utilization of an existing commuter rail line: the Lawrence Caltrain station. Heavy dependence upon the automobile will decrease as future development in the Plan area provides a mix of uses to allow people to live, work, shop and relax in the area without needing an automobile for access. Increasing walking and bicycling opportunities also furthers the sustainability goal by providing a diversity of transportation choices.

LAND USE

Opportunities for the future of the Lawrence Station Area are dependent to some degree on conditions that currently exist. These may relate to existing land uses and the pattern of ownership and existing facilities; the degree to which the existing transportation network serves the project area; and the short, medium, and long-term opportunities provided by the real estate market in this part of Silicon Valley.



land USE

INTRODUCTION

The land use plan for the Lawrence Station area, illustrated in Figure 3.2, defines a land use pattern and allowable development densities that will result in a diverse neighborhood with an active daytime and nighttime environment that supports transit ridership both outbound and inbound of Lawrence Station. It is a mixed-use plan, conceived to result in a new neighborhood with a variety of housing types as well as office/research and development (R&D) uses that will provide significant employment. And, it is a flexible plan, allowing business and property owners to play a central role in its implementation over time and according to their specific needs and circumstances.

Mixed-use refers to development that combines different types of land uses—usually homes, shops, offices and community facilities—within easy walking distance. Within that broad definition, mixed-use development can take many forms: it may be vertical (within the same building). For example, the traditional office over the store is vertical mixed-use. Mixed-use can also be horizontal, such as office and residential in different buildings but on the same block or adjoining blocks. It may be low-, medium- or high-density; it may combine just two uses or several; and it may be located near a transit station (in which case it is also known as transit-oriented development) or accessible primarily by other means.

Mixed-use development is an old concept that is being revived and is gaining renewed popularity across the country. Through the early 20th century, before the widespread advent of zoning, most neighborhoods featured a diversity of land uses, and housing above stores was common. These development patterns can still be seen in older, traditional neighborhoods. Zoning developed as a response to rapid industrialization and urbanization, at a time when factories and many commercial activities were noisy, odorous or hazardous. In its early stages, zoning focused on separating and buffering housing from industrial and commercial uses, to protect residents from polluting, noxious and harmful activities.

While many industrial uses still need to be segregated, much commercial activity today is benign or easily controlled. Retail, restaurants and offices can be safely integrated with housing. Indeed, there are many advantages to doing so. Compared to isolated and sprawling suburban development, mixed-use makes for more vibrant, active and convenient neighborhoods, and gives residents more opportunities to socialize and work near home. Equally important, when properly planned, mixed-use reduces dependence on driving and increases transit usage, thereby optimizing the return on transit investments, reducing the rise of greenhouse gas emissions and reducing the need to build ever-more highways and parking lots.

Flexibility in this land use plan means that most properties in the Plan area have the option to develop office/R&D, commercial, or residential uses. This provides enormous advantages to property owners and developers to respond to market conditions as they may evolve and to tailor uses and densities to particular locations within the Plan area.

LAND USE CHALLENGES

Several existing land uses in the Plan area present challenges for a vibrant, transit-oriented neighborhood. Most land uses and densities as of 2021 do not support transit; there is a preponderance of low-density, light industrial, one- and two-story uses north of the railroad tracks. These low intensity employment uses are surrounded by surface parking lots. The area south of the tracks is dominated by single-family and some medium-density multifamily residential neighborhoods, which have poor access to the station.

While there is abundant square footage of retail uses in the Plan area and nearby in the City of Santa Clara, generally they are poorly located, inaccessible to pedestrians, and of a type that is inconsistent with the needs of the existing office/R&D uses, neighborhoods or transit users. Although it is unknown how many properties in the area would redevelop as part of the plan, there will surely be properties and uses that will remain. A key aspect of the plan will be to allow existing properties in the Plan area to remain and thrive.

LAND USE

Land Use Goals

- LU-G1 Protect existing residential areas south of the railroad tracks.
- **LU-G2** Allow existing legal uses in the Plan area to remain as legal, conforming uses with the ability to grow and expand. These uses, however, should be discouraged from using hazardous materials in their operation, especially when located adjacent to residential uses and sites identified as appropriate for residential development.
- LU-G3 Promote a mix of employment and residential uses.
- **LU-G4** Although the plan allows for flexible use of property, a balance should be found to ensure the mix of uses remains diverse at all times.
- **LU-G5** Provide a mix of uses within the Plan area that encourages transit ridership, creates a neighborhood of 24-hour activity and supports the provision of amenities such as open space and support services such as retail.
 - **LU-G6** Provide a flexible land use pattern that provides the desired balance of employment and residential uses in order to create an active daytime and nighttime environment.
 - **LU-G7** Incorporate land use flexibility to respond to variable market conditions, while promoting a blend of employment, residential and retail uses.
 - LU-G8 Provide amenities and services for existing and new neighborhoods.
 - **LU-G9** Provide sufficient development intensity to allow the feasible development of associated amenities (such as open space) and support services.
 - LU-G10 Maximize development intensities in order to support transit usage.
 - LU-G11 Respect the scale and character of the existing residential uses located south of the railroad tracks.

Land Use Policies

- **LU-P1** Buffer / transition new development located adjacent to existing residential neighborhoods through site planning, land use and design strategies.
- **LU-P2** Allow existing legal businesses to remain and prosper as legal conforming uses.

- **LU-P3** Allow transition to higher density transit-supportive uses as opportunities arise through turnover of businesses or property ownership.
- **LU-P4** Establish appropriate levels of development for employment and residential uses to ensure an appropriate ratio exists in the plan area.
- **LU-P5** Ensure compatibility between adjoining residential and non-residential uses.

HOUSING

Housing will be allowed on specifically-zoned properties, as stand-alone residential or a part of a mixed use project. The residential components of mixed-use projects should be planned to maximize privacy for the residents while taking advantage of new and existing employment centers in the area.

AFFORDABLE HOUSING

An Affordable Housing and Anti-Displacement Strategy was prepared as part of the original 2016 LSAP to assess the potential need for affordable housing in the Plan area and recommend strategies to meet the City's affordable housing goals. The key findings and recommendations are listed here.

The City's affordable housing policies as of 2021 include a 15 percent affordability requirement for residential developments, and housing mitigation fees for most net new nonresidential development.

The Regional Housing Needs Allocation (RHNA) is a program implemented by ABAG that sets goals for future housing in accordance with State law. Sunnyvale will be allocated a goal that about 40 percent of new housing in Sunnyvale should be affordable at Low and Very-Low Income levels. However, requiring developers to provide affordable housing comparable to the RHNA targets is infeasible, as it creates an extreme cost burden that would eliminate the financial incentive to construct much new housing. Not for profit housing developers that specialize in affordable housing will be key players in helping Sunnyvale towards the RHNA affordability goals. In order to provide developers with a financial incentive to produce more affordable housing than is required under current City policy, benefits that maintain profitability through added value or reduced costs will be needed. Therefore, this Plan includes a variety of affordable housing strategies, including the following:

- A local incentive program that provides additional density (i.e., marketrate units) in exchange for additional affordable units (very low-income) for both for-sale and rental projects.
- Parking requirement reductions for all projects as compared to other areas of the City.
- Financial support for the construction or renovation of units by nonprofit builders and apartment operators by prioritizing the use of local resources such as the Housing Mitigation Fund in the Plan area.
- Procedurally support the construction or renovation of units by nonprofit builders and apartment operators. Facilitate providing affordable housing through the state density bonus law and assert that development projects reaching lower income levels through the use of tax credits and similar resources are expected and encouraged.

ANTI-DISPLACEMENT

To avoid displacement of existing lower-income residents, no upzoning or increases in allowable densities on sites currently occupied by housing will occur. Retaining existing density allowances will minimize the financial incentive to demolish and replace existing units to achieve higher property values, thus minimizing the concern that existing residents will be physically displaced by new development.

Housing Goals

- **H-G1** Provide sufficient housing in the Plan area to support an increase in rail transit ridership.
- **H-G2** Provide a range of housing types in the station area to provide for all income groups and lifestyles.
- **H-G3** Encourage and support development of affordable housing in the Plan area.

Housing Policies

- **H-P1** Encourage a diverse mix of housing tenure, including ownership, rental, affordable and housing for seniors.
- **H-P2** Prioritize the provision of affordable housing in the Plan area.
- **H-P3** Provide City-based incentives to promote development of affordable housing.
- **H-P4** The City's affordable housing requirements for residential development are based on the total number of units proposed in the project that are obtained by base maximum density plus the green building bonus and highest density achieved with incentive points, if proposed. Additional units obtained through the state density bonus are not counted towards the affordable housing requirement calculation. If no incentives are proposed, the affordable housing requirement is based on the total number of units proposed in the project, as allowed by the zoning district's base maximum density.

RETAIL

Retail development is an important component of the plan area in order to serve employees and residents of the area. Retail components can include restaurants, personal services, stores and hotels. Kifer Road, Sonora Court, Willow Avenue, Reed Avenue, and the Santa Vittoria Terrace portion of the new loop road provide excellent opportunity locations for ground floor restaurants and retail uses in order to take advantage of the tree-lined streets and proximity to the station.

Retail Goals

- **R-G1** Encourage a variety of retail uses.
- **R-G2** Provide retail that supports the needs of surrounding neighborhoods.
- **R-G3** Retain existing regional-serving retail but do not encourage additional regional-serving retail.
- **R-G4** Provide retail that is convenient and accessible to pedestrians and transit users.
- **R-G5** Do not encourage new auto-oriented and auto-serving retail.



Retail Policies

- **R-P1** Concentrate retail uses closest to the station in order to energize the station area.
- **R-P2** Encourage the development of restaurant uses on Kifer Road, Sonora Court, Willow Avenue, Reed Avenue, and Santa Vittoria Terrace.

INDUSTRIAL

The industrial users in the Plan area as of 2021 are an important part of the city, and are allowed to maintain their business and expand as necessary. Care should be taken, however, to ensure industrial materials, operations and work hours are compatible with the new uses as the area redevelops to more transit-oriented mix of uses.

Industrial Goals

I-G1 Allow existing legal industrial uses to remain in the area, but ensure materials used, operations and work hours are compatible with nearby residential users.

Industrial Policies

I-P1 Evaluate proposed use of hazardous materials in industrial operations on a case-by-case basis when located adjacent to residential uses and sites identified as appropriate for residential development. Sites that use hazardous materials or generate hazardous wastes in Sunnyvale are inspected by Sunnyvale Department of Public Safety Certified Unified Program Agency (CUPA) that ensures facilities comply with federal, state, and local regulations.

New retail uses in the plan area will be oriented to serve neighborhood needs for goods, services, dining and entertainment.

OPEN SPACE AND RECREATION

Parks and open space are essential amenities for residents and workers that provide breathing room and recreational opportunities in a built urban environment. Its uses can include active and passive recreation, wildlife habitat, food production, and simple visual relief.

The Plan area contains no publicly dedicated parks, but there are a few private open spaces available for public use, such as the mixed-use development at Kifer Road and Santa Vittoria Terrace, and on the 1100 block of Aster Avenue. Public open space is also found outside the Plan area at Ponderosa Park and Elementary School. Eventually a two-acre site at Lily Avenue and Toyon Avenue (part of the former "Corn Palace" site) will be developed as a public park.

Visual open space and landscape improvements are found in various areas throughout the Plan area including the landscaped embankments of Lawrence Expressway, within the Calabazas Creek and El Camino Drainage channels, the attractive mature Redwood and Cedar plantings on Sonora Court, the large private open space at 945-955 Kifer Road, the mature street trees along Kifer Road, San Zeno Way, and Uranium Drive and the mature landscape of the existing neighborhoods south of the Caltrain tracks. However, none of these landscape improvements provide usable open space that is available for public use.

See Chapter 19.37 of the Municipal Code for landscaping requirements and Chapter 19.35 for residential useable open space requirements and site/ surface parking lot landscaped area requirements.

Open Space Goals

- **OSG-1** Establish a system of parks and public spaces connected by green corridors and linear parks that serve and connect both new residential development and new non-residential development.
- **OSG-2** Provide open space within a five-to-ten minute walk of all residents and employees.
 - **OSG-3** Connect open space areas to local and regional bikeways and trail networks to the greatest extent possible.

Open Space Policies

- **OSP-1** Strive to provide at least 54 acres of new open spaces and plazas open to the public throughout the Plan area.
- **OSP-2** Utilize the Calabazas Creek corridor to create new linear open space connectors available to the public.
- **OSP-3** Evaluate improving the following street corridors as Green Streets as linkages in the open space connector system.
 - Loop Road, including Santa Vittoria Terrace
 - Sonora Court
 - Kifer Road
 - Willow Avenue
 - Aster Avenue
 - Reed Avenue
 - Uranium Drive
 - Lawrence Station Road
- **OSP-4** Provide pedestrian and bicycle amenities on all Green Streets, including abundant landscaping, Class I or Class II bicycle facilities, lighting and intersection amenity and safety improvements.
- **OSP-5** Locate all new dedicated open space to be adjacent to, and accessible from, the backbone open space system of linear parks and Green Streets.
- **OSP-6** Preserve and protect the existing mature street trees on Sonora Court, Uranium Drive, San Zeno Way, and Kifer Road.
- **OSP-7** Prepare a comprehensive maintenance program for all open spaces, plazas, and landscape areas with defined responsibilities for public and private stakeholders in the Plan area.

LAND USE





LAND USE CLASSIFICATIONS

The Land Use Plan (Figure 3.2) designates nine land use categories for the Plan area, one of which is exclusively a residential use, three are exclusively employment uses, and five are mixed-use designations. These designations align with the different zoning districts of the LSAP.

The land use classifications in this section represent City of Sunnyvale policy and are intended to be broad enough to allow flexibility in implementation, but specific enough to provide sufficient direction to carry out the Plan. In addition to the direction related to uses provided here, public uses, including parks, government offices, police and fire stations, and public schools, are permitted in all land use classifications, subject to environmental review and City approval (except for public schools and certain governmental offices). Table 3.1 describes the density and height development standards associated with these land use designations, including bonus densities driven by incentives. These standards are also found in Chapter 19.35 of the Municipal Code.

FLEXIBLE MIXED-USE I (MXD-I ZONING DISTRICT)

Properties designated Flexible Mixed-Use I are located north of the tracks within 1/4 to 1/2-miles of Lawrence Station. For properties on Sonora Court, refer to the Flexible Mixed-Use I/Sonora Court district. Because of this proximity to the station and commensurate abundant transportation access, high base maximum density is required for future development in this district.

Office, research and development (R&D), and residential uses are allowed in this classification. Retail uses are also allowed and encouraged in this area in order to create a critical mass of successful retail activity. Uses may be configured as vertical mixed-use, such as with retail under several floors of residential or office, or as single use buildings or parcels.

FLEXIBLE MIXED-USE I/SONORA COURT (MXD-I/S ZONING DISTRICT)

Properties designated Flexible Mixed-Use I/Sonora Court are located along Sonora Court, a cul-de-sac one block north of the railroad tracks, and just northwest of Lawrence Station. Parcels on Sonora Court are significantly smaller than others north of the tracks, averaging 1.2 acres. Because of the closest proximity to the station and smaller parcel sizes, the highest base maximum density is required for future development in this district.

Office, research and development (R&D), and residential uses are allowed in this classification. Retail uses are also allowed and encouraged in this area in order to create a critical mass of successful retail activity. Uses may be configured as vertical mixed-use, such as with retail under several floors of residential or office, or as single use buildings or parcels.

FLEXIBLE MIXED-USE II (MXD-II ZONING DISTRICT)

Areas designated Flexible Mixed-Use II west of Lawrence Expressway fall within approximately 1/4-mile of the station, and areas east of Lawrence are approximately 2/3-mile of the station, across Calabazas Creek. Under this classification, required base maximum densities for future development are slightly lower than in MXD-I because of further distances from Lawrence Station. A mix of land uses, including office, research and development, industrial, and residential uses are allowed and encouraged in this land use classification. Retail uses are allowed and encouraged.

FLEXIBLE MIXED-USE III (MXD-III ZONING DISTRICT)

The Flexible Mixed-Use III designation applies to the properties at 1155-1175 Aster Avenue (former Calstone/ Peninsula Building Materials site) that lies directly south of Lawrence Station and the rail tracks. These parcels face the recently constructed Aster Avenue townhomes to the south and the existing multi-family apartments to the west. Redevelopment of the site was approved in 2019 with a mixed-use project containing 741 rental and forsale units and 1,500 square feet of retail near the station entry. At the time of approval, the 741 units were subtracted from the 2,323 net new units in the original LSAP Development Capacity. The project was designed to respect the scale and character of adjacent existing residential uses. The proximity of existing residential uses are the reason why the base maximum densities are lower than those found north of the station where there are no immediate existing residential neighbors. Retail development, in a vertical mixed-use format, was approved along the Willow Avenue frontage to cater to train passengers and persons in the neighborhood.

FLEXIBLE MIXED-USE IV (MXD-IV ZONING DISTRICT)

The Flexible Mixed-Use IV designation is limited to one small area south of the station near the intersection of Lawrence Expressway and Reed and Willow Avenues. These parcels are near existing residential neighborhoods and are immediately adjacent to the expressway. The area is a convenient location for local-serving retail services, residential, and office/ R&D uses. Because of the existing retail services onsite relied on by local residents and the site's strategic location at a major intersection, redevelopment of the site requires provision of retail services. Redevelopment may include ground floor retail with residential or office/R&D above, or in a horizontal format with separate buildings. Redevelopment plans must consider the County's plans for the Lawrence Expressway grade separation, which may require dedication of land on the parcel nearest the expressway.

HIGH-DENSITY RESIDENTIAL (R-5 ZONING DISTRICT)

The high-density residential land use designation is found only on two sites on Willow Avenue, south of the Caltrain tracks. One of the sites was redeveloped in 2012 to a 16-unit townhome project on Buttercup Terrace. These parcels are surrounded by multifamily residential uses to the west and north (across El Camino Channel). Residential uses are assumed for the area, but other nonresidential uses per the R-5 zoning district use table may be considered. Unlike MXD-zoned properties, density is determined by lot area, consistent with Citywide R-5 standards. R-5 properties are not eligible for additional densities in the LSAP Incentives Program.

LSAP INDUSTRIAL AND SERVICE (M-S/LSAP ZONING DISTRICT)

The LSAP Industrial and Service District applies to the southeast corner of Kifer Road and Lawrence Expressway/Lawrence Station Road, which includes three properties; the largest of which has been historically occupied by a

large-scale retail use (Costco). These sites have a different designation than other adjacent properties because the City desires a strong retail presence to remain at this highly visible street intersection. To that end, residential uses are not permitted and a minimum retail requirement of 25% has been placed to ensure a similar FAR as the existing large-scale retail use. Office, R&D, and Industrial uses are allowed with required retail. Redevelopment may consist of a vertical mixed-use format with ground floor retail and office/R&D/industrial above, or in a horizontal format in separate buildings.

LSAP INDUSTRIAL AND SERVICE 60% (M-S/LSAP 60% ZONING DISTRICT)

The LSAP Industrial and Service 60% designation is for only one site on the north side of Kifer Road on the western boundary near Commercial Street. The historic use of this site was for a private open space area for major companies in the area. The maximum FAR is lower than many other areas of the LSAP in order to preserve a majority of the existing open space and mature trees onsite. Only industrial, smaller-scale retail and service, office, and R&D uses are allowed in this designation, per the use table in the M-S zoning district. Residential is prohibited.

LSAP INDUSTRIAL AND SERVICE 120% (M-S/LSAP 120% ZONING DISTRICT)

The LSAP Industrial and Service 120% designation applies to two sites located south/southwest of the M-S/LSAP 60% site. The sites are on the south side of Kifer Road on the western boundary near Commercial Street. The historic use of one of the sites was chemical storage, and as such environmental remediation has been ongoing for years. For this reason and others, residential uses are prohibited. Similar to M-S/LSAP 60% zoning, only industrial, smaller-scale retail and service, office, and R&D uses are allowed per the use table in the M-S zoning district.

Table 3.1: Station Area Development Standards

		Office/R&D/Industrial		Retail	Residential		Height (feet)
Land Use color	Land Use/Zoning	Base Maximum FAR	Maximum FAR with incentives ³	Minimum FAR	Base maximum density (du/ac) ^{1, 2}	Total du/ac incentive points available	Maximum residential and non-residential height
	Flexible Mixed-Use I (MXD-I)	35%	150%	N/A	45	35	100
	Flexible Mixed-Use I/Sonora Court (MXD-I/S)	35%	150%	N/A	54	26	100
	Flexible Mixed-Use II (MXD-II)	35%	150%	N/A	36	32	100
	Flexible Mixed-Use III (MXD-III)	35%	100%	N/A	28	17	55
	Flexible Mixed-Use IV (MXD-IV)	35%	50%	25%	28	17	55
	High-density Residential (R5)	N/A	N/A	N/A	Based on lot area per SMC Table 19.30.040	N/A	55
	LSAP Industrial and Service (M-S/LSAP)	35%	150%	25%	N/A	N/A	85
	LSAP Industrial and Service 60% (M-S/LSAP 60% FAR)	35%	60%	N/A	N/A	N/A	85
	LSAP Industrial and Service 120% (M-S/LSAP 120% FAR)	35%	120%	N/A	N/A	N/A	85

1 New residential development in the LSAP is required to build to at least 85 percent of the zoning district's base maximum zoning density.

2 Additional densities may be achieved above the base maximum density or density obtained through the City's Green Building Program and/or the LSAP Incentives Program by providing affordable housing consistent with State Density Bonus Law. Additional densities above the base maximum density are calculated in the following order: apply the density bonus percentage through the City's Green Building Program, add the incentive points gained through the LSAP Development Incentives Program, then apply the State Density Bonus percentage achieved by the project.

3 A Development Agreement is required for additional FAR above the base maximum through the LSAP Incentives Program. Development agreements are not required for projects consistent with the additional FAR allowed through participation in the City's Green Building Program.

LAND USE





SUDI YARA BOUNDAN
SUNNYVALE / SANTA CLARA BORDER
EL CAMINO STORM DRAIN CHANNEL /
CALABAZAS CREEK

•••• STUDY AREA BOUNDARY

SUNNYVALE EXISTING LAND USE LOW DENSITY RESIDENTIAL LOW MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL INDUSTRIAL & SERVICE EXISTING PUBLIC PARKS EXISTING SCHOOLS AND OTHER CIVIC USES

SUNNYVALE LSAP LAND USE FLEXIBLE MIXED-USE I

PRIMARY LOOP ROAD

FLEXIBLE MIXED-USE II FLEXIBLE MIXED-USE III

FLEXIBLE MIXED-USE IV HIGH-DENSITY RESIDENTIAL LSAP INDUSTRIAL AND SERVICE

LSAP INDUSTRIAL AND SERVICE 60%

LAWRENCE CALTRAIN STATION

FLEXIBLE MIXED-USE I / SONORA COURT

C

SANTA CLARA EXISTING & GENERAL PLAN LAND USE MEDIUM DENSITY RESIDENTIAL HIGH DENSITY RESIDENTIAL REGIONAL MIXED USE LOW INTENSITY OFFICE/R&D LOW DENSITY RESIDENTIAL

PUBLIC FACILITIES

Public facilities include government, civic, educational and public services, such as open space and recreation facilities, schools and community centers. The Plan area currently contains no public facilities or Public Facility (PF) zoning. However, it is envisioned that a variety of public facilities will be needed to serve the area as development proceeds. Some of these will be provided through mandatory fees consistent with existing City of Sunnyvale policy. Others will be provided through development incentives for new development. Therefore, the precise location and programmatic content of these facilities is unknown and is not illustrated on the land use plan.

PARKS AND OPEN SPACE

A key feature of the Plan is to ensure that a system of parks, recreational facilities and open space are developed. Current City of Sunnyvale policy relating to the provision of parks and recreation facilities sets a target standard of 5 acres of open space be provided per 1,000 persons residing within each neighborhood planning area which is being implemented by park dedication requirements. For housing densities in the Plan area, there is a 0.009 acres of park dedication required per dwelling unit. The total need within the Plan area to serve the existing and future population growth would be at least 54 acres of open space (5,935 dwelling units multiplied by 0.009 acres).

Because of the urban nature of the planned new development and because there is very little public or publicly-accessible land available in the Plan area, the Plan envisions that parks, recreation and open space facilities will be provided through three measures:

- 1. Ponderosa Park and Approved Park at Lily Avenue and Toyon Avenue (former Corn Palace site). Some of the need can be met for those residents south of the tracks that are near Ponderosa Park or the approved park at the former Corn Palace site (unnamed at time of plan update).
- 2. Capitalize on underutilized opportunities. An example includes the Calabazas Creek channel, which can provide linear park connections between neighborhoods, parks and open spaces.
- 3. Land dedication, publicly accessible private parks, and/or in-lieu fees consistent with established City policy and applicable to population

increases resulting from new development in the Plan area in the future. For design standards related to the provision of open space in new development areas and properties, see Chapter 6: Urban Design.

Figure 3.1: Open Space Framework, illustrates the key elements of the planned parks and open space system for the Plan area. Calabazas Creek, combined with Green Street linkages, will provide the backbone of the system. Land dedications or providing public access easements on private open spaces resulting from the development process will provide the major public open spaces that are needed and will be strategically located to be accessible from the backbone system.

DEVELOPMENT POTENTIAL

The LSAP is a flexible mixed-use plan that will result in a blend of office/R&D, retail, industrial and residential development. In many areas, the Plan allows for the long-term development of significantly higher densities than are currently allowed in other parts of the City.

FLEXIBLE MIXED-USE

The LSAP is designed to accommodate development according to the timing and needs of property owners and the marketplace. Unlike traditional zoning, which typically establishes single-use districts with fixed densities, the LSAP allows a flexible mix of uses at a range of densities. Zoning districts have been established in Chapter 19.35 of the Sunnyvale Municipal Code to allow for this flexibility.

INCENTIVE-BASED PLAN

The LSAP is an incentive-based plan. Because very little land in the Plan area is publicly-owned, implementation of the LSAP will be heavily driven by private property owners. Development incentives (in the form of density bonuses) will allow property owners to develop their properties beyond the base maximum densities (residential) and base maximum floor area ratios (office/R&D/industrial) in exchange for providing community benefits such as mixed-use development, connectivity enhancements, public open space, additional affordable housing, financial contributions, and other features that advance the goals of the Plan. In residential development, community benefits are assigned a defined amount of points. Development Agreements, subject to adoption by the City Council, are required for office/ R&D/industrial projects requesting access to higher floor area ratios (FAR) through the incentives program. Development agreements are not required for projects consistent with the additional FAR allowed through participation in the City's Green Building Program. Developers are not required to build with incentives. Rather they will have the option to choose which incentives best suit their business plans and economic goals.

For projects with residential uses that propose to include affordable units under State Density Bonus Law, the bonus percentage that must be provided under state law is added to the highest density obtained with incentive points for the particular project, or to the base maximum density if the project applicant does not propose to utilize incentive points through the LSAP Incentive Program.

The LSAP Development Incentives Program has been established under separate cover, and will be updated periodically.

DEVELOPMENT CAPACITY

In order to ensure that long-term development does not exceed the carrying capacity of infrastructure systems and the environment, a growth-monitoring program with a development capacity was established with the adoption of the original LSAP.

The original 2016 LSAP prescribed a development capacity of 2,323 net new residential units and 1.2 million square feet of net new office/R&D, consistent with the findings of the Environmental Impact Report (EIR) that was conducted as part of the planning process. The housing capacity was raised from 2,323 to 5,935 units as part of the 2021 update. If the 5,935 net new unit and/or 1.2 million net new square feet of office/R&D development capacity is reached, subsequent development proposals would need to conduct additional environmental analysis per CEQA.

DEVELOPMENT ASSUMPTIONS

A key goal of the Plan is to ensure that future new development is of a type and at sufficient density to create a diverse area that can support a mix of employment and residential uses, supports transit use, and can provide necessary amenities and support services, such as open space and neighborhood retail. Therefore, base maximum development densities are established. New residential development will not be allowed at densities less than 85 percent of these base maximum densities. The assumptions below were used in determining the Plan buildout for purposes of environmental impact analysis and infrastructure needs.

Original 2016 LSAP

The original LSAP's development potential was estimated under a variety of assumptions and scenarios. These scenarios included:

- 1. Minimum Density– 2,000 net new units; net office/R&D loss of 250,000 sq. ft.; 78,000 sq. ft. net new retail sq. ft.; and 700 net new industrial sq. ft.
- 2. Maximum Density with Incentives 4,650 net new units; 2.4 million sq. ft. of office/R&D; 78,000 sq. ft. net new retail sq. ft.; 9,000 net new industrial sq. ft.
- 3. Estimated Likely Development– 2,323 net new units; 1.2 million net new office/R&D/industrial sq. ft.

All three of the above development scenarios included estimates for existing residential, office/industrial/R&D, and retail uses in the original study area that were not expected to change. The scenarios assumed a residential ratio of 2.42 people per unit, 400 square feet per employee for retail, and 420 square feet per employee for office/R&D/light industrial.

The Estimated Likely Development scenario was determined to be the appropriate scenario evaluated in the original LSAP's EIR, and was adopted by the City Council as the development capacity for the LSAP as this scenario was based on reasonable development goals and assumptions for the Plan area. The adopted boundaries did not include existing residential areas in the original study area.

2021 Update

The 2021 LSAP update to the development capacity consisted of increasing the maximum number of net new housing units from 2,323 to 5,935. The 1.2 million square feet of net new office/R&D/industrial development did not change. The estimated yield was obtained by identifying 30 opportunity sites where there was a reasonable potential for future redevelopment. Parcels not included in the opportunity sites were those that recently redeveloped, had multiple owners, or were unlikely to redevelop, such as the Costco site east of Lawrence Expressway.

Development Goals

- **D-G1** Develop the Plan area with a diverse mix of uses at intensities sufficient to support and take advantage of the significant existing public investment in transit.
- D-G2 Encourage a range of development intensities in order to achieve neighborhood diversity and allow flexibility for businesses, property owners, workers and residents.
- **D-G3** Implement the development of the Plan, including the provision of amenities and support services through development incentives rather than relying exclusively on regulatory actions or direct public investment.
- **D-G4** Ensure that new development and construction activities improve, rather than adversely impact, the natural environment.

Development Policies

- **D-P1** Within the Plan area actively work with the City of Santa Clara to ensure consistency between the City of Sunnyvale's LSAP and the City of Santa Clara's General Plan, LSAP, and Zoning provisions.
- D-P2 Maintain the LSAP Development Incentives Program.
- **D-P3** Encourage development at the highest density obtained with incentive points in order to maximize the provision of neighborhood-serving amenities, support services and infrastructure improvements.
- **D-P4** Require new residential development to build to at least 85 percent of the zoning district's base maximum density.
- **D-P5** Additional residential densities may be achieved above the base maximum density or density obtained through the LSAP Incentives Program by providing affordable housing consistent with State Density Bonus Law.
- **D-P6** A Development Agreement is required for additional office/R&D/ industrial FAR above the base maximum through the LSAP Incentives Program. Development agreements are not required for projects consistent with the additional FAR allowed through participation in the City's Green Building Program.
- **D-P7** Allow a Transfer of Development Rights (TDR) to occur in the Plan area. TDR is an entitlement to construct additional density above the base maximum density on a specific receiver parcel when an equal amount of potential density is transferred by mutual agreement from

another specified donor parcel that gives up its right to develop up to the base maximum density.

The amount of density that may be transferred from a donor parcel to a receiver parcel shall be calculated using the difference between the number of units proposed/approved on the donor parcel and the number of units allowed by the base maximum density on the donor parcel. A receiver parcel may obtain allocations from one or more donor parcels.

The following criteria apply for TDR:

- The TDR may only occur between LSAP-zoned parcels.
- The TDR results in construction of retail space (at least 2,000 sq. ft.); publicly-accessible open space (at least 0.5 acres); a segment of the Loop Road; Primary Class I Shared-Use path; or Secondary Pedestrian/Bicycle Pathways and/or Streets along the entire length/ width of the site on either the donor or receiver parcel.
- When development rights are transferred, all such rights are thereafter depleted with regard to the donor parcel.
- Receiver parcels are subject to the development standards (other than density) that apply to their zoning district, even if the donor parcel providing the transferred density is in a separate zoning district.
- A Special Development Permit (if not already associated with a development application) is required between the property owners transferring and receiving the development rights under the TDR.
- Findings shall be made that the receiver parcel has sufficient area to accommodate the increased intensity of development, that the impacts of the development will be mitigated to a satisfactory level, and that the total development meets all of the applicable requirements of the City's General Plan, provisions of the LSAP, and Zoning Code.
- **D-P8** Approved office/R&D/industrial square footage above existing development is subtracted from the remaining balance of net new development capacity. For residential development, the existing square footage of demolished office/R&D/industrial buildings is added back to the remaining balance of net new development capacity.

CIRCULATION AND PARKING

Circulation and Parking describes the circulation framework for the Station Area, which consists of the roadways and patterns of movement for pedestrians, bicyclists, transit and other vehicles and focuses on improving access to the train station and to parcels within the study area. Strategies to manage parking supply and demand are outlined as well.



CIRCULATION AND PARKING

The circulation system within the Plan area will play an important role in supporting future development by expanding mobility choices and providing a safe, convenient way to travel within the area, and to other areas, regardless of one's travel mode. The LSAP incorporates a "complete streets" approach for circulation planning that accommodates all travel modes so that driving is an option, but not a necessity. Complete streets are designed and operated to enable safe and convenient access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. This Plan strives to meet both the mobility and parking needs of existing businesses, visitors, and employees while also accommodating future development planned for the area. Effective planning for future land uses requires creation of a truly multi-modal transportation system.

THE CIRCULATION FRAMEWORK

The Circulation Framework is the system of streets and blocks that are the primary determinants of structure in an urban area. The Framework determines where circulation for motor vehicles, pedestrians, bicycles and transit will occur, and where land uses and buildings will be arranged and located.

In 2021, the Circulation Framework in the Plan area is extremely limited. North of the Caltrain tracks, due to the industrial nature of many of the 2021 uses, the area is designed almost exclusively for the use of motor vehicles, particularly automobiles and trucks. Although the area has started changing, since the adoption of the Plan in 2016, the area is historically dominated by parking lots and a pattern of large industrial parcels with very few streets. Due to the constraints imposed by the configuration of Lawrence Expressway, access to the station from the north is via San Zeno Way and Lawrence Station Road, both of which are narrow streets, located close to the expressway that provide only partial access that is difficult to understand and navigate. These streets are also not well-located to optimize access to property along both sides of their street frontage.

South of the railroad tracks, existing residential neighborhoods border the Plan area. These residential areas have a more fine-grained pattern of streets and blocks that, with a few exceptions, are well-scaled to pedestrians and bicycles and provide good access for motor vehicles. Access to Lawrence Station is constrained from this direction by indirect street access on Willow Avenue, and French Street from the City of Santa Clara side of the street. Although Willow Avenue provides two-way access to the station, it does not occur at a full four-way intersection and pedestrian access is limited to one side of the street for most of Willow Avenue.

The Lawrence Station Sense of Place Plan ("SOP" or "Sense of Place Plan") has been prepared to supplement this Plan. The Sense of Place Plan is incorporated into this plan by reference and builds off the goals, policies, and guidelines outlined in the LSAP and provides standards and recommendations to shape the future character and improve the streetscape experience around the station.

Figure 4.1 illustrates the major planned circulation elements of the LSAP Circulation Framework. The Circulation Framework Plan includes existing streets as well as new the new loop road and shared-use paths that are strategically located to allow multi-modal mobility throughout the Plan area. The new circulation patterns illustrated are conceptual in nature and do not represent specific alignments. The final location, width, and alignment will be determined upon review of development projects on sites in and near the path of the additional circulation improvements.

The following is a discussion of the key major segments of the future circulation framework for the Plan area. The circulation framework contains two parts: circulation improvements and existing street improvements.

CIRCULATION IMPROVEMENTS

In order to provide improved access throughout the Plan area in general, and to Lawrence Station in particular, a framework of the new loop road and shared-use paths has been established. While east-west connections throughout the Plan area are relatively good, north-south linkages at the local level, particularly north of the tracks, are poor, due to the barrier presented by the railroad tracks and the historical large-lot industrial development of the area. Therefore, a primary goal of the new loop road is to provide improved north-south access throughout the Plan area.

The new circulation network will emerge over time and specific alignments may vary as individual properties are redeveloped by individual property owners. As these properties are reconfigured, developer incentives to provide improvements for these new corridors will be available.

Loop Road

The Loop Road will be a private collector street with public access that will provide direct north-south access in the area north of the Caltrain tracks. West of Lawrence Expressway, the Loop Road would begin at Kifer Road and Semiconductor Drive/Santa Vittoria Terrace, moving southward through private property to Sonora Court which provides direct access to the station via San Zeno Way. East of Lawrence Expressway, the Loop Road would begin at Kifer Road and Corvin Drive, moving south and to the rear of private properties on Kifer Road, and westward to Lawrence Station Road, which provides direct access to the station. The Loop Road will thus allow vehicles travelling east-west on Central Expressway and Kifer Road to readily access the north-bound platform of Lawrence Station, as well as significantly improve visibility and access to properties along its length.

The Loop Road will be a richly-landscaped multi-modal street, designed according to complete streets concepts, with a wide pedestrian zone containing sidewalks and street trees, bicycle lanes, bus transit stops, and a travel lane in each direction, with on-street parking wherever feasible. The Loop Road will be designed in such a manner that it can accommodate bus transit, serving the new neighborhood and providing an important bus

Figure 4.1: Circulation Framework



transit link to Lawrence Station. Coordination with VTA will be required to identify timing, transit stop locations and amenities.

The primary focus of retail activities in the Plan area will be along the north-south portion of the Loop Road now known as Santa Vittoria Terrace, connecting Kifer Road to Lawrence Station on the west side of Lawrence Expressway via Sonora Court and San Zeno Way. This segment of the Loop Road is centrally located in the densest mixed-use zoning districts of the Plan area and will provide a venue for a wide range of pedestrian-oriented commercial retail activities that can serve the nearby mix of uses north of the station as well as the existing residential neighborhoods to the south, creating a destination point.

This Loop Road segment will be a pedestrian-friendly place, with travel lanes in each direction wide enough to accommodate bus transit, bicycle lanes, parallel parking in certain areas, and a wide pedestrian zone containing sidewalks, street trees and street furnishings. The segment is designed so that traffic speeds will be low.

The majority of this Loop Road segment, known as Santa Vittoria Terrace, was completed as part of a mixed-use development at 1120-1130 Kifer Road. Santa Vittoria Terrace connects the intersection of Kifer Road and Semiconductor Drive to the rear of the parcel, and has been designed to continue through the adjacent property to the south out to Sonora Court, leading to Lawrence Station via San Zeno Way. The City may consider transfer of development rights for completing the Loop Road segment through a parcel on Sonora Court. The exact alignment of this vital connection will be determined as properties in the vicinity redevelop.

Primary Class I Shared-Use Paths

In the area north of the Caltrain tracks, the plan envisions two main Class 1 bicycle/pedestrian shared-use paths through private property at the east and west ends of the LSAP boundaries with eventual direct access to the train station. The shared-use paths would be privately owned and maintained with public access easements. The shared-use path would be paved, and include lighting, landscaping, and amenities along its path. On the east end, a trailhead is envisioned on Uranium Drive, and the shared-

use path would either follow the existing rail spur, or if determined to be infeasible, at the rear of parcels fronting Kifer Road. The shared-use path would cross Calabazas Creek to the rear of private properties on Kifer Road, and may utilize a dedicated shared-use path easement on the property at 106 Lawrence Station Road (self-storage use in 2021) in order to provide an outlet to Lawrence Station. On the west end, a trailhead is envisioned on Kifer Road just west of Commercial Street, and would extend to the rear of parcels fronting Kifer Road and connect to a shared-use path constructed in 2020 toward the terminus of Sonora Court, which provides direct access to Lawrence Station via San Zeno Way.

Secondary Roadways and Bicycle/Pedestrian Pathways

A secondary roadway and bicycle/pedestrian pathway network through private property will provide enhanced local access and will provide more opportunities for walking and bicycling through shortened travel paths to the station and commercial areas both within the neighborhood and to and from nearby areas. In addition to pedestrian and bicycle access, automobile access may also be considered. The secondary roadways and pathways would be privately owned and maintained with public access easements. Secondary roadways and bicycle/pedestrian pathways are shown east of Lawrence Expressway to break up the historical large-lot development pattern. Roadways and pathways east of Lawrence Expressway are to align with La Rambla Avenue, Copper Road, and Pancoast Place in the City of Santa Clara.

Another route is shown on private property west of Lawrence Expressway to connect the new Loop Road to San Zeno Way. A direct north-south route is also proposed on private property at Lawrence Expressway and Reed Avenue for seamless access to Lawrence Station. The locations of the secondary routes shown in Figure 4.1 are conceptual. The exact alignment and design of these vital linkages will be determined as properties in the vicinity redevelop.

Bicycle/Pedestrian Rail and Roadway Crossings

The plan envisions that north-south connectivity for pedestrians and bicyclists will be vastly improved by two new railroad track crossings. Due

to potential land use conflicts, traffic considerations and other physical constraints, it is unlikely to develop these two additional track crossings as vehicular streets. Today, the underpass at the Caltrain station and the Lawrence Expressway overpass provides the only north-south track crossing opportunities in the area. Figure 4.2 illustrates the location of two additional grade-separated crossings of the railroad tracks that will serve to increase connectivity to the station as well as to local and regional destinations from the neighborhoods on either side of the Caltrain corridor.

The crossing east of Lawrence Expressway at Calabazas Creek is being evaluated as part of the Calabazas Creek Trail study by the City of Santa Clara and would likely include a pedestrian/bicycle overcrossing spanning the tracks. Further north on Calabazas Creek where it intersects with Kifer Road, a trail undercrossing beneath Kifer Road is shown on Figure 4.2. This would provide continuous access for bicyclists and pedestrians on the trail without having to cross through vehicular traffic on Kifer Road.

The crossing to the west of Lawrence Expressway was part of the original 2016 plan to connect the 1100 block of Aster Avenue to the west end of Sonora Court. The feasibility of a crossing, either by an aerial structure above the tracks or below the tracks in an underground tunnel, was evaluated as part of the redevelopment process of 1155-1175 Aster Avenue (former Calstone/ Peninsula Building Materials site). There are challenges with incorporating the crossing in either scenario. The presence of an existing large-diameter storm drain line on the project site impedes either option. The bottom of the storm drain line is located at least six feet beneath the surface, and an underpass connection would require a deep excavation depth with a lengthy access ramp. The storm drain line also constrains the area where an aerial structure could be located because of clearance space needed for maintenance of the line. There are also concerns about the lack of space on the north side of the tracks to land the aerial structure at the Sonora Court street level. The City did not require provision of the crossing due to these issues, but required recordation of an irrevocable offer of dedication on the property should there be the funding and demand to construct a crossing in the future.

STREET IMPROVEMENTS

Improvements to existing (2021) streets will be needed to ensure safety and improved mobility for all street users.

Lawrence Expressway

In 2003, the Santa Clara County Expressway Study recommended the grade separation of Lawrence Expressway at the Reed/Monroe, Kifer Road, and Arques Avenue intersections. In the summer of 2013, in a follow-up study jointly-funded by the County and the cities of Sunnyvale and Santa Clara, the Lawrence Expressway Grade Separation (LEGS) Concept Study was initiated to consider a range of alternatives for design of the grade separation at the three intersections. Three alternative concepts were studied. In the recommended concept, Lawrence Expressway would be depressed under the three study intersections as well as Central Expressway and the Caltrain tracks. Grade separated interchanges at each of the three intersections would include median ramps from the expressway up to the cross-streets with signalized intersections.

Bicycle and pedestrian movements along Lawrence Expressway would be provided in a corridor running adjacent to and slightly elevated above the vehicular roadway. Bicycle and pedestrian movements between the Lawrence Expressway corridor and the cross-streets would occur via twodirectional shared ramps on either side of the cross-street. An optional feature of the recommended concept is the provision of bus pullouts along the expressway directly beneath Lawrence Station. Such pullouts, combined with vertical circulation elements such as stairs and elevators, would provide direct access between the station and bus service along the expressway. At the time of plan production, it is unclear whether this feature will be part of final study.

Pedestrian and bicycle crossing distances would be significantly shorter compared to existing conditions in the proposed concept plan. Additionally, vehicle conflicts with pedestrians and bicyclists would be reduced by eliminating a number of right turn movements that currently exist.

Upon receiving support for the concept study, these findings will be included in the County's Expressway Plan 2040 Study.

In the long term, if designed well, initial studies indicate that grade separation of Lawrence Expressway across the Plan area will provide opportunities to a) reduce traffic congestion on local intersections, b) reduce the barrier to eastwest movement created by the existing design of the Expressway, c) better balance vehicle access to the Caltrain station while minimizing conflicts with pedestrians, and d) improve through capacity of the Expressway itself. Therefore, grade-separation improvements to the Expressway as it crosses the Plan area are a high priority of this Plan.

If Lawrence Expressway is placed below grade, multiple east-west pedestrian and bicycle connections across the expressway should be provided. In addition, pedestrian and bicycle access to the Caltrain station from both north and south should be prioritized.

It is anticipated that the grade separation project would require significant right-of-way acquisitions on properties with frontage on Lawrence Expressway.

Kifer Road

Kifer Road is a commercial/industrial collector street that stretches across the northern boundary of the plan area (with one property in the Plan area located on the north side of Kifer Road). Kifer Road begins outside the Plan area at Fair Oaks Avenue and continues past the eastern LSAP boundary into the City of Santa Clara. There are four travel lanes with a two-way center turn lane and unbuffered bicycle lanes. The original 2016 LSAP proposed consideration of a road diet on Kifer Road that would remove one travel lane from each side of the road. Due to the increase in housing density as part of the 2021 Plan update and plans for a new circulation system north of the tracks, a road diet on Kifer Road is no longer appropriate. The Sense of Place Plan shows specific improvements to Kifer Road, which include wider and continuous sidewalks, bicycle lanes with buffers, and a new landscaped median with left-turn pockets. Right-of-way dedications east of Lawrence Expressway may be required for these improvements.

The majority of Kifer Road through the study area is shared with the City of Santa Clara, and coordination of roadway redesign must be done in concert with that jurisdiction.

Sonora Court

Sonora Court runs in an east-west direction parallel to and north of the Caltrain tracks. The street is a dead-end local street to vehicle traffic serving a pre-2021 area of low-density industrial/R&D uses that may transition to higher intensity developments over time. A shared-use path (constructed in 2020) runs through private property and connects Kifer Road to the terminus of Sonora Court. Perhaps the most noteworthy aspect of Sonora Court are the very large and handsome Redwood and Cedar street trees that line the street on both sides in a wide planting strip along the curb. These trees are among the most significant natural assets of the entire Plan area. As of 2021, there are no public sidewalks or bicycle lanes on Sonora Court.

The Plan envisions Sonora Court as the main access route to Lawrence Station via San Zeno Way from the new Santa Vittoria Terrace segment of the Loop Road west of Lawrence Expressway, as well as the ingress/egress point of the primary Class I shared-use path access route from Kifer Road to the station. The layout of Sonora Court would be reconfigured to remove on-street parking on one side of the street to accommodate bicycle lanes in both directions. New sidewalks would be constructed behind existing trees at a sufficient distance to preserve the trees.

San Zeno Way/Lawrence Station Road

San ZenoWay and Lawrence Station Road run parallel to Lawrence Expressway on the west and east sides, respectively. These streets provide access to Lawrence Station from Kifer Road, but are too narrow to accommodate bus access to the station. Sonora Court can be accessed from either of these streets, and a small portion of San Zeno Way is used for vehicles, pedestrians, and bicyclists on Sonora Court to access the station. These two streets may be affected by the Lawrence Expressway Grade Separation Project, which may require right-of-way dedications. For this reason, major improvements are not planned on these streets, but existing access will be maintained, with streetscape enhancements applied upon site redevelopment.

Uranium Drive

Uranium Drive is located at the east end of the LSAP, north of the railroad tracks, and forms a T-intersection with Kifer Road. It runs along the boundary between the City of Sunnyvale and the City of Santa Clara. It terminates at a cul-de-sac near the tracks, but there is a connection to Bowers Avenue, a main arterial in Santa Clara, through Mead Avenue. The Sense of Place Plan shows specific improvements to Uranium Drive, which include removal of on-street parking and construction of new sidewalks on the Sunnyvale side (while preserving existing mature trees), buffered bicycle lanes, and minor reductions in travel lane width. Right-of-way dedications may be required for these improvements to this street must be done in consultation with the City of Santa Clara.

Willow Avenue

Willow Avenue provides roadway access to Lawrence Station from Reed Avenue. The street runs in a northerly direction from Reed Avenue, bending around a few properties to the station. The intersection of Willow Avenue and Reed Avenue is unsignalized due to the nearby signalized intersections at Lawrence Expressway and Timberpine Avenue. Willow Avenue also intersects with Aster Avenue at a stop-controlled, three-way intersection a block south of the tracks. The Sense of Place Plan shows specific improvements to Willow Avenue, which include continuous sidewalks and bicycle lanes, removal of on-street parking in the northbound direction between Reed Avenue and Aster Avenue, a shortened and more visible pedestrian crossing at Reed Avenue, a passenger loading zone at the station, and transition of Class II to Class III bicycle lanes where Willow Avenue turns into French Street underneath Lawrence Expressway in the City of Santa Clara's jurisdiction. Right-of-way dedications may be required for these improvements, with access easements for sidewalks. Any improvements near French Street will require consultation with the City of Santa Clara.

Aster Avenue

Aster Avenue serves as one of the southern boundaries of the Plan area, and connects Evelyn Avenue to Willow Avenue. The sites at 1155-1175 Aster Avenue are the only LSAP properties along Aster Avenue, and improvements

to the street were required as part of the redevelopment project approved in 2019. The improvements include new sidewalks where they do not exist, upgrades to existing bicycle lanes, and a new two-way left turn lane down the center of the street. Crossing improvements to the Willow Avenue and Aster Avenue intersection are also required.

Reed Avenue

Reed Avenue is the southernmost boundary of the Plan area. It is a residential collector street with four travel lanes and a two-way center left turn lane. Reed Avenue only interfaces with a few LSAP properties at Willow Avenue. From an engineering design perspective, Reed Avenue from Evelyn Avenue to Lawrence Expressway has pavement widths that exceed the needs of existing or projected traffic volumes. Options for a potential road diet, protected bicycle lanes, and landscaped median were studied, but ultimately not implemented because of the small road frontage in the Plan area and impediments to turning access from existing residential properties outside the Plan area. The Sense of Place Plan includes enhancements to Reed Avenue such as enhanced sidewalks, wider bicycle lanes with buffers, and reduced travel lane widths.

New Signalized Intersections

Additional signalized intersections in the Plan area are to be studied or were found at the time of the 2021 update to be warranted in order to create controlled crossings for all modes of travel and to facilitate the safe circulation of pedestrians, bicyclists, vehicles and buses. These intersections are:

- Kifer Road and Uranium Drive
- Kifer Road and Commercial Street (warranted as part of a development project)
- Kifer Road and a driveway at 1020 Kifer Road (warranted as part of a development project)

The final details of these new signalized intersections will be determined by the City's Public Works Department.

Circulation Framework Goals

- **CF-G1** Create a complete, multi-modal transportation network that supports a mixed-use neighborhood throughout the Plan area.
- **CF-G2** Create a balanced circulation system that is accessible to all modes of travel and does not favor one mode over another.
 - **CF-G3** Create a new Loop Road that provides a variety of vehicular access options and is scaled to bicycles and pedestrians.
- **CF-G4** Provide improved north-south access throughout the Plan area.
- **CF-G5** Improve access to bus and rail transit by all modes of travel.
- **CF-G6** Create streets (both new and improved) that are comfortable and convenient for pedestrians, so walking is a pleasure and accessing residences and businesses is easy.
- **CF-G7** Make the area in and around Lawrence Station bicycle-friendly, so residents and employees of all ages and abilities can feel comfortable and secure biking to work, services, and for recreation.
- **CF-G8** Minimize the impacts of Lawrence Expressway on the Plan area.

Circulation Framework Policies

- **CF-P1** In the residential areas south of the Caltrain tracks, retain the existing framework of streets and blocks. Improve street connections to the residential areas south of the Caltrain tracks to provide safer street crossings and access improvements for pedestrians, bicycles and transit users.
- **CF-P2** Prioritize the provision of improved north-south access for pedestrians and bicyclists between the northern and the southern portions of the Plan area.
- **CF-P3** Establish a secondary bicycle/pedestrian network through private property of publicly-accessible north/south and east/west paths.
- **CF-P4** Study two new railroad track crossings for pedestrians and bicyclists: one at the Calabazas Creek Trail (per study by the City of Santa Clara); the other west of Lawrence Expressway connecting Aster Avenue with the western end of Sonora Court. Coordinate with the City of Santa Clara on the Calabazas Creek Trail crossing.
- **CF-P5** In the area north of the Caltrain tracks, develop a Loop Road that will provide direct north-south access to Lawrence Station from Kifer Road on both the east and west sides of Lawrence Expressway.

- **CF-P6** Locate the Loop Road to align with Corvin Road on the east and to intersect with Kifer Road and Semiconductor Drive/Santa Vittoria Terrace, west of Lawrence Expressway.
- **CF-P7** Incorporate Sonora Court, San Zeno Way, and Lawrence Station Road in the alignment of the Loop Road.
- **CF-P8** Provide direct frontage access to Lawrence Station via the Loop Road.
- **CF-P9** In the Santa Vittoria Terrace segment of the Loop Road between Kifer Road and Sonora Court, establish a pedestrian-friendly north-south commercial Main Street with retail and service uses to support the surrounding neighborhood.
- **CF-P10** To the extent possible, locate the Loop Road and all new shared-use paths and pathways along property lines between parcels in order to minimize impacts on individual properties and building operations and to share benefits between property owners. This will also allow phased development on a parcel-by-parcel basis at the discretion and timing of property owners as they seek to redevelop their land. Allow flexibility in the final locations of the loop road, shared-used paths, and pathways based on specific site conditions.
- **CF-P11** Provide a wide, landscaped pedestrian sidewalk zone, continuous Class II/Class IIB bicycle lanes, and transit stops continuously along Kifer Road in the Plan area.
- **CF-P12** Support efforts to grade-separate Lawrence Expressway across the Plan area in order to a) reduce traffic congestion on local intersections, b) reduce the barrier to east-west movement created by the existing design of the Expressway, c) better balance vehicle access to Lawrence Station, while minimizing conflicts with pedestrians, and d) provide direct vertical access to the Lawrence Station, and e) improve through capacity of the Expressway itself.
- **CF-P13** Ensure the existing mature street trees along Kifer Road, Uranium Drive, San Zeno Way, and Sonora Court will not be adversely impacted by street improvement projects. Incorporate the mature trees into the landscape improvements of the street.
- **CF-P14** Where applicable, align new driveways with existing traffic signals or existing driveways on the opposite side of the street. New publicly-accessible roadways and pathways east of Lawrence Expressway with access to Kifer Road shall align with La Rambla Avenue, Copper Road, and Pancoast Place in the City of Santa Clara.

CF-P15 In addition to conforming to the City's vehicle miles traveled (VMT) requirements, development projects may be required to conduct a local transportation analysis (LTA) per Council Policy 1.2.8. Development projects shall address any operational deficiencies identified in the LTA in accordance with Council policy.

PEDESTRIAN IMPROVEMENTS

As of 2021, pedestrian activity in the Plan area is constrained, due to the barriers presented by Lawrence Expressway, the railroad tracks, large busy intersections, and the industrial nature of large portions of the Plan area. Providing safe and attractive facilities for pedestrians throughout the area is an important goal of the LSAP, with strong emphasis on providing linkages to Lawrence Station and other destinations such as neighborhood parks, schools and shopping areas.

Pedestrian activity around Lawrence Station will likely increase as the LSAP lays the foundation for walkable streets throughout the Plan area. The Loop Road, primary shared-use paths, secondary pathways, and rail crossings will provide a walkable network, providing access to all areas of the neighborhood as well as convenient connections to the station from areas both north and south of Kifer Road. Pedestrian improvements to existing streets will be provided to enhance their role as important pedestrian corridors.

Improved pedestrian access in the Plan area will also be facilitated through enhancements to the pedestrian environment including crosswalk enhancements, curb extensions (bulbouts), and wider sidewalks along all major pedestrian corridors. For urban design guidelines related to these pedestrian improvements in the Plan area, see Chapter 6: Urban Design.

CROSSWALK ENHANCEMENTS

Improvements at major intersections throughout the Plan area, particularly along key pedestrian corridors, will enhance mobility for people of all ages and physical conditions. Crosswalk enhancements can include improvements at both signal-controlled and uncontrolled intersections. Pedestrian enhancements are particularly important at uncontrolled intersections to ensure the visibility of pedestrians to drivers. Improvements to enhance visibility in these situations may include:

- Enhanced crosswalk markings and striping, where determined appropriate by the City's Public Works Department
- Removal of free-right-turns and "pork chop" islands (requires coordination with other jurisdictions, such as the County of Santa Clara for Lawrence Expressway)
- High visibility signs and markings
- Advance yield or stop lines
- Curb extensions or bulbouts
- Rectangular rapid flashing beacons (RRFBs)
- Pedestrian crossing devices, including overhead flashing beacons and pedestrian hybrid beacons (PHB).

Improved crosswalk markings will be studied at existing and proposed signalized intersections as part of development projects, as well as at all marked crossings at unsignalized locations.

CURB EXTENSIONS (BULBOUTS)

A bulbout is an expansion of the width of a sidewalk, typically achieved by expanding into the parking zone. Bulbouts at intersection corners (corner bulbouts) greatly improve the pedestrian environment by providing increased pedestrian waiting area allowing pedestrians to be more visible, reducing pedestrian/vehicle conflict points and reducing street crossing distances and associated crossing times, with no impact on vehicular travel lanes. They are particularly appropriate at intersections with wide crossing distances and high vehicle speeds which create a barrier to safe and easy pedestrian crossings.

Throughout the Plan area, wherever feasible, bulbouts will be provided at the intersection of all new streets and at locations where shared-use paths intersect streets, where feasible. Bulbouts are not feasible on all existing streets, since only streets with on-street parking can be designed to include

Figure 4.2: Pedestrian Circulation System







Clear definition of street and sidewalk areas will be provided throughout the Plan area for all users of the public right-of-way, including pedestrians, bicyclists, and motor vehicles. Curb extensions (corner bulbouts) will enhance the pedestrian zone and improve accessibility for the elderly and disabled.

these features. Bulbouts will be considered along all primary pedestrian corridors where local conditions permit.

In the long term, if the Lawrence Expressway Grade Separation (LEGS) project moves forward, the need for bulbout improvements may diminish, depending on how access ramps for the Expressway are designed. If access ramps from Lawrence Expressway to any streets in the Plan area are provided, then bulbout improvements will be needed wherever feasible.

SIDEWALK IMPROVEMENTS

Sidewalks are a critical element in the creation of good pedestrian environments. Wide sidewalks in good condition encourage walking and may provide space for seating and socializing as well as for lighting and landscape amenities such as street trees.

Throughout the Plan area the recommended minimum sidewalk dimension, where right of way widths can accommodate, is ten feet, including a minimum pedestrian travel zone width of six feet and a four-foot minimum landscaped buffer zone, which may include tree wells. These dimensions provide a comfortable travel path width and buffer between the pedestrian and vehicle traffic, but are considered minimums. A wider 15-foot sidewalk is needed on the Santa Vittoria Terrace segment of the loop road due to higher pedestrian volumes. See the Streetscape section of Chapter 6: Urban Design for additional sidewalk design considerations.

Remediation of sidewalk gaps and other unsafe conditions in the existing pedestrian network are also needed. These improvements include upgraded sidewalks to a minimum six foot-wide pedestrian travel zone, and street tree planting behind the curb. In particular, sidewalk upgrades are needed in the following locations:

- Both sides of Willow Avenue
- Multiple locations along Kifer Road in the Plan area
- East side of Lawrence Station Road

New sidewalks are also needed along the entire length of Sonora Court and west side of San Zeno Way and Uranium Drive and will be located behind

existing mature street trees as to preserve the trees from construction damage.

ADA ACCESSIBILITY

A network of accessible routes is a critical component of any transit-served environment. This is particularly true for disabled or older residents who may desire to walk to destinations but need safe and easy-to-use sidewalks, intersections and pathways.

The most troublesome barriers in the area today are the missing or inadequate sidewalks and intersection corner ramps. These conditions can be found throughout the area, much of which was developed 50 years ago. Investments in new sidewalks and interior pathways by development projects will resolve these issues in all areas of the Plan over time.

All new pedestrian facilities and improvements to existing facilities will be designed to be fully accessible, with appropriate widths, grades, transitions, warning strips, and audio or other crossing indicators, in compliance with the accessibility standards established by the Americans with Disabilities Act (ADA).

Pedestrian Goals

P-G1 Provide safe, inviting, and attractive pedestrian connections for residents, workers and visitors to Lawrence Station and other key destinations in the Plan area.

Pedestrian Policies

- P-P1 Promote walking access through new street connections.
- P-P2 Facilitate pedestrian access and safety along key pedestrian corridors through pedestrian enhancements, including crosswalk enhancements, curb extensions (bulbouts), and wider sidewalks.
- **P-P3** Provide curb extensions (bulbouts) on all new streets, where feasible, and on select existing streets along primary pedestrian corridors.
- **P-P4** Continue to promote the inclusion of pedestrian improvements along and across Lawrence Expressway as the Lawrence Expressway Grade Separation (LEGS) study is implemented.

- P-P5 If Lawrence Expressway is elevated or placed below grade, encourage the provision of multiple east-west connections between Sunnyvale and Santa Clara neighborhoods on each side of the expressway.
- **P-P6** For new sidewalks in the Plan area, provide a minimum sidewalk width of ten feet inclusive of a minimum paved pedestrian travel zone width of six feet and a landscaped four-foot street buffer zone. Exceptions may be approved by the City's Public Works Department based on site-specific conditions, such as preserving existing mature trees.
- **P-P7** For new sidewalks along Sonora Court and the west side of San Zeno Way and Uranium Drive, provide sidewalks behind trees with a minimum pedestrian travel zone width of six feet. Sidewalks not in conflict with existing trees shall follow the dimensions in P-P6. Exceptions may be approved by the City's Public Works Department for the purpose of preserving existing mature trees.
- P-P8 For new sidewalks on the Santa Vittoria Terrace segment of the loop road, provide a minimum sidewalk width of 15 feet inclusive of a five-foot building zone, minimum paved pedestrian travel zone of six feet, and a landscaped four-foot wide street buffer zone per Figure 6.11. Exceptions may be approved by the City's Public Works Department based on site-specific conditions, such as preserving existing mature trees.
- **P-P9** Eliminate sidewalk gaps on Willow Avenue, Sonora Court, Uranium Drive (City of Sunnyvale side), and Kifer Road in the Plan area.
- **P-P10** Ensure that all new and improved pedestrian facilities are designed to comply with ADA standards.

BICYCLE IMPROVEMENTS

Encouraging the use of bicycles for local and inter-neighborhood access is a key priority of the LSAP. Achieving this use can help increase transit ridership, and reduce automobile usage, particularly for local trips. An essential requirement is a network of continuous, interconnected, and safe bicycle facilities that can be used by residents, workers and visitors.

As of 2021, in the Plan area there are few existing bike lanes or other facilities designated for bicycle transportation. Providing safe and direct designated facilities for bicycles within the Plan area is essential in order to improve connections to Lawrence Station, parks, schools, and other local destinations, as well as to adjacent neighborhoods and citywide routes.

Bicycle facilities are designated according to six levels of service or "Classes."

A Class I shared-use path is separated from motor vehicle traffic. Typically, Class I shared-use paths are designed as multi-use facilities, available for use by pedestrians, joggers, baby carriages, and skaters as well as bicycles. To accommodate all users, typical design standards for Class I shared-use paths include an overall width of 12-14 feet, including a hard surface of 8-10 feet wide and a two-foot-wide walking/jogging surface on each side. The City of Sunnyvale standard for Class I shared-use paths is 14 feet, exclusive of shoulders. As of 2021, a Class I shared-use path is present along the west side of 1020 Kifer Road, connecting Kifer Road to Sonora Court.

Class II bicycle facilities are striped bicycle lanes, typically on primary arterials and collector streets, designated for the exclusive use of bicyclists. Class IIB bicycle facilities are Class II facilities separated from vehicle traffic by a painted buffer. The buffer provides additional comfort for users by providing space from motor vehicles or parked cars.

Class III bicycle facilities are typically referred to as Bicycle Routes, where bicyclists share the street with vehicular traffic. While they do not have striped lanes, they often have bicycle route marking signs to guide bicyclists through the area, as well as street markings warning motorists of the

increased presence of bicyclists and the need to "share the road." Class III Bicycle Routes are typically located on secondary streets with low traffic volumes and design speeds. Class IIIB bicycle facilities are referred to as Bicycle Boulevards which are typically located on calm, local streets where bicyclists have priority but share roadway space with vehicles. There are shared roadway bicycle markings on the pavement as well as traffic calming features such as speed humps.

Class IV bicycle facilities are referred to as Separated Bikeways where an onstreet bikeway is separated from motor vehicle traffic by a curb, median, planters, parking delineators, or other physical barriers.

The Sense of Place Plan illustrates the bicycle network planned for the Plan area. When complete, the bicycle network will provide a continuous system of Class I, Class II, and Class IIB facilities that will allow safe connections throughout the Plan area.

The LSAP bicycle network has three key elements:

- Existing bicycle facilities. Facilities that already exist in and adjacent to the Plan area.
- Planned bicycle facilities. Facilities that are currently in the planning stages or already part of adopted plans by the City of Sunnyvale, the City of Santa Clara or the County of Santa Clara, but are not yet built.
- Proposed bicycle facilities. New facilities proposed by this Plan.

EXISTING BICYCLE FACILITIES

Lawrence Expressway and Central Expressway (Bicycles Permitted)

Both of these major arterial roadways allow bicyclists and currently contain striped wide shoulders. While these two facilities do provide long-distance bicycle access, because of the high vehicular speeds and traffic conditions, bicyclists are advised to exercise caution and the expressway should only be used by advanced bicyclists. Additionally, because Lawrence Expressway is grade-separated at the railroad tracks, access to Lawrence Station by bicycles is inconvenient and indirect.

Kifer Road (Class II)

Kifer Road contains on-street bicycle lanes east and west of Lawrence Expressway, with no striped buffers.

Reed Avenue (Class II)

In Sunnyvale, Reed Avenue currently contains on-street bicycle lanes with no striped buffers, which extend to the city limits at Lawrence Expressway. Bicycle lanes do not extend beyond that point into Santa Clara where Reed Avenue turns into Monroe Street.

Aster Avenue (Class II)

Aster Avenue includes on-street bicycle lanes that provide access to connect to existing on-street bicycle lanes on East Evelyn Avenue, just outside the Plan area.

PLANNED BICYCLE FACILITIES

Calabazas Creek Trail (Class I Shared-Use Path)

As of 2021, the City of Santa Clara is in the planning stages to improve the Calabazas Creek corridor as a linear park that will include a Class I multi-use pedestrian–bicycle trail. Although the trail is mostly in Santa Clara, a portion of it will traverse Sunnyvale in the northeastern quadrant of the Plan Area.

The Calabazas Creek Trail preliminary alignment is located along the west side of Calabazas Creek north of the tracks and on the east side of the creek south of the tracks. This trail will form the backbone of a key north / south bicycle connection and alternative to riding on Lawrence Expressway. The trail will provide linkages to many regional destinations, including the San Tomas Aquino on-street trail east of the Plan area. Therefore, future bicycle facilities that connect to Lawrence Station and neighborhoods southeast of the Plan area will connect to this trail.

Willow Avenue (Class IIB)

As of 2021, the City is in the planning stage to install on-street bicycle lanes on Willow Avenue from Reed Avenue to Aster Avenue. Also in 2021, a continuation of the bicycle lanes is in progress from Aster Avenue near Lawrence Station as part of the redevelopment project at 1155-1175 Aster Avenue.

PROPOSED BICYCLE FACILITIES

The Sense of Place Plan includes improvements to close the gaps in the existing and planned bicycle network through the development of an interconnected system of Class I and Class II facilities.

Class I Shared-Use Path Improvements

Capitalizing on the planned Calabazas Creek Trail east of Lawrence Expressway and a recently constructed shared-use path connecting Kifer Road to Sonora Court west of Lawrence Expressway, the Class I shared-use path network will be expanded in the Lawrence Station Plan area. This will include three important legs:

• A new north-south, and east-west Class I shared-use path would link Kifer Road near Commercial Street to the recently constructed shared-use path on the property at 1020 Kifer Road, which connects to Sonora Court. From Sonora Court, bicycles can access the station via San Zeno Way.



The pedestrian path that runs between Reed Avenue and Cassia Way provides important midblock connectivity for pedestrians. Additional such pathways (with improved landscaping and lighting) will be provided in all new development areas.

Figure 4.3: Bicycle Framework



- A new east-west Class I shared-use path would begin at the east end of the Plan area at Uranium Drive, cross over Calabazas Creek and connect with the future Calabazas Creek trail, then extend parallel to the tracks out to Lawrence Station Road, directly to the station.
- A new north-south Class I shared-use path would link Aster Avenue, crossing the rail line, and connect to Sonora Court, as discussed in the New Circulation Improvements section.

Class II and Class IIB Bicycle Improvements

On-street Class II or Class IIB bicycle lanes will be provided to close gaps between existing bicycle lanes on existing streets as well as provide bike lanes along new primary street corridors, including the following:

- Loop Road on Private Property. Class IIB buffered bicycle lanes along private property portions of the Loop Road will allow bicyclists to access the station and areas between the tracks and Kifer Road, both east and west of Lawrence Expressway.
- Uranium Drive. Class IIB buffered bicycle lanes will be provided on both the Sunnyvale and Santa Clara sides of the street, linking Kifer Road to Mead Avenue in Santa Clara.
- Sonora Court. Class II bicycle lanes will be provided on both sides of Sonora Court, linking the new Class I shared-use path at the terminus to San Zeno Way, and to Lawrence Station. Buffers are not proposed due to right-of-way constraints.
- Reed Avenue. Class IIB buffered bicycle lanes will be provided on both sides of Reed Avenue, at least in the Plan area boundary between Willow Avenue and Lawrence Expressway, and likely outside of the Plan area boundary to Evelyn Avenue or Wolfe Road.

Class III Bicycle Facilities

It is not envisioned that any street or circulation corridors will be designated as a Bicycle Route except for a portion of Willow Avenue from the 1155-1175 Aster Avenue site to the City boundary. The City of Santa Clara is also planning for Class III facilities on French Street, which transitions from Willow Avenue at the city boundary beneath the Lawrence Expressway overpass.

Open Space Connections

The Sense of Place Plan indicates, in a conceptual way, the location of new neighborhood open spaces in the future development areas of the Plan and the public linkages for pedestrian and bicycles to these open spaces. These open space locations and connections are conceptual and do not represent final specific locations. However, ensuring that all new open spaces are connected to publicly accessible streets, bicycle facilities and pedestrian linkages is an essential ingredient of the Plan and will be a required feature of future development proposals. Open spaces may be publicly dedicated or privately owned and maintained with public access easements.

Intersection Improvements

On streets with bicycle facilities, bicycle detection loops will be installed at signalized intersections to allow bicyclists to activate traffic signals without the need to dismount to use pedestrian push buttons and crosswalks. Detection of bicyclists at signalized intersections will also improve efficiency, decrease delay to bicyclists, and discourage red light running by bicyclists without causing inordinate delays to motorists.

Signage and Wayfinding

All Class I and Class II/Class IIB bicycle facilities will have directional signage and bicycle route marking signs directing bicyclists to Lawrence Station, parks, schools and other local and inter-neighborhood destinations.

Bicycle Parking and Storage

Together with perceived lack of safety riding on the streets, lack of secure bicycle parking is often cited in surveys as one of the top deterrents to bicycling. The provision of secure bicycle parking is, therefore, as essential to increasing bicycle ridership as the provision of safe bicycle lanes and routes. Bicycle parking and storage infrastructure is typically installed as part of a development project approved for property redevelopment.

The City of Sunnyvale has bicycle parking standards that are appropriate for the Plan area. Additionally, the Santa Clara Valley Transit Authority (VTA) has published bicycle parking guidelines that include elements appropriate for
the Plan area. The City of Sunnyvale's bicycle parking supply requirements for the Plan area include the following:

Long-term storage (>2 hours): Provide Class I bicycle parking, consisting of lockers, rooms with key access, or attended/unattended bike stations. This type of storage is appropriate at Lawrence Station, multi-family residential developments, and places of work.

Short-term storage (up to 2 hours): Provide Class II bicycle parking, consisting of racks with two points of contact that allow for locking at least one wheel as well as the bicycle frame. Bicycle racks are most appropriate to serve visitors to retail establishments, libraries, medical offices, office buildings, and residential buildings. Locate bicycle racks such that pedestrian circulation is not adversely impacted, security is maximized (i.e., in well-lit, visible areas with high volumes of foot traffic), and with a layout that maximizes parking capacity.

See Chapter 19.35 of the Municipal Code for minimum Class I and Class II bicycle parking requirements in the Plan area.

BICYCLE SHARING

Over time, as the Plan area becomes a more important destination in Sunnyvale, a bicycle sharing program could be initiated. A bicycle sharing system consists of a fleet of specially-designed, heavy- duty, durable bicycles that are locked into a network of docking stations located throughout a region. Bicycles can be rented from, and returned to, any station in the system, creating an efficient network with many possible combinations of start and end points.

Bicycle Goals



Encourage the use of bicycles for local and inter-neighborhood access by residents, workers, and visitors of all ages and abilities.

Bicycle Policies

- B-P1 Require property development to provide Class I, Class II and Class IIB bicycle facilities to fill in the gaps in the existing and planned bicycle network.

- **B-P2** Provide direct Class I, Class II, and Class IIB bicycle connections to the future Calabazas Creek Trail.
- **B-P3** Provide two new primary Class I shared-use paths at the east and west ends of the LSAP boundaries with access to Lawrence Station.
- **B-P4** Provide Class IIB (or Class II where determined by the City) bicycle access on the Loop Road.
- **B-P5** Connect new neighborhood open spaces with publicly-accessible streets, bicycle facilities and pedestrian linkages.
- **B-P6** Install bicycle detection loops at signalized intersections.
- **B-P7** Provide Class I or Class II bicycle parking per LSAP bicycle parking requirements.

PUBLIC TRANSIT

Commuter heavy rail (Caltrain), local bus, public and private shuttles currently serve the Plan area. See Figure 4.4 for the existing transit network.

COMMUTER HEAVY RAIL (CALTRAIN): LAWRENCE STATION

Data from the Caltrain 2019 Annual Passenger Count indicates Lawrence Station served 1,962 average mid-weekday passengers, including 1,004 onboarding and 958 offboarding. Historical ridership data indicates that the average weekday ridership at the station reached over 2,500 in 2001, indicating the station has the capacity to serve higher numbers of passengers than current ridership.

Diversifying land uses and increasing densities will support the long-term viability of Lawrence Station. Depending on the specific characteristics of land uses ultimately developed near the station, daily transit ridership is estimated to increase to levels comparable to those at the California Avenue Caltrain station in Palo Alto, a station that supports a range of users, including visitors and employees of the California Avenue retail district. There is potential for the Lawrence Station area to similarly become activated as the station and its surrounding mix of land uses generates a range of users and activities.

Lawrence Station was reconstructed in recent years and already has many station amenities, including covered benches, adequate signage, schedule information, ticket vending machines, a public pay phone, real- time message boards, shuttle access, and bicycle and vehicle parking. As the Plan area develops and access to the station is improved, increased ridership will likely warrant the provision of additional amenities, such as more bicycle parking.

LOCAL BUS SERVICE

In the Plan area, bus service is provided by the Santa Clara Valley Transportation Authority (VTA). However, VTA buses do not serve Lawrence Station directly, due to existing access issues. The only bus stop in the Plan area is the local-serving Route #21, with a stop approximately 1/4-mile from the station at the corner of Reed Avenue and Willow Avenue. Outside the Plan area is the local-serving Route 20 at Arques Avenue and Lawrence Expressway, just less than a mile from the station. The next nearest stop outside the plan area is on the frequent Route 57 at Bowers Avenue and Kifer Road in the City of Santa Clara, which is 1 ¼ miles from the station.

Figure 4.4: Existing Transit Network



COMMUTER SHUTTLES

While no VTA bus routes directly access the station, there are two public Caltrain shuttles that provide service, including:

- Bowers-Walsh: Between Lawrence Station and Bowers/Walsh area office buildings during commute periods.
- Mission: Between Lawrence Station and Mission College and Intel areas during commute hours.

The project area is also served by VTAs Altamont Commuter Express (ACE) Gray Line South Sunnyvale Shuttle that provides directional shuttle service (eastbound in AM and westbound in PM) along Kifer Road and connects the project area to the Great America ACE train station in Santa Clara.

In addition to the public shuttles, several private shuttles provide service between Lawrence Station and major employers within the Cities of Sunnyvale and Santa Clara.

ACCOMMODATING FUTURE TRANSIT

The limited bus transit connections within the Lawrence Station area are a result of low levels of demand and disconnected roadway access from nearby major roadway corridors. While in 2021, the VTA had no plan to add bus transit service within the Plan area, the agency will re-evaluate the need for new service as access to the station improves, new development proceeds and demand increases. As of 2021, Caltrain is planning additional commuter rail service to the station in conjunction with electrified operations. The higher intensity office/R&D, retail, and residential land uses established in this Plan will create an increase in transit demand. Therefore, the LSAP includes planning and design measures that will allow both bus and rail transit service to be expanded in the future as demand warrants.

The increased roadway connectivity and mixed land uses will have a positive effect on the potential for direct bus access to the area. Potential transit connections south of the Plan area include re-routing VTA Route #21 on Reed Avenue/Monroe Street to the southbound platform.

North of the tracks, the Loop Road greatly increases the potential for transit connectivity to the northside of the station. Opportunities to signalize



intersections, as summarized earlier in this chapter, should be evaluated in coordination with potential transit route accessibility.

Bus Transit Stop Improvements

In addition to potential bus route modifications, new and improved bus transit amenities will enhance the experience for transit patrons. Most existing bus stops along Kifer Road and Reed Avenue have minimal stop amenities and frequently only include a bus stop sign, without furnishings or shelters. Therefore, bus pull-outs, and added stop amenities such as shelters, furnishings, lighting and signage will be provided along the Loop Road, Kifer Road, Reed Avenue, and all other potential future bus routes wherever local conditions allow.

Public Transit Goals

PT-G1 Improved public transit in the Plan area, including both commuter rail and bus service.

Public Transit Policies

- **PT-P1** Work with Caltrain to reevaluate the adequacy of amenities, such as bicycle parking, seating, and shelters, at Lawrence Station as ridership numbers increase.
- **PT-P2** Work with VTA to evaluate the requirements for new bus service as access improves, development proceeds and demand increases.
- **PT-P3** Work with VTA to assess the potential re-routing of existing bus service to directly reach Lawrence Station.
- **PT-P4** Provide bus stops with bus pull-outs, shelters, furnishings, lighting and signage along the Loop Road, Kifer Road, Reed Avenue and all other future bus transit streets in the Plan area. Coordinate with the VTA on locations and design details.
 - **PT-P5** Locate bus stops on the Loop Road approximately every 1/4-mile (1,300 feet) or per recommendation from the VTA.

PARKING

The provision and management of the parking supply in the Lawrence Station Plan area is closely associated with how people travel to and from the area. Parking should be considered not in isolation, but in conjunction with pedestrian and bicycle access, transit availability, and land use decisions. In addition, while the implementation of individual parking strategies can contribute to the overall success of the transportation element for the project, the use of complementary and coordinated strategies will compound benefits.

Table 4.1 describes parking strategies that will be implemented as the Plan area is developed over time.

Parking strategies are organized into the following three sections:

- Parking Supply
- Parking Management Strategies
- Transportation Demand Management (TDM) Programs.

It is critical that parking supply in the Plan area be effectively managed and not overbuilt in the future. The provision and management of parking should be such that it:

- Does not create an overabundance of parking, which may end up as an invitation to driving.
- Discourages auto trips for those who have an option to travel by other modes, including walking, bicycling and transit.
- Serves those who must drive and might not make the trip if they perceive that parking will not be available when they arrive.

Existing Parking Supply

Historically, there is an overabundance of on- and off-street parking in the Plan area. The 122-space Lawrence Station parking lot, which charges a fee for parking, is typically only 10-20 percent occupied. In order to avoid paying the parking fee, additional station-related park-and-ride demand is met onstreet, particularly on Sonora Court. Despite the use of on-street parking by Caltrain riders, on-site observations indicate there is sufficient on-street parking for other drivers.

The overabundant parking supply in the Plan area provides an opportunity to manage future supply so that it promotes and supports transit and more closely relates to the needs of employers and residents of the area.

Parking Supply Requirements

Parking requirements for development within the Plan area are codified in Chapter 19.35 of the Zoning Code. Additional reductions in parking requirements will be allowed based on the specific characteristics of the supply in question (e.g., senior housing, affordable housing) and on the incorporation of parking management strategies.

Applying the LSAP Parking Requirements in Chapter 19.35 of the Zoning Code could potentially reduce parking needed by up to 50%. This would amount to a potential savings of land or structured parking floors of approximately 208 acres that could be used for other purposes and also reduce development costs.

PARKING MANAGEMENT STRATEGIES

Shared Parking

Restricting the availability of any parking pool to a single use (i.e. only residential or only office), results in poor utilization of the parking supply. The LSAP provides a great opportunity for the implementation of a shared parking scheme that can greatly reduce parking requirements on an individual basis. For example, office/industrial/R&D parking lots and garages see peak parking demand during the daytime whereas residential parking is most needed in the evening, nights and weekends. Rather than providing distinct parking supplies to meet these complementary uses, the same parking supply can be used by employees during the day and residents in the evenings and at night, significantly reducing parking requirements for both land uses and making their development more economically feasible.

Shared parking will be phased into the Plan area as development takes place. Initial developments will need to provide parking at the higher end of the

Table 4.1: Parking Strategies

Priority	Parking Strategy
Short-Term	All land uses:
	Reduce the requirements for off-street parking (reflected in Chapter 19.35 of the Sunnyvale Municipal Code).
	Provide bicycle parking.
	Unbundle parking costs from property costs.
	Lawrence Station:
	Work with Caltrain to find the appropriate price to attract drivers to the station parking lot and improve its utilization.
	Retail, Office/R&D, Industrial:
	Allow credits for TDM Program demonstrating high alternative mode share and corresponding to lower parking requirements on a case-by-case basis.
Mid- and Long- Term	Residential, Office/R&D, Industrial:
	Encourage shared parking.
	Residential:
	Encourage car sharing.

rates as outlined in Chapter 19.35 of the Zoning Code, since they will have less opportunity for shared parking in the initial development phases. Later developments can provide less parking and use available shared parking supply.

Shared parking requirements should be in place ahead of development and be implemented as nearby complementary land uses come online. If possible, it would be beneficial to phase development so that complementary projects are completed around the same time, so that shared parking can be implemented as soon as new projects are occupied.

Structured Parking

Where feasible, parking should be provided in structures rather than surface lots to avoid developments surrounded by parking lots. Although structures

are more expensive, there are potential cost efficiencies associated with constructing consolidated, shared parking structures, or constructing parking structures concurrent with a new development. Additionally, parking structures allow for higher densities to be built, especially on smaller sites.

Planning for a parking structure should be considered when a shared parking analysis for proposed customer-serving uses (retail, restaurant) indicates that there are insufficient parking spaces (either surface or structured) located within a 1/4-mile radius of the development to serve the estimated parking demand.

Parking structures can also be integrated into housing as well as retail and office/industrial/R&D uses. However, the implementation of shared parking garages should only occur when there is substantial densification of the Plan area and a focus of uses (such as retail) that triggers the need for an adjacent high-capacity parking facility.

Unbundling

There is frequently a mismatch between the fixed number of parking spaces provided with a unit of housing and the household's needs. Furthermore, a fixed parking provision raises the cost of housing and hides the true parking cost.

"Unbundling" parking is a strategy that sells or rents parking separately from the price of a residence or commercial lease. Unbundling parking from property costs provides transparency to the cost of parking so that people can make better informed decisions about housing and car ownership costs. It also makes better use of the parking supply by allowing parking spaces that would have been allocated to carless households to be used by households with additional cars. Unbundling is also complementary to shared parking since any excess supply of spaces can be leased or rented to outside entities on a short-term basis, provided every unit has the option to access to at least one space. As of 2021, unbundled parking is not allowed elsewhere in the City, but the Plan area provides an excellent opportunity for trial utilization. In the case of commercial tenants, commercial leases can unbundle parking (parking spaces are leased separately rather than automatically included with building space), and list parking as a separate line item (parking rents are listed separately from building rents).

Car Sharing

Car sharing is a complementary strategy to the reduction of the parking supply because it meets the needs of people who typically drive a car infrequently and leave it parked the rest of the time. Empirical research has found that the availability of shared cars can significantly reduce car ownership, which has a direct impact on the need to provide parking. Thus, encouraging car sharing among employees and residents is an important strategy in the LSAP.

Lawrence Station is an excellent initial opportunity site for a small number of car sharing spaces. For comparison, car sharing is currently provided at the Redwood City station (three spaces), the downtown Palo Alto station (two spaces), and the San Jose Diridon station (two spaces). Initially, one car sharing spot for Lawrence Station would be appropriate. As development occurs and ridership increases, the number of car sharing spaces can increase to two or even three spaces, depending upon demand.

Residential Permit Parking (RPP)

RPP programs can be considered as a mechanism to regulate on-street parking only if needed. Such programs are counter to optimized utilization of the fixed parking supply, because they restrict who can park and at what times. In addition, since such programs typically place restrictions on how long non-residents can park, their enforcement tends to be inefficient because parking control officers must establish that a car has been parked for a certain period of time before a citation can be issued.

The program could also be designed carefully to prevent underutilization of one type of parking and oversubscription elsewhere. For example, the residential parking permits should not be given to residents of developments where there are parking spaces available for rent or purchase. This will ensure that the on-street parking remains available for short-term visitors rather than being used for long-term auto storage.

RPP restrictions and the provision of additional parking at Lawrence Station should be implemented only if and when empirical data demonstrates an unambiguous need for such measures.

Parking Goals

PK-G1 Reduce future parking supply so that it promotes and supports transit ridership as well as the needs of local retail, employment and residential uses.

Parking Policies

- **PK-P1** Maintain specific parking requirements for all new development in the Plan area.
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 - **PK-P2** Establish a shared parking program in advance of development, with the following features:
 - a. Require developers to submit a shared parking analysis.
 - b. Allow new development to either provide sufficient off-street parking supply to meet the incremental increase in parking demand associated with the proposed project, and/or lease parking spaces from earlier parcel owners who have available parking located adjacent to the development parcel (within 1/4 mile radius or closer).

- c. Require new residential development to provide no more than 2 parking spaces per residential unit for exclusive use by residents. Additional parking supply that may be needed for the development shall be provided in shared facilities that will be required to be open to all users, including transit station patrons.
- d. Require management by the parcel owner.
- e. Verify the accuracy of the parking demand estimates of the shared parking model based on interim parking demand counts over the course of the build-out of the Plan area. Conduct parking counts during the peak parking demand period as identified in the shared parking analysis: weekday afternoons in December. Parking ratios in the shared parking model shall be calibrated to the parking demand counts if there is a significant discrepancy.
- **PK-P3** Plan for structured parking as demand increases. This can be in the form of a stand-alone parking structure for nearby users, or shared parking integrated with residential or office/R&D uses.
- **PK-P4** Unbundle parking costs from property or lease costs, provided that every unit has the option to access at least one parking space.
- **PK-P5** Work with Caltrain to provide parking spaces at Lawrence Station for the exclusive use of car sharing vehicles.
- **PK-P6** Establish a residential parking permit (RPP) program in the Plan area in the future if / when analysis demonstrates a need for such measures, and if funded by property owners.

TRANSPORTATION DEMAND MANAGEMENT

Jurisdictions in the Bay Area increasingly require Transportation Demand Management (TDM) strategies designed to reduce the number of people driving alone to and from their place of business (and in some cases residence) in favor of walking, bicycling, taking transit or shuttles, carpooling or vanpooling. Common TDM strategies include providing shuttle service, providing bicycle parking and "end-of-trip" facilities (showers, lockers), marketing campaigns to discourage auto trips, offering transit passes to employees, providing dedicated carpool/vanpool parking spaces, offering cash in place of a free parking space (parking cash-out), and charging for parking.

Currently, Sunnyvale has a codified TDM requirement for higher intensity office/industrial development, and multi-family residential development. As a condition of project approval, other sites have been required to implement a TDM program. Many large employers have had experience with TDM and understand the benefits of implementing such a program. Given the high proportion of auto usage in Sunnyvale, there is a great opportunity to realize benefits from TDM programs.

New nonresidential development in the Plan area will be required to implement a TDM program with robust monitoring measures. For example, office/R&D developments will be required to meet a daily trip reduction target of at least 20 percent and a peak hour trip reduction target of at least 35 percent. TDM trip reduction for residential and retail uses is more difficult to achieve than for office uses. However, residential and retail projects will also be required to develop TDM programs and meet specific targets. Residential uses will be required to meet the adopted Multi-Family Residential TDM program goals.

Transportation Demand Management (TDM) Goals TDM-G1 Reduce vehicle trips in the Lawrence Station Plan area through TDM programs.

Transportation Demand Management Policies

TDM-P1 Encourage businesses and property owners to collaborate on areawide TDM strategies for their sites in the Plan area.

- TDM-P2 Achieve a daily trip reduction target of 20 percent and a peak hour trip reduction target of 35 percent for new Office/R&D development.
- TDM-P3 Achieve a peak hour trip reduction of 5% for new retail development
- **TDM-P4** Encourage the provision of the following features as part of a TDM program for the Plan area:
 - a. Provide shuttle service
 - b. Provide bicycle parking and end-of-trip facilities (e.g., lockers, showers)
 - c. Create marketing campaigns to discourage auto trips
 - d. Offer free transit passes to employees
 - e. Dedicate carpool/vanpool parking spaces
 - f. Offer cash in place of a free parking space (parking cash-out)
 - g. GreenTrip registration.

UTILITIES AND PUBLIC SERVICES

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Public infrastructure, in the form of utilities and public services, is a very important part of the long-term success of a neighborhood, district or city. These facilities must not only be carefully planned for but they must also be provided in a timely manner, whenever possible in anticipation of growth rather than lagging behind and in response to growth.

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UTILITIES AND PUBLIC SERVICES

Public utilities and public services such as schools and emergency services are an important part of the long-term success of a neighborhood, district or city. These facilities must not only be carefully planned for but they must also be provided in a timely manner in anticipation of growth. This section outlines the basic components of public infrastructure and public services that will be needed in the Plan area.

UTILITY INFRASTRUCTURE

The capacity of existing city-owned utilities to accommodate planned growth was assessed for the Plan area in 2015 for the original LSAP and in 2021 for the LSAP update. Estimated improvements that may be required are discussed in the sections that follow. Analysis of proposed conditions is limited to storm drainage, potable water supply and wastewater management within the incorporated boundary of Sunnyvale. Other utilities, including telephone, cable, gas and electric infrastructure are supplied by their respective private franchise operators and are not a part of this discussion.

STORM DRAINAGE

The City of Sunnyvale owns and maintains the local storm drainage facilities in the Plan area. These local systems discharge into a regional system, under the jurisdiction of Valley Water, formally known as the Santa Clara Valley Water District (SCVWD), which conveys storm run-off to the San Francisco Bay.

In the Plan area, Valley Water facilities include the El Camino Storm Drain Channel (ECSDC) and Calabazas Creek. From the residential neighborhood located to the southwest of the Plan area, the ECSDC flows northward and then eastward, running along the railroad's southern edge before connecting to Calabazas Creek, approximately one-half-mile east of Lawrence Station. Calabazas Creek flows from south to north connecting into the San Tomas Aquino Creek which empties into Guadalupe Slough approximately 3-miles north of the ECSDC confluence.

Planned Drainage Improvements

Drainage improvements within the Plan area will be required to conform to the parameters set forth by the City and Valley Water. The City's development policies address storm drainpipe design for capacity and quality. Storm drains are to be sized per the current Santa Clara County Drainage Manual. Storm drains are required to accommodate a 10-year design storm and postdevelopment flow rates cannot exceed pre-development flow-rates, on a project-by-project basis.

As of 2021, new developments that create or replace more than 10,000 square feet of impervious surface must comply with Provision C.3 of the Municipal Regional Permit (MRP) and with California State Water Board requirements. The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has published a "C.3 Stormwater Handbook" that assists developers in meeting local municipal and State regulations through the use of Low Impact Design (LID) strategies.

The Plan area is underlain by soils with low percolation rates. Therefore, infiltration is generally not practical. In such situations, commonly-accepted LID strategies include treatment methods such as bio-retention basins and flow-through planters, as well as green roofs, media filtration devices and utilization of pervious surfaces.

While it is typical for individual, private projects to incorporate treatment systems within their individual sites on a project-by-project basis, provisions for treatment of run-off from either new or newly widened public streets will also be required.

The Plan is developed land with high percentages of impervious surfaces that direct storm water runoff directly into the public storm drain infrastructure with little to no retention or treatment. As projects are implemented that comply with the MRP requirements, it is anticipated that the overall percentage of impervious surface within the Plan area will decrease, so additional mitigations for storm water peak flow conveyance, either incorporation of detention facilities to attenuate peak flows, or upsizing of existing conveyance facilities to accommodate increased peak flows, is not anticipated.

Local storm drainage infrastructure that collects and conveys runoff to major storm drain systems will need to be reconfigured to accommodate redevelopment. New streets and shared-use paths/pathways serving new development will contain new storm drainage systems that will comply with City of Sunnyvale design standards and specifications.

Flood Plain Management

Areas along the southern portion of Lawrence Expressway and near the railroad right-of-way are identified (as of 2021) by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) to be within Zone AO, as is shown in Figure 5.1. These properties have a 1% or greater chance of flooding each year (often referred to as "the 100-year event"), with an average inundation depth of 1-to-3-feet.

The sites at 1155-1175 Aster Avenue (former Calstone/Peninsula Building Materials site) is within Zone AO, and the redevelopment project raised the grades by importing fill material, by an average of 1.5 feet to elevate the building floor and mechanical features above the Base Flood Elevation per City policy on construction within Flood Zones. A Conditional Letter of Map Revision by Fill (CLOMR-F) was required to ensure that fill within the existing flood plain does not adversely affect other properties.

^{5.2} LAWRENCE STATION AREA PLAN

Figure 5.1: Flood Plain



LEGEND

- •••• STUDY AREA BOUNDARY
- CITY BOUNDARY
- EL CAMINO STORM DRAIN CHANNEL/ CALABAZAS CREEK
- LAWRENCE CALTRAIN STATION (EXISTING PEDESTRIAN / BICYCLE UNDERCROSSING)

FLOOD PLAIN INFORMATION



ZONE A - AREAS SUBJECT TO INUNDATION BY THE 1% CHANCE FLOOD EVENT, FLOOD DEPTHS NOT ESTIMATED

POTABLE WATER

Water Supply and Demand

The City of Sunnyvale has adequate water supply commitments, through its local wells and its contracts with Valley Water and the San Francisco Public Utilities Commission (SFPUC), to reliably meet the projected water needs of its residents and businesses for the foreseeable future.

Notwithstanding the above, in order to comply with the provisions of Senate Bills 610 and 221, which both passed the California State Senate in 2001, the City of Sunnyvale is required to prepare a Water Supply Assessment (WSA) that defines the Plan area as a single project, and verifies that adequate water can be supplied to the area, consistent with the assumptions of the LSAP. The increased demands within the Plan area can then be incorporated into the baseline assumptions for any subsequent water supply analysis within the city. The WSA conducted for the 2021 Plan amendment found that the City has adequate water supply to accommodate the plan buildout under normal, single dry, and multiple dry year conditions between 2020 and 2040.

Water Distribution

The water distribution system is owned by the City of Sunnyvale and operated by the Department of Environmental Services; it consists of a pipe network which lies predominantly beneath the traveled roadways in the public street rights of-way, and a system of reservoirs that store water and regulate pressures. Over 80% of the distribution and trunk lines in the City were installed in the 1960's and are nearing the end of their estimated 50year service life, so rehabilitation and/or replacement is needed to minimize the need for emergency repairs.

Many of the distribution lines to and within the Plan area are 8-10 inches in diameter and pressures are between approximately 75 pounds per square inch (psi) and 90 psi. Like the City as a whole, these lines are mostly located within public street rights-of-way. As new projects are developed and new private streets are installed, new private distribution mains will be needed to serve fire and domestic water needs.

Overall, the densities of development projected for the Plan area will represent an increase over existing conditions, which will, in turn, increase domestic and fire water demand in the area. The infrastructure analysis that was conducted for the 2021 Plan amendment concluded that existing infrastructure would be sufficient to serve the plan buildout.

Hydraulic analyses for individual projects will be required based on final land plans, building types, water demand estimates, fire flow requirements and phasing, in order to establish final, actual line sizes in each street, as well as confirm that the existing mains are adequate.

Recycled Water

Recycled water can be appropriate for developments with large nonpotable water demands. The City of Sunnyvale Recycled Water Feasibility Study provides guidance on how the City intends to develop its recycled water delivery network.

Currently, there is a storage tank and pump station north of the rail lines. A new recycled water main line, referred to as "Kifer East," is to be constructed along Kifer Road, from the existing main in Wolfe Road across the Plan area.

Service within the Plan area is included as an optional project in Phase 3 out of 4 phases of the recycled water development program. Completion dates are not set but late phasing indicates that this region has comparatively high costs to benefits. Development contemplated in the LSAP could move this area to a higher priority rank when the recycled water plan is updated in the future.

When recycled water arrives in the Plan area, landscape improvements along the Loop Road and new shared-use paths/pathways will provide an opportunity for recycled water irrigation. Additional opportunities for the use of recycled water include site landscape improvements for mixed-use residential, office/R&D and industrial uses, dual-plumbed buildings, as well as for public open space. The plan prohibits the use of recycled water irrigation under the dripline of Redwood and Cedar trees. The Feasibility Study for Recycled Water Expansion explains that the City intends to fund expansion of the recycled water system through grants, low-interest loans, partnerships with neighboring agencies, and user rates.

WASTEWATER MANAGEMENT

Wastewater from the Plan Area is conveyed through the City's wastewater collection system to the Donald M. Somers Water Pollution Control Plant (WPCP), which is approximately four miles north of Lawrence Station. In 2014, the City began construction on upgrades that are part of a 20year improvement program to bring much-needed repairs to the plant and accommodate new regulations and technology. The WPCP has an existing capacity to treat 29.5 million gallons of wastewater per day (MGD) before discharging to the San Francisco Bay. It is currently operating at approximately 50% of its capacity, as projections made in 1983 anticipated higher levels of industrial land uses and wastewater flow levels than have been realized. As a result of the upgrades, the average dry weather flow processing capacity of the WPCP would be reduced from the existing 29.5 MGD to 19.5 MGD. While the existing capacity can accommodate the plan's buildout, with the decrease in capacity at the upgraded WPCP, there would be insufficient capacity in the future for the plan's buildout. The City will be updating the WPCP Master Plan with subsequent environmental review in the near future to include sufficient treatment capacity for existing and planned development and additional growth.

Most wastewater from the Plan area is conveyed to the WPCP through a trunk main that flows from south to north in Lawrence Expressway. That trunk main is fed by a series of smaller public mains and private laterals. The conveyance facilities consist of gravity pipe lines made predominantly of vitrified clay (VCP), but mains are also constructed of various other materials including polyvinyl chloride (PVC), high density polyethylene, reinforced concrete, ductile iron, and cast iron. There is also a single wet well lift station on Kifer Road located at the crossing over Calabazas Creek.

In order to determine what the wastewater infrastructure needs for the Plan area may be, baseline sewage generation for the existing conditions was estimated, based on rates published in the Sunnyvale Sewer Master Plan, supplemented by manhole survey data and flow monitoring in certain locations and record drawings provided by the City. No adjustment was made for future conservation measures which may reduce expected demands by customers. Wastewater generation for the Plan area will increase in the future due to the uses and densities envisioned in the LSAP. An analysis was conducted of the proposed buildout of the 2021 update to the LSAP. The analysis found the existing Kifer Road lift station has enough capacity to serve the LSAP buildout. However, for the increase in residential development, the existing sanitary sewer system has three pipelines that do not meet design criteria:

- Existing 10-inch VCP sewer main located in San Zeno Way, connecting into Kifer Road.
- Existing 10-inch VCP sewer main located at the intersection of Willow Avenue and Aster Avenue.
- Existing 27-inch VCP sewer main in Lawrence Expressway, north of Kifer Road in the City of Santa Clara, but under the jurisdiction of the City of Sunnyvale.

A sanitary sewer infrastructure impact fee is established with the Plan update to cover the costs of these required improvements. Developers may also make the upgrades in lieu of fee payment.

Utilities Goals

- **U-G1** Ensure that storm water management programs in the Plan area achieve overall storm water quality compliance at both the individual project level as well as the area-wide level.
- **U-G2** Provide each development area with a water conveyance system that is capable of delivering adequate flow and pressure to meet Uniform Fire Code requirements for all proposed buildings.
- **U-G3** Provide each development area with an available public sewer main that is capable of conveying wastewater to the City's Water Pollution Control Plant.
- **U-G4** Provide each development area with the highest telecommunication bandwidth connectivity available.
- **U-G5** Avoid flooding of new development by requiring flood prevention measures for those developments located in the flood zone.

Utilities Policies

- **U-P1** Promote the use of bio-retention basins and flow-through planters, as well as green roofs, infiltration trenches, media filtration devices, and pervious surface treatments as a part of stormwater management strategies for new development.
- **U-P2** Prepare standards for the Loop Road and shared-use paths/pathways that allow storm water to be treated "at the source."
 - U-P3 Prepare a comprehensive, area-wide plan for storm water management and treatment.
- **U-P4** Ensure adequate land area is allocated for area-wide storm water management and treatment facilities.
 - U-P5 Require all finished floors for proposed habitable structures to have at least 0.5-feet freeboard to the 1% Flood Elevation.
- **U-P6** Minimize the use of irrigation-dependent landscape improvements for public streets, rights-of-way, and open space.
- **U-P7** In areas where large irrigation demand is anticipated, construct improvements such that they can be efficiently switched to recycled water when it is available.
- **U-P8** Establish a program to encourage the use of recycled water for landscape improvements on private development projects.

- **U-P9** Require developers to coordinate with telecommunication providers and have the necessary infrastructure installed.
- **U-P10** Prepare a regional sewer system master plan that identifies an overall plan and incremental public improvements that will be required for area build-out based on capacity or rehabilitation to reduce in flow and in filtration.
- **U-P11** Establish a sanitary sewer infrastructure impact fee for residential developments that contribute to sanitary sewer impacts found for the plan update.
- **U-P12** Prepare a regional master domestic and recycled water delivery plan, including hydraulic model, based on assumed building densities, height and construction types, that delineates infrastructure needs for area build-out.

^{5.6} LAWRENCE STATION AREA PLAN

PUBLIC SERVICES

Schools

The Plan area is served by the Sunnyvale School District (elementary and middle school) and Fremont Union High School District (high school). The Plan area is within the attendance boundary of Ellis Elementary School. Students from Ellis Elementary attend Sunnyvale Middle School, both of which are in the Sunnyvale School District. High school students attend Fremont High School, one of several high schools in the Fremont Union High School District.

Public Safety

The Sunnyvale Department of Public Safety provides fully integrated public safety services including Police, Fire, and Emergency Medical Services. This model of service delivery requires each sworn officer to be fully trained in all three disciplines. The Police Bureau operates out of Public Safety Headquarters at 700 All America Way. The closest fire stations are Station #2 (approximately 0.5 miles west of the plan area) and Station #4 (approximately 0.5 miles southwest of the plan area). The City of Santa Clara Fire Department also has a fire station on Corvin Drive, just north of the plan area boundary. Public services, such as fire stations, are a permitted use in all LSAP zoning districts.

Recreation

As of 2021, there are no public parks or recreational facilities in the plan area. The closest public facilities in Sunnyvale are Ponderosa Park (0.45 miles to the southwest) and Fair Oaks Park (0.65 miles to the northwest). A future two-acre public park will be built approximately 0.5 miles south of the plan area at Lily Avenue and Toyon Avenue (former Corn Palace site). There are, however, two recently approved private parks with public access easements-at the mixed-use project at 1120-1130 Kifer Road, and at another mixed-use project in the 1100 block of Aster Avenue (former Calstone/Peninsula Building Materials site). There is also park space planned in the City of Santa Clara's LSAP located northeast of Kifer Road and Lawrence Expressway.

URBAN DESIGN AND STREETSCAPE GUIDELINES

The character of the built environment is an important component of the success of city districts and neighborhoods. The significant change that is likely in the Lawrence Station Area over time requires that clear design guidelines be put in place to direct the design of buildings, their sites, and the surrounding public environment of streets and open spaces. This chapter describes and illustrates these guidelines.

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URBAN DESIGN

Urban design focuses on the design of the physical environment, with particular emphasis on the character and design of the public realm, neighborhood identity, livability and sense of place. This chapter describes goals, standards and guidelines that focus on the future character and built form of the Plan area.

The Plan area and its surroundings have a relatively short history as a built urban environment. Much of what is seen today in the Plan area was built after World War II in the 1960s and 1970s. Prior to this time, the area was known for vast acreages of agricultural land, particularly orchards. The layout and development pattern in the area is a result of this development history, with an rectilinear pattern based on the original agricultural grid, infilled with post-war suburban development of large parcel development, discontinuous street patterns, curvilinear streets (especially in residential neighborhoods), and low scale buildings.

In 1962, the system of County expressways, including Lawrence Expressway and Central Expressway, was established, with subsequent widening and grade separations in intervening years. These expressways were also aligned with the north/south grid, further strengthening the underlying urban framework of the Plan area. This underlying grid pattern has been used as the basis for the physical framework of new streets and blocks of the LSAP.

DEVELOPMENT VISION

The Plan area contains a variety of neighborhoods, districts and places with differences in scale and character and varying opportunities for conservation and development. The character and scale of development in the Plan area, as well as the surrounding areas, is noticeably different north and south of the Caltrain rail tracks.

South of the Caltrain tracks, land uses are primarily residential and development is typical of suburban neighborhoods developed as large tracts after World War II. These neighborhoods are stable and attractive places to live, with attractive tree-lined streets and single and multi-family buildings. Since these areas were developed for vehicular access, pedestrian and bicycle access is often missing or incomplete, and walking to the Caltrain station is circuitous and challenging.

In the area south of the railroad tracks, the overall scale of development will change in select locations, with policies to protect and enhance the character and quality of existing residential neighborhoods. This protection will include ensuring adequate scale transitions between existing neighborhoods and new development areas. In select locations, such as 1155-1175 Aster Avenue and the corner property at Reed Avenue and Willow Avenue/Lawrence Expressway, new, higher intensity development is envisioned or has been approved. These guidelines will help ensure that the development is compatible in scale and character with the surrounding residential neighborhoods.

The area north of the tracks is generally characterized by very large parcels, currently occupied by primarily one-story industrial, research-and-development (R&D) and warehousing uses, as well as a large format retail (big box) establishment. Excluding the few sites that redeveloped in recent years, building coverage and overall intensities are low. Parking is typically in surface lots surrounding buildings.

North of the tracks, the LSAP envisions a future that is a departure from the existing pattern of low scale buildings and parking lots. Reflecting the overall trend toward higher-density development for multi-family residential, office and R&D in Silicon Valley and increasing land values, this area will be allowed

and encouraged to naturally transition to a more urban scale, consistent with this Plan and the design guidelines of this chapter. Over time, the area north of the tracks will become a regional and local urban hub, job center, and new neighborhood for urban living, served by a diverse multi-modal circulation system.

The design guidelines in this chapter will help shape this physical development process. The design guidelines that follow have two general categories:

- 1. Area-wide guidelines that apply to the Plan area as a whole.
- 2. Specific Area Guidelines which apply to subareas within the Plan area.

These guidelines apply to new development of specific parcels, private and public, within the Plan area.

In addition, this chapter provides guidelines for the design of private streets and public rights of way (Streetscape Guidelines).

The guidelines include language that expresses a standard, which must be followed by using the terms: "shall," "must," or "required." Guidelines that are more qualitative and express design intent use the terms: "should," "may," "encouraged," and "discouraged."

Proposed deviations to guidelines that express a standard may be considered on a case-by-case basis as part of the planning permit review process by the body holding the public hearing or Director of Community Development making the decision on the permit.

^{6.2} LAWRENCE STATION AREA PLAN



Small-scale streets and pedestrian lanes can be used to create a street and block pattern scaled to pedestrians, bicycles and motor vehicles that provides direct connections to transit, parks, and important neighborhood destinations.

AREA-WIDE GUIDELINES

Several guidelines apply to all areas throughout the Plan area. These include Sustainability, Connectivity, Industrial to Residential Transition, Site Planning, Building Design, Open Space and Landscape, and Parking.

SUSTAINABILITY

Sustainability is a key value of these urban design guidelines. The Plan's overarching concepts and goals are inherently sustainable, as they encourage transit use, promote bicycling and walking instead of driving, and encourage land use diversity and flexibility. The urban design guidelines, however, focus on the individual design aspects that will make the Plan area a livable and desirable place. The design guidelines in the Plan supplement specific Citywide sustainability policies and programs, such as the Reach Codes. Many of the guidelines have been included to ensure that the LSAP upholds the City's commitment to sustainability. Those that have strong environmental sustainability content have been noted with the following symbol.



CONNECTIVITY

A primary goal of the LSAP is to improve circulation and connectivity for all modes of travel, particularly pedestrians, bicyclists and other forms of transit, such as buses. One of the most important considerations in achieving this goal is establishing the new framework of the Loop Road, shared-use paths, and pathways that allow access through the Plan area without lengthy and discouraging diversions. The Loop Road also provides new opportunities for vehicular traffic circulation and access to land and buildings. The new framework emphasizes improved north-south connectivity, both to provide access to Lawrence Station as well as to link the neighborhoods on both sides of the tracks together and to improve access to regional transportation facilities such as Central Expressway. The Sense of Place Plan illustrates the location and criteria for this new framework.

As of 2021, there is no portion of the Plan area that has been developed with an idealized street and block pattern. Between Reed Avenue and the

railroad tracks, the multifamily developments include internal walkways and open spaces that provide circulation routes for local residents but not the public at large. The curvature of Willow Avenue also results in a longer and circuitous route to the station. The industrial development pattern of the area north of the Caltrain tracks evolved with only one pedestrian/bicycle connection across the rail corridor and very large block sizes suited to truck and automobile access to serve the low scale industrial uses.

Connectivity Policies

- **CON-P1** Carry out the Sense of Place Plan's publicly-accessible framework of the Loop Road, shared-use paths, and pathways scaled to pedestrian and bicycle users, with the Loop Road accessible to all modes of travel.
- **CON-P2** Achieve nearest term construction of the publicly-accessible Loop Road, shared-use paths, and secondary pathways/roadways by providing incentives for private development projects and the option to transfer development rights for construction of the improvements on offsite properties.
- **CON-P3** Obtain funding for the pedestrian and bicycle rail crossings identified in the plan.
- **CON-P4** Work with the County of Santa Clara to assure that the changes to Lawrence Expressway associated with the grade separation project do not inhibit connectivity within the Plan area.

Connectivity Guidelines

- **CON-UDG1** On properties where the Sense of Place Plan identifies the location of the new Loop Road, shared-use paths, and secondary pathways/roadways, development projects shall be required, at a minimum, to provide a public access easement for their future construction. Development incentives may be provided for the construction of the improvements.
- **CON-UDG2** The Loop Road, shared-use paths, and secondary pathways/ roadways should follow the locations, cross sections, and alignments shown in the Sense of Place Plan.
- **CON-UDG3** If, upon development review, the City determines that creating the Loop Road through a property identified on the Sense of Place Plan is not immediately feasible, property owners shall construct an initial shared-use path per the locations, cross

sections, and alignments shown in the Sense of Place Plan and reserve public space for future implementation by recording a public access easement.

- **CON-UDG4** Ensure that the Loop Road connects to Kifer Road and Corvin Drive east of Lawrence Expressway and Kifer Road and Semiconductor Drive/Santa Vittoria Terrace west of Lawrence Expressway, with direct access to Lawrence Station via Sonora Court and San Zeno Way.
- **CON-UDG5** Utilize Sonora Court and portions of San Zeno Way and Lawrence Station Road to bridge the loop road and primary Class I shared-use path connections between the east and west sides of Lawrence Expressway.
- **CON-UDG6** Ensure the primary Class I shared-use paths provide a direct path from Kifer Road to Sonora Court, west of Lawrence Expressway; and from Uranium Drive to Lawrence Station Road/Lawrence Station, east of Lawrence Expressway.
- **CON-UDG7** Add publicly-accessible pedestrian pathways on secondary pathways identified in the Sense of Place Plan when multi-modal access is not feasible.
- **CON-UDG8** Secondary pathways/roadways north of tracks should bridge the Loop Road with other public streets or primary shared-use paths. Secondary pathways south of the tracks should provide a more direct route to Lawrence Station.
- **CON-UDG9** Property owners shall record an agreement, either on the final map or through a separate legal instrument, to allow adjacent property owners to connect to the new publicly-accessible Loop Road, shared-use paths, and/or secondary pathways/roadways in order to form one continuous and uninterrupted thoroughfare as intended in the Sense of Place Plan.
- **CON-UDG10** Prohibit security gates on publicly-accessible routes.
- **CON-UDG11** Maintain an open, walkable environment throughout the Plan area.

INDUSTRIAL TO RESIDENTIAL TRANSITION

In zoning districts that allow flexible mixed-uses, a variety of land use types could be proposed on one site, or adjacent to other sites, such as new residential next to an existing industrial site. The Plan anticipates that many existing industrial/office/R&D uses will continue to remain, while others will develop to mixed-use residential or single-use residential nearby. There are several compatibility considerations for introducing residential uses in long-standing industrial areas, such as noise, air quality, and aesthetics. In the reverse, there are also compatibility considerations for locating new industrial/office/R&D uses next to existing residential in the Plan area not separated by the railroad tracks. Therefore, guidelines are established in the Plan to ensure compatibility between these different land uses.

Industrial to Residential Transition Policy

ITR-P1 Ensure compatibility between residential and industrial/office/ R&D uses upon review of new development on the same site or neighboring sites in order to minimize adverse impacts between the different land uses.

Industrial to Residential Transition Guidelines

- ITR-UDG1 Consider existing land uses during site planning and strive to locate compatible uses next to each other. On a case-by-case basis, address adverse impacts to existing adjacent industrial/ office/R&D uses for development projects that propose to convert industrial sites to residential.
- **ITR-UDG2** Industrial sites proposed for residential development should not be located in proximity to a use that would create hazardous conditions for the proposed residential development in order to protect all occupants of the sites, and to enhance compatibility among sites within the Plan. The City may require a risk assessment to address compatibility issues for any proposed industrial to residential conversion.
- **ITR-UDG3** Phase I Environmental Site Assessments (ESA), and if warranted, Phase II ESAs, are required for all residential development projects on existing industrial/office/R&D sites. Applicants shall participate in the appropriate state or county agency oversight programs for review of remediation measures related to any contaminated environmental media, including, but not limited to, soil, groundwater, and soil gas vapor.

ITR-UDG4 Acoustical studies shall be conducted for development of new land uses that are different than the adjacent land uses (e.g. new residential next to existing industrial). The intent is to protect new users from noise impacts from adjoining uses, and in the inverse. Acoustical attenuation measures recommended by the studies shall be incorporated into development projects.

ITR-UDG5 At a minimum, buffers must meet the minimum landscaped buffer standards in Chapter 19.37 of the Zoning Code. Other types of buffers the City may consider include:

- Streets, pathways, and trails.
- Parks and open space.
- Increased building setbacks beyond minimum requirements.
- **ITR-UDG6** The following measures are required for new development of office/R&D/industrial uses adjacent to existing residential sites, not separated by the railroad tracks:
 - Landscaped buffers and walls that meet the minimum standards in Chapter 19.37 of the Zoning Code.
 - All loading areas and trash enclosures shall be set back a minimum of 20 feet from the adjoining residential property line.
 - Light standards on private property located within a required landscaped buffer shall not exceed 15 feet in height.
 - A minimum building setback of 20 feet per the setback requirements in Chapter 19.35 of the Zoning Code.
 - No exhaust fans shall be placed on walls facing residential uses, except as may be required by the City. In addition, no machines or fans shall be placed on the roof of the building which exhausts dust or odors.
 - Prohibit use of outdoor loudspeakers at all times, except as may be approved for special events in accordance with the Municipal Code.
 - All unenclosed materials, equipment and/or supplies of any kind shall be maintained within an approved enclosed area. Any stacked or stored items shall not exceed the height of the enclosure.

SITE PLANNING

See Chapter 19.35 of the Municipal Code for building setback and parcel size requirements.

Site Planning Policies

- **SP-P1** Achieve a more urban and visually interesting character, by siting buildings to adjoin the public environment of streets and sidewalks, rather than being set back behind surface parking and large planted setbacks.
- **SP-P2** Provide access routes for bicyclists and pedestrians within new development to existing or future connections offsite.

Site Planning Guidelines

- **SP-UDG1** Site buildings to reinforce the street edge or corner by maximizing building frontage along the street. Building setbacks will vary by street type, as noted in the Zoning Code.
- **SP-UDG2** In larger parcels north of the tracks, establish a fine-grained grid of building blocks no longer than 400 feet on a side, with pedestrian access around the blocks. Provide mid-block through-connections for blocks greater than 400 feet. Mid-block connections may include pedestrian-only access or shared access for vehicles, bicycles, and pedestrians.
- **SP-UDG3** For the retail portion of the Loop Road along Santa Vittoria Terrace, and for retail on Willow Street and Reed Avenue, locate the primary building façade for retail uses at the street right-of-way/property line (0 feet setback). Exceptions to this guideline are allowed and encouraged to emphasize the retail zone and widen the sidewalk as follows:
 - Up to 10 feet maximum setback from the property line.
 - Contiguous with the sidewalk grade and accessible to the public.
 - Upper levels of the building may extend over the maximum setback area to create arcades and overhangs.
- **SP-UDG4** For the retail portion of the Loop Road along Santa Vittoria Terrace, and for retail on Willow Street and Reed Avenue, ensure that retail spaces have interior depths of at least 40 feet, with 60 feet as an ideal.

- **SP-UDG5** Maintain neighborhood and street character by locating residential uses adjacent to, and across the street from one another where possible.
- **SP-UDG6** Limit curb cuts to minimize pedestrian-vehicular conflicts.
- **SP-UDG7** Accommodate fire and emergency access per state and local codes and site them to avoid pedestrian and bicycle conflicts.
- **SP-UDG8** Portions of buildings are encouraged to be set back to preserve existing large canopy street trees or adequately accommodate new street trees.
- **SP-UDG9** For residential or mixed use development, parking shall be accessed from the side street/drive aisle or rear alleys, away from pedestrian priority ways.

For nonresidential development, parking should be accessed from the side street/drive aisle or rear alleys, away from pedestrian priority ways.



Small building setbacks and alcoves provide additional space for merchandising without interrupting pedestrian flows, while also maintaining a strong street wall.

BUILDING DESIGN

Several components of building design are particularly important in creating a comfortable and attractive pedestrian and transit-oriented development pattern.

Building Height

Building heights will vary considerably throughout the Plan area. In the areas south of the tracks, heights will be lower to be compatible with nearby low scale (generally one-to-three story) residential uses. North of the tracks, heights can be higher. The tracks themselves provide an ample physical separation from residential uses south of the tracks. Rising land values, changing spatial requirements, and construction codes are resulting in taller buildings for office, R&D and residential uses. See Chapter 19.35 of the Municipal Code for height limit requirements.

Building Height Policy

BH-P1 Encourage the greatest concentration of taller buildings in the Plan area north of the tracks in the vicinity of Lawrence Station in order to ensure a high concentration of jobs and residents in close proximity to the station and emphasize the area's function as a transit hub.

Building Height Guidelines

- **BH-UDG1** Restrict building heights to 50 feet tall within 20 feet of public parks and publicly accessible open spaces to maintain a pedestrian scale and maximize daylight/sky exposure. This building height restriction applies on at least one side of public parks and publicly-accessible open spaces.
- **BH-UDG2** Place taller buildings or building elements at corner intersections to achieve greater visibility, scale relationships, and architectural massing and interest.
- **BH-UDG3** Ensure that building height, massing, and spacing allow views to Lawrence Station from streets wherever possible.
- **BH-UDG4** Vary building heights within blocks and parcels in order to provide visual interest and variety and to avoid a blocky, uniform appearance.

- **BH-UDG5** Provide optimal solar access for residents and workers in the design and location of buildings.
- **BH-UDG6** The solar access requirements of the Zoning Code do not apply to development in the LSAP.

Building Massing and Articulation

Building massing refers to the apparent bulk and dimensions of various parts of a building. Articulation refers to potential variations in the planes of the building such as roofs and façades.

Building Massing and Articulation Policy

BMA-P1 Modulate and articulate the massing on large buildings in order to reduce their apparent scale, ensure their compatibility with the surrounding development, and help create a pedestrian-scaled environment.

Building Massing and Articulation Guidelines

- **BMA-UDG1** To provide variation in wall planes, each side of a building shall include at least three distinct vertical modules that project from the primary wall plane by at least 15 feet wide by 5 feet deep.
- **BMA-UDG2** Buildings shall be organized with a horizontal base, middle, and top as a fundamental design approach.
 - The building base should be differentiated with projections and setbacks and enriched with finer grain design detail and decorative elements, such as awnings, canopies, arcades, entries, window treatments, planter boxes, etc., to support a more pedestrian-oriented streetscape.
 - The middle and top portions of the building, including the upper floors above the building base should be set back from the back of the sidewalk and articulated to create a regular rhythm and sense of pedestrian-scaled enclosure to the public realm. Smaller sites and sites with shallow depths may propose alternative design approaches to provide architectural interest through quality exterior materials and architectural features.
- **BMA-UDG3** New development along the railroad tracks between existing Sunnyvale and Santa Clara residential neighborhoods to the south shall give special attention to scale and massing, to prevent

significantly altering the existing neighborhood character. The height and massing of new development towards the railroad tracks should be generally similar in scale to the adjacent residential district and step up to the taller building heights further away from the railroad tracks.

- **BMA-UDG4** Articulation of the building facades on the ground and upper floors is a priority, to avoid the appearance of a monolithic structure.
 - Continuous flat facades shall be avoided and instead facades shall be articulated through use of increased upper floor setbacks; building recesses/openings; architectural wall projections from the main wall plane; recessed windows; awnings; recessed or projecting balconies; bay windows; and breaks in the horizontal and vertical planes.
 - Every 275 linear feet of the façade on non-residential buildings shall have a minimum wall recess/opening of at least 30 feet wide by 30 feet deep. The recess/opening may occur anywhere within the 275 feet.
 - Every 175 linear feet of the façade on residential/mixed-use buildings shall have a minimum wall recess/opening of at least 15 feet wide by 15 feet deep. The recess/opening may occur anywhere within the 175 feet. Balconies and useable open spaces may be located within the wall recess/opening.
- **BMA-UDG5** Variable heights and roof forms shall be used to break up the length of the building roofline. Buildings built within 15 feet of the maximum height limit shall reduce height by at least one story every 100 linear feet. The location of the height reduction may occur anywhere within the 100 feet.
- **BMA-UDG6** Roof treatments, such as cornices and overhangs, are encouraged to define building tops. Parapets without architectural detailing are not allowed.
- **BMA-UDG7** Building tower elements that project above the main building roofline (particularly at building corners) are encouraged. The length of tower elements shall not exceed more than 25 percent of the length of building façade.
- **BMA-UDG8** Accentuate major gateways and termini in the Plan area with architectural focal points.

- **BMA-UDG9** Reinforce street corners with changes in architectural massing, exterior colors and materials, and height.
- **BMA-UDG10** Screen rooftop mechanical and other equipment from sight in all directions from the property lines, as demonstrated by line of sight drawings. The screening shall match the building architecture.

Building Orientation, Entries, and Façades

Building design, particularly at the ground level, is important to creating pedestrian environment that is interesting, attractive and feels secure, particularly on retail streets and in areas surrounding the transit station.

Building Orientation, Entries and Façades Policy

- **BO-P1** Activate the street and sidewalk by providing active ground floor uses, locating building entries and windows in appropriate locations, and providing pedestrian-scaled elements.
- **Building Orientation, Entries and Façades Guidelines**
- **BO-UDG1** Orient buildings to ensure that the primary façades and entrance areas of all buildings face the street, open space areas, or other pedestrian-oriented circulation areas.
- **BO-UDG2** Place windows and storefronts at the street level and ground floor.
- **BO-UDG3** Use clear, non-reflective glazing on all windows at street level.
- **BO-UDG4** Emphasize building entries with small entry plazas, vertical massing, and architectural elements such as awnings, arcades, or porticos.
- **BO-UDG5** Design entries so that they are clearly identifiable from the street and primary pedestrian corridors. Each development must identify primary pedestrian corridors to ensure each entry leads to a primary pedestrian corridor.
- **BO-UDG6** Provide a walkway leading from the street to the building entrance if the building is not located directly on a public sidewalk.
- **BO-UDG7** Enhance building entries and the adjoining pedestrian realm with plazas and landscaping.



Articulation and step-backs of large building masses can enhance the pedestrian scale and allow penetration of sunlight. Such articulation also improves the relationship between existing residential areas and new development.

- **BO-UDG8** For retail development with multiple store entries, orient all entries to the street or public plaza. Utilize the outdoor space for cafés or other outdoor retail uses.
- **BO-UDG9** For retail areas, design the floor-to-ceiling height of the first floor to be greater than that of upper floors to accommodate ground-floor retail space. The height of retail areas on the first floor shall be a minimum of 18 feet.
- **BO-UDG10** Include features that add depth, shadow and architectural interest, such as balconies, recesses, cornices, bay windows, and step-backs at upper floors, consistent with the building's style and scaled for pedestrians.
- **BO-UDG11** Blank walls along streets, the Loop Road, shared-use paths, and secondary pathways/roadways shall be no greater than 30 linear feet without being interrupted by a window or entry. For large-format retail buildings, see additional guidelines related to Mixed-Use/Retail Buildings along Pedestrian Retail Streets.

Building Design Guidelines for Specific Building Types

In addition to the general building design guidelines that apply for all buildings, additional guidelines apply to specific building types.

Residential Buildings

Residential Building Policies

- **RB-P1** Ensure that residential buildings contribute activity to public streets and open spaces.
- **RB-P2** Ensure that residential buildings provide privacy for residents.
- **Residential Building Guidelines**
- **RB-UDG1** Entries to residential buildings must be accessible directly from the street or public open spaces.
- **RB-UDG2** For ground floor units in residential development, the main entrance shall lead directly to the street to create a lively streetscape and a direct relationship with the street and pedestrian realm. Use balconies, stoops, windows, and courtyards to provide architectural interest.
- **RB-UDG3** Employ variation in scale and form for residential development, allowing for both pedestrian-scaled and larger-scaled massing.



Design buildings to face the street and reinforce the overall circulation framework of the area, without large parking lots separating the public realm from the building. Use special design features to accent corners, as well as planting and lighting to unify and soften street corners.

- **RB-UDG4** In areas south of the tracks, residential development across from existing residential shall be no more than three stories in height at the street level. Each story above the third floor shall be stepped back from the front wall of the story below by at least 30 feet.
- **RB-UDG5** In residential development adjacent to a public street or publicly-accessible road or shared-use path/pathway, a building base with a maximum height limit of 50 feet shall be established. Above 50 feet, upper floors of the entirety of the building shall be set back a minimum distance of 15 feet from the front wall of the building base.
- **RB-UDG6** Above 75 feet, the length of the building floorplate(s) shall be reduced in length by a minimum of 10% from the floor below.
- **RB-UDG7** Windows shall be recessed a minimum of three inches from the adjacent wall surface to create architectural relief, definition, and shadow.

Mixed-Use/Retail Buildings along Pedestrian Retail Streets

Also refer to the Toolkit for Mixed-use Development in Sunnyvale for mixeduse goals and policies.

Mixed-use/Retail Buildings Policy

MU-P1 Ensure that buildings contribute to the character of public pedestrian areas and support a successful retail environment.

Mixed-use/Retail Buildings Guidelines

- **MU-UDG1** Building entrances shall be oriented to the street and shall be spaced no more than 50 feet apart.
- MU-UDG2 Clearly address the public realm by providing glazing on at least 75 percent of the ground floor retail façade facing the street or public space.
- **MU-UDG3** Storefronts, windows, and entry doors should be recessed at least six inches from the adjacent wall surface to create architectural relief, definition, and shadow.
- MU-UDG4 Utilize architectural elements such as recesses, awnings, colonnades, and pronounced entrances.

- **MU-UDG5** Where entries orient to parking areas, provide continuous sidewalks from the street directly to the doorway.
- **MU-UDG6** If large-format, or "big-box," retail (25,000 or more square feet in gross building area) is developed, design buildings to support the pedestrian environment as follows:
 - Locate and orient buildings along primary street edges and provide fenestration (windows, glass storefronts, and openings), signage, and entries.
 - Fenestration and/or entries shall occupy a minimum of 30 percent of the façade with 50% fenestration being the goal.
 - Place smaller retail spaces along the street side of large format retail buildings, thereby breaking down the massing of the building and creating a more pedestrian-friendly environment
- MU-UDG7 In areas south of the tracks, mixed-use development across from existing residential shall be no more than three stories in height at the street level. Each story above the third floor shall be stepped back from the front wall of the story below by at least 30 feet.
- **MU-UDG8** In mixed-use development adjacent to a public street or a publicly-accessible road or shared-use path/pathway, a building base with a maximum height limit of 50 feet shall be established. Above 50 feet, upper floors of the entirety of the building shall be set back a minimum distance of 15 feet from the front wall of the building base.

Above 75 feet, the length of building floorplate(s) shall be reduced in length by a minimum of 10% from the floor below.

MU-UDG9 Where outdoor dining areas are provided, dining activities shall not encroach into a minimum clear width of five feet for pedestrian access at any given point along the pedestrian travel zone.

Office/R&D Buildings

- Office/R&D Buildings Policy
- **OR-P1** Office/R&D buildings should exhibit the appearance of modern and technologically-advanced working and meeting environments that are engaging, durable, aesthetically-pleasing,



(Above) Design residential buildings to provide open space that is usable and visually attractive for both residents and the public

(Right) Provide entries from residential units directly to the street wherever feasible, with plantings and raised terraces to provide privacy and amenity for both residents and the public.

and accessible. They should be flexible to accommodate the various space and equipment needs for individual or multiple tenants. Special attention should be given to the selection of exterior finishes and public art installations, particularly in the plazas or forecourts, entry lobbies, and other areas with public access.

Office/R&D Buildings Guidelines

- **OR-UDG1** Façade design should include high quality exterior materials, windows, sun control devices and other design elements to produce a well-articulated building. Techniques to create high quality exteriors include changes in materials and/or color, variations in the vertical planes, and incorporation of upper level outdoor common areas should be used to avoid a monolithic and sterile appearance.
- **OR-UDG2** Additional articulation and transparency should be provided on the ground floor and at corners for a visually inviting pedestrian experience.
- **OR-UDG3** Windows should be well proportioned. Glazing should provide a high degree of light transmittance and prevent glare.



- **OR-UDG4** Main entrances for the public, staff, and visitors should be clearly identifiable.
- **OR-UDG5** The lobby should be inviting, well-lit, secure, and clearly visible from the street, both day and night.
- **OR-UDG6** Indoor atriums, outdoor plazas and public amenity areas should be incorporated into building frontages for employee and visitor uses.
- **OR-UDG7** Public art is encouraged in the design of atriums, plazas, and public amenity areas.
- **OR-UDG8** Roofs should be designed with usable rooftop gardens and/ or light-colored roofing, to help reduce heating and cooling loads, address 'urban heat island' effects, and provide workers a significant private outdoor amenity area.
- **OR-UDG9** Parking should be accessed from alleys, away from pedestrian priority ways, when possible.



(Top) Articulate building masses to clearly define entries and different functional areas. (Bottom) Provide continuous active ground-floor uses with a strong orientation to the sidewalk along pedestrian retail streets.

BUILDING MATERIALS

Building Materials Policies

- **BM-P1** Encourage variety in building materials to create a visually interesting environment.
- **BM-P2** Use building materials to define the functional levels of a building and its relationship to the public realm (particularly at the street level).
- **BM-P3** Ensure that materials avoid excessive monumentality or a monolithic character.
- **BM-P4** Ensure that materials fit with the character and context of the existing development.
- **BM-P5** Prioritize sustainability as a key consideration.

Building Materials Guidelines

- **BM-UDG1** Use high-quality, durable architectural materials and finishes that provide a sense of permanence. High-quality materials include, but are not limited to:
 - Architectural quality cast-in-place concrete
 - Glass fiber reinforced concrete (GFRC)
 - Decorative (non-structural) modular brick masonry (modular brick should be unglazed, utilizing traditional textures and colors)
 - Stone (particularly to be used at the pedestrian level at column bases, window sills, window surrounds, stringcourses, and cornices)
 - Decorative terra cotta
 - Stucco and cement plaster (stucco and cement plaster are encouraged to have controlled surface textures and composed patterns of reveal and control joints to create interest; do not use stucco finish to simulate the use of another material, i.e. wood trim window sills)
 - Architectural metal panels
 - Standing seam metal roofing
 - Barrel roofing tile

- Slate or concrete roofing tile
- Precast concrete (architectural quality, utilizing subtle colors and fine-grained aggregates to create a "cast stone" appearance).
- **BM-UDG2** Use materials that express their true properties. Faux reproductions of materials are prohibited with the exception of products that mimic the appearance of wood.
- **BM-UDG3** Give preference to sustainable materials, buildings systems, and technologies.
- **BM-UDG4** Use materials that improve building envelope performance through insulation values and thermal mass.
- **BM-UDG5** Avoid highly reflective surfaces and materials that can cause heat or glare for pedestrians.
- **BM-UDG6** Avoid dark materials that absorb heat and reduce solar reflectivity.
- **BM-UDG7** Use glazing that is as clear and non-reflective as possible in order to provide transparency and visibility while meeting energy and daylighting performance requirements.
- **BM-UDG8** Where new development is planned near existing residential development, new windows and outdoor spaces should be carefully designed to respect the privacy of adjacent and nearby neighbors by limiting direct views into the windows of other residential units.
- **BM-UDG9** Window design should contribute to and complement the architectural character and style of the building. Its materials, and features, such as the trims and sills, should be of high quality and include some depth to cast shadows and articulate the building.
- **BM-UDG10** Development projects shall comply with the City's Bird-Safe Design Guidelines.
- **BM-UDG11** Building bases should be strongly defined with architectural features such as a stringcourse, a continuous horizontal band along the length of the building façade, step backs, or changes in materials and color. Employ accent materials such as tile insets or natural stone at the ground level to add texture, color, and visual interest. The base should be expressed with façade treatments and detailing that are scaled to pedestrians.

URBAN DESIGN |



Differentiate the levels of a building particularly at the ground floor, through the use of design elements and materials. Clear, non-reflective glazing contributes visual activity to the public realm and an improved sense of security at night.

BM-UDG12 Employ color to differentiate between building elements and to moderate the scale of buildings.

- A variety of colors are encouraged, selected to enhance natural material choices such as stone, wood, and natural metals, and quality architectural materials such as precast concrete, brick masonry, and barrel tile.
- Building colors should be compatible with one another.
- Residential units shall be a different color than retail portions of the building. Use colors with a very high degree of light reflectance sparingly to control glare. Use darker and more intense colors at the building base.



OPEN SPACE AND LANDSCAPE

Well-landscaped, publicly-accessible open space is an essential ingredient of any urban environment for both passive and active recreation purposes. Appropriate landscaping also provides visual interest and beautification, helps mitigate heat island effects, and provides a means to satisfy storm water management mandates.

In 2021, the Plan area had few publicly-accessible open spaces or areas of attractive landscaping that are consistent with current sustainability goals. Therefore, new development on parcels throughout the area will be required to provide landscaped open space for public use.

Open Space and Landscape Policies

- **OS-P1** Ensure that open space provided by new development is accessible and attractive.
- **OS-P2** Design open spaces to prioritize sustainability, including incorporation of stormwater Best Management Practices (BMPs).

Open Space and Landscape Improvement Guidelines

- **OS-UDG1** Open space acreages may vary by parcel size as parcel sizes vary. Open space from one parcel may be combined with open space required for an adjacent parcel in order to create a larger single open space area.
- **OS-UDG2** Up to 25 percent of required open space may be covered by the building above.
- **OS-UDG3** Pedestrian rights-of-way can contribute to the public open space provisions.
- **OS-UDG4** The cross-section dimension of a plaza, courtyard, or mid-block pedestrian connection should be a minimum of 20 feet.
- **OS-UDG5** Do not exceed a grade differential greater than four feet between an open space or plaza area and the adjacent sidewalk grade.
- **OS-UDG6** Include public art as part of open space improvements, per the public art requirements of the Zoning Code.
- **OS-UDG7** For residential uses, provide useable open space in accordance with the Zoning Code.

- Useable open space should be well landscaped to enhance the aesthetics of individual developments.
- Residential common areas may be provided in a variety of formats, including courtyards, roof gardens, play areas, and outdoor kitchens.
- Common areas, located at upper-level floors for use by building residents and visitors, may qualify as useable open space.
- Podium or rooftop patios and gardens with useable open spaces are highly encouraged.
- Outdoor common areas and common spaces should provide shaded and unshaded areas, adequate lighting for appropriate nighttime use and security, and well-designed seating options, such as seat walls, planter ledges, benches, moveable seating, fixed seating, and seating steps.
- **OS-UDG8** Use water pervious surface materials that allow for stormwater capture for parking areas, driveways and pathways to the extent that they do not cause damage to public streets or other infrastructure.
- **OS-UDG9** Use sustainable surface materials for paving, such as reclaimed pavers, locally produced materials, or concrete and asphalt with fly ash content.
- **OS-UDG10** Include sustainable landscape design strategies, materials and finishes.
- **OS-UDG11** If recycled water is available in the Plan area, use salt tolerant planting to maximize use of this water resource. Prohibit its use on salt-sensitive plantings to remain, such as the Redwood trees on Sonora Court.
- **OS-UDG12** Healthy significantly sized trees should be incorporated into the design of plazas and open space areas.
- **OS-UDG13** Public gathering areas are encouraged to include well-designed seating options such as benches, seat walls, planter ledges, moveable chairs, and seating steps. Seating and gathering areas should have a mixture of shaded and unshaded areas to increase usability in various weather conditions.

- **OS-UDG14** Use of appropriate native vegetation and water-conserving plant material of varying textures and colors is highly encouraged. Plant material shall conform to water efficient landscaping requirements in the Zoning Code.
- **OS-UDG15** All areas of public open space areas should be visible from surrounding building entrance, residential units, or nonresidential spaces, or other frequently occupied indoor/ outdoor spaces to maximize natural surveillance.
- **OS-UDG16** On private property, use preferred landscaping materials, including, but not limited to:
 - Precast concrete unit pavers
 - Integral colored concrete
 - Natural stone
 - Glass fiber reinforced concrete/ultra-high-performance concrete
 - Precast concrete
 - Stabilized crushed stone
 - Stainless steel, corten steel, or powder-coated metal
 - Polycarbonate panels
 - Tempered glass



Well-designed small pedestrian spaces, mini parks and plazas with seating, planting and lighting provide popular public space in the urban environment.
PARKING

As the Plan area evolves over time, densities will increase and it will become feasible to provide parking in structures or underground rather than at ground level in surface lots. This will have the benefit of minimizing the footprint of surface parking, which as of 2021 dominates existing development north of the tracks. It will also free up additional land for new building development, open space and landscape improvements.

General Parking Policy

PK-P1 Minimize the footprint of parking in the Plan area and ensure that parking facilities, whether in structures, underground, or in surface lots, are well-designed, functional, attractive, and fit well into their surrounding context.

General Parking Guidelines

- **PK-UDG1** In order to minimize pedestrian/vehicle conflicts and optimize street operation, minimize curb cuts as follows:
 - Share access drives and access easements to parking facilities.
 - Share parking among uses, such as residential and office, as well as between developments, and within entire subareas.
 - In particular, minimize the number of vehicular access points (curb cuts) from the following streets: Loop Road, Willow Avenue, Aster Avenue, Uranium Drive, and Sonora Court.
- **PK-UDG2** No curb cuts shall be allowed along the retail portion of the Loop Road known as Santa Vittoria Terrace.
- **PK-UDG3** Arrange development in a configuration such that parking is internally-focused with the minimum number of access lanes necessary.
- **PK-UDG4** Provide bicycle parking stalls per Chapter 19.35 of the Zoning Code.
- **PK-UDG5** Ensure that bicycle parking is secure and weather-protected.
- **PK-UDG6** Provide car-sharing spaces, electric vehicle charging stations, and disabled parking spaces per Chapter19.46 of the Zoning Code, or if superseded by more restrictive requirements in the Building Code and Reach Codes.

PK-UDG7 Provide safe access for pedestrians through parking facilities to building entries.

Surface Parking Lot Guidelines

PK-UDG8 In residential and mixed-use projects, the maximum amount of surface parking spaces provided shall not exceed 20% of the total provided parking spaces.

In office/R&D/industrial projects that exceed the base maximum floor area ratio (notwithstanding projects within the additional FAR allowance of the Green Building Program), the maximum amount of surface parking spaces provided shall not exceed 25% of the total provided parking spaces.

- **PK-UDG9** Locate surface parking lots away from street edges, behind buildings, and provide decorative, landscaped, or other screening.
- **PK-UDG10** Use a mix of trees, shrubs, and ground cover to landscape perimeter setback areas around parking lots.
- **PK-UDG11** Provide a ratio of one tree per three (3) parking spaces on the perimeter of the lot and one tree per six (6) parking spaces on the interior of the lot. Comply with parking lot shading requirements in Chapter 19.46 of the Zoning Code.
- **PK-UDG12** Provide landscape islands in surface parking lots instead of tree wells, wherever possible.
 - Landscape islands shall be a minimum of six feet in width.
 - Where tree wells are provided, they shall be a minimum of five feet by five feet, to provide an adequate area to support tree growth.
- **PK-UDG13** Accommodate pedestrians and bicycle traffic with pedestrianonly pathways and bicycle facilities through parking areas. Shade these areas with trees and architectural elements such as trellises and awnings.

Parking Structure Guidelines

- **PK-UDG14** Design parking structure access lanes to have the character of an attractive, well-landscaped small urban street.
- **PK-UDG15** Locate parking structures away from primary pedestrian corridors as identified on development plans.

- **PK-UDG16** Parking structures that face public streets, publicly-accessible streets, or publicly-accessible shared-use paths/pathways/ roadways shall include screening so that parked vehicles are not visible.
- **PK-UDG17** Create visual interest and reduce the mass of parking structures through the use of:
 - Variation in the dimension and proportion of openings of the façade. Every 200 linear feet of the parking structure façade facing a public street, publicly-accessible street, or publiclyaccessible shared-use path/pathway shall have a minimum wall recess/opening of at least 20 feet wide by 20 feet deep. The recess/opening may occur anywhere within the 200 feet.
 - Decorative screens, railings, and trellis elements of durable, high-quality materials.
 - Materials and designs that are similar to surrounding buildings on site.
 - Awnings, arcades, trellises, or porticos along street-facing façades and pedestrian connections.
 - Provide parking access lanes and driveways at spacing along the street of not less than 100 feet.
 - Where parking lanes or courts are visible from the street, planter beds with trees or potted plants should be located between garage doors.
 - Create shared, unallocated parking spaces, such as carports, in order to maximize site area for new building development and open space.
- **PK-UDG18** Locate and design pedestrian entries and stairwells for parking structures:
 - As identifying architectural elements.
 - Adjacent to public streets and along major pedestrian connections.
 - To ensure that they are visually open and free of visual obstruction to promote a feeling of security and comfort.
 - To minimize conflicts between pedestrians, bicycles, and vehicles.

- **PK-UDG19** For lower density residential development, such as townhouses:
 - At-grade garage doors, aligned in a row, shall not directly face the public street.
 - Arrange at-grade garages around well-landscaped parking lanes and/or parking courts leading to individual garages.
- **PK-UDG20** Stair and elevator cores should be designed as important architectural components and should be treated with high quality materials and lighting.
- **PK-UDG21** The use of finer-detailed cladding materials and decorative elements are encouraged at upper floors.
- **PK-UDG22** For parking structures located within buildings occupied by other land uses (such as parking on the ground and upper floors of a residential building), parking areas facing public streets or publicly-accessible streets shall be concealed from exterior view with a solid wall of at least six feet high, or by building area such as residential units, non-residential spaces, and active uses.

SPECIFIC GUIDELINES FOR URBAN DESIGN SUBAREAS

Within the overall Lawrence Station Plan area, seven subareas have been identified that generally correspond with the nine different zoning districts of the LSAP described in Chapter 3 and illustrated in Figure 3.2. Because of their locational and site characteristics, it is envisioned that each of these subareas will have a somewhat different physical character. Therefore, in addition to the general guidelines described above, which apply to site planning, building design, open space and parking throughout the entire Plan area, specific design guidelines for the development of each of these subareas are needed. For purposes of these guidelines, these specific subareas are illustrated in Figure 6.1. The seven subareas include the following:

- Transit Core West (MXD-I and MXD-I/S zoning districts)
- Transit Core East (MXD-I and M-S/LSAP zoning districts)
- Transit Supporting West (MXD-II zoning district)
- Transit Supporting East (MXD-II zoning district)
- West Kifer (M-S/LSAP 60% and 120% zoning districts)
- Peninsula (MXD-III zoning district)
- Lawrence/Reed/Willow (MXD-IV and R-5 zoning districts)

Table 6.1 includes guidelines that apply to multiple subareas. An "X" in the column for each subarea indicates a guideline that applies to that particular subarea. Following Table 6.1 is a description of each Urban Design Subarea and specific urban design guidelines that apply.

Figure 6.1: Subareas



LEGEND

• • STUDY AREA BOUNDARY

- CITY BOUNDARY
- EL CAMINO STORM DRAIN CHANNEL/ CALABAZAS CREEK
- LAWRENCE CALTRAIN STATION
- 1/4-MILE AND 1/2-MILE DISTANCE FROM THE STATION

Table 6.1: Guidelines that Apply to Multiple Subareas

	Subarea								
Guideline	Transit Core West	Transit Core East	Transit Supporting West	Transit Supporting East	West Kifer	Peninsula	Lawrence/ Reed/Willow		
SA-UDG1 For buildings adjacent to the tracks, incorporate landscaped buffers to mitigate the negative effects of noise and vibration from train operations. At a minimum, projects should include an eight-foot tall decorative masonry wall along the railroad tracks if the project includes residential uses.	X	х	X	X	X	X			
SA-UDG2 Prioritize development of new public open space over other development incentives, given the current lack of open space. Public open space may be privately owned and maintained with a public access easement.	X	X	X	X		Х			
SA-UDG3 Follow the Sense of Place Plan's publicly- accessible framework of the Loop Road, shared-use paths, and pathways.	Х	Х	Х	Х	X		Х		
SA-UDG4 New development along Calabazas Creek shall have active ground floor uses for at least 25% of the frontage along the future creek shared-use pathway that are compatible with future public access and park environment goals. Active ground floor uses include:		Х		Х					
 Mixed-use buildings with ground level commercial spaces (restaurants, retail, personal services, recreational and athletic facilities), office lobbies, and/or residential entrances and residential amenity spaces (gym, community rooms/kitchens); along with private useable open spaces at the upper levels; 									
Primary face of entertainment uses;									
 Attached residential units, such as townhouses or live/work units, that are served by rear access drives; and 									
Other uses and configurations that achieve the goal and intent of activating the frontage.									
SA-UDG5 Building service and parking areas shall not be located to face Calabazas Creek or the loop road.	Х	Х		Х					

Table 6.1: Guidelines that Apply to Multiple Subareas (continued)

	Subarea								
Guideline	Transit Core West	Transit Core East	Transit Supporting West	Transit Supporting East	West Kifer	Peninsula	Lawrence/ Reed/Willow		
SA-UDG6 For properties along Calabazas Creek, locate private open space along Calabazas Creek to increase the perceived scale of the linear park.		Х		Х					
SA-UDG7 For properties along Calabazas Creek, ensure that new development promotes a public feeling for the Calabazas Creek linear park.		Х		Х					
SA-UDG8 For properties along Calabazas Creek, provide visual indicators of the delineation between development and the public space of the Calabazas Creek linear park without the use of fences.		Х		X					
SA-UDG9 For properties along Lawrence Expressway, San Zeno Way, and Lawrence Station Road, coordinate development plans with Santa Clara County for potential land dedications required for the Lawrence Expressway Grade Separation Project.	X	X					X		
SA-UDG10 Provide right-of-way dedications along Kifer Road, where determined by the City, to be consistent with Kifer Road cross section in the Sense of Place Plan, to install new median and bicycle lane improvements. Sidewalk easements shall be provided.		X		X					

TRANSIT CORE WEST

The Transit Core West subarea is defined as the area north of the station, west of Lawrence Expressway, which includes properties along Kifer Road, San Zeno Way and Sonora Court. Its location near Lawrence Station offers opportunities for increased development to more transit-oriented uses. This Subarea will be one of the most active and diverse subareas in the Plan area (see Figure 6.2). The focus of the subarea will be the west end of the Loop Road at Santa Vittoria Terrace, which will be the primary retail street in the Plan area, terminating at Sonora Court, with close access to Lawrence Station via San Zeno Way. The majority of Santa Vittoria Terrace was constructed in 2020 with the mixed use project at 1120-1130 Kifer Road (Figure 6.3). Vertical mixed-use development is encouraged along Santa Vittoria Terrace. Active ground floor uses (preferably retail, restaurant and entertainment uses), are required along a sizeable percentage of the ground floor frontage along Santa Vittoria Terrace in order to ensure it promotes a walkable, pedestrian-friendly street that provides goods and services to surrounding neighborhoods and pleasant access to Lawrence Station.

The form of future development of this area will be crucial to improving connectivity to the station for all modes, particularly pedestrians and bicyclists. The Subarea also has the significant Redwood and Cedar trees which line Sonora Court, making improvements to this area an opportunity to create a unique, character-defining environment while also protecting these unique resources.

As described in the Chapter 4 of this report, the County of Santa Clara's Roads and Airports Department is planning to grade-separate Lawrence Expressway adjacent to this subarea by depressing the roadway below grade. Grade-separation of the Expressway may change the configuration of San Zeno Way, may require a right-of-way dedication on private property, and may alter access patterns to this subarea. Redevelopment plans for properties along San Zeno Way/Lawrence Expressway must consider the County's plans for the Lawrence Expressway Grade Separation project.

Figure 6.2: Transit Core West Subarea



Transit Core West Subarea Policy

TCW-P1 Encourage the development of a mixed-use village center, focused on Santa Vittoria Terrace; and capitalizing on existing tree assets and connectivity opportunities on Sonora Court.

Transit Core West Subarea Guidelines

- **TCW-UDG1** Design Sonora Court to be a special street with a strong open space/landscaped character incorporating the existing mature Redwood and Cedar trees.
- **TCW-UDG2** To allow for maximum visual interaction between ground floor uses and the pedestrian zone, active ground floor uses are required along properties that include Santa Vittoria Terrace for at least 75% of the building frontage. Active ground floor uses include:
 - Mixed-use buildings with ground level commercial spaces (restaurants, retail, personal services, recreational and athletic facilities), office lobbies, and/or residential entrances and residential amenity spaces (gyms, community rooms, kitchens); along with private useable open spaces at the upper levels;
 - Primary face of entertainment uses;
 - Attached residential units, such as townhouses or live/work units, that are served by rear access drives; and
 - Other uses and configurations that achieve the goal and intent of activating the street.





LEGEND

- Kifer Streetscape with Existing Redwoods
- Retail Plaza with Enhanced Paving
- "Fall-down" Style Bollards
- Publicly Accessible Park
- S Publicly Accessible Private Road
- B EVA Private Access
- Garage Entry
- Enhanced Vehicular Paving
- West Pool Lifestyle Courtyard Private Access
- East Pool Lifestyle Courtyard Private Access
- Perimeter Fence
- Crosswalk Enhanced Paving
- B EVA Shared Use / Public Access
- B EVA- Public Access
- B Resident Amenity Space

TRANSIT CORE EAST

This large subarea east of Lawrence Expressway is bounded to the north by Kifer Road, the Caltrain tracks to the south, and Calabazas Creek to the east. In 2021, the Subarea includes the Costco site, Intuitive Inc. properties and other office/R&D uses. Major land use change is not expected in this subarea in the short term, but there may be opportunities for transitions to more transit-oriented uses and densities as well as circulation and access improvements with the new Loop Road, shared-use paths, and pathways.

There is an existing low and medium-density neighborhood in the City of Santa Clara south of the railroad tracks, and as of 2021, there are high-density residential developments being constructed north of the tracks in the City of Santa Clara's LSAP northeast of Kifer Road and Lawrence Expressway. Therefore, in the long term, this subarea is suitable for both employment and residential uses at relatively high densities. It is likely that Costco will remain in this location for many years. The Plan includes policies to ensure the long-term use of large-scale retail on the Costco site and two other adjoining sites at the southeast corner of Kifer Road and Lawrence Station Road/Lawrence Expressway.

The lack of north/south connectivity through this subarea is a significant impediment to improving access to the station. Improvements to provide pedestrian, bicycle and motor vehicle routes are needed. To this end, a critical new segment of the Loop Road, as well as a Class I shared-use path will traverse the Subarea paralleling the railroad tracks. Secondary pathways/roadways will also break up the existing large block pattern and provide connectivity in all directions. The Loop Road, secondary streets, and pathways would align with the street system in the City of Santa Clara's LSAP, particularly Corvin Drive and Copper Road or Pancoast Place.

Calabazas Creek flows north on the east edge of the Subarea. The Creek is currently fenced, engineered with a trapezoidal concrete channel and serves as a drainage facility for Valley Water. As of 2021, it is inaccessible to the general public. However, the City of Santa Clara and Valley Water are moving forward with long-standing plans to transform the Creek into an attractive

Figure 6.4: Transit Core East Subarea



linear park and shared-use path facility in the near future. Therefore, the Creek has strong potential to become a form-giving design amenity for development along the creek. The design of future site and building improvements along the creek will therefore need to further enhance the linear park improvements.

As described in the Chapter 4 of this report, the County of Santa Clara's Roads and Airports Department is planning to grade-separate Lawrence Expressway adjacent to this subarea by depressing the roadway below grade. Grade-separation of the Expressway may change the configuration of Lawrence Station Road, may require a right-of-way dedication on private property, and may alter access patterns to this subarea. Redevelopment plans for properties along Lawrence Station Road/Lawrence Expressway must consider the County's plans for the Lawrence Expressway Grade Separation project.

Transit Core East Subarea Policy

- **TCE-P1** Support a transition of this area to a denser, transit-oriented neighborhood with new connectivity improvements through the historically large block pattern for more direct access to Lawrence Station. For the property at the east edge of the Subarea, orient development along Calabazas Creek to enhance future linear park improvements.
- **Transit Core East Subarea Guidelines**
- **TCE-UDG1** Align connectivity improvements with streets in the City of Santa Clara's Lawrence Station Area Plan such as Corvin Drive, Copper Road, and Pancoast Place.
- **TCE-UDG2** Support the continued use of large-scale retail on the Costco site at 150 Lawrence Station Road. If redevelopment is to occur, the proposed development shall provide a minimum retail floor area of at least 25% of the site area, which is consistent with the size of the existing Costco building.

TRANSIT-SUPPORTING WEST

The Transit-Supporting West Subarea is located between Transit Core West and Kifer West, bounded by Kifer Road and the railroad tracks. The Subarea includes a large property owned by Intuitive Inc. (as of 2021) where two new office/R&D buildings and a parking structure were approved in 2016, along with retention of an existing office building at 1020 Kifer Road. The development project included a new pedestrian/bicycle shared-use path (constructed in 2020) that connects Kifer Road to Sonora Court. An industrial property at 960 Kifer Road is also part of this subarea. The Subarea is a flexible mixed-use area, suitable for both employment and residential uses. The minimum residential density is lower than that of the Transit Core subareas due to the Subarea's location further away from the station. Redevelopment may occur in the near term on the 960 Kifer Road property in the Subarea. A critical new segment of the western primary Class I shared-use path will traverse the rear of this parcel, linking with the recently constructed shareduse path constructed in 2020.

Figure 6.5: Transit Supporting West Subarea



Transit-Supporting West Subarea Policy

TSW-P1 Complete the development of this Subarea with the land uses allowed by the Plan and provide connections to adjoining subareas and Lawrence Station.

Transit-Supporting West Subarea Guidelines

- **TSW-UDG1** Provide a new primary Class I shared-use path linkage between the Kifer West subarea and the existing shared-use path on the property at 1020 Kifer Road.
- **TSW-UDG2** Provide bike/pedestrian access to Kifer Road from the Class I shared-use path.
- **TSW-UDG3** Ensure development is compatible with recent development elsewhere in the subarea and in the Kifer West subarea.

TRANSIT-SUPPORTING EAST

The Transit-Supporting East Subarea is located at the eastern end of the Plan area, bounded by Kifer Road on the north, the Caltrain tracks on the south, Calabazas Creek to the west and Uranium Drive on the east. It is surrounded on three sides by the City of Santa Clara, and therefore integration with the land use patterns and circulation systems in that city is necessary. Linear park improvements along Calabazas Creek as well as completion of new shared-use paths and pathways in the direction towards Lawrence Station will help stimulate development in this subarea. As with the Transit Core East, development would be oriented along the Creek.

The original LSAP's vision for this area was to remain an employment center and transition over time from lower intensity industrial to higher industrial/ office/R&D intensities mainly because the area is outside the customary walking distance to the station. In 2021 this area was rezoned to allow flexible mixed-uses, including residential. The new shared-use paths and pathways would help shorten the distance to the station for pedestrians and bicyclists. **Transit-Supporting East Subarea Policies**

- **TSE-P1** Allow a transition of this area to include higher density residential and office/R&D uses that include connectivity improvements across Calabazas Creek to the Transit Core East subarea, and through to the station. Integrate the area better with the land use patterns and circulation systems of the surrounding area. Ensure compatibility of new residential uses with existing industrial/office/R&D uses, and vice versa.
- **TSE-P2** For the property at the west edge of the Subarea, orient development along Calabazas Creek to enhance future linear park improvements. Ensure new development enhances the Creek corridor and provides public access routes, activity, amenities, and an increased sense of security.

Transit-Supporting East Subarea Guidelines

TSE-UDG1 Provide right-of-way dedications along Uranium Drive, where determined by the City, to be consistent with Uranium Drive cross section in the Sense of Place Plan, to install new bicycle lane improvements. Sidewalk easements shall be provided.

Transit Supporting East

Figure 6.6: Transit Supporting East Subarea

WEST KIFER

The West Kifer Subarea consists of the parcels on either side of Kifer Road near Commercial Street that were added to the Plan area as part of the 2021 amendments. The Subarea serves as the western gateway to the Plan area, and is adjacent to the Transit-Supporting West Subarea. The purpose of expanding the boundary was to provide a comprehensive planning approach for the Kifer Road corridor and accommodate future nonresidential development that would provide community benefits envisioned in the LSAP.

At the time of the 2021 update, the property owner of the West Kifer parcels (Intuitive Inc.) was planning a new corporate campus on the north and south sites of the Subarea. The north site was historically utilized as a private park for nearby company employees. It contains many mature trees that line the perimeter of the site. The south site was used for industrial and R&D purposes. The campus project would unify Intuitive Inc.'s existing workforce in the area, reducing daily trips between buildings. The project would also fulfill LSAP goals of increasing transit ridership through improved pedestrian

Figure 6.7: West Kifer Subarea

and bicycle access to the station and sustainable development through enhanced green building features.

- West Kifer Subarea Policies
- **WK-P1** Allow industrial intensification in this subarea to develop a major employment center within close proximity to Lawrence Station.
- WK-P2 Preserve existing open space and tree assets, and provide direct pedestrian/bicycle connections to the station from Kifer Road.
- West Kifer Subarea Guidelines
- **WK-UDG1** Provide the western primary Class I shared-use path on the south site, strategically located to connect Kifer Road through the Transit- Supporting West Subarea to Lawrence Station via Sonora Court and San Zeno Way.
- **WK-UDG2** On the north site, maximize the existing tree canopy by preserving trees and maintain open space to the extent feasible as determined by the City Arborist.
- **WK-UDG3** Remediate existing identified environmental contamination as part of site redevelopment.





PENINSULA

Figure 6.8: Peninsula Subarea

The Peninsula Subarea is the former Calstone and Peninsula Building Materials site at 1155-1175 Aster Avenue, which was approved for residential redevelopment with a small retail use in 2019. The site is located immediately south of the station across the tracks, at the northwest corner of Aster Avenue and Willow Avenue. The redevelopment project was modeled on the original 2016 LSAP development intent to capitalize on the strategic location of the site and convert to higher intensity residential uses with local serving retail services. The project form was designed to be compatible with the existing surrounding low/medium density neighborhood, where lower building heights were proposed near existing residential. Privately-owned open space with public access is available along Aster Avenue. Land along the west side of the site has been reserved for a future Class I shared-use path with a potential future rail crossing to Sonora Court. Long-term change on the site is not envisioned due to the recent redevelopment approval.

ATERATE Lawrence Reed/Willow CUMBREAV COLUMNIEAV Peninsula Subarea Policies

- **PS-P1** Ensure new development is compatible with the existing surrounding neighborhood.
- **PS-P2** Continue to monitor the feasibility of constructing a new bicycle/ pedestrian rail crossing at the northwest corner of the site.

Peninsula Subarea Guidelines

- **PS-UDG1** Incorporate pedestrian access routes in all directions, in order to provide convenient pedestrian movement through the subarea.
- **PS-UDG2** Locate tallest buildings and highest densities along the train tracks, transitioning to lower scale buildings to the south and west, where they adjoin or face nearby apartments and townhouses.
- **PS-UDG3** Concentrate small-scale retail uses, providing coffee, sandwiches or other services, at the eastern end of the subarea along Willow Avenue in order to serve residents as well as train passengers.
- **PS-UDG4** Locate public open space to be directly visible and accessible from Aster Avenue as well as from the west boundary pedestrian/ bicycle linkage.
- **PS-UDG5** Pursue funding opportunities for a new bicycle/pedestrian rail crossing at the northwest corner of the site.

LAWRENCE/REED/WILLOW

The Lawrence/Reed/Willow Subarea consists of the small set of parcels located at the northwest corner of Reed Avenue and Lawrence Expressway, bounded by Willow Avenue on the west and north; and two parcels to the north across Willow Avenue. The parcels at the corner of Reed Avenue and Lawrence Expressway are currently a mix of retail and service uses. The two parcels north of that site are currently a commercial child care center and a 16-unit townhome development.

As described in the Chapter 4 of this report, the County of Santa Clara's Roads and Airports Department is planning to grade-separate Lawrence Expressway adjacent to this subarea by depressing the roadway below grade. Grade-separation of the Expressway will likely change the configuration at Lawrence Expressway and Reed Avenue, may require a right-of-way dedication on private property along the Expressway, and may alter access patterns to this subarea. Redevelopment plans at this corner must consider the County's plans for the Lawrence Expressway grade separation.

This subarea is envisioned as a mixed-use area with medium-high residential densities and services catering mostly to local needs. The Plan allows increases in density at the corner of Reed Avenue and Lawrence Expressway with flexible mixed uses along with a retail commercial requirement. The two parcels to the north will continue to allow residential uses in accordance with the R-5 zoning district. Since this subarea is centrally-located among residential neighborhoods south of the tracks and it is surrounded by important pedestrian corridors on three sides, new uses will be developed to enhance the pedestrian environment.

Lawrence/Reed/Willow Subarea Policy

LRW-P1 Redevelop this subarea with residential and neighborhoodserving non-residential uses that are designed for easy access by pedestrians, bicyclists and transit.

Lawrence/Reed/Willow Subarea Guidelines

LRW-UDG1 Locate retail uses along Willow and Reed Avenues in conformance with General Site Planning Guidelines earlier in this chapter.

- **LRW-UDG2** Site planning should prioritize enhanced bicycle and pedestrian access to Lawrence Station by providing a north-south shared-use path from Reed Avenue to Willow Avenue as shown in the Sense of Place Plan circulation diagram.
- **LRW-UDG3** Provide right-of-way dedications along Willow Avenue, where determined by the City to be consistent with the Willow Avenue cross section of the Sense of Place Plan, to install new bicycle lane improvements. Sidewalk easements shall be provided.

Figure 6.9: Lawrence/Reed/Willow Subarea



STREETSCAPE DESIGN GUIDELINES

INTRODUCTION

The street system in Sunnyvale provides the majority of the city's public space. It is the conduit through which most circulation passes, the place where a large amount of personal interaction and commerce occurs, a place of recreation, and the backdrop on which a memorable image of the city is created. While many people experience public parks and other open spaces occasionally, almost everyone experiences public streets daily. Creating a high-quality street environment is, therefore, of benefit to the vast majority of Sunnyvale citizens and visitors.

These guidelines emphasize the quality of the street environment by focusing detail on the design of the streetscape – the area framed by building walls. The quality of public streets is thus dependent upon two aspects:

- Improvements within the public right-of-way.
- The character of improvements to properties that abut the public rightof-way, particularly the ground level of buildings. Where it is appropriate to influence building design to achieve the goals for the public environment, specific requirements have been established.

Existing conditions as of 2021 in the Plan area vary widely from street to street and parcel to parcel and new development will vary depending on site conditions. Therefore, these guidelines are tailored to the specific conditions of individual development areas.

The framework of streets, both existing and proposed, varies between the portions of the Plan area located north and south of the railroad tracks. South of the tracks, a network of local, collector and arterial streets is well established and serves the existing neighborhoods well. The framework of this network will remain the same but with enhancements to the pedestrian and bicyclist realm, with better access to transit.

North of the Caltrain tracks, the existing framework of public streets and pedestrian ways differs markedly from the south. Streets such as Kifer Road, San Zeno Way and Lawrence Station Road frame the area, but there are no public rights-of-way available which penetrate through the area in either a

north-south or east-west direction (with the exception of a short, dead- end segment of Sonora Court). As Chapter 4 describes, a new Loop Road, Class I shared-use paths, and pathways are needed to serve future development of the area and provide improved access to the station and other local destinations. These Streetscape Design Guidelines are therefore intended to supplement the proposed circulation framework and Sense of Place Plan and provide guidance on their design and character.

Streetscape Policies

- **ST-P1** Create a coordinated street environment that is supportive of new development and strengthens connections to Lawrence Station and other important neighborhood destinations.
- **ST-P2** Design and construct streets as Complete Streets: contextsensitive, safe, convenient and attractive for all modes of travel and users.
- **ST-P3** Create a pedestrian environment on the Loop Road, Class I shared-use paths, and secondary pathways/roadways that is:
 - Interesting, with appealing things to see, touch, hear and smell that makes one's time in the area a positive experience and encourages return visits.
 - Attractive, with building and landscape improvements that create a beautiful setting in which people can walk, drive, shop, work, and live.
 - Safe, allowing people to feel comfortable and secure, whether alone or in a group, during the day, evening and night.
 - Successful, where walking becomes a primary means of local transportation, enhancing transit ridership and supporting a thriving neighborhood and retail climate.

The following guidelines provide both broad and detailed objectives for achieving these goals. Many elements of streetscape design should be consistent throughout the Plan area, while other elements may be more appropriate to particular street types or location. Therefore, these Guidelines contain two parts:

- General guidelines that apply to all streets in the Plan area.
- Guidelines that apply to specific streets or specific situations, both existing and new, in the Plan area.

GENERAL DESIGN GUIDELINES FOR NEW AND RENOVATED STREETS

Implementation of the following guidelines must take into account the cost and difficulty of disrupting existing conditions. Therefore, the guidelines are not rigid requirements. The idea is to adapt to existing conditions wherever necessary while ensuring the design intent and goals are achieved.

Curb Extensions (Bulbouts)

As described in Chapter 4, bulbouts will be provided when feasible throughout the Plan area. In general, they are only feasible on streets with on-street parking, because the bulbout extends into the parking lane, thereby widening the sidewalk. Therefore, their location must be carefully considered in order to minimize parking losses in areas where parking supply is critical.

In the Plan area, there are three types of bulbouts:

- Corner Bulbouts. This is particularly important at unsignalized and wide (multi-lane) intersections that carry large volumes of traffic. At signalized intersections, bulbouts have an added benefit of allowing slightly shorter signal cycle timing, thereby potentially improving traffic flow. Additionally, bulbouts improve walking conditions with shorter crossing distances and increased visibility for pedestrians.
- Transit Bulbouts (Transit Mini-Plazas) are typically located at corners with bus stop locations. They are longer to accommodate the length of a bus. Because of their larger size, they provide additional space for passenger queuing, shelters, seating and other transit-related amenities.
- Amenity Bulbouts can be placed in any location where additional sidewalk space is desired, such as Santa Vittoria Terrace. They provide opportunities for seating, planting, outdoor dining, furnishings and other amenities.

Curb Extensions (Bulbouts) Guidelines

- **SE-UDG1** Minimize impacts on existing drainage systems, transit turning requirements, parking lanes and rights-of-way, existing trees and pedestrian paths of travel when locating and installing curb extensions.
- **SE-UDG2** To the extent possible, accommodate subsurface utilities, including existing drainage facilities in the design and construction of curb extensions.
- **SE-UDG3** Incorporate green stormwater infrastructure in new curb extension installation as directed by the City.

URBAN DESIGN |



Sidewalk Paving

Sidewalk Paving Policy

SW-P1 To provide a permanent, durable, interconnected network of pedestrian walkways that is accessible to all users, easily maintained, and provides a generally consistent appearance throughout the Plan area. Allow variation in materials and design in special nodes, plazas and gathering points on privately owned and maintained sidewalks.

Sidewalk Paving Guidelines

- **SW-UDG1** In general, use natural concrete (without unique color additives) for all sidewalks, including areas where public sidewalks extend into the setback area of a parcel.
- **SW-UDG2** Prohibit special coloring, stamp patterns and unusual scoring patterns, except at special locations, since matching of colors and patterns can be difficult when future maintenance or repairs are conducted
- **SW-UDG3** On privately owned and maintained pathways (including those available for public access), use special paving materials, such as unit pavers made of brick, stone, or concrete at special nodes, plaza areas and streets, within curb extensions and other special pedestrian areas in order to differentiate them from the public sidewalk and define a specific place.





Street Planting

Street Planting Policy

- **STP-P1** Enhance the urban forest in the Plan area in order to:
 - Provide shade and shelter
 - Mitigate adverse environmental conditions such as wind and pollution
 - Add scale to both pedestrian and vehicular streets
 - Enhance property values
 - Provide habitat for wildlife
 - Manage stormwater
 - Beautify the area.

Street Planting Guidelines

- **STP-UDG1** Plant new street trees on all streets while preserving existing trees wherever possible.
- **STP-UDG2** Locate street trees in the curb zone of the street (within 4-6 feet of the curb, depending upon sidewalk width) unless the width of the sidewalk and/or right-of-way prevents planting in that area. In such cases, locate street tree planting within the front setback of private parcels if possible.
- **STP-UDG3** Where feasible in on-street parking areas, plant trees in bulbouts to soften the visual impact of parking.
- **STP-UDG4** Use medium-to-large canopy trees on large streets as approved by the City Arborist.
- **STP-UDG5** Use pedestrian-scaled, ornamental trees to define small-scaled pedestrian ways as approved by the City Arborist.
- **STP-UDG6** To the extent feasible, space street trees at a distance on average of 35 feet.
- **STP-UDG7** Protect existing street trees wherever possible throughout the Plan area, particularly in the southern residential neighborhoods, along Kifer Road, San Zeno Way, Uranium Drive, and on Sonora Court.



(Top) An attractive "complete street" with access for pedestrians, bicycles and motor vehicles. Street trees and ground covers planted between the curb and sidewalk provide an attractive pedestrian zone and separate pedestrians from vehicular traffic.

(Bottom) Large deciduous canopy trees give definition and character to a neighborhood and provide shade in summer and sun in winter.

- **STP-UDG8** Where tree removal is unavoidable, provide replacement trees in accordance with the City's Tree Replacement Guidelines.
- **STP-UDG9** Ensure new tree plantings are appropriate for an urban environment and meet the following minimum criteria:
 - Drought tolerance
 - Ease of maintenance
 - Trees native to the region
 - Non-invasive root system
 - Adequate canopy height to allow clearance for service, emergency and transit vehicles.
 - Open branching and leaf structure to allow visibility both to and from buildings, particularly in retail areas.
 - Deciduous (in most cases) to allow summer shade and winter sun to reach the pedestrian areas of the street.
 - High-water table tolerance.
 - Salt water tolerance to allow use of potential future recycled water systems.
- **STP-UDG10** For shrub and groundcover planting in planting strips and medians, follow the criteria above for street trees. In addition:
 - Select and maintain planting not to exceed 24" in height.
 - Select and maintain plantings that will remain within the confines of the planting strip area.
 - Provide means of crossing planting strips for motorists parked adjacent to the planting.





(Top) Bioswales along the street provide an attractive landscape with low water requirements while also assisting in drainage and stormwater management from paved surfaces. (Bottom) Trees and shrubs can add scale, help soften edges, and beautify pedestrian streets.



Lighting

Lighting Policy

- L-P1 Use lighting to create a nighttime environment that:
 - Supports safety and security
 - Is appealing and attractive
 - Meets the functional needs for vehicular and pedestrian circulation
 - Defines specific gateways streets, and subareas
 - Enhances special areas, such as retail districts, parks, and natural features.
 - Promotes a bird safe environment

Lighting Guidelines

- L-UDG1 Utilize the LSAP lighting standard identified in the Sense of Place Plan, Figure 3-24, along public streets in order to create a unique district within the City. Refer to Figure 3-23 in the Sense of Place Plan for the locations of the LSAP lighting standard placement.
- L-UDG2 On publicly-accessible shared-use paths and pathways, utilize the lighting standard identified in the Sense of Place Plan, Figure 3-24.
- **L-UDG3** Comply with Dark Sky goals and requirements in the selection of luminaires during project design.
 - L-UDG4 Provide roadway illumination levels on public and private streets per the City's Public Works Department roadway lighting design criteria.
 - L-UDG5 Utilize energy-efficient lighting, such as light-emitting diode (LED) bulbs and induction lighting of warm white color (with color temperatures ranging from 2700 to 3200 degrees Kelvin). Compact fluorescent and metal halide are acceptable alternatives if LED and metal halide are not feasible.
 - L-UDG6 Lighting metalwork should consist of dark colors that match other light poles in the area. Include an ultraviolet-protectant clear coating to prevent color fading.
 - L-UDG7 Provide white light on all streets and pedestrian ways in the Plan area.

- **L-UDG8** On private property, use poles and fixtures that are attractive and complement the character of the street and building environment.
- L-UDG9 Use pole heights that relate to the scale of the street /shared-use pathway/path and its users.
 - On Santa Vittoria Terrace, the Loop Road, publicly accessible shared-use pathways and paths, and other internal private streets, mount luminaires on poles not exceeding 18 feet in height.
 - On Kifer Road, Uranium Drive, Lawrence Station Road, San Zeno Way, Sonora Court, Aster Avenue, Willow Avenue, and Reed Avenue, mount luminaires on poles not exceeding 30 feet in height. Poles equipped with enhanced wireless communications technology may exceed this height with City review.
- L-UDG10 Shielding and careful placement shall be used for all light fixtures to prevent glare and light spillover for pedestrians, motorists, and nearby residences.
 - The output of all area lighting fixtures should be shielded and directed below the horizontal to prevent light pollution and preserve dark skies.
 - Building facade uplighting, roof "wash" lighting, and landscape uplighting should be carefully shielded to restrict lighting to the intended surfaces only, prevent spill lighting (especially towards residences) and operated on timers that shut off illumination entirely after midnight nightly.
 - Light sources of low level and stairway lighting should be shielded from direct view.
- L-UDG11 Light poles on the top level of a parking garage shall be shielded to avoid up-lighting.
- L-UDG12 Adequate lighting in public open spaces shall be included for evening/nighttime uses and security and should be integrated as design features, to provide ambient lighting. Path lighting may be used to highlight main pedestrian circulation. Pole lighting should be placed adequately and equipped with necessary cutoff fixtures, to prevent light pollution and glare to the adjacent properties.

Street Furnishings

Street furnishings are the various elements that are placed along sidewalks and plazas. With the exception of transit shelters, this section only applies to publicly-accessible private streets, shared-use pathways, and paths. Street furnishings include:

- Seating
- Trash receptacles
- Consolidated newspaper racks/stands
- Bicycle parking facilities and lockers
- Tree guards
- Planters
- Signage and wayfinding elements
- Transit shelters

Street Furnishing Policy

- **SF-P1** Provide well-designed furnishings along publicly-accessible private streets, shared-use pathways, and paths that are:
 - Useful and comfortable for pedestrians
 - Meet the functional needs of utilities and services
 - Attractive
 - Generally consistent throughout the Plan area.

Street Furnishings Guidelines

SF-UDG1 Generally, use street furnishings that are:

- Designed to convey a coordinated design expression between all of the furnishing elements in the Plan area.
- Readily available from established manufacturers to avoid expensive custom fabrication and ensure ease of replacement.
- Durable and easy to maintain. Components should be made of durable, high-quality materials such as painted or stainless steel, painted cast iron, painted or powder-coated aluminum,

and integrally colored precast concrete or composite materials.

- **SF-UDG2** Metal surfaces should be powder-coated or painted with highly durable metal paints such as waterborne acrylic polyurethane. An ultraviolet protectant clear coating should be used to prevent color fading.
- **SF-UDG3** Incorporate unique, specially-designed street furnishing elements to provide a unique character in special areas such as Santa Vittoria Terrace.
- **SF-UDG4** Design and/or finish utility and service devices to either visually recede or, as appropriate, match other furnishing items.
- **SF-UDG5** Fully screen all service facilities serving private property from the public street and adjoining properties with walls, fences, and/ or landscaping treatments. Colors and finishes of enclosures should be coordinated with colors and finishes of fencing, other painted metal surfaces to be used onsite, or associated with the building's material and color scheme.

The following guidelines apply to specific street furnishing elements:

Seating

SF-UDG6 Install seating that is user-friendly, but does not encourage long term use and sleeping. Refer to Figure 3-19 of the Sense of Place Plan for thematic design.

Trash Receptacles

- **SF-UDG7** Provide two trash receptacles at diagonally opposite corners of each private street intersection in areas with high pedestrian circulation, such as Santa Vittoria Terrace. Refer to Figure 3-19 of the Sense of Place Plan for thematic design.
- **SF-UDG8** Provide trash receptacles with recycling options.

Bicycle Parking Facilities and Lockers

- **SF-UDG9** Provide bicycle parking facilities on each side of private streets in each block per VTA guidelines. Refer to Figure 3-19 of the Sense of Place Plan for thematic design.
- **SF-UDG10** Place bicycle parking facilities in the curb zone such that locked bicycles do not obstruct the sidewalk pedestrian path of travel.

- **SF-UDG11** In places where a larger number of bicycle parking facilities are needed, consider the use of an on-street parking space or creation of a curb extension (amenity bulbout) for bicycle parking.
- **SF-UDG12** Property owners should monitor the use of bicycle parking facilities and adjust the location, quantity and type where warranted. This process should involve the local bicycling community.



Bicycle parking located in the curb zone avoids the pedestrian path of travel.

Transit Shelters

- **SF-UDG13** Support the provision of transit shelters at all VTA bus transit stops. Coordinate with VTA on specific design requirements and locations.
- **SF-UDG14** Transit shelters may be custom-designed or pre-manufactured products.
- **SF-UDG15** Transit shelter facilities may be incorporated into adjacent buildings.
- **SF-UDG16** Ensure transit shelter facilities are publicly-accessible 24 hours per day.
- **SF-UDG17** Include the following features in transit shelters, subject to VTA approval:
 - Shelter from wind and rain
 - Seating
 - Lighting, either from street sources or within the shelter
 - Information related to area-wide wayfinding, transit routes, scheduling and costs
 - Transparent design to allow users to be visible from the surrounding streets and feel secure
 - Constructed and sited to minimize visual obstruction of adjacent businesses and residences
 - ADA compliant, both in design and siting
 - Compatible with the character of the street and surrounding built environment.





On-street Signage and Wayfinding

Today, wayfinding throughout the Plan area is exceedingly difficult. Even for longtime residents and employees of the area, it is not clear that the linkage to Lawrence Station and other local destinations is close and easy. The new framework of the Loop Road, Class I shared-use paths, and pathways will significantly help to facilitate connections for all travelers to the station. However, there will remain a need for a coherent and clear system of signage to direct pedestrians, bicyclists and motorists to the station and other important area destinations. The Sense of Place Plan includes new gateway signage to highlight entry into the Plan area and directional signage catered to pedestrians and bicyclists to Lawrence Station and other destinations.

On-Street Signage and Wayfinding Goal

- **OSW-G1** Implement the Sense of Place Plan's coordinated signage program that:
 - Clearly and attractively directs people to Lawrence Station and other neighborhood destinations, services and amenities.
 - Reinforces a sense of place with design elements that give the neighborhood a unique identity.
 - Provides gateway signs to highlight entry into the Plan area.
- **On-Street Signage and Wayfinding Guidelines**
- **OSW-UDG1** Follow the Sense of Place Plan that includes larger gateway signage at key intersections and Plan area entrances (Figure 3-20) and smaller directional signage (Figures 3-21 and 3-22) as shown in the Streetlife and Wayfinding Plan (Figure 3-17).
- **OSW-UDG2** Include the following features in the planning and installation of the signage and wayfinding system:
 - Direct pedestrians, bicyclists and motorists to major area destinations, especially Lawrence Station.
 - Define and mark gateway entries into the Plan area.
 - Promote transit use by indicating the location of bus and shuttle stops and system routing.

- Facilitate efficient traffic flow by directing drivers to destinations such as important roadways and parking facilities.
- Select typography, graphics, form, illumination and mounting to be compatible with the design of area street furnishings.
- Avoid visual clutter through the creation of efficient and clear signage that does not require a large amount of repetition.
- Consolidate information on a single pole, whenever feasible.
- Design directional signage in a consistent manner throughout the Plan area, regardless of the street type or land use.
- Design signage and way finding system to be appropriatelyscaled to the various modes and speeds of travel.
- **OSW-UDG3** Coordinate with the County of Santa Clara, Caltrain and VTA on the design requirements of all public wayfinding systems.

Banners in Rights-of-Way

OSW-UDG4 Banners in the public right-of-way may only be installed and maintained by the City. Private banners with advertising messages are prohibited.



Intersection Design (General Guidelines)

As the Plan Area redevelops over time, modifications to several existing intersections will be required. This section describes guidelines that apply to the renovation of existing intersections as well as the construction of new intersections within private development projects in the Plan area (see Figure 6.10). The guidelines that follow are conceptual in nature. Further traffic and civil engineering studies will be required prior to design and construction at specific locations.

General Intersection Design Policy

ID-P1 Enhance safety and convenience for all intersection users, particularly for pedestrians and bicyclists, in a manner that is compatible with the design character of the particular street and neighborhood.

General Intersection Design Guidelines

- **ID-UDG1** As identified by the City's Transportation and Traffic Manager, provide highly visible crosswalks at uncontrolled crossings in accordance with City standards and the Sense of Place Plan.
- **ID-UDG2** Where feasible, provide minimal curb return radii as determined by the City's Transportation and Traffic Manager in order to reduce pedestrian street crossing distance and slow turning traffic.
- **ID-UDG3** Wherever feasible, provide curb extensions (bulbouts) with a 15-foot maximum curb return.
- **ID-UDG4** Where curb extensions (bulbouts) are installed, install drainage improvements as needed in order to allow clear walkways. Alternatively, curb extensions may be built separate from the existing curb to continue drainage along the existing curb. Ensure such improvements are ADA compliant.
- **ID-UDG5** Provide lighting adequate for intersection safety as well as illumination of sidewalks.
- **ID-UDG6** Stripe bicycle lanes, where designated, continuously to the stop bar.

- **ID-UDG7** At signalized intersections, provide:
 - Pedestrian countdown signals to indicate how many seconds are available for pedestrians to cross and to signal motorists that they should anticipate and yield to pedestrians in the intersection.
 - Visual and audible cues for pedestrians who are sight and hearing impaired.
- **ID-UDG8** Coordinate with the County of Santa Clara to eliminate all "free-right" turns at Lawrence Expressway intersections in the Plan area.

Figure 6.10: Typical Private Street Intersection





DESIGN GUIDELINES FOR SPECIFIC STREETS

The following guidelines are intended to provide more direction for specific streets that will play a particularly important functional role within the Plan area.

Loop Road

Loop Road Design Policy

LR-P1 The Loop Road will be a primary collector street, designed to convey the character of a richly-landscaped green boulevard, providing direct north-south and east-west connections to Lawrence Station and other destinations in the Plan area north of the Caltrain tracks for all modes of travel. Since the Loop Road will traverse through private property, it is envisioned as a private street with public access easements through each property.

Completely new road area will be constructed east of Lawrence Expressway and on the parcel south of 1120-1130 Kifer Road to connect Santa Vittoria Terrace to Sonora Court. Existing streets on Sonora Court, San Zeno Way, and Lawrence Station Road will form the remaining loop road area west of Lawrence Expressway.

Street Cross Section Guidelines

- LR-UDG1 Provide a roadway and pedestrian realm (path of travel and curb zone) width of 60 feet.
- **LR-UDG2** Within this width, provide the following functional elements: one vehicular travel lane in each direction, Class IIB bicycle lanes, and a ten-foot wide pedestrian zone with sidewalks and street trees per Figure 3-6 of the Sense of Place Plan.
- **LR-UDG3** Coordinate with VTA to ensure the street cross-section is adequate for bus transit usage.

Intersection Design Guidelines

- **LR-UDG4** Install transit bulbouts, where appropriate, at all intersections.
- **LR-UDG5** Provide mid-block pedestrian crossings, as determined by the City's Transportation and Traffic Manager, along the length of the Loop Road if distances between intersections exceed 400 feet.

- **LR-UDG6** Link mid-block pedestrian crossings directly to pedestrian routes to the station and other destinations.
- **LR-UDG7** Employ traffic calming devices on the Loop Road as determined by the City's Transportation and Traffic Manager, to ensure safe pedestrian crossings.

Pedestrian Environment Guidelines

LR-UDG8 Provide a minimum sidewalk width of six feet with a four-foot wide planting strip along the curb.

Loop Road (Santa Vittoria Terrace Segment)

Future retail uses and services will be focused along Santa Vittoria Terrace, a new pedestrian-oriented mixed-use private street (with public access) that runs north-south between Kifer Road (at the intersection of Semiconductor Drive) and Sonora Court. As of 2021, Santa Vittoria Terrace has been constructed through 1120-1130 Kifer Road, and the road would continue through a parcel to the south upon time of its redevelopment to connect to Sonora Court. Alternatively, the road may continue through the Kifer Road parcel to the east, connecting to San Zeno Way. This street will form the walkable heart of the Transit Core West neighborhood, providing neighborhood-serving goods and services for residents and workers in the Plan area.

The character of the street is envisioned as a walkable, mixed-use neighborhood commercial street.

Loop Road (Santa Vittoria Terrace Segment) Retail Street Design Policies

- **SV-P1** The policies for this street include the following:
 - Promote and emphasize pedestrian activity.
 - Create an environment that supports the development of pedestrian-oriented retail.
 - Support transit usage, particularly Caltrain, with safe and attractive pedestrian circulation to and from the station and nearby bus transit stops.

- Create a distinct identity for the retail area.
- Design for low vehicular travel speeds.

Street Cross Section Guidelines

- **SV-UDG1** Provide a roadway and pedestrian realm (path of travel and curb zone) width of 80 feet.
- **SV-UDG2** Within this width, provide the following functional elements: one vehicular travel lane in each direction, on-street parking, Class II bicycle lanes and a 15-foot wide pedestrian zone per Figure 3-7 of the Sense of Place Plan.
- **SV-UDG3** Install traffic calming measures as determined by the City's Transportation and Traffic Manager to ensure traffic speeds will be low.
- **SV-UDG4** Coordinate with VTA to ensure the street cross-section is adequate for bus transit.
- **Intersection Design Guidelines**
- **SV-UDG5** Provide curb extensions (corner bulbouts) at all intersections.

Pedestrian Environment Guidelines Guidelines

- **SV-UDG6** Provide a minimum sidewalk width of 15-feet (five-foot building zone, six-foot pedestrian circulation zone, four-foot wide curb zone). See Figure 6.11.
- **SV-UDG7** Since the buildings along the street will be built at, or near, the back of sidewalk, the sidewalk is defined here as the entire area between the curb and the building wall. The sidewalk may be contained completely within private property with a public access easement.
- **SV-UDG8** Subdivide the sidewalk into three zones (see Figures 6.11 and 6.12):
 - Curb Zone: minimum four feet wide, containing the elements that separate the sidewalk from the street and provide the necessary infrastructure to support pedestrian and motorist activity, including lighting, signage, furnishings, street trees, and other vertical elements.
 - Pedestrian Circulation Zone: minimum six-feet wide, and clear of obstruction.



CE HALL

ALC: DOG

Figure 6.11: Section of Santa Vittoria Terrace Pedestrian Zone



CRANES

- Building Zone: immediately adjacent to the building wall. Depending on the width of the overall sidewalk, the building zone may contain amenities such as seating, outdoor dining, merchandise displays, planting or architectural elements of the building, as long as these do not interfere with pedestrian movement.
- **SV-UDG9** Plant pedestrian-scaled ornamental trees unique to this location along the street.

Setback Guidelines

SV-UDG10 Locate ground floor retail at the back of sidewalk (zero setback).

Figure 6.12: Plan View of Santa Vittoria Terrace Pedestrian Zone





Sonora Court

Sonora Court will become a key east-west segment of the Loop Road accessing Lawrence Station on the west side of Lawrence Expressway. It will also link the new east-west primary Class I shared-use path at the culde-sac to the station. The most important assets of the street, the existing mature Redwood and Cedar trees, will be preserved with new roadway and sidewalk improvements.

Sonora Court Design Policies

SC-P1 The design policies for Sonora Court include the following:

- The existing Redwood and Cedar trees shall be preserved and protected and shall not be removed.
- Design the street (particularly the pedestrian zone) to capitalize on the existing trees and wide planting areas to create a mature, park-like environment, with attractive, usable outdoor urban spaces that relate to, and enhance future building development along the street.
- Capitalize on the existing Redwood and Cedar trees to create a unified design vocabulary that is unique from other street segments.
- Recycled water irrigation is prohibited within the dripline of Redwood and Cedar trees.

Street Cross Section Guidelines

- **SC-UDG1** Provide an overall public right-of-way width of 56 feet.
- **SC-UDG2** Within the existing right-of-way, retain the existing paved roadway cross-section and curb locations and the existing curbside planting strip in order to avoid disturbance to the root systems of the Redwood and Cedar trees.
- **SC-UDG3** Reallocate the paved street space between the curbs to provide the following functional elements: one vehicular travel lane in each direction, Class II bicycle lanes, and parking on the north side of the street (see Figure 3.16 of the Sense of Place Plan).

Pedestrian Environment Guidelines

SC-UDG4 Retain the curbside planting strip where the Redwoods and Cedars are located at its current dimension.



The mature redwood trees on Sonora Court are one of the strongest natural assets in the Plan area. Their protection is a high priority.

- **SC-UDG5** Incorporate small outdoor seating areas for passive activities and outdoor dining.
- **SC-UDG6** Utilize the existing location and footprint of private building walkways for new public sidewalks in order to protect the existing trees. Require public sidewalk easements for legal access.
- **SC-UDG7** Exercise extreme care when initiating construction activities in the vicinity of the Redwood and Cedar trees. Minimize changes within the planting strip containing the existing trees.
- **SC-UDG8** Before construction activities, consult with a certified arborist and prepare a tree protection plan.

Setback Guidelines

SC-UDG9 Retain the existing building streetwall line (set back from the curb) to the maximum extent possible in order to protect the existing Redwoods and Cedars and reinforce the park-like character of the street.

Kifer Road

Kifer Road is an important existing thoroughfare, designated by the City of Sunnyvale as a Commercial/Industrial Collector, which must accommodate relatively high volumes of traffic as well as transit vehicles and trucks. Additionally, the majority of Kifer Road through the study area is shared with the City of Santa Clara. Kifer Road was designed with an emphasis on accommodating vehicular traffic, with unappealing facilities for pedestrians and bicyclists, no on-street parking and few areas of attractive planting and streetscape improvements. The Sense of Place Plan includes improvements to Kifer Road for pedestrians and bicyclists, which include wider and continuous sidewalks, bicycle lanes with buffers, and a new landscaped median with left-turn pockets.

Kifer Road Design Policies

- **KR-P1** The policies for Kifer Road include the following:
 - Ensure it provides efficient access for motor vehicles and bus transit without consuming unnecessary excess quantities of land for that purpose.
 - Enhance its usability for pedestrians and bicyclists.
 - Strengthen the existing visual quality and character of the street as a green boulevard.

Street Cross Section Guidelines

- **KR-UDG1** If feasible, retain the existing roadway curb locations. However, right-of-way dedications may be required east of Lawrence Expressway if existing widths do not accommodate the Sense of Place Plan upgrades. Sidewalk easements shall be provided.
- **KR-UDG2** Reallocate the paved street space between the curbs to provide the following functional elements: two vehicular travel lanes in each direction, a landscaped center median with left turn pockets, and Class IIB bicycle lanes (see Figure 3-8 in the Sense of Place Plan).
- **KR-UDG3** Coordinate changes to the cross-section of Kifer Road with the City of Santa Clara and the County of Santa Clara (near Lawrence Expressway).

Pedestrian Environment Guidelines

- **KR-UDG4** Between the curb and the building setback line, include generous plantings of large trees, signage and lighting, and a wide sidewalk.
- **KR-UDG5** Provide a minimum sidewalk width of ten feet inclusive of fourfoot wide tree wells and six-foot travel path.
- **KR-UDG6** Preserve all existing street trees along Kifer Road to the maximum extent possible.
- **KR-UDG7** Infill areas that lack existing trees with new street tree plantings.
- **KR-UDG8** Complement the existing character of the street by infilling new trees in an informal arrangement with a variety of species.



Meander sidewalks on existing streets where necessary to provide a separation between pedestrians and vehicular traffic and avoid existing mature trees.

New Internal Local Circulation Streets

All other internal streets on private property shall be subject to the following criteria.

New Internal Local Circulation Streets Design Policies

- **NI-P1** Place streets in locations that can connect to routes to Lawrence Station and other neighborhood destinations.
- NI-P2 Provide public access on internal streets identified in the Sense of Place Plan.
- **NI-P3** Promote and emphasize pedestrian activity.
- NI-P4 Design for low vehicular travel speeds.
- **Street Cross Section Guidelines**
- **NI-UDG1** To the maximum extent feasible, establish the grid of internal streets with a pattern of blocks no longer than 400 feet on a side.
- **NI-UDG2** Provide a minimum width of 50 feet.
- **NI-UDG3** Within this width, provide the following minimum functional elements: one vehicular travel lane in each direction, on-street parking on one side of the street, and a pedestrian zone with sidewalks and a planting strip on both sides of the street.
- NI-UDG4 Install traffic calming measures as determined by the City's Transportation and Traffic Manager to ensure traffic speeds will be low.
- **NI-UDG5** Due to low vehicular travel speeds, bicycles will share the street with vehicular traffic, either in a Class III or Class IIIB condition as determined by the City.
- **NI-UDG6** Employ traffic calming devices to ensure safe pedestrian crossings.
- **NI-UDG7** Build streets per City standards for residential streets.

Pedestrian Environment Guidelines

NI-UDG8 Provide a minimum sidewalk width of six feet separated from the street by a minimum four-foot-wide planting strip containing street trees, lighting and signage.

Setback Guidelines

NI-UDG9 In general, set buildings back a minimum of ten feet from the back of sidewalk to allow for landscaping unless a variation in setback is warranted due to local conditions.

Primary Class I Shared-Use Paths

Primary Shared-Use Paths Design Policies

- **SU-P1** Complete the primary shared-use-path circulation framework in the Sense of Place Plan with a network of publicly accessible routes for pedestrians and bicycles.
- **SU-P2** Ensure pedestrian/bicycle ways are safe and accessible to all users.
- **SU-P3** For the segment of the shared-use path east of Calabazas Creek, encourage coordination with Union Pacific Railroad to locate the shared-use path within the existing rail spur area. If this is infeasible, locate the shared-use path along the rear of private property adjoining the spur.

Primary Shared-Use Paths Cross-Section

- **SU-UDG1** When located in an open landscape, provide a minimum width of 22 feet consistent with Figure 3-2 of the Sense of Place Plan.
- **SU-UDG2** Within this shared-use path width, provide a minimum paved width of 14 feet, exclusive of shoulders. This will allow adequate room for multiple pedestrian and bicycle users as well as maintenance and emergency vehicles, if needed.

Design and Materials Guidelines

- **SU-UDG3** Use concrete or similar permanent paving. Decomposed granite or other soft surface materials are prohibited.
- **SU-UDG4** Provide continuous pedestrian-scaled lighting on all shared-use paths to ensure a feeling of security.
- **SU-UDG5** Use overhead lighting rather than bollards to allow easy visibility of oncoming pedestrians and bicyclists. Lighting should be directed to the path surface and dim during late night hours.
- **SU-UDG6** Plantings may be of a design that is either consistent with the palette of adjoining properties or of a design that delineates the shared-use path. The selection of plant material should consider use of native plants, shade trees, and non-invasive plantings.

URBAN DESIGN |



- **SU-UDG7** Ensure that plantings do not obscure visibility of the shared-use path from surrounding properties and public spaces and do not interfere with emergency vehicle access.
- **SU-UDG8** Provide amenities like seating, water fountains, and trash receptacles to provide a comfortable and inviting environment for the shared-use path users.

Secondary Pathways

PP-P1 Complete the secondary pedestrian path circulation framework in the Sense of Place Plan with a network of publicly accessible routes for pedestrians and bicycles when local conditions permit.

Secondary Pathways Cross-Section

- **PP-UDG1** When located in an open landscape, provide a minimum width of 22 feet consistent with Figure 3-2 of the Sense of Place Plan.
- **PP-UDG2** Within the pathway width, provide a minimum paved width of 14 feet, exclusive of shoulders. This will allow adequate room for multiple pedestrian users as well as maintenance and emergency vehicles, if needed.

Design and Materials Guidelines

- **PP-UDG3** Use concrete or similar permanent paving. Decomposed granite or other soft surface materials are prohibited.
- **PP-UDG4** Provide continuous pedestrian-scaled lighting on all paths to ensure a feeling of security.
- **PP-UDG5** Use overhead lighting rather than bollards to allow easy visibility of oncoming pedestrians.
- **PP-UDG6** Plantings may be of a design that is either consistent with the palette of adjoining properties or of a design that delineates the pathways.
- **PP-UDG7** Ensure that plantings do not obscure visibility of the paths from surrounding properties and public spaces and do not interfere with emergency vehicle access.
- **PP-UDG8** Provide amenities like seating, water fountains, and trash receptacles to provide a comfortable and inviting environment for the pathway users.


Other Streets

Lawrence Expressway

As mentioned previously in this Plan, the Expressway is owned and managed by the County of Santa Clara, and therefore is not under the jurisdictional control of the City of Sunnyvale. The County is planning major modifications to the Expressway in the segment that traverses the Plan area, including grade-separation below grade. These modifications have the potential to greatly improve local accessibility and quality of the neighborhoods in the Plan area. However, these improvements will likely require significant land dedications on properties along Lawrence Expressway.

Lawrence Expressway Policy

LE-P1 Work with the County of Santa Clara on the Lawrence Expressway Grade Separation Project to study planned changes to the expressway, San Zeno Way, Lawrence Station Road, Kifer Road, Reed Avenue, Willow Avenue, and other streets and properties affected by the project.

Lawrence Expressway Design Guidelines

- **LE-UDG1** Improve the intersections at Reed/Monroe and Kifer, including the provision of pedestrian countdown timers.
- **LE-UDG2** Improve the appearance of the embankments by providing additional landscape improvements.
- **LE-UDG3** Incorporate streetscape improvements to areas not affected by the grade separation project during development review.

Willow Avenue

Willow Avenue currently provides the only vehicular access to the Lawrence Caltrain station from the south, and is also a key access route for pedestrians and bicyclists. Improvements to Willow Avenue between Lawrence Station and Aster Avenue were required as part of the redevelopment of the 1155-1175 Aster Avenue (former Calstone/Peninsula Building Materials site). The Sense of Place Plan includes provisions for pedestrian and bicycle access improvements.

Design Policy for Willow Avenue

WS-P1 Design to be safe and attractive.

Design Guidelines for Willow Avenue

- **WS-UDG1** Provide continuous sidewalks on Willow Avenue. Require sidewalk easements on the east side of the street for sidewalk improvements with a minimum six-foot paved width and four-foot minimum tree wells (see Figure 3-14 of the Sense of Place Plan).
- **WS-UDG2** Accommodate bicycles in the roadway by providing Class II/IIB bicycle lanes south of Aster Avenue and Class II bicycle lanes north of Aster Avenue.

Reed Avenue

Reed Avenue is a wide residential collector street that traverses a small portion of the LSAP boundary along parcels in the Lawrence/Reed/Willow Subarea. The Sense of Place Plan includes minor enhancements to Reed Avenue for pedestrian and bicycle access improvements.

Design Policy for Reed Avenue

RA-P1 Design to reduce the visual width of the street and improve safety for bicyclists with Class IIB bicycle lanes. Provide sidewalk enhancements for pedestrians, especially near the existing VTA bus stop near the intersection at Willow Avenue.

Design Guidelines for Reed Avenue

- **RA-UDG1** On the north side of Reed Avenue, provide sidewalks with a minimum six-foot paved width and four-foot minimum tree wells (see Figure 3-12 in the Sense of Place Plan).
- **RA-UDG2** Reconfigure the street by reducing travel lane widths with Class IIB bicycle lanes. Retain on-street parking on both sides of the street.
- **RA-UDG3** Provide a curb extension (corner bulbout) at Reed Avenue and Willow Avenue if determined feasible by the City.

Aster Avenue

Aster Avenue along the Plan area boundary was required to be improved as part of the redevelopment of the 1155-1175 Aster Avenue project being improved as part of the redevelopment of (the former Calstone/ Peninsula Building Materials site). The improvements will close a major gap in pedestrian circulation through a construction of new sidewalk along the frontage. A new two-way left turn lane will be installed in the center of the street. Crossing improvements to the Willow Avenue and Aster Avenue intersection will also be made.

Design Policy for Aster Avenue

AA-P1 Maintain the quality of improved pedestrian and bicycle conditions and seek out additional enhancements in the future as needed.

Uranium Drive

Uranium Drive is a cul-de-sac at the east end of the LSAP with access to Kifer Road and Bowers Avenue (via Mead Avenue) in the City of Santa Clara. Uranium Drive is envisioned to be significantly enhanced with new sidewalks and bicycle lanes, and will be the location of the main trailhead for the new primary Class I shared-use path. Improvements to this street must be done in consultation with the City of Santa Clara given that the street centerline serves as the City boundary with Santa Clara.

Design Policy for Uranium Drive

UD-P1 Transform Uranium Drive into a complete street with improved bicycle and pedestrian facilities. Preserve existing mature street trees on the City of Sunnyvale side of the street.

Design Guidelines for Uranium Drive

- **UD-UDG1** Provide sidewalks with a minimum six-foot paved width and four-foot minimum tree wells. Require sidewalk easements where determined by the City.
- **UD-UDG2** Reallocate the paved street space between the curbs to provide the following functional elements: one vehicular travel lane in each direction (with narrowed lanes), Class IIB bicycle lanes, and on-street parking on the City of Santa Clara side. Remove on-street parking on the City of Sunnyvale side to accommodate the new Class IIB bicycle lanes. See Figure 3-11 of the Sense of Place Plan.
- **UD-UDG3** Preserve all existing street trees along Uranium Drive to the maximum extent possible.
- **UD-UDG4** Coordinate changes to the cross-section with the City of Santa Clara.
- **UD-UDG5** Locate the primary trailhead at the Union Pacific rail spur, or on adjoining parcels if acquisition of the rail spur is not feasible.
- **UD-UDG6** Provide a signalized intersection at Kifer Road and Uranium Drive in order to provide a safer bicycle and pedestrian crossing.

San Zeno Way/Lawrence Station Road

San Zeno Way and Lawrence Station Road run parallel to Lawrence Expressway on the west and east sides, respectively, and may be affected by the Lawrence Expressway Grade Separation Project. For this reason, major improvements are not planned, but opportunities for streetscape enhancements will be studied upon site redevelopment. The southern portions of both streets will be utilized to bridge the new Loop Road on either side of Lawrence Expressway.

Design Policy for San Zeno Way/Lawrence Station Road

SL-P1 Work with the County of Santa Clara on the Lawrence Expressway Grade Separation Project to study planned changes to San Zeno Way and Lawrence Station Road. Incorporate streetscape improvements to areas not affected by the grade separation project during development review.

Design Guidelines for San Zeno Way/Lawrence Station Road

- **SL-UDG1** Preserve existing trees along San Zeno Way and explore opportunities to meander new six-foot sidewalks behind the existing trees.
- **SL-UDG2** Provide improved sidewalks with a minimum six-foot paved width and four-foot minimum tree wells on Lawrence Station Road.
- **SL-UDG3** Maintain the southern portions of each street for use in the new loop road.



PLAN IMPLEMENTATION

Implementation of the LSAP will require the coordinated efforts of both the public and private sector working cooperatively to achieve the goals of the plan.



PLAN IMPLEMENTATION

The LSAP includes a variety of plans and policies to guide the future redevelopment of the area surrounding the Lawrence Caltrain Station. The Plan also contains recommendations that will require direct action by the City, partner agencies and the private sector.

In many situations where change in an existing built-up urban area is contemplated, there are City-owned properties that can be used for public facilities or infrastructure improvements in order to support and stimulate new private investment. Such is not the case in the LSAP, where, except for existing public street rights-of-way and drainage corridors, there is very little publicly-owned land. Therefore, implementation of the LSAP will require the coordinated efforts of both the public and private sector working cooperatively to achieve the goals outlined in this Plan. This section of the Plan provides a broad discussion of the key features of a program to implement the Plan. Included are discussions of principles, implementation actions and responsibilities, potential funding sources, and project priorities.

IMPLEMENTATION PRINCIPLES

Three core principles underlay all of the strategies outlined in this chapter and have guided the land use plans and other goals and policies of the LSAP.

- All land use changes in the Plan area will be undertaken at the initiative and schedule of private landowners. The City of Sunnyvale has no intent to purchase land for redevelopment or force private landowners and businesses to change land uses in order to meet the objectives of the Plan.
- Existing legal uses will continue to be allowed and will not be adversely impacted by the implementation of the Plan. The Plan focuses on opportunities for new development.
- In cases where acquisition of land or easements may be needed for the improvement of areawide and regional infrastructure (such as water and sewer improvements, and other circulation improvements), it is the intent of the City of Sunnyvale that such acquisitions will take place through conditions of approval in conformance with existing City regulations and policies and state statutes. Development incentives may be awarded for physical construction of improvements.

IMPLEMENTATION ACTIONS AND RESPONSIBILITIES

Implementation of the LSAP will require the coordinated efforts of both the public and private sector working cooperatively to achieve a common goal. Table 7.1 lists the key improvements that will be needed to achieve the goals of the Plan and the range of implementation methods and potential responsibilities that can be used to complete these improvements. As Table 7.1 illustrates, implementation of the LSAP can be achieved through the coordinated application of four general types of public and private actions, including:

- 1. Public Policy and Regulatory Actions
- 2. Impact Fees
- 3. Grant Funding
- 4. Administrative Actions

PUBLIC POLICY AND REGULATORY ACTIONS

As private-sector development occurs in accordance with the Plan, various public improvements and benefits will be required as part of the approval process in order to provide needed infrastructure, open space, circulation and parking facilities and other needs that will result from the increased development.

Some of these public improvements will be required as a condition of development approval per existing procedures of the City of Sunnyvale for mandated development requirements. Others will be provided through development incentives, which will be administered through the City regulatory process. Therefore, the policies of the General Plan as well as the Zoning Code and other City regulations will be essential ingredients of a successful implementation strategy.

City of Sunnyvale General Plan

In April 2017, the City adopted an update to the City's Land Use and Transportation Element (LUTE) of the General Plan. The LUTE incorporated the planned land uses under the LSAP. The LUTE designates land uses in the LSAP as Transit Mixed Use (TMU). The LUTE also includes policies that promote the goals of this Plan. A simultaneous update to the LUTE reflects the updated land uses and boundary changes associated with the adoption of this plan.

Table 7.1: Summary of Implementation Tools

This table is illustrative of potentic	ul davalan mant raan anaihilitiar	. athar machaniana ma	, ha available
	a development responsibilities	; omer mechanisms ma	v pe avallaple.
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	City of Sunnyvale					Partner Agencies				
Project Component	Mandated Development Requirements	Regulatory (Zoning) Impact Fe		Indated Regulatory (Zoning) Impact Fees Direct Public Investment elopment uirements			Direct Public Investment Ad Act		Admin. Actions	
		TDR/ PDR	Dev. Incentives		CIP	Joint Development	Grants/ Loans			
Land Use Mix										
Mixed-use		•	•							
Affordable Housing	•	•	•	•		•	•			
Retail in targeted areas	•	•	•							
Circulation & Parking Improvements										
Loop Road public access easement	•									
Loop Road improvements		•	•							
Public street improvements	•		•	•			•			
Santa Vittoria Terrace improvements			•							
Roadway connection modifications (inter- section improvements, ADA ramps, etc)				•			•			
Primary Class I shared-use path public access easement	•									
Primary Class I shared-use path public access improvements		•	•							
Secondary path public access easements	•									
Secondary path improvements		•	•							
Transit Passes	•		•							
Track crossings (East and West)					•	•	•			
Below-grade parking			•							
Grade separations -Lawrence Expressway	•			•	•				•	
Regional transit (infrastructure and facilities)									•	

* TDR/PDR: Transfer of Development Rights / Purchase of Development Rights CIP: Capital Improvement Plan

Table 7.1: Summary of Implementation Tools (continued)

This table is illustrative of potential development responsibilities; other mechanisms may be available.

		City of Sunnyvale					Partner Agencies		
Project Component	Mandated Development Requirements	Regulatory (Zoning)		Impact Fees	Direct Public Investment			Admin. Actions	
		TDR/ PDR	Dev. Incentives		CIP	Joint Development	Grants/ Loans		
Bus transit improvements (operations and facilities)	•								•
Shuttle service improvements & expansion								•	•
Open Space									
Land acquisition	•	•	•	•					
Open space improvements			•	•		•			
Calabazas Creek linear park improvements						•			•
Urban Design objectives									
Connectivity	•		•						
Industrial to residential transition	•								
Best site planning and building design practices	•								
Sustainable development	•		•						
Setbacks to encourage pedestrian-friendly streets	•								
Noise mitigation	•								
Infrastructure Improvements									
Sewer upgrades	•			•	•				
Drainage	•								
Recycled Water					•	•			

* TDR/PDR: Transfer of Development Rights / Purchase of Development Rights CIP: Capital Improvement Plan

7.4 LAWRENCE STATION AREA PLAN

Zoning Code

Physical development and implementation of the LSAP will primarily be driven by the activities of private landowners, developers and businesses in the area. The Zoning Code (Title 19 of the Sunnyvale Municipal Code) regulates the activities of the private sector in development, and implements the goals and policies of the General Plan; it is one of the most important tools in the implementation of the Plan. Chapter 19.35 of the Zoning Code includes regulations specific to the LSAP. In addition to the Zoning Code, the Subdivision Code (Title 18 of the Sunnyvale Municipal Code) regulates subdivisions of land for private ownership.

Flexible Mixed-use

Encouraging mixed-use development in a manner that is flexible and responsive to business and property-owner decision-making and the marketplace is a key goal of the LSAP. Therefore, several mixed-use land use categories specific to LSAP properties have been established and incorporated into the Zoning Code, consistent with the Land Use Plan described in Chapter 3.

Development Incentives

Since very little land in the Plan area is publicly-owned, implementation of the LSAP will be heavily driven by the business plans and economic goals of private property owners. It is anticipated that new development will notably increase property values and should be able to support a significant amount of new infrastructure investment in the Plan area. Development incentives (in the form of density bonuses) will allow property owners to develop their properties beyond the base maximum densities (residential) and floor area ratios (office/R&D/industrial) in exchange for providing community benefits such as mixed-use development, connectivity improvements, additional open space, additional affordable housing, financial contributions, and other features that advance the goals of the Plan. In residential development, community benefits are assigned a defined amount of points which translate into dwelling units per acre (du/ac). Development Agreements, subject to approval by the City Council, are required for office/R&D/industrial projects requesting access to higher floor area ratios (FAR) through the incentives program. Development agreements are not required for projects consistent

with the additional FAR allowed through participation in the City's Green Building Program. Developers are not required to build with incentives. The LSAP Incentive Program is designed to be updated over time as City priorities change. The incentives program is available under separate cover.

Growth Monitoring Program

Unlike traditional zoning, which typically establishes single-use districts with fixed densities, the LSAP's innovative development strategy, which allows a flexible mix of uses at a range of densities, could result in a degree of unpredictability regarding both the pace of change and the ultimate result at build-out. In order to ensure that long-term development does not exceed the carrying capacity of infrastructure systems and the environment, a growth-monitoring program with a development capacity was established with the adoption of the original LSAP.

The Environmental Impact Report (EIR) that was conducted as part of the planning process to update the plan analyzed a buildout of up to 5,935 residential units in the plan area. The buildout also includes 1.2 million square feet of net new office/R&D/industrial development studied in the original 2016 EIR. Once this development threshold is reached the City would need to undergo additional environmental analysis per the California Environmental Quality Act (CEQA) before approving any subsequent developments.

IMPACT FEES

In order to reach the long-term goals of the Plan Area, extensive public infrastructure improvements will be required. Infrastructure improvement categories include new and improved roadway connections, local streetscape improvements, bicycle and pedestrian improvements, local and regional utility improvements, and new and improved public open spaces and public facilities such as schools and recreation facilities. Developers in the City pay school impact fees directly to the respective school districts.

Funding these necessary public infrastructure improvements will require the coordinated efforts of both the public and private sector working cooperatively.

Circulation improvements, including acquisition of right-of-way and costs associated with providing new rail crossings and other improvements for pedestrians and bicycles, will require unique funding mechanisms. Much of the cost associated with the Loop Road and other new streets and pedestrian / bicycle facilities, including right-of-way acquisition, can be provided through incentives to new private development.

However, it is likely that some of these improvements, as well as the new pedestrian rail crossings, parks and schools and local and regional utility and drainage improvements, will require additional funding. These funds can come from a variety of sources, including direct public investments from partner agencies, transportation, recreation and similar grants, and from development Impact Fees.

As with many California jurisdictions, the City of Sunnyvale already charges development impact fees to fund community improvements and affordable housing required by new development. The impact fee funding accrues incrementally over time as new development occurs. Development impact fees can only fund capital improvements (i.e., not ongoing maintenance expenses) that are on the fee program project list, which is amended from time to time by the City. Development impact fees cannot be used to fund infrastructure improvements required to serve existing development or cover

existing deficiencies. The City currently collects the following development impact fees, many of which will be applied to new development in the Plan area.

- Housing Mitigation Fees
- Park Dedication in-lieu Fees (when land is not dedicated)
- Plan Maintenance Fee
- Sanitary Sewer Impact Fee for Residential
- Sense of Place Fee
- Storm Drainage Fees
- Transportation Impact Fees
- Water and Sewer Connection Fees

In addition, school districts that serve the area collect School Impact Fees.

GRANT FUNDING

Grant Funding

Grant funding sources may be available to assist with new development in the Plan area, particularly because of Plan goals to enhance and intensify a transit-served urban infill location. Grant funding can significantly reduce both the City's and the developers' obligation toward infrastructure financing.

Potential external funding sources include programs available at the regional or State level that particularly focus on infrastructure improvements, and provision of diverse housing and transportation improvements. Many of these are summarized in Table 7.2 Potential Funding Sources.

Grant funding sources and available amounts will vary over the longterm build-out of the Plan area, but recent examples include the State's Proposition 1B and 1C programs for transportation improvements and affordable housing, respectively, as well as the Metropolitan Transportation Commission's Transportation for Livable Communities and Housing Incentive Programs and One Bay Area Grants.

ADMINISTRATIVE ACTIONS

Certain actions can be provided as part of the daily administrative function of the City of Sunnyvale. Generally, these include responsibilities for the ongoing monitoring, management, and maintenance of the Plan area. Perhaps the most important of these actions will be monitoring new development that will occur in the Plan area.

Growth Monitoring Program

As mentioned previously, monitoring growth in the Plan area will be critically important to ensure future development does not exceed the carrying capacity of infrastructure systems and the environment. Therefore, the City will develop a monitoring program to:

- 1. Monitor development in the Plan area as it approaches the development threshold of 5,935 residential units and 1.2 million square feet of net new office/R&D/industrial development based on the findings of the EIR. As the area approaches development thresholds, initiate a process to update the plan and conduct additional environmental analysis.
- 2. Regularly monitor development proposals and infrastructure needs to ensure they are supportive of the goals and vision of the Plan.

Table 7.2: Potential Funding Sources This list is not inclusive. Funding sources are likely to change in the future.

Potential Funding Sources	Wildlife Conservation Board Public Access Program
Federal	State Department of Housing and Community Development
National Endowment for the Arts (NEA) Grants ("Our Town", etc)	Regional
ArtPlace Grants	Transportation Fund for Clean Air
Congestion Mitigation & Air Quality	Transportation for Livable Communities
Recreational Trails Program	Transportation Enhancement Program
Federal Lands Transportation Program	Regional Bicycle and Pedestrian Program
Rivers, Trails & Conservation Program	Safe Routes to Transit
Safe Routes to School - SRTS	Lifeline Transportation Program
Community Development Block Grants	Bay Area Air Quality Management District
Highway Safety Improvement Program	County
Low-income housing Tax Credits	VTA Programming and Grants Section
State	Santa Clara County Transportation Funds
Caltrans Roadway Improvements	Measure A (2016) Affordable Housing Bond
Caltrans Bicycle Transportation Account	City
Caltrans Transportation Development Act	Potential Business Improvement District (BID) Formation
California Art Council "Creating Places of Vitality" Grant	Potential Transportation Management Association (TMA)
Proposition 1 Grant	Housing Mitigation Fees
Proposition 1C Grant - Transportation HCD	
Safe Routes to Transit	
Bicycle Transportation Account	
California Conservation Corps	
State Infrastructure Bond Funds	
Office of Traffic Safety	
Community Based Transportation Planning Demonstration	
Transportation Development Act, Article III	
Environmental Justice: Context Sensitive Planning Grants	

PHASING

It is not envisioned that development of the area in accordance with the Plan will occur all at once. As property owners determine that it is financially advantageous, redevelopment of individual parcels will occur incrementally.

Although not all property owners will be seeking to change the use of their property in the near term, several established businesses are already increasing their footprints in the area through property acquisition and new construction to allow them to expand their current operations. In addition, based on discussions held between City staff and various property owners, several properties are likely candidates for redevelopment and land use change in the near and intermediate term, in accordance with the concepts of the LSAP.

NEXT STEPS

The LSAP is a planning document that outlines overall concepts, goals, policies and guidelines. Next steps to consider in the implementation process include:

- Initiate coordination with partner agencies to accelerate Plan improvements, including:
 - Peninsula Joint Powers Board: Lawrence Station improvements.
 - County of Santa Clara: Lawrence Expressway and Central Expressway improvements.
 - City of Santa Clara: Coordination of development phasing, transportation, and public infrastructure improvements.
 - School Districts: Facilities demand analysis and timing.
 - Valley Water: Coordination of improvements for linear parks and pedestrian facilities along Calabazas Creek.
 - VTA: Coordination of potential transit route modifications and street design standards.
- Prepare applications for grant funding for detailed planning, design and capital improvements.
 - Annually review grant application opportunities and prepare applications to fund capital improvements identified in the LSAP and Sense of Place Plan.



APPENDICES

- A: Market Research Study, EPS, February 2020
- B: Fiscal Impact Analysis, EPS, February 2020
- C: Housing Expansion Infrastructure Impact Study, BKF, June 2020
- D: Intuitive Corporate Campus Infrastructure Impact Study, BKF, June 2020
- E: Acknowledgements



APPENDIX A | MARKET RESEARCH STUDY

APPENDICES

Technical Memorandum Sunnyvale Lawrence Station Area Plan Update - Market Research February 5, 2020 Page 2

Key Findings

This memorandum summarizes local and regional real estate market conditions and highlights potential opportunities for housing and commercial/industrial development in the LSAP area. The following presents key findings, with further detail provided throughout this memorandum.

- Employment growth in Sunnyvale outpaced residential growth, resulting in strong demand for housing. Jobs in the City increased by more than 10,700 between 2010-2017 (the last year for which job data is available), representing a 14 percent increase in employment. During the same period, the City's housing supply increased by only about 2,600 units, or 10 percent growth. These trends of housing growth falling short of job growth are also found throughout Santa Clara County and contribute to the City's consideration of the reorientation of the LSAP to encourage greater housing density.
- The LSAP area is well poised to absorb several multifamily projects currently under construction or approved, plus more in the future. Rent growth in the portion of Sunnyvale encompassing the LSAP has been strong, even as the LSAP's ZIP code area (which extends beyond the LSAP boundaries) added roughly 1,000 new multifamily units, nearly half of all the units added in the City since 2010. At present, another 2,000 housing units are either under construction or approved within or immediately adjacent to the LSAP boundaries, but these units are expected to be absorbed very quickly given the very strong demand for housing in the city and region. Strong demographic growth spurring housing demand coupled with rising rents indicates a favorable market for continued higher density multifamily development, in line with the evolving vision of the LSAP.
- The LSAP area is somewhat less competitive for new commercial development than are other parts of the City. Recent office/R&D development in Sunnyvale is primarily grouped in the Peery Park and Moffett Park districts and substantial retail/entertainment space is set to come online in the CityLine development in Downtown Sunnyvale. The LSAP area has historically been zoned for industrial uses. As such, the LSAP has received less interest and achieves lower rent prices than other areas in the City for commercial office and retail development, but still is poised for future employment growth. The fact that only a small portion of the new development is being built on a speculative basis indicates strong demand from specific/individual users (such as Intuitive Surgical) and should translate into rapid absorption.
- Industrial space in the LSAP area is in high demand, but general trends show continued decline in the need for such space. The City and County have both had significant reductions in the total supply of industrial space, with most new industrial construction happening in less costly areas such as Gilroy or Milpitas. The already-adopted LSAP plans for virtually all existing industrial properties to be converted to higher density residential and office-oriented zoning, and the potential higher-density LSAP would include the same small amount of retained industrial space. Under either scenario, the industrial land uses, tenants, vendors, and services offered currently in the LSAP would have limited other viable spaces to relocate to in the City and may be displaced to other locations in the broader South Bay/Silicon Valley region, or even outside the region. These displacement impacts on the businesses and employees in light industrial/manufacturing industries should be balanced

TECHNICAL MEMORANDUM

 To:
 Pat Angell, Ascent Environmental, Inc.

 From:
 Darin Smith, Anisha Gade, and Luke Foelsch

 Subject:
 Sunnyvale Lawrence Station Area Plan Update - Market Research; EPS Project #181012

 Date:
 February 5, 2020

Ascent Environmental, in coordination with the City of Sunnyvale (City),

are currently exploring a potential update to the residential density of

Environmental engaged Economic & Planning Systems (EPS) to provide

real estate advisory services. This memorandum provides the findings

the Sunnyvale Lawrence Station Area Plan (LSAP) and potential

expansion of the LSAP boundaries. As part of that process, Ascent

from EPS's preliminary market research, with the goal of providing Ascent Environmental and the City with market intelligence to inform

The City adopted the Lawrence Station Area Plan (LSAP) in 2016 to

analysis for the adopted LSAP, as well as advised the City on its

affordable housing fees and policies in the Plan Area.

guide future development of the area surrounding the Lawrence Caltrain Station in Sunnyvale, California. In prior years, EPS conducted economic

In mid-2018, the City decided to conduct studies for additional housing opportunities and an expansion of the western boundary of the LSAP to

include three additional office/research and development (R&D) sites.

presence and growth aspirations for Intuitive Surgical, a manufacturing

EPS is now being engaged to advise the City on increasing the maximum

density of residential parcels. EPS is charged with specifying population

and employment trends so as to approximate potential housing demand

as well as assessing the viability of converting allowable land uses to

This boundary expansion is meant to explore the implications of the

company with a large presence in the station area and City.

accommodate higher density housing.

zoning modifications and station area planning.

Background

he Economics of Land Use



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against the important housing needs among residents and the real estate space needs of office/tech employers in the City.

- Mid- to longer-term market conditions are likely to support the Plan Area's more intensive office uses (including denser flex/R&D). Though much of the recent commercial development in Sunnyvale has been in other areas of the city, market conditions and tenant demand suggest that the Plan Area will be able to attract more intensive commercial uses well aligned to address the growing needs of an expanding tech industry. Given the historical zoning designation of the LSAP area for mixed-use and light industrial land uses, most of the existing buildings are relatively low density, and could be redeveloped for higher density workplaces. The LSAP area's accessibility and increasing vibrancy as a result of mixed-use development and 24-hour population should make the area competitive for additional workplaces, particularly as other areas of the City are built out.
- Current market conditions support the concept of allowing additional housing development in the LSAP, while still encouraging opportunities for the preservation and intensification of employment uses. The adopted LSAP and the currently considered revisions vary only in the amount of housing that would be allowed, as both scenarios have the same amount of office, flex/R&D, industrial, and retail uses allowed. As such, it is not expected that the ultimate buildout of the LSAP under either scenario would make a substantial difference in the employment base for the area. However, the higher-density allowance *could* increase the financial viability of housing, which may expedite though not fundamentally change the transition of lower-value employment uses to residential. EPS will continue to study financial opportunities and implications of such use conversion within the LSAP in separate fiscal analysis as well as more specific financial feasibility analysis to characterize the existing uses most likely to be subject to redevelopment pressure to create new housing.

Site Context

The local area of the LSAP lies in the eastern portion of the City. Figure 1 shows the LSAP within the City's boundaries as well as the larger regional context of Silicon Valley. The City sits between the Cities of Santa Clara to its east, Mountain View to its west, and Cupertino to its south. The City's northern border abuts the San Francisco Bay. The City is connected to the broader region via major transportation hubs and corridors, including US Highway 101, Interstate 280, and State Route 82 (El Camino Real), San Jose International Airport, freight and commuter rail corridors, VTA bus routes and other transportation corridors.

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Figure 1 Regional Context of Lawrence Station Area Plan



Sources: ESRI Business Analyst; Economic & Planning Systems, Inc.

The LSAP is an irregularly shaped rectangular area anchored by the Lawrence Station stop along the Caltrain line, as shown in Figure 2. Given that Lawrence Station has historically been surrounded by relatively low-intensity land uses that do not optimize transit ridership, the LSAP is intended to transform the neighborhood by establishing a framework for future development of the area and improving the relationship between transit availability and land use for the longterm development for an economically, environmentally and socially vibrant mixed-use district in Sunnyvale.

In 2018, the Sunnyvale City Council decided to study the expansion of the Plan Area's western edge to include the Intuitive Surgical properties, also depicted in Figure 2. This market study compares the socio-economic and real estate characteristics of this potentially expanded Plan Area with the entire City of Sunnyvale and other surrounding cities as well as the broader regional context of Santa Clara County. While the Plan Area was primarily designated for mixeduse, commercial and light industrial land uses, the LSAP envisions transforming this region into a higher density of residential and commercial land uses that will enable multimodal access.

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Figure 2 Local Context of Lawrence Station Area Plan



Source: City of Sunnyvale

Regional Socio-Economic Trends

The LSAP lies within the larger Silicon Valley region, one of the strongest regional economies in the country. While historically the region was known for its agricultural and rural character as well as the accompanying farming, ranching, orchard and canning industries, today, the area is better known for its contributions to technological innovation. Given the economic boom of this current business cycle, Silicon Valley and the greater Bay Area region have experienced high levels of in-migration and population growth.

With regards to population, Sunnyvale is the County's second largest city, behind San Jose, which is also the largest city in the nine-county San Francisco Bay Area. As shown in **Figure 3**, Sunnyvale had approximately 131,500 residents in 2000 and has since grown to roughly 153,400, as of 2018. This increase of nearly 22,000 new residents represents a 17 percent increase since 2000, which is a growth rate roughly on par with Sunnyvale's neighboring municipalities. Much of this population growth (approximately 13,300 residents) occurred since 2010, as job seekers flocked to the tech and innovation economies of Silicon Valley.

With San Jose accounting for more than half of the nearly two million residents in Santa Clara County, Sunnyvale and its surrounding cities of Santa Clara, Mountain View, Cupertino, and Palo Alto account for another one-quarter of the County's population. The remaining 21 percent of the County's population is located in small towns and unincorporated areas.

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180,000 Population Growth 2010 2018 160.000 Population Growth 2000-2010 10% Growth 2010-2018 140,000 @ 2000 Pippulation 7% Growth 2000-2010 11% 120,000 15% 100.000 -80,000 10,000 154 40,000 20,000 - 0 City of Sunnyvale Santa Clara Palo Alto Mountain View Cupertind

Figure 3 Population Trends in Surrounding Cities in Santa Clara County

In terms of the overall employment trend in the area, it is noteworthy that most of the jobs in this area of Silicon Valley are concentrated in the northeastern portion of Santa Clara County, as shown in **Figure 4**. This is especially important when understanding the economic role of the City within the larger Silicon Valley environment. The City is located in the heart of this region and as such, has historically enjoyed a relatively high concentration of jobs, given the presence of Google, Apple, and Lockheed Martin Space Systems, among several others. However, the highest concentrations of employment in the County are located in areas of San Jose, Cupertino, and Palo Alto.

Going forward, it can be expected that Sunnyvale will continue to attract considerable interest from commercial developers. Within the very strong Silicon Valley sub-regional economy, Sunnyvale's centrality, transportation connectivity, and strong presence of industry-leading companies makes Sunnyvale appealing for future development. In particular, the LSAP area would be well poised to attract office and multifamily developers, as well as retail and service commercial developers because of its close proximity to commuter rail service, the intersection of the Lawrence and Central Expressways as well as being roughly one mile south of US Route 101.

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Sources: State of California, Department of Finance; Economic & Planning Systems, Inc.

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Figure 4 Map of Employment Concentration in Santa Clara County



Source: Census LEHD 2017 Dataset

Looking at employment trends over time, the total number of jobs in the City has grown significantly since the end of the Recession from approximately 78,000 in 2010 to roughly 95,760 in 2019, according to the City. Employment growth in the broader San Francisco Bay Area has been some of the strongest in the country during this business cycle, helped in large part by the boom in tech and innovation industries of Silicon Valley.

The number of jobs in Sunnyvale grew by 14 percent during the current business cycle between 2010 and 2017, the latest year for which data are publicly available at the city level. As shown in **Figure 5**, nearly 10,700 new jobs were added in the City, roughly in line with absolute employment growth in Palo Alto. Employment grew by roughly double this amount in the City of

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Santa Clara. Meanwhile, the two smaller municipal economies in the County, Mountain View and Cupertino, grew at a robust pace, with total employment in Mountain View almost equaling that of Sunnyvale. All together, nearly 87,600 new jobs were added in this northeastern part of the County, accounting for 47 percent of job growth countywide during this time period.

Figure 5 Employment Trends in Surrounding Cities in Santa Clara County



Source: U.S.Census Bureau, OnTheMap

As evidenced by the sector-level breakout of employment in **Figure 6**, of the twelve largest industry sectors in Sunnyvale, the "Professional, Scientific, and Technical Services" sector and the "Information" sector, the two sectors where tech and innovation economy jobs are categorized, added the most new jobs from 2010 to 2017. Information, the smaller of the two sectors, grew by roughly 4,500 jobs at an average rate of 8.4 percent annually during these seven years while the largest of all sectors, Professional, Scientific, and Technical Services, added roughly 7,000 jobs at an average rate of 6.2 percent annually. As of 2017, these two sectors accounted for almost 35,700 jobs, or slightly more than 40 percent of overall employment.

In addition to these two sectors, overall employment is also buoyed by growth in the administration and support, health care and social assistance, as well as the accommodation and food services sectors, which added approximately 5,300 jobs since 2010. Even as the manufacturing sector remained steady until 2014, there has been a loss of more than 8,400 jobs since 2002. Nonetheless, manufacturing remains the second largest employment sector, with nearly 17,000 jobs.

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Between 2002 and 2017, the share of jobs in Sunnyvale belonging to the Manufacturing sector decreased by almost 14 percent. This shift in employing industries runs parralel with the changes observed in the real estate market, as discussed in the following section.

Figure 6 Sunnyvale Employment Growth by Industry Sector



Source: U.S.Census Bureau, OnTheMap

Real Estate Market Assessment

The following section compares market conditions and trends for multifamily, office, industrial, and retail real estate in the LSAP with those of Sunnvyale, the surrounding cities, and Countywide. When there is not enough data for the LSAP in particular, EPS relied on trends for the ZIP code (94086) or submarket which encompasses the LSAP. Please also note that the subsequent data that are indicated as "Sunnyvale" pertain to the entire City of Sunnyvale. Based on the comparative market data and analysis presented, EPS has drawn conclusions concerning real estate development potential within the LSAP.

Existing Land Uses

To begin with an overarching picture of the composition of commercial real estate in the varying geographies of interest, Figure 7 lists existing commercial square footages and multifamily units based on information from the real estate data source, CoStar. Please note that not all projects that were under construction as of May 2019 are included in this inventory as these projects had not yet become leasable (and as such, did not yet have vacancy and rent information). Due to the history of the LSAP Area being designated as primarily light industrial, much of the area remains in flex/R&D and industrial land use categories, but it is now zoned under the LSAP to allow a mix of land uses including residential, office/R&D, and retail.

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Figure 7 Summary of Real Estate Inventory, 2019

		Commercial Property (Sq. Ft.)						
Geography	Office	Industrial	Flex/R&D	Retail	Other/ Specialty	Units		
LSAP	291,726	1,142,594	1,365,436	139,282	192,000	16		
As a Share of Citywide Total	2%	19%	9%	3%	12%	0%		
Sunnyvale (Citywide)	18,782,882	5,879,747	15,883,409	4,080,940	1,561,410	25,599		
As a Share of County Total	14%	170	15%	0%	5%	14%		
Santa Clara County	129,662,321	88,635,477	104,004,860	73,920,139	34,188,441	185,653		

According to CoStar data, the largest share of commercial space in the LSAP is the Flex/R&D category, which often includes flexible commercial space that can be used for a variety of uses such as office, R&D, light manufacturing, etc. This category of commercial space is commonplace in the City and sub-region, serving as the rapid prototyping and maker spaces necessary for many firms in the tech and innovation industries of Silicon Valley. According to CoStar, there is nearly 1.4 million square feet of flex/R&D space in the LSAP, representing 9 percent of all flex/R&D space in the City. CoStar indicates that there is an additional 1.1 million square feet of industrial space in the LSAP area, accounting for 19 percent of all industrial space in the City. Because the distinctions between "flex/R&D" buildings and "industrial" buildings can be vague, it can be useful to consider the two categories together. Combined the LSAP area's flex/R&D and industrial buildings sum to roughly 2.5 million square feet, and represent about 12 percent of the City's total supply of such buildings - much higher than the LSAP's share of Citywide office space and retail.

Sunnyvale on the whole contains a comparatively larger share of the County's office, flex/R&D, and multifamily development, and relatively little of the County's industrial and retail development. The City's share of industrial and retail development approximately reflects its proportion of the County's population (around 7 percent), while the office and flex concentrations indicate a comparatively strong cluster of such uses in Sunnyvale.

Intuitive Surgical is the primary employer in the LSAP area and one of the City's largest, with an estimated 1.526 employees in 2019 according to the City's "Community and Business Profiles" document. Additionally, Fortinet, Inc., a cybersecurity firm which recently expanded its headquarters, lies just outside the LSAP boundary and employs 800 in its Sunnyvale location.

According to 2019 CoStar data, Intuitive Surgical owns 134.8 total acres of land in the expanded LSAP area and currently occupies roughly 1.0 million square feet of industrial and flex/R&D space. In addition, approximately 192,000 square feet of space in the LSAP falls in the Specialty category, which encompasses religious structures, parking facilities, and other specialty commercial uses. Within the boundaries of the LSAP, there is a 127,000 square foot self-storage facility, and 65,000 square feet occupied by two stone masonry retailers.

Apart from commercial spaces, there is a small inventory of 16 existing townhomes in the southern portion of the LSAP area at Buttercup Terrace, located at 1171 Willow Avenue.

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Multifamily

Given that there are so few residential units existing in the LSAP (though there are several on parcels adjacent to the irregularly shaped LSAP boundaries), EPS relied on a broader dataset by summarizing trends for the ZIP code in which most of the LSAP geography lies. This information is compared to the overall performance of multifamily buildings throughout the City (which is indicated in the following graphs as "Sunnyvale") and other surrounding cities as well as the County. **Figure 8** illustrates how the monthly average effective rent per unit across various geographies has grown steeply since the end of the Recession. The average rent in the LSAP ZIP code grew relatively in line with that of the City as a whole as well as the City of Santa Clara, rising from nearly \$1,600 in 2010 to approximately \$2,700 by April 2019. This trend is also fairly close to that of the average rent throughout Santa Clara County, which grew from \$1,600 in 2010 to \$2,500 by April 2019. Rents in Mountain View and Cupertino remained consistently above that of the LSAP ZIP code, Sunnyvale, Santa Clara, and the County throughout this time period. Note that these figures represent the full stock of apartments in each jurisdiction; the newer stock typically achieves higher rents than those indicated in this comparison.

Figure 8 Multifamily Rents (Effective Monthly Average, Per Unit)



Source: CoStar

In particular, when comparing newly built apartments in the current business cycle since 2010, the effective monthly rents in buildings within a 2-mile radius of the LSAP range from \$2,767 for studios to \$4,926 for three-bedroom units, as of May 2019, as shown in **Figure 9**. This translates to a range of rents per square foot of \$3.71 for the three-bedroom units to \$4.03 for studio apartments. The nearest newly built project to the LSAP is the Monticello Apartment Homes mid-rise apartment complex (located just southeast of Lawrence Station adjacent to the LSAP at 3555 Monroe Street, but in the City of Santa Clara.). This 825-unit complex owned by

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the Irvine Companies was constructed in 2016. As of October 2019, asking rents at the Monticello range widely, from \$2.99 per square foot for some two-bedroom units to \$4.69 per square foot for some one-bedroom apartments, but the average asking price among 43 available units averaging 1,009 square feet is \$3,598 per month or \$3.57 per square foot. It is expected that the rezoning of the LSAP to allow for higher density housing would command similar rent levels, or perhaps even a slightly higher premium, given that future developments would constitute newer product. The range of rents in the 94086 ZIP code area as well as the Citywide average are slightly higher than the range of rents in projects in close proximity to the LSAP area.

Figure 9 Comparison of Rent by Unit Type in Apartments Built Since 2010

Geography / Item	Studio	One Bedroom Units	Two Bedroom Units	Three Bedroom Units
2-Mile Radius Around LSAP (roughly	50% in City of San	ita Clara)		
Effective Rent per Unit	\$2,767	\$3,053	\$3,944	\$4,926
Average Unit Size (Sq. Ft.)	686	788	1,143	1,328
Rent per Square Foot	\$4.03	\$3.87	\$3.45	\$3.71
94086 ZIP Code Area				
Effective Rent per Unit	\$3,121	\$2,967	\$4,184	\$5,326
Average Unit Size (Sq. Ft.)	626	762	1,134	1,438
Rent per Square Foot	\$4.99	\$3.89	\$3.69	\$3.70
Sunnyvale, CA				
Effective Rent per Unit	\$2,804	\$3,048	\$4,127	\$5,256
Average Unit Size (Sq. Ft.)	619	763	1,110	1,406
Rent per Square Foot	\$4.53	\$3.99	\$3.72	\$3.74

Source: CoStar

The supply of new multifamily deliveries, among all Santa Clara County cities, was greatest in San Jose. More than 15,300 units came online in San Jose from 2011 through early 2019, as shown in **Figure 10**, accounting for nearly 60 percent of all units delivered throughout the County. There were 2,827 new apartment units built in the City of Sunnyvale during this time period, the second highest among the cities in the County. The 1,025 new units that came online in ZIP code 94086 accounted for almost 40 percent of the City total.

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Figure 10 New Multifamily Units Added 2011 – YTD April 2019



Source: CoStar

Looking forward, the LSAP is beginning to see more, higher density multifamily development. There is currently one multifamily project under construction at 1130 Kifer Road. Greystar Real Estate Partners is constructing 520 new mid-rise apartment units, which are set to deliver in the next six to twelve months. Most recently, another 741-unit residential project was approved in February 2019 for the CalStone/Pacific Building Materials site at 1155-1175 Aster Avenue. In addition, along the northern boundary of the LSAP, north of Kifer Road and east of the Lawrence Expressway in the City of Santa Clara, two projects are currently under construction that will add another 537 apartments and nearly 500 condos.

The multifamily vacancy rate reflects the impact of this new supply of multifamily units. Leasing trends and housing demand remained strong during this business cycle, driven by a large in-flux of new residents working in jobs in the robust, tech-driven industries of Silicon Valley. Therefore, even as a substantial number of new units came online, these units were absorbed by market demand. The vacancy rate in many cities in the region fluctuated slightly but remained low, as shown in **Figure 11**. At times when a large number of units were delivered, such as in 2016, when multiple projects throughout the region came online, the vacancy rate increased in the City of Sunnyvale and its neighboring comparable cities of Cupertino, Mountain View, and Santa Clara. A similar trend was prevalent at the ZIP code level as well as at the County level. However, as the units were absorbed by market demand, the vacancy rate generally decreased across the board.

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Figure 11 Comparison of Multifamily Vacancy Rates

The imbalance of employment growth compared to housing supply is another indication of the need for more housing. Between 2010 and 2015, the number of primary jobs located in the City grew by roughly 9,000.¹ During this period, only 1,456 multifamily units along with approximately 444 new single-family units were added.² While jobs grew by 12 percent during this period, the total number of housing units grew by only 3 percent. The pace of new housing production has not kept pace with job growth, creating great market pressure to consider rezoning efforts such as the LSAP amendments that would allow for higher density housing.

Moreover, market trends, stemming from strong job and population growth among a younger, working-age cohort in the region, indicate that there is strong demand for apartments. Many recent apartment complexes in the competitive market area are built as mid-rise (i.e. five stories with structured or podium parking) and include lifestyle amenities to appeal to millennials and working professionals, such as gyms, recreational/outdoor spaces, and bicycle facilities/storage, etc. These trends are largely in support of rezoning plans such as the LSAP. Current and expected demand for housing is likely to support low vacancies and rent growth that can enable the redevelopment of flex/R&D and industrial properties to accommodate higher density housing.

Source: CoStar

¹ Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics

² Data on single-family units are from the California Department of Finance's Population and Housing Estimates for single-family detached and attached units.

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Indeed, such redevelopment of industrial properties for residential use has been prominent in Sunnyvale in recent years. The City has created an "Industrial to Residential (ITR)" combining district³ in several locations allowing former industrial and commercial properties to convert to residential use. Five such areas were identified, including one in the LSAP area referred to as "Housing Site 4b," now more commonly known as the Calstone site, and nearby properties south of the Caltrain tracks (and already approved for 741 new housing units). Other examples include the Tasman Crossing area, which has added many residential units including the Tamarind Square, Encasa, and Anton 1101 apartment complexes, and the Fair Oaks Junction area which has added the Onizuka Crossing apartments and many townhomes. As a City that is largely urbanized already, ITR sites such as these have been among relatively few where large-scale residential projects have been achievable. However, these projects have also resulted in a loss of industrial space in the City of Sunnyvale, which according to CoStar has diminished from 9.27 million square feet in 1999, to 7.73 million square feet in 2010, to only 5.88 million square feet in 2019.

Office

The last decade has seen a significant increase in the total pool of office square footage in Santa Clara County, with a large portion of that attributable to Sunnyvale. Of the 20 million square feet of office space brought online in Santa Clara County since 2010, about a third is located in Sunnyvale. Only a small fraction of this office space is located in the LSAP currently, about 300,000 square feet, which accounts for approximately 10 percent of all commercial real estate in the Plan Area.

Given the small size of the local office market and the fact that there were no new office deliveries or major building demolitions since 2010, changes in a few occupants' tenancy became a significant factor in the operating metrics of the plan area. The sharp fluctuation in the office market vacancy rate in the LSAP is highly correlated to individual tenants' leasing activity. As shown in **Figure 12**, as a result of roughly 90,000 square feet of space being vacated in 2013 at 1390 Kifer Road, the vacancy rate spiked to 32.2 percent. When Intuitive Surgical began occupying this space in early 2019, the office vacancy rate decreased suddenly from 34.2 percent to 1.2 percent. Despite the sudden shift in the vacancy rate based on a few tenants' leasing activity, it is worth noting that not all of the office space in the Plan Area is taken up by larger firms occupying a large office footprint. Many of the current lease holders of office space in the LSAP are small and mid-sized professional services firms and medical offices.

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Figure 12 LSAP Office New Supply, Absorption, and Vacancy Rate

As is to be expected, given that most of the office space in the LSAP is in the Class B category, even as lease rates have grown throughout the region, the pace of rent growth has been less dramatic in the local area. As seen in Figure 13, the average office full-service lease rate has grown most dramatically in the City overall (more than doubling from \$30.48 per square foot in 2010 to \$62.67 by the first quarter of 2019.) The average lease rate for office space in the County grew from about \$25 per square foot to nearly \$46 during this time period. Meanwhile. the average asking rate in the LSAP went from nearly \$21 per square foot in 2010 to \$37 by 2019. These rent data indicate that the LSAP's office space is not as highly in demand as it is in other parts of the City and County. This is true of newer office product as well. According to CoStar data, office projects within a two-mile radius of the LSAP that came online during the current business cycle since 2010, had annual asking rents of \$46.14 per square foot while those of new offices in the 94086 ZIP code as well as the City overall had annual asking rents of \$75.00 per square foot.⁴ New office projects in the LSAP would be expected to command asking rents similar to those projects that are within the two-mile radius of the LSAP, though again premiums might be expected for new buildings and perhaps for the LSAP area's proximity to the Caltrain station.

³ https://sunnyvale.ca.gov/civicax/filebank/blobdload.aspx?BlobID=23604

⁴ Data are from CoStar, as of May 2019.

Source: CoStar

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Figure 13 Office Rent Trends



Source: CoStar

As for the development pipeline, Intuitive Surgical is proposing a 1.213 million square foot office/R&D/manufacturing campus on the three parcels assumed to be included in the LSAP expansion. The status of their project is pending, and City staff indicate that its approval will be contingent on the LSAP amendments. Other than that major project, there are no office projects currently underway in the LSAP. However, within a two-mile radius, in the western corner of the City of Santa Clara, there is a 260,000 square foot office project set to come online in December 2019. The project is being built on a speculative basis and therefore currently being marketed to prospective tenants. Adjacent to the LSAP area, the Fortinet office building has been recently approved at 901 Kifer Road. The 172,000 square foot project is currently undergoing building permit plan check. Furthermore, in the northwestern corner of the City of Sunnyvale, there are several office projects underway in the Peery Park and Moffett Park districts. It is also worth noting that while there is some speculative office construction throughout Sunnyvale, much of the new development is tied to campus-style expansions by large/established tech companies.

The current concept for an amended LSAP would maintain the amount of office envisioned in the adopted LSAP (1.2 million square feet). While recent trends indicate that office space in the LSAP area has not performed at the same high levels found elsewhere in Sunnyvale, the growth in office uses in the City and region, and the LSAP area's advantages for accessibility, suggest that the LSAP should continue to provide opportunities for future office uses.

Flex/R&D

The largest share of the LSAP properties is categorized as flex/R&D space, a building type that can accommodate many tenant types ranging from offices to research labs and prototyping studios, etc. These sorts of spaces have been common for many necessary functions of technology and innovation industries, but in recent years Silicon Valley technology companies have increasingly used more traditional office building configurations.

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Contrasting the substantial growth seen in office space over the last decade, the amount of square footage classified as flex/R&D space has experienced a steady decline in the broader region. Since 2010, the total pool of flex/R&D space has dropped by 10 percent across Santa Clara County (116 MSF to 104 MSF) and by 16 percent in Sunnyvale (19 MSF to 16 MSF). Still, given the robust pace of expansion since the end of the Great Recession in these economic sectors throughout this region, demand for available flex/R&D space remained very strong in this time period, with flex/R&D vacancies declining Countywide from 15.3 percent to 8.3 percent in 2019 while the City's flex/R&D vacancies fell from 15.2 percent to 3.6 percent in the same period.

Flex/R&D space in the LSAP area has been very stable over the past five years. Intuitive Surgical constructed a new 155,000 square foot flex/R&D building in 2013, which was immediately occupied. Despite this increase in supply, as seen in Figure 14, the overall flex/R&D vacancy rate in the LSAP has remained below 2 percent since 2016, well below the Countywide average of 8.3 percent.



Figure 14 LSAP Flex/R&D New Supply, Absorption, and Vacancy Rate⁵

Source: CoStar

As a result of this demand, the average asking rent for flex/R&D space in the LSAP has generally remained above that of flex/R&D space in the City and County, as shown in Figure 15. As of April 2019, the average asking rent in the LSAP reached \$36.21, a 140 percent increase from the rate of \$15.08 in 2010. Moreover, this rate is nearly \$4 higher than the average flex/R&D asking

⁵ Figure 14 shows net absorption, meaning how much space was newly occupied versus newly vacated in a given year. For example, in 2010 there was no new construction, but roughly 180,000 more square feet of space was occupied than in the previous year. By contrast, in 2012, LSAP tenants in aggregate occupied 120,000 fewer square feet than was occupied in 2011.

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rate of the City and more than \$8 higher than that of the County. Thus, while the local office supply appears to be in less demand than in other parts of the competitive market area, the LSAP's flex/R&D space is in a very strong competitive position.

Figure 15 Flex/R&D Rent Trends



Source: CoStar

However, it should be noted that of the handful of new flex/R&D projects that came online since 2010 within a two-mile radius of the LSAP, or in the 94086 ZIP code, or Citywide, almost none were built speculatively. Because almost all of this new flex/R&D space was built with the needs of particular tenants in mind, almost none of this space was made available on the market and therefore, rent data on this newly available flex/R&D space are not representative of the potential rent that future speculative flex/R&D space may command.

There is currently one flex project of roughly 326,000 square feet under construction within the boundaries of the LSAP. This project is the only flex project under construction throughout the City and County. This project is being built by Intuitive Surgical, a medical devices manufacturer, to expand its campus in the LSAP. Moreover, given the physical characteristics of this project, it is more in line with office projects elsewhere in the City, illustrating the blurry line between flex/R&D and more traditional office space.

These indicators suggest that flex/R&D space in the LSAP area has been well-utilized and competitive in the broader market area, and should continue to be incorporated as potential uses in the LSAP. Indeed, the City envisions that the amount of flex space will increase from the current 1.4 million to 2.4 million square feet, under both the adopted LSAP and the scenario with higher density housing. However, EPS anticipates that existing, relatively low-intensity flex/R&D uses in the LSAP area will be subject to continued pressure to redevelop for higher-density, higher-value uses such as residential and more traditional office space. Many (though not all) flex/R&D activities can be effectively accommodated in office buildings, particularly as office buildings move toward larger and more open floorplate designs.

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Industrial

Given the zoning designation of the LSAP, along with Flex/R&D space, industrial space accounts for a substantial share of the commercial real estate in the Plan Area. Moreover, a high concentration (19 percent) of all industrial space in the City is located in the LSAP. As discussed above, in recent years there has been a trend of converting industrial space into much-needed housing and office space, despite the continuing need to preserve certain types of industrial uses and zoning. These market pressures have resulted in a reduction of the City's industrial building supply from 7.73 million square feet in 2010 to only 5.88 million square feet in 2019 – a 24 percent decrease in the City while the County's industrial supply has decreased by only about six percent in the same period. According to the adopted 2016 LSAP and continuing into the currently envisioned higher-density scenario, the total amount of industrial space in the LSAP is anticipated to decrease by another million square feet by plan buildout, leaving only 26,500 square feet of industrial space in the LSAP area.

The vacancy rate for industrial space in the Plan Area is around 5 percent and indicative of wellutilized industrial space. Despite the need for particular types of industrial space, there were no new deliveries or major site demolitions during this business cycle, as shown in **Figure 16**. Still, there has been significant activity in the industrial real estate market in Sunnyvale, as buildings have been repositioned and turned over for new tenants. "Gross absorption" of industrial space in the City – the amount of space that has been re-tenanted even if it does not increase the overall occupied space– has equaled 1.92 million square feet between 2010 and 2019, meaning that a full third of the city's current industrial space has been re-tenanted during that period. The County has also had significant industrial re-tenanting with roughly 40 percent of its industrial space turning over since 2010.

As a result of this high demand and limited supply of industrial space, asking rents have escalated rapidly in both the LSAP and the City and County overall, more than doubling in all areas since 2010. The average asking rent of industrial space in the LSAP has fluctuated between being higher and lower than that of the City, but generally higher than that of the County, as shown in **Figure 17**. However, much of this industrial product is older than 2010 since no new industrial buildings were built anywhere in Sunnyvale during the current business cycle. It is reasonable to assume that future new industrial space in the LSAP could command at least modest price premiums over the rates achieved in the existing supply.

In terms of new industrial space, there are no such projects under construction in the LSAP nor the City. And in fact, there are only four industrial projects under construction in the County; three manufacturing sites in northern Milpitas and one warehouse site in Gilroy to the south.

These indicators suggest that industrial space in the LSAP has been well-utilized, but still commands rents that are well below what might be achievable for office or more intensive flex/R&D uses. Thus, EPS anticipates that existing industrial uses in the LSAP area will be subject to continued pressure to redevelop for higher-density, higher-value uses. The adopted LSAP reflects this pressure by assuming a major reduction in the amount of industrial space that will remain in the LSAP, which is consistent with long-term trends in the total amount of industrial space in the City and County. The potential LSAP scenario with higher residential density maintains the same small amount of industrial space.

Figure 16 LSAP Industrial New Supply, Absorption, and Vacancy Rate⁶



Figure 17 Industrial Rent Trends



Note: No industrial rent data were available for the LSAP during 2012-2013; the dashed line is intended to show a linear rate of growth between the two known data points in 2011 and 2014. Source: CoStar

⁶ Figure 16 shows net absorption, meaning how much space was newly occupied versus newly vacated in a given year. For example, in 2012 roughly 65,000 more square feet of space was occupied than in the previous year. By contrast, in 2013, LSAP tenants in aggregate occupied 85,000 fewer square feet than was occupied in 2012. Specific details regarding which businesses expanded or contracted in a given year is not available.

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In either scenario, a significant portion of the City's industrial building supply is expected to be redeveloped for more intensive uses in the future, which will affect the ability of the City to maintain industrial uses within its diverse employment base. However, the alternative – to use regulations to effectively protect a larger portion of the industrial properties in the LSAP – would likely limit the amount of housing and more intensive workplaces to be developed, thus adversely affecting landowners' property values, contradicting evident market trends and pressures, and limiting the City's ability to effectively respond to demand for housing near transit.

Retail

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Given the small size of the retail market in the LSAP, there is not sufficient data to compare operating metrics. Therefore, EPS compared the performance of the retail space of the larger 94086 ZIP code with that of the City and County. As shown in **Figure 18**, the retail vacancy rate in the ZIP code area has been below 1 percent for several years, well below that of the City and County. Reflective of this high demand for retail space in the 94086 ZIP code area, the average asking triple-net retail rent in the ZIP code area exceeded that of the City and County beginning in 2014, as shown in **Figure 19**. However, with regards to new retail developments that came online since 2010, the triple-net asking rent per square foot was \$48.00 for retail space within a two-mile radius of the LSAP, as well as the 94086 ZIP code, and Citywide.⁷ Therefore, it is expected that future retail space within the LSAP could reasonably command rents similar to retail space elsewhere in the City.

Figure 18 Retail Vacancy Trends



⁷ Data are from CoStar, as of May 2019.

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\$50 \$45 \$40 \$35 \$30 \$25 \$20 515 \$10 2010 2011 2012 2013 2014 2015 2016 2017 2018 YTD April 2019 -Tio Code: 94085

Figure 19 Retail Rent Trends

Source: CoStar

Despite the strong operating conditions of the retail space market in the larger ZIP code area, there is currently no stand-alone retail project under construction in the Plan Area. However, there are approximately 7,400 square feet of retail planned in the Greystar multifamily project as well as another 1,500 square feet in the recently approved residential project at the Calstone/Pacific Building Materials site. Additionally, within a two-mile radius of the LSAP area, the SummerHill multifamily project also contains a retail component (40,000 square feet) as well as three stand-alone retail projects slated to add another 132,000 square feet by the end of the year.

These indicators suggest that the LSAP area has performed well as a retail location, though the supply of retail space is relatively small. As the LSAP area adds housing and jobs in the future, additional support for retail can be expected in the area, and such retail use may be incorporated as small components of mixed-use office or residential buildings.

Development Pipeline

In assessing the commercial and residential property markets in the LSAP, its surrounding vicinity, and comparing to the City at large, EPS has also compiled information on several projects currently in the pipeline. The map in **Figure 20** calls out the larger, multi-phase residential and commercial projects that have either been approved and/or broken ground as well as highlights all other projects currently under construction.

Many of the residential projects currently under construction are concentrated in the eastern portion of the City. The majority of the residential construction will be mid-rise multifamily product, which would be consistent with the reorientation of the Plan Area to accommodate higher density housing. Within the boundaries of the LSAP approximately 520 units are currently under construction in the Greystar project and as of February 2019, another 741 units have been

A.14 LAWRENCE STATION AREA PLAN

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approved for the Calstone/Pacific Building Materials site at 1155-1175 Aster Avenue. In addition, there are a number of projects underway within a two-mile radius of the Plan Area that are slated to bring roughly 2,700 more units on the market within the next 12 to 18 months. These projects include SummerHill's development of 537 apartments and 450 condos along the northern edge of Kifer Road, just north of the LSAP in the City of Santa Clara as well as The

Irvine Company's development of nearly 1,400 units near the intersection of El Camino Real and Lawrence Expressway, among others.

Meanwhile, the northwestern corner of the City is more heavily weighted towards office properties, especially those projects concentrated in and around the Peery Park and Moffett Park developments. Slightly more than four million square feet of new office space should come online in the next 12 to 18 months while another 2.5 million square feet of new office projects are being proposed.

There is less new construction of other commercial property types such as flex/R&D, industrial, or retail, but it is to be expected that some office and residential projects will likely build in retail components on site. There is also a strong concentration of six blocks of retail, dining, and entertainment space in the CityLine Sunnyvale development, which is in the first phase of construction. In addition, two smaller, retail-only projects (totaling roughly 30,000 square feet) have been proposed for Peery Park and South Sunnyvale.

With strong population and employment growth leading to sustained housing demand, market trends have supported new residential developments. Robust employment growth throughout the region has also signaled the need for more intensive office uses. Given that positive market trends are already showing support for these types of land uses, the conversion of flex, R&D, light manufacturing/industrial, logistics and storage uses to accommodate higher density housing and more intensive office use should be absorbed relatively quickly by the market. EPS will continue to study these market conditions and the impact of rezoning in the LSAP in an upcoming fiscal analysis.

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Draft Memorandum

Sunnyvale Lawrence Station Area Plan Update - Market Research

Figure 20 Map of Development Pipeline (as of November 2019)



Sources: City of Sunnyvale; CoStar; ESRI Business Analyst; Economic & Planning Systems, Inc.

APPENDIX B | FISCAL IMPACT ANALYSIS

APPENDICES

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of the LSAP development scenarios make it very difficult to determine with any precision what parcels will be developed at what time. All results are expressed in constant 2019 dollars.

Residual Land Value Analysis

This residual land value analysis compares the market value and the development cost for a prototypical development project with a certain set of requirements (height, density, parking, affordable housing, etc.), resulting in an estimated amount that a developer could reasonably pay to acquire a parcel for development. The analysis achieves two objectives: (1) assesses the extent to which existing uses in the LSAP area are likely to be redeveloped for higher value uses, by determining whether the value of the property is greater as land for new residential development or as an existing building used for office, retail, or industrial uses, etc.; and (2) assesses the financial capacity for new development to provide desirable community benefits while remaining feasible, and whether tradeoffs from the City are likely to be necessary in achieving community benefit objectives.

EPS developed high-level static pro formas to calculate and compare the residual land values associated with a residential prototype for the current LSAP and the high density LSAP. EPS relied on our market research findings and development cost estimates from recent pro formas prepared by or vetted with locally active developers.

Summary of Key Findings

The redevelopment of the area is projected to yield fiscal gains for the City of Sunnyvale under both the current LSAP and the higher density scenario, with the higher density scenario yielding the greatest net benefit.

This analysis estimates that the net annual fiscal impact of the proposed Plan on the City's General Fund is positive and significant at Plan buildout, as shown in **Table 1**. The estimated \$5.41 million (current LSAP) or \$5.65 million (high density LSAP) net additional City funds would replace and exceed the positive net fiscal impact of \$4.49 million that the existing uses currently have on the City's General Fund.

Table 1 Fiscal Impact Summary

Revenue/ Expense Category	Existing Conditions	Current LSAP	High Density LSAP
Total General Fund Revenues	\$6,913,944	\$11,820,073	\$17,555,532
Total General Fund Expenditures	\$2,428,476	\$6,415,020	\$11,904,368
Net Annual Fiscal Impact on General Fund	\$4,485,468	\$5,405,053	\$5,651,164

2. The multi-billion dollar increase in assessed value at buildout generates significant property tax increases for the City, and represents the major new revenue source driving the increase in LSAP's already net positive fiscal impact.

Buildout under the current LSAP is projected to generate nearly \$4.05 million in annual property tax revenue accruing to the City's General Fund and the high density alternative is

TECHNICAL MEMORANDUM

To:	George Schroeder.	City of Sunnyvale

- From: Darin Smith, Kate Traynor, and Anisha Gade
- Subject: Sunnyvale Lawrence Station Area Plan Fiscal Analysis; EPS #181012

The City of Sunnyvale retained Economic & Planning Systems, Inc. (EPS)

residual land value analysis of the Lawrence Station Area Plan (LSAP or

This fiscal impact analysis indicates whether the LSAP, at buildout, can

employees to the additional taxes and other public revenues generated

costs indicates whether the Plan is expected to generate an annual fiscal

by new development. The difference between the new revenues and

EPS developed three static fiscal models evaluating (1) the existing development in the LSAP area (as is), (2) the total buildout allowable under the current LSAP (based on the City's "Estimated Likely Development"), and (3) the LSAP at buildout under the proposed higher density amendment. These models include a broad range of assumptions concerning the development program, development values, public service levels and costs, among others, that were compiled from information provided by the City of Sunnyvale and other sources. The

be expected to have a positive or negative overall effect on the City's General Fund. It compares the additional costs incurred by the City's

General Fund from providing public services for new residents and

surplus (positive outcome) or an annual fiscal deficit (negative

"the Plan") as well as the proposed amendment to increase housing

density within the Plan area. The proposed amendment would allow more housing than is currently planned under the LSAP without altering

as part of the Ascent team to conduct a fiscal impact analysis and

Date: February 4, 2020

the current commercial uses.

Fiscal Impact Analysis

outcome).

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conomic & Planning Systems, Inc. Ine Karser Plaza, Suite 1410 Iakland, CA 94612-3604 10.841.9190 tel 10.740.2080 fax

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www.epsys.com

ownership and uses and the scale of development allowed under either Z:\SharedProjects\Oakland\181000s\181012_SunnyvaleLSAP\Deliverable\Fiscal Impact Memo September 2019\181012_Memorandum_202420 docx

results are intended to represent the comparative impacts of the full

buildout under each scenario, and are based on current information

regarding market values for development and the City's current year

budget allocations for various municipal services. The modeling does

not provide a time series of fiscal impacts because the diversity of

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projected to generate \$7.13 million. Accounting for transfer of property in some cases and redevelopment in other cases, these are multimillion dollar increases over the current \$1.34 million in annual property tax revenue generated by the existing uses. The growth in property tax revenue is attributable to the anticipated \$2.12 billion (current LSAP) or \$4.53 billion (high density LSAP) increase in the assessed value of the project parcels, from about \$1.04 billion today. These figures reflect the very high value of new residential development in Sunnyvale, even after accounting for the City's inclusionary housing requirements.

3. Sales tax revenue will continue to be a major driver of the area's positive fiscal results, with added residents and workers under each buildout scenario generating additional sales taxes for the City of Sunnyvale.

The existing retail businesses in the LSAP are anchored by Costco, and generate substantial revenue for the City in the form of sales tax. The analysis uses calendar year 2018 actual sales tax revenues received and reported by the City for all 90 businesses in the LSAP. For consistency, both LSAP scenarios assume sales tax revenues to continue at the existing level and additionally incorporate increases in sales driven by new local residents and employees.

The City has indicated that the Costco site is not expected to be redeveloped under the LSAP. Under the LSAP buildout scenarios, the total amount of retail square footage is being increased by 80,000 square feet, but more critically, the introduction of 2,323 or 5,935 new residential units will bring new households and their associated spending to the City. Given the market prices of housing in Sunnyvale, the new households are generally high income, and are estimated to spend between 17 to 29 percent of their household incomes on taxable expenditures (depending on income levels)¹ – 50 percent of which is assumed to be captured at retail locations in the City, including the retail within the plan area. Added employees from the commercial program also contribute to demand for taxable retail sales.

Development of the LSAP will generate increased municipal expenditures as a result of new population, particularly those expenditures associated with providing public safety services.

The commercial and residential uses increase the LSAP's municipal "service population" (the industry standard measure of residents' and workers' demand for services is that a worker's demand weighs 50 percent of a resident's demand) from approximately 3,867 today to 10,215 under the current LSAP and 18,956 under the high density LSAP. The demand for services from this growing population is projected to increase annual spending on public safety from \$1.52 million under existing conditions to \$4.01 million under the current LSAP and \$7.45 million under the high density LSAP. Other municipal service expenses (such as Public Works, General Government, and Information Technology) are also expected to increase significantly as a result of the projected growth.

5. Residual land value calculations suggest that many existing nonresidential uses in the LSAP are likely to remain in place for the near-to mid-term, because their value as commercial and industrial buildings exceeds the value of their underlying land for residential development. Technical Memorandum Sunnyvale Lawrence Station Area Plan Fiscal Analysis February 4, 2020 Page 4

Market transactions and achievable rents indicate that many nonresidential uses in the LSAP area continue to have high value as workplaces in the strong Silicon Valley market, while residential development faces very high development costs (even with very high market values) that constrain the ability to buy out existing workplaces to clear land for residential uses. The estimated residual land value of a project in the current LSAP is approximately \$3.0 million per acre, which means we would expect a developer intending to build a rental product to pay no more than \$3.0 million per acre for the land. The estimated residual land value of a project in a high density LSAP is approximately \$3.9 million per acre prices well above the estimated \$3.0-\$4.0 million per acre value for residential development. That residual land values for residential development are lower than nonresidential building market values suggests that demand to convert existing LSAP real estate to residential will be modest in the near term.

Residential development is certainly in high demand, but in the near term is likely to be limited to older properties that do not command top market pricing for nonresidential use. Because of this dynamic, EPS does not believe that it is likely that there is "excess value" to developers or landowners that can be leveraged to achieve significantly greater community benefits as part of the potential LSAP amendments, without further delaying the potential residential development due to added costs.

¹ Based on the most recent estimates from the Bureau of Labor Statistics' Consumer Expenditure Survey.

Lawrence Station Area Plan Context

The City of Sunnyvale is in Santa Clara County and is home to about 155,000 residents and nearly 96,000 jobs, as shown in **Table 2**.

Table 2 Sunnyvale Citywide Assumptions

Item	Amount	Source
Housing Units	59,953	DOF
Occupied Households	57,327	DOF
Population	155,567	DOF
Total Primary Jobs ¹	95,760	City of Sunnyvale
Service Population ²	203,447	US Census / DOF

(1) Per City of Sunnyvale Business License database as of 12/12/2019.

(2) Service population is calculated by adding total residential population and half of total employment.

Sources: California Department of Finance (2019); City of Sunnyvale Business License database (2019); Economic & Planning Systems, Inc.

The Lawrence Station Area Plan ("the Plan") encompasses 141 parcels on 199 acres of developed land within the City of Sunnyvale, adjacent to the existing Lawrence Caltrain Station². The Plan adopted by City Council in 2016 represents a significant change from existing conditions, because the LSAP area was almost entirely developed for industrial and flex/R&D uses and the Plan calls for the addition of significant residential development as well as intensified workplace development. **Table 3** shows that under existing conditions, industrial uses represent over one-third of all development in the LSAP area. Under the adopted LSAP, almost all of what is currently considered industrial use could be converted to or replaced by new uses, including over 900,000 square feet of new office space and over 1,000,000 square feet of Flex/R&D space. Additionally, the current Plan allows the development of 2,323 new residential units, much of which may also be expected to occur on currently industrial properties.

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Table 3 LSAP Nonresidential Uses

Commercial	Existing ¹	Estimated Likley Development Scenario under Current LSAP ²	Net New
Retail/Amenities	139,282 sq.ft.	220,000 sq.ft.	80,718 sq.ft.
Office	291,726 sq.ft.	1,200,000 sq.ft.	908,274 sq.ft.
Industrial	1,142,594 sq.ft.	26,500 sq.ft.	-1,116,094 sq.ft.
Flex/R&D	1,365,436 sq.ft.	2,400,000 sq.ft.	1,034,564 sq.ft.
Other/Specialty ³	192,000 sq.ft.	0 sq.ft.	No Change
Total	3,131,038 sq.ft.	3,846,500 sq.ft.	907,462 sq.ft.

 Based on Costar data using the LSAP boundary, collected for 2019 EPS Market Assessement. Includes parcels identified as part of LSAP boundary expansion.
 Based on LSAP documents provided by City of Sunnyvale.

(3) Specialty uses encompass commercial uses such as religious structures and parking facilities.

When the LSAP was adopted by the City Council in 2016, the Council requested a study to identify additional housing opportunities within the LSAP area, beyond the 2,323 units allowed under the Plan. In 2018, as a result of the study, the Council selected a preferred LSAP alternative which would increase the density allowance for MXD-1 and MXD-1I zoned areas to 100 dwelling units per acre and allow residential uses in the M-S/LSAP and O-R zoned areas up to 100 dwelling units per acre, expanding residential capacity by an additional 3,612 units for a total allowable 5,935 units. Under an amended LSAP with higher density residential allowances, the City does not propose any change to the amount of nonresidential uses allowed under the Plan.

In both the current LSAP and the proposed high density scenario, the residential units are expected to consist of both for-sale and rental units, but with a heavier emphasis on rental units given the densities envisioned. For this analysis, EPS has assumed that 75 percent of the new units would be rentals, and 25 percent would be for-sale – a ratio generally consistent with the combined expectations of the two residential projects approved in the LSAP area thus far (Greystar and Calstone). Further demonstrating the market tolerance for ownership, the 900-unit Nuevo complex that is currently under construction just outside the LSAP in the City of Santa Clara is slated to offer approximately 40 percent of new units would be rentals, but would not yield substantially different results even if 100 percent of new units were rentals.³

² In 2018 the City initiated a General Plan Amendment to expand the Western boundary of the LSAP to include three additional office/research and development (R&D) sites. This analysis includes the three parcels added in the boundary expansion.

³ An EPS sensitivity analysis testing the contribution of the for-sale units to the overall fiscal impact of the area shows that even in an LSAP with up to 100 percent rental units, the net positive fiscal impact would be approximately \$5 million under both the current LSAP and a high density LSAP, very similar to the results assuming 25 percent ownership units.

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In line with Sunnyvale's existing affordable housing policies, the analysis assumes that 12.5 percent of the for-sale units will be affordable to moderate-income (120 percent of Area Median Income) households⁴ and 15 percent of the rental units will be affordable to low- and very low-income (80 and 50 percent of Area Median Income, respectively) households⁵. For both for-sale and rental projects, developers may comply with the City's affordable housing programs through in-lieu fees instead of building affordable units, subject to City Council approval. For purposes of this analysis, EPS has assumed that affordable units are provided onsite, which is conservative in the sense that this assumption results in reduced assessed value (lower property tax revenue) and lower household spending (lower sales tax revenue), and may also yield lower residual land values than may be achievable through payment of the in-lieu fee.

The projected residential details of the Plan, including existing uses, current LSAP uses, and higher density uses if the Plan is amended, are summarized below in **Table 4**.

Table 4 LSAP Residential Uses

	Existing ¹	Current LSAP ²	High Density LSAP ²
For Sale Units Market Rate	16	508	1,298
% BMR <u>BMR</u> Subtotal		12.5% <u>73</u> 581	12.5% <u>186</u> 1,484
Rental Units Market Rate % BMR <u>BMR</u> Subtotal		1,481 15% <u>261</u> 1,742	3,783 15% <u>668</u> 4,451
Total Units	16	2,323	5,935

(1) Based on Costar data using the LSAP boundary, collected for 2019 EPS Market Assessement. Includes parcels identified as part

of LSAP boundary expansion.

(2) Based on LSAP documents provided by City of Sunnyvale.

For fiscal impact analysis, it is important to estimate the number of employees and residents in a project area, so that the level of municipal services required for the area can be evaluated. At buildout, the current LSAP is expected to support 9,184 employees and 5,622 new residents. The high density LSAP would support the same number of employees and 14,363 new residents.

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Estimated service population for the Plan area is derived as a combination of all new residents and half of all employees, an industry standard assumption reflecting the expectation that employees spend less time utilizing City facilities (parks, library, etc.) and requiring or participating less in most municipal services. A summary of the key LSAP parameters along with employment density assumptions is shown below in **Table 5**, which indicates that buildout of the high density LSAP would be projected to have a service population nearly double that of the current LSAP.

⁴ According to City of Sunnyvale Ordinance number 2976-12.

⁵ According to Ordinance No. 3147-19, adopted October 8, 2019.

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Table 5 LSAP Description, Population, Employment, and Service Population Estimates by Scenario

				Existing				Current LSA	Р		Hig	h Density LS	AP	
	Assum	ptions		E	Estimate	d		F	Projecte	d		Р	rojected	1
Item	Pop. per Unit ²	Sq.Ft. per Emp. ³		Population	Jobs	Service Population ⁴	Development Program	Population	Jobs	Service Population ⁴	Development Program	Population	Jobs	Service Population ⁴
LSAP Development Cap ¹							2,323				5,935 units			
For Sale Residential														
Market Rate % BMR⁵	2.42		16 units	39		39	508 12.5%	1,229		1,229	1,298 units 12.5%	3,141		3,141
BMR Subtotal	2.42			- 39		<u>0</u> 39	<u>73</u> 581	<u>177</u> 1,406		<u>177</u> 1,406	<u>186</u> units 1,484 units	<u>450</u> 3,591		<u>450</u> 3,591
Rental Residential														
Market Rate % BMR ⁶	2.42			-			1,481 15%	3,584		3,584	3,783 units 15%	9,155		9,155
BMR Subtotal	2.42			-			<u>261</u> units 1,742 units	<u>632</u> 4,216		<u>632</u> 4,216	<u>668</u> units 4,451 units	<u>1,617</u> 10,772		<u>1,617</u> 10,772
Commercial Retail/Amenities Office Industrial Elox(P&D		400 420 420	139,282 sq.ft. 291,726 sq.ft. 1,142,594 sq.ft. 1,265,426 sq.ft.		348 695 2,720	174 348 1,360	220,000 sq.ft. 1,200,000 sq.ft. 26,500 sq.ft. 2 400 000 sq.ft.		550 2,857 63	275 1,429 32 2 857	220,000 sq.ft. 1,200,000 sq.ft. 26,500 sq.ft.		550 2,857 63	275 1,429 32 2,857
Other/Specialty ⁷ Subtotal		300	<u>192,000</u> sq.ft. 3,131,038 sq. ft.		640 7,654	<u>320</u> 3,828	<u>0 sq.ft.</u> 3,846,500 sq. ft.		9,184	2,837 <u>-</u> 4,593	<u>0</u> <u>sq.ft.</u> 3,846,500 sq. ft.		9,184	2,637 <u>-</u> 4,593
Total				39	7,654	3,867		5,622	9,184	10,215		14,363	9,184	18,956

(1) Unit total of 2,323 per currently zoned LSAP Development Cap, 5,935 per proposed higher density revision.

(2) Population per unit based on City of Sunnyvale assumption in LSAP Final Redline version.

(3) Square footage and employment densities based on LSAP Final Redline version.

(4) Service population is calculated by adding total residential population and half of total employment. It represents a measure of public service demand in which employees are given one-half the weight of residents because of more

modest service demands.

(5) Per city's 12.5% affordable requirement for for-sale residential units.

(6) Per City's 15% affordable requirement for rental units.

(7) "Specialty" uses encompass commercial uses such as religious structures and parking facilities.

Sources: City of Sunnyvale; Economic & Planning Systems, Inc.

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Fiscal Impact Analysis

This section describes the methodology and key assumptions used in calculating the impact of the existing conditions, the current LSAP and the High Density LSAP on Sunnyvale's General Fund. The fiscal analysis examines the Plan area's ability to generate adequate revenues to fund the City's costs of providing public services to the area. The services analyzed comprise General Fund services (e.g., police, fire, general government). It does not include an evaluation of capital facilities or funding of capital facilities needed to serve new development.

The fiscal analysis is based on the City's General Fund Budget for FY 2018-19, tax regulations, statutes, and other general assumptions discussed herein. Specific revenues and expenditures that would be affected by new development in the City were identified and estimated. Each revenue item is estimated based on current State legislation and current City practices. Future changes by either State legislation and City practices may affect the revenues and expenditures estimated in this Fiscal Analysis. All costs and revenues are shown in constant 2019 dollars.

For each revenue and expenditure item, EPS used the most appropriate forecasting methodology available, summarized below.

- Market-Specific Assumptions. For the revenues that are based on the assessed values of
 properties (property taxes and property taxes in lieu of vehicle license fees), EPS has
 estimated the market value of the envisioned residential and commercial development,
 including adjustments as appropriate for below-market-rate housing unit values.
- Average Revenue or Cost per Service Population. This approach estimates average revenues or costs per the City's current service population and applies that average revenue or cost to the Project's proposed service population. Revenues and costs are based on the City's most recently adopted budget (FY 2018-19).
- **Per Employee Population.** Some revenue items, business license tax revenue in particular, are most appropriately estimated on a per-employee basis since the tax is levied by employee and is not impacted by number of residents.
- Not Estimated. Some budget items are not estimated because certain City revenues and expenditures are not directly affected by the existing development or the new development associated with this Project. For example, Transient Occupancy Tax (TOT) revenues are not estimated as no hotels are anticipated in the Plan area⁶.

Annual General Fund Revenues

New General Fund proceeds attributable to the LSAP will include sales tax, property tax, property tax in lieu of vehicle license fee (VLF), franchise fee, utility users' tax, as well as licenses, fees, and permits. **Table 6** provides a summary of the Sunnyvale Fiscal Year 2018-19 Adopted General Fund revenue budget and a description of the forecasting method relied upon for each relevant revenue source. **Table 7** summarizes the annual revenues estimated to be generated

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by the existing conditions, revenues expected to be generated by the current LSAP, and revenues estimated to be generated by the high density LSAP. More detail regarding the calculations is provided following these summaries.

Table 6 FY 2018-19 Revenue Budget Summary and Fiscal Impact Estimating Factors

Item	FY2018-19 Total	Percent Variable ¹		Allocation Factor
Selected General Fund Revenues				
Property Tax	\$56,399,910		12.8%	of 1% of base assessed value ²
Property Tax In-Lieu of VLF	\$18,705,959			existing VLF
Sales Tax	\$31,913,429		1.05%	of estimated taxable sales ³
Business License Tax ⁴	\$1,840,495		\$12.63 / \$12.70	per employee/rental unit
Construction Tax ⁵	\$4,582,427			not estimated
Real Property Transfer Tax	\$1,835,575		\$0.55 per \$1,000	of equity value transferred for 5% of L:
Transient Occupancy Tax	\$16,541,424			not estimated
Utility Users Taxes	\$8,297,656		\$40.79	per service population
Franchises ⁶	\$7,368,207		\$36.22	per service population
Rents and Concessions	\$3,118,316			not estimated
Permits and Licenses	\$1,415,807		\$6.96	per service population
Service Fees ⁷	\$6,091,270		\$29.94	per service population
Sale of Property	\$17,600,000			not estimated
Other Revenues ⁸	\$3,979,629			not estimated
Total Revenues	\$179,690,104			
Selected General Fund Expenditures				
General Government ⁹	\$22,674,354	25%	\$27.86	per service population
Community Development	\$1,388,137	75%	\$5.12	per service population
Public Works	\$23,883,249	75%	\$88.04	per service population
Environmental Services	\$1,481,555	75%	\$5.46	per service population
Information Technology	\$9,875,655	75%	\$36.41	per service population
Library and Community Services	\$19,566,959	75%	\$72.13	per service population
Public Safety	\$93,560,144			
Police Services	\$32,377,386	90%	\$143.23	per service population
Fire Services	\$32,822,638	90%	\$145.20	per service population
Other Public Safety ¹⁰	\$28,360,120	75%	\$104.55	per service population
Total Expenditures	\$172,430,053			

(1) EPS assumption; reflects percentage of costs that are population-dependent, as opposed to fixed costs

(2) LSAP is located entirely in TRA 009-002.

(3) Allocation factor consists of one percent base Sales Tax rate added to Public Safety Sales Tax, which is estimated at .05 percent of all Sales T revenue per Sunnyvale budget page 147.

(5) The Construction Tax, levied by City ordinance at a rate of \$0.0054 of building permit valuation, is not estimated because it is a one-time tax, fit impact estimates focus on ongoing sources of revenue to the General Fund.

(6) The City receives a one-time franchise payment from PG&E each year which represents approximately 39% of all Franchise Fee revenue. The other main franchise agreements are with our cable television providers and Specialty Solid Waste.

(7) Service Fees includes Refuse Service Fees, Water Service Fees, Sewer Service Fees, and Park Dedication Fees. The majority of revenue in the category comes from the Department of Public Safety, the Recreation Division in the Department of Library and Community Services, the Commun Development Department, and the Department of Public Works.

(8) Other Revenues includes In-Lieu Charges, Transfers and Inter-Fund Revenues.

(9) General Government includes the City Attorney, City Manager, Finance Department, and Human Resources.

(10) Other Public Safety includes but is not limited to Investigation Services, Community Safety Services, Public Safety Administration Services, ar Safety Recruitment Projects.

Sources: City of Sunnyvale Adopted Operating Budget FY 2018-19, p. 52; 280-466; County of Santa Clara Controller-Treasurer; Economic & Planning Systems, Inc.

⁶ EPS omitted TOT estimates since (a) there is no clear expectation of hotel development within the LSAP area, (b) there is no standardized rule of thumb for hotel use generation from other types of commercial development, and (c) the amount of revenue generated by employees would be the same under both density scenarios.

⁽⁴⁾ The Sunnyvale Business License Tax is capped by the number of employees or the number of rental units in Sunnyvale (whichever is higher) a levide every two years. If the tax is calculated by employee, the maximum tax is \$23,894.60 for any business with 946 employees or more. If the ta calculated by rental unit, the maximum tax is \$10,691.90 for any business operating 421 rental units or more. To estimate business license tax rev the LSAP a per employee/rental unit tax rate is derived using the maximum tax rate (\$23,894.60 per 946 employees and \$10,691.90 per 421 rental then divided by two to account for the City's two-year collection cycle. The rates are them applied to the employee population, adjusted to factor in estimated to employ 2,500 employees, and the development program, adjusted for the assumption that 20% of developments are larger than the 4 cap.
Table 7 Summary of General Fund Revenues by Scenario

Item	Existing Conditions	Current LSAP	High Density LSAP
Estimated GF Revenue ¹			
Property Tax	\$1,335,683	\$4,053,939	\$7,134,334
Property Tax In Lieu of VLF	\$420,884	\$1,277,235	\$2,247,672
Sales Tax	\$4,598,405	\$5,112,567	\$5,717,838
Business License Tax	\$88,783	\$125,714	\$143,253
Construction Tax	\$0	\$0	\$0
Real Property Transfer Tax	\$28,674	\$87,028	\$153,157
Transient Occupancy Tax	\$0	\$0	\$0
Utility Users Taxes	\$158,102	\$416,670	\$773,215
Franchises	\$140,389	\$369,987	\$686,586
Rents and Concessions	\$0	\$0	\$0
Permits and Licenses	\$26,977	\$71,096	\$131,934
Service Fees	\$116,047	\$305,837	\$567,543
Sale of Property	\$0	\$0	\$0
Other Revenues	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
Total Revenues	\$6,913,944	\$11,820,073	\$17,555,532

(1) See Table 6 for allocation factors.

Sources: City of Sunnyvale; Economic & Planning Systems, Inc.

Property Tax

Property taxes are based on the assessed value of land and improvements. At present, the combined parcels in the LSAP area generate \$1.33 million per year – a figure reflecting both the nature of the existing uses (with a significant industrial component) and the assessed values for older buildings as constrained by Proposition 13. The current LSAP at buildout, consisting of 2,323 residential units and 3.84 million square feet of commercial space, would have an estimated net assessed value increase of \$2.12 billion over the area's existing assessed value of \$1.04 billion. The high-density alternative, consisting of 5,935 residential units and 3.84 million square feet of commercial space, would have an estimated net assessed value increase of \$4.53 billion. **Table 8** summarizes estimated values and the per unit and per square foot assumptions driving the estimates.

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Table 8 Assessed Value Estimates

	-	Currer	nt LSAP	High Den	sity LSAP
Item	per unit or per sq.ft.	Units / Building Sq.Ft.	Estimated Value	Units / Building Sq.Ft.	Estimated Value
Existing Assessed Value ¹					
Anticipated for Redevelopment Anticipated to Remain Existing Subtotal			\$638,421,804 \$404,265,584 \$1,042,687,388		\$638,421,804 <u>\$404,265,584</u> \$1,042,687,388
Max Buildout Zoned		2,323 units		5,935 units	
Market Rate ² BMR ³ Subtotal	\$939,000 \$381,000	508 units <u>73</u> <u>units</u> 581	\$477,012,000 <u>\$27,813,000</u> \$504,825,000	1,298 units <u>186</u> <u>units</u> 1,484	\$1,218,822,000 <u>\$70,866,000</u> \$1,289,688,000
<u>Rental Residential</u> Market Rate BMR ⁴ <i>Subtotal</i>	\$655,778 \$270,800	1,481 units <u>261 units</u> 1,742 units	\$971,207,218 <u>\$70,678,800</u> \$1,041,886,018	3,783 units 668 <u>units</u> 4,451 units	\$2,480,808,174 <u>\$180,894,400</u> \$2,661,702,574
Commercial ⁵ Retail/Amenities Office Industrial Flex Subtotal	\$586 \$548 \$222 \$344	220,000 sq.ft. 1,200,000 sq.ft. 26,500 sq.ft. <u>2,400,000 sq.ft.</u> 3,846,500 sq.ft.	\$128,982,857 \$657,495,000 \$5,890,956 <u>\$825,588,000</u> \$1,617,956,813	220,000 sq.ft. 1,200,000 sq.ft. 26,500 sq.ft. <u>2,400,000 sq.ft.</u> <u>3,846,500 sq.ft.</u>	\$128,982,857 \$657,495,000 \$5,890,956 <u>\$825,588,000</u> \$1,617,956,813
Total New Value of Max Buildout			\$3,164,667,831		\$5,569,347,387
Net New Value			\$2,121,980,443		\$4,526,659,999

(1) Based on FY 18-19 Assessed values and Sunnyvale LSAP documents.

(2) Market value based on 2-bedroom condos in Sunnyvale, built 2016-2019, sold 2017-2019, per Redfin.

(3) Value based on City's 2019 Maximum Sale Price per Sunnyvale BMR Home Ownership Guidelines. To qualify for the Housing Division's BMR Home Ownership program, household combined gross annual income cannot exceed the maximum moderate-income limit (120%).

(4) Value calculated using rents affordable at 70% of AMI to approximate the City required mix of 10% of units affordable at Low Income and 5% of units at Very Low Income. If the affordable component is developed by a nonprofit developer the units will not be subject to property taxes, which will impact value.

(5) Commercial values based on EPS market research, driven by Costar rents within a two mile radius of the Sunnyvale LSAP.

Sources: Redfin; Santa Clara County Assessor Recorder; City of Sunnyvale; CoStar; Economic & Planning Systems, Inc.

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Property tax collections are based on 1.0 percent of the assessed value, and the City of Sunnyvale receives 12.8 percent of the property tax base from the LSAP area. This share is assumed to be fixed going forward. The estimated impact on fiscal revenues is depicted in **Table 9**.

Property Tax In-Lieu of Vehicle License Fees (VLF)

In 2004, the State of California adjusted the method for sharing VLF with local jurisdictions, replacing the VLF with property tax, which grows proportionate to increases in the City's assessed value. The fiscal analysis uses a formula provided by the California State Controller's Office to forecast property tax in-lieu of vehicle license fee (in-lieu VLF). In-lieu VLF or Motor Vehicle In-Lieu is calculated by taking the percentage increase in the City's assessed value resulting from the development and applying that percentage increase to the City's current State allocation of in-lieu VLF revenue. For example, the assessed value of new development under the current LSAP is estimated to increase the City's total current assessed value by 6.53 percent, and thus, is estimated to increase the in-lieu VLF revenues by 6.53 percent, as seen in **Table 9**. The current LSAP at buildout is expected to generate approximately \$1.28 in annual in-lieu VLF revenue, while the higher density scenario would generate an additional \$1 million.

Table 9 Property Tax, Property Tax In Lieu of VLF Estimates

	Annual Total at Buildout				
Item	Assumption / Factor	Existing Condition	Current LSAP	High Density LSAP	
Property Tax					
Existing Assessed Value ¹		\$1,042,687,388	\$1,042,687,388	\$1,042,687,388	
New Estimated Value		NA	\$3,164,667,831	\$5,569,347,387	
Net Value Increase		NA	\$2,121,980,443	\$4,526,659,999	
Property Tax	1.0%	\$10,426,874	\$31,646,678	\$55,693,474	
Sunnyvale General Fund Share	12.81% of the value	\$1,335,683	\$4,053,939	\$7,134,334	
Property Tax In Lieu of VLF Existing Citywide Property Tax in Lieu of VLF		\$18,705,959	\$18,705,959	\$18,705,959	
Citywide Assessed Value ²		\$46,352,122,074	\$48,474,102,517	\$50,878,782,073	
LSAP Area as Percent of Citywide Assessed Valu	ue ³	2.25%	6.53%	10.95%	
Net New Property Tax In Lieu of VLF ⁴		\$420,884	\$1,277,235	\$2,247,672	

(1) Information provided by the Santa Clara County Assessor's Department. Includes parcels identified as part of LSAP boundary expansion.

(2) FY2018/19 value based on the Santa Clara County Assessor Annual Report.

(3) Calculated by dividing net value increase by citywide assessed value.

(4) Calculated by multiplying existing property tax in lieu of VLF by project net assessed value increase.

Sources: Redfin; City of Sunnyvale Adopted Operating Budget FY 2018-19; Santa Clara County Assessor; Economic & Planning Systems, Inc.

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Sales Tax

Sales tax generation is based on estimates of taxable sales generated by the new residential and employment population in the plan area. Existing retail sales taxes are influenced heavily by an existing Costco Wholesale store that is anticipated to remain in all LSAP scenarios. The analysis uses actual sales tax revenue of nearly \$4.6 million for all 90 businesses within the LSAP for calendar year 2018 for the purpose of describing the City's existing revenues. These revenues from existing businesses are not anticipated to change significantly, so these revenues are carried through in both proposed scenarios.

Additionally, service population-based estimates were used for the purposes of projecting new sales tax revenues generated by new residents and employees under each potential development scenario. While the retail uses in the area are projected to increase from approximately 140,000 square feet to 220,000 square feet under the current LSAP and the higher density scenario, the driver of demand for that additional square footage is expected to be the spending of new residents and employees rather than the retail space itself. Thus, rather than calculate new sales tax using a revenues per retail square footage approach, the forecast of new sales tax is based on estimated household income and spending on taxable items, and the portion of spending assumed to be captured by the City.

EPS constructed weighted average household incomes based on projected market-rate and affordable home pricing. Market-rate renter households are estimated to have an income of \$139,960, and renter households occupying the affordable units are estimated to have average incomes of \$82,775. Among homeowners, market rate households are estimated to have average incomes of \$193,277 and households occupying the affordable units are estimated to have average incomes of \$141,950. EPS established a share of taxable spending for each income group,⁷ and assumed that 50 percent of total taxable expenditures will be captured by retailers located in Sunnyvale (both inside and outside the LSAP area). In addition, EPS assumed that workers in the area will spend an average of \$10 per workday on taxable goods and services (lunches, for example), based on consumer expenditure surveys⁸, and again assumes that 50 percent of such spending will occur within the City of Sunnyvale. EPS makes the conservative assumption that all sales at new retail spaces are from residents and employees of the LSAP. Sunnyvale's General Fund receives 1.05 percent of taxable sales, as shown in **Table 10**.

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Table 10 Retail Sales Tax Revenue

	Assumptions	Annual Total at Buildout		
tem		Current LSAP	High Density LSAP	
Existing Revenues Generated by Businesse	es to Remain in LSAP ¹	\$4,	,598,405	
RESIDENTIAL-BASED SALES				
Existing Market-Rate Condominium Units				
Annual Household Income		\$289,837	\$289,837	
Taxable spending per household ²	17.7% of total income	\$51,301	\$51,301	
Total Sales Generated by Existing Residents				
Total Taxable Spending	16 units	\$820,816	\$820,816	
Expenditures Captured by Sunnyvale ³	50% of taxable expenditures	\$410,408	\$410,408	
New Market-Rate For Sale Units				
Annual Household Income		\$193,277	\$193,277	
Taxable spending per household ²	17.7% of total income	\$34,210	\$34,210	
Fotal taxable spending	508 / 1,298 for sale units	\$17,378,680	\$44,404,580	
New Below Market Rate For Sale Units			• · · · · · · ·	
Annual Household Income	120% AMI	\$141,950	\$141,950	
Taxable spending per household	26.2% of total income	\$37,191	\$37,191	
l otal taxable spending	73/186 BMR Units	\$2,714,943	\$6,917,526	
New Market-Rate Rental Units		\$120.060	\$120 OG	
	00.4% of total income	\$139,900	\$139,900	
Total taxable spending	1481 / 3 783 rental units	\$47 882 211	\$122,331 \$122,308,173	
Total taxable spending	14017 0,700 Tental dints	φ47,002,211	φ122,000,110	
New Below Market Rate Rental Units	70% AMI	\$82 775	\$82 775	
Faxable spending per bousehold ²	28.6% of total income	\$23.674	\$02,110	
Total taxable spending	261 / 668 BMR units	\$6 178 914	\$15 814 232	
Total taxable spending	2017 000 Divirt drifts	ψ0,110,014	\$10,014,202	
Total Sales Generated by New Residents	0.202/E.02E upito	¢74 164 749	\$190 444 E11	
Exponditures Cantured by Supportale ³	EQ% of texable expenditures	\$27 077 274	\$04 733 366	
	50 % of taxable experiorities	<i>431,011,31</i> 4	<i>434,122,23</i> 0	
EMPLOTEE-BASED SALES				
Employee Retail Purchases				
Jany Unice Worker Laxable Spending	\$10 per work day	\$2 E00	¢0 500	
Total Taxable Spending	9.184 employees	\$22,960,000	\$22,960,000	
Expenditures Captured by Sunnyvale ⁴	50% of retail expenditures	\$11,480,000	\$11,480,000	
Total Taxable Retail Sales		\$48,967,782	\$106,612,664	
TOTAL NEW SALES TAX	1.05% of taxable sales	\$514,162	\$1,119,433	
TOTAL SALES TAX		\$5,112,567	\$5,717,838	

(1) Based on calendar year 2018 actual sales tax revenue reported by the City of Sunnyvale.

(2) Based on Bureau of Labor Statistics Consumer Expenditure Survey, 2017. Consumer Expenditure Survey includes the following taxable purchases: food away from home, selected groceries, alcohol and tobacco, household furnishings and housekeeping, vehicle and gas expenses, apparel, personal services, personal care products, and entertainment.

(3) Assumes 50 percent of taxable retail spending by City of Sunnyvale existing and new residents is captured by the retailers within the City, based on amount and range of retail supply in the City.

(4) Assumes that 50 percent of taxable retail spending by employees who work in the City of Sunnyvale are captured by the City.

 $^{\rm 7}$ Based on the 2017 Bureau of Labor and Statistics Average Annual Expenditures and Characteristics for various income levels.

⁸ Employee Survey on Payroll Tax and Spending Habits, Accounting Principals, 2013.

Sources: City of Sunnyvale: California Board of Equalization: U.S. Bureau of Labor Statistics: CoStar: and Economic & Planning Systems. Inc.

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Business License Tax

Sunnyvale collects Business License Taxes in tiered amounts that are capped by the number of employees or the number of rental units in Sunnyvale (whichever is higher) and is levied every two years. EPS estimated an annual tax rate using the City cap of 946 employees per business and 421 rental units per apartment community. A per employee or per unit tax rate of approximately \$12.65 is then applied to the employee population, reduced to factor in one firm estimated to employ 2,500 employees (of which only 946 would be subject to the tax), and the rental apartment development program, reduced for the assumption that 20 percent of rental units would be exempt because they are in projects that exceed the 421 unit cap. Business tax revenue is expected to be roughly \$126,000 under the current LSAP and \$143,000 under the high density LSAP (see **Table 7**). This is compared to \$88,783 under existing conditions.

Real Property Transfer Tax

The City receives a transfer tax from any sold property based on \$0.55 for every \$1,000 of sales value. EPS estimates that about 5 percent of all new property, both residential and commercial, will be resold annually based on experience in comparable jurisdictions. This means that each property, on average, would be resold every 20 years. Based on this assumption, EPS estimates that the current LSAP will contribute roughly \$87,000 to the City's General Fund revenues and a high density LSAP would contribute roughly \$153,000 (see **Table 7**). This is compared to an estimated \$28,674 under existing conditions.

Utility Users Tax

The City of Sunnyvale collects utility user taxes on utilities such as telephone, electricity, cable, etc.. These proceeds are estimated using the "per service population" approach and are estimated at approximately \$40.79 per service population (see **Table 7** for revenue estimates by scenario).

Franchise Tax

The Project is expected to result in Franchise Tax proceeds to the City. These proceeds are estimated using the "per service population" approach and are estimated at approximately \$36.22 per service population (see **Table 7** for revenue estimates by scenario).

Licenses and Permits

The Project is expected to result in Licenses and Permits proceeds to the City. These proceeds are estimated using the "per service population" approach. This methodology results in the estimated average of about \$6.96 per service population (see **Table 7** for revenue estimates by scenario).

Service Fees

The Project is expected to result in Charges for Services proceeds to the City. These proceeds are estimated using the "per service population" approach and are estimated at approximately \$29.94 per service population (see **Table 7** for revenue estimates by scenario).

Annual General Fund Expenditures

This section describes the methodology and key assumptions for calculating various General Fund expenditure items. While fixed costs are independent of new development, variable costs are assumed to increase based on new growth in the City. Only variable costs are used to project the General Fund expenditures in this analysis. The estimating approach for each General Fund item is described along with a summary of LSAP-generated expenditures below in **Table 11**.

					Total Cost	
Item	FY 2018-19 Budget	Percent Variable⁵	Cost Allocation Methodology	Existing	Current LSAP	High Density LSAP
Service Population				3,867	10,215	18,956
General Government ¹	\$22,674,354	25%	\$27.86 per service population	\$107,735	\$284,590	\$528,114
Community Development	\$1,388,137	75%	\$5.12 per service population	\$19,799	\$52,301	\$97,055
Public Works	\$23,883,249	75%	\$88.04 per service population	\$340,451	\$899,329	\$1,668,886
Environmental Services ²	\$1,481,555	75%	\$5.46 per service population	\$21,114	\$55,774	\$103,500
Information Technology	\$9,875,655	75%	\$36.41 per service population	\$140,797	\$371,928	\$690,188
Library and Community Services ³	\$19,566,959	75%	\$72.13 per service population	\$278,927	\$736,808	\$1,367,296
Public Safety						
Police Services	\$32,377,386	90%	\$143.23 per service population	\$553,870	\$1,463,094	\$2,715,068
Fire Services	\$32,822,638	90%	\$145.20 per service population	\$561,488	\$1,483,218	\$2,752,411
Other Public Safety ⁴	\$28,360,120	75%	\$104.55 per service population	\$404,295	<u>\$1,067,978</u>	<u>\$1,981,850</u>
Total Expenditures	\$172,430,053			\$2,428,476	\$6,415,020	\$11,904,368

Table 11 General Fund Expenditures and Estimating Methodology

(1) Includes Departments of City Manager, City Attorney, Human Resources, and Finance.

(2) Environmental Services includes management of the City's potable and recycled water systems, sanitary, and storm sewer systems; treatment of wastewater; the collection of

garbage and recyclables; and the diversion of recyclables through the operation of the Sunnyvale Materials Recovery and Transfer Station.

(3) The Community Services Division is responsible for the day-to-day programming of City parks and recreational facilities.

(4) Other Public Safety includes but is not limited to Investigation Services, Community Safety Services, Public Safety Administration Services, and Public Safety Recruitment Projects.

(5) EPS assumption; reflects percentage of costs that are population-dependent, as opposed to fixed costs.

Sources: City of Sunnyvale Adopted Operating Budget FY 2018-19, p. 52; 280-466; Economic & Planning Systems, Inc.

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General Government

Per the City of Sunnyvale's Adopted Operating Budget for FY 2018-19, the City's General Government category includes the following functions:

- City Attorney
- City Manager
- Finance
- Human Resources

Based on EPS's research in similar jurisdictions, new development of the Project's scale typically affects administrative and legislative government costs by only a fraction of these department's operating budgets. For example, the growth is not expected to result in an additional City Manager, Finance director, or City Attorney, or even proportionately more staff under each such department. As a result, EPS assumes that 25 percent of the cost of General Government services are variable and will be affected by new development. This yields a per service population estimate of about \$27.86.

Community Development

Per the City of Sunnyvale's Adopted Operating Budget for FY 2018-19, the Community Development Department's functions include building safety, planning, housing, and Community Development Block Grant administration. EPS assumes that the cost structure for Community Development is 75 percent variable, which yields a per service population estimate of \$5.12 based on the existing citywide average, as shown in **Table 11**. This 75 percent variability assumption is relatively conservative, as development functions may increase on a one-time basis with population growth but cities may not incur proportionately increased ongoing, annual development costs related to increased service populations.

Public Works

Per the City of Sunnyvale's Adopted Operating Budget for FY 2018-19, this category includes costs associated with operating and maintaining the City's infrastructure and facilities including public streets, and utilities. EPS estimates a percent variability of 75 percent, yielding a per service population estimate of \$88.04, as shown in **Table 11**. This 75 percent variability assumption is relatively conservative, because the LSAP's development will occur within an existing urban area with most core infrastructure in place.

Environmental Services

According to the Department's description, the Environmental Services Department maintains the City's potable and recycled water systems, sanitary and storm sewer systems, wastewater treatment system, collects garbage and manages recyclables. EPS assumes that the cost structure for the department is 75 percent variable, which yields a per service population estimate of approximately \$5.46 based on the existing Citywide average, as shown in **Table 11**. Again, this 75 percent variability assumption is relatively conservative, because the LSAP's development will occur within an existing urban area with most core infrastructure in place.

Information Technology

According to the Department's description, the Information Technology Department (ITD) provides an IT framework and solutions to all City departments, encompassing technical services to over 1,200 users within the City. EPS assumes that the cost structure for the department is 75 percent variable, which yields a per service population estimate of approximately \$36.41 based

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on the existing Citywide average, as shown in **Table 11**. This 75 percent variability assumption is relatively conservative, as it is in proportion to other conservative assumptions about staffing and expenditure growth.

Library and Community Services

According to the Department's description, the Sunnyvale Public Library is open seven days a week, 66 hours per week and sees an average of approximately 2,000 visits per day. EPS assumes that the cost structure for the department is 75 percent variable, which yields a per service population estimate of approximately \$72.13 based on the existing Citywide average, as shown in **Table 11**. Please note that EPS has not expressly assumed that a new library facility would be provided in or for the LSAP area, and thus the facilities and staffing costs are mostly fixed, rendering this 75 percent variability a conservative assumption.

Police Services

Per the City of Sunnyvale's Adopted Operating Budget for FY 2018-19, this department provides 24 hours-a-day and 365 days-a-year policing services to the City, keeps the peace and prevents and controls crime. Jurisdictions frequently maintain relatively constant numbers of police service staff (sworn officers, etc.) on a per capita basis as they grow, but command staff and facilities are not necessarily expected to grow at the same per capita pace. EPS assumes that the cost structure for Police Services is 90 percent variable, which yields a per service population estimate of \$143.23 based on the existing citywide average, as shown in **Table 11**.

Fire Service

According to the Department's description, Fire Services prevents fires and hazardous materials related emergencies, minimizes injuries and property loss when an emergency occurs and provides public education and outreach during inspections. As with Police Services, EPS assumes that the cost structure for Fire Services is 90 percent variable, which yields a per service population estimate of \$145.20 based on the existing citywide average, as shown in **Table 11**.

Other Public Safety

Other Public Safety includes Investigation Services, Community Safety Services, Public Safety Administration Services, and Public Safety Recruitment Projects. EPS assumes that the cost structure for Other Public Safety services is 75 percent variable, which yields a per service population estimate of \$104.55 based on the existing citywide average, as shown in **Table 11**.

Net New Annual Fiscal Impact on General Fund

Based on the assumptions and analysis described above, the proposed development will be able to produce net revenues to the City's General Fund at both LSAP buildouts, as summarized in **Table 1** and in **Table 12**, below. Actual fiscal impacts may vary due to the timing of the Plan buildout and changes in economic and budgetary conditions.

Table 12 Summary of Net Fiscal Outcome

ltem	Existing Conditions	Current LSAP	High Density LSA
Estimated GF Revenue ¹			
Property Tax	\$1,335,683	\$4,053,939	\$7,134,33
Property Tax In Lieu of VLF	\$420,884	\$1,277,235	\$2,247,67
Sales Tax	\$4,598,405	\$5,112,567	\$5,717,83
Business License Tax	\$88,783	\$125,714	\$143,25
Construction Tax	\$0	\$0	\$
Real Property Transfer Tax	\$28,674	\$87,028	\$153,15
Transient Occupancy Tax	\$0	\$0	\$
Utility Users Taxes	\$158,102	\$416,670	\$773,21
Franchises	\$140,389	\$369,987	\$686,58
Rents and Concessions	\$0	\$0	\$
Permits and Licenses	\$26,977	\$71,096	\$131,93
Service Fees	\$116,047	\$305,837	\$567,54
Sale of Property	\$0	\$0	\$
Other Revenues	\$0	\$0	\$
Total Revenues	\$6,913,9 <mark>44</mark>	\$11,820,073	\$17,555,53
Estimated GF Expenditures ²			
General Government ³	\$107.735	\$284,590	\$528,114
Community Development	\$19,799	\$52.301	\$97.055
Public Works	\$340,451	\$899.329	\$1.668.886
Environmental Services	\$21 114	\$55 774	\$103 500
Information Technology	\$140 797	\$371 928	\$690,188
Library and Community Services	\$278.927	\$736.808	\$1,367,296
Subtotal	\$908,823	\$2,400,730	\$4,455,03
Public Safety			
Police Services	\$553.870	\$1.463.094	\$2,715.068
Fire Services	\$561.488	\$1,483,218	\$2,752.411
Other Public Safety	\$404.295	\$1,067,978	\$1,981.850
Total Expenditures	\$2,428,476	\$6,415,020	\$11,904,36
Total Net Annual Fiscal Impact	\$4,485,468	\$5,405,053	\$5,651,16

(1) See Table 6.

(2) See Table 10.

(3) Includes Departments of City Manager, City Attorney, Human Resources, and Finance.

Sources: City of Sunnyvale; Economic & Planning Systems, Inc.

Sensitivity Analysis

As noted above, EPS has assumed that 75 percent of the new units would be rentals, and 25 percent would be for-sale – a ratio generally consistent with the combined expectations of the two residential projects approved in the LSAP area thus far (Greystar and Calstone). In response to City inquiries, EPS ran a sensitivity analysis to test this assumption's impact on the results. Property tax revenue is one of the two largest revenue sources driving the positive fiscal results (sales tax being the other major driver), but under current market conditions for-sale units have higher value and thus generate a higher level of annual property tax revenues to the City: property taxes than rental units. The more for-sale units in a project, the higher anticipated property tax revenues to the City: property taxes are based on property values and in Sunnyvale market-rate sale prices per unit for condominiums are significantly higher than the estimated value of a comparable rental unit,

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based on its capitalized income stream. Affordable for-sale units for moderate income households are also priced much higher than the capitalized value of affordable rental units for low and very low income households.

Because for-sale units generate significantly more revenue to the City, the assumption that 25 percent of the units will be for sale boosts the projected revenue from the LSAP. However; even in a scenario where 100 percent of units in the LSAP are rental, either as currently proposed or a higher density version, the net fiscal impact is positive and exceeds the current fiscal impact from the area, generating a minimum of nearly \$5.00 million annually, as shown below in **Table 13**.

Table 13 Summary of Tenure Sensitivity Analysis

ltem	Existing Conditions	Current LSAP		High Densi	ty LSAP
Tenure		% Owne	rship	% Owne	rship
		25%	0%	25%	0%
For Sale					
% Total	100%	25%	0%	25%	0%
Subtotal	16	581	-	1,484	0
Rental					
% Total	0%	75%	100%	75%	100%
Subtotal	-	1,742	2,323	4,451	5,935
Total	16	2,323	2,323	5,935	5,935
Fiscal Impact					
Revenues	\$6,913,944	\$11,820,073	\$11,554,511	\$17,555,532	\$16,849,295
Expenses	\$2,428,476	\$6,415,020	\$6,415,020	\$11,904,368	\$11,904,368
Net Fiscal Impact	\$4,485,468	\$5,405,053	\$5,139,491	\$5,651,164	\$4,944,927

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Residual Land Value Analysis

To understand the likelihood of a particular property or an aggregation of properties to be redeveloped for other uses as is envisioned under the current and high density LSAP scenarios, EPS has aimed to estimate and compare the value of properties for their existing use (e.g., as a leasable building for a flex/R&D tenant) versus the value of the underlying land for new development. If the land is worth more in the open market than the building is worth, a property owner may be motivated to sell the property for development. If the existing building generates greater proceeds than the property owner could gain by selling the site for development, it is likely to remain in its current use as a leasable building. These considerations are particularly important in understanding whether and to what extent the planned development under either LSAP scenario is likely to occur in the near- to mid-term based on foreseeable market conditions. Because both LSAP scenarios have the same amount of nonresidential use allowed, this analysis focuses on the feasibility of residential uses of different types and densities. Likewise, given the densities expected, we have focused on rental residential rather than for-sale.

This analysis utilizes a "static" (i.e. stabilized year) pro forma financial feasibility framework to estimate a prototypical rental residential development's market value, development cost, and the land value supported by the current LSAP zoning and by the increased density proposed for the LSAP. This approach compares real estate development value with the cost of project development in constant 2019 dollars. When real estate market values exceed development costs, the difference represents what a developer is able to pay for land. This calculation, commonly referred to as "residual land value," is the primary output of this analysis.

For a prototypical rental product, the analysis determines finished real estate value based on assumptions including market-supportable lease rates, operating costs, and market-based expectations for returns on investment. Development cost assumptions reflect standard (location-adjusted) "hard" construction costs (labor and materials for the building, its site, and its parking) and typical project "soft" costs (e.g., architecture and engineering, permit and impact fees, etc.). The assumptions reflect EPS research and third-party data (e.g., CoStar Group market data and Saylor construction cost estimates) as well as estimates of the various impact fees a developer would pay under the City's current fee schedule.

Pro Forma Model Assumptions

Site Assumptions

For the current LSAP scenario, the analysis assumes a typical project would be constructed at a density of 65.1 dwelling units per acre based on the comparable product currently under construction by Greystar in the LSAP, entitled for 520 units on 7.99 acres. For the high density LSAP scenario, the analysis assumes 100 dwellings units per acre based on the City's proposed upzoning. Assuming a 4-acre development site is typical for this Plan area (smaller than the Greystar project, but common and even above average for infill development in Silicon Valley), the prototypical residential development evaluated would be 260 units for the current LSAP and 400 units for the high density LSAP. Under both scenarios, EPS has assumed that the average unit size is 1,000 square feet of leasable living space, and that the buildings have an 80 percent efficiency ratio (i.e., leasable space accounts for 80 percent of the total building area).

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Value Assumptions

This analysis builds on the market conditions established in EPS's LSAP Market Research Memorandum, and assumes achievable lease rates based on market research conducted using sources including CoStar Group, Redfin, and EPS knowledge of the local and regional commercial real estate landscape.

Rental Housing – Under both the current and high density LSAP scenarios, the multifamily rental market rate housing is expected to have a monthly lease rate of \$3.66 per square foot (about \$3,660 per month for an average 1,000 square foot unit). The below market rate rental housing will be priced for low- and very-low-income households (about \$1.95 per square foot or \$1,949 per month). The analysis also assumes stabilized vacancy is five percent and landlord operating expenses are approximately \$13,000 per unit per year for the market rate units and \$11,000 per unit per year for the below market rate units, accounting for lower taxes levied on below market units. Both rents and operating assumptions are the same as those used to derive value estimates for the fiscal analysis (see **Table 8**).

Cost Assumptions

For both the current LSAP and the high density LSAP, this analysis assumes five-story, woodframe construction. Wrapped parking (units surrounding an above-ground, concrete parking structure) is assumed for the low density scenario and podium parking (two or more parking levels below the units) is assumed for the high density LSAP.

Site Costs – Site costs include demolition costs, basic site work, open space and park land costs, infrastructure costs (i.e., streets and utilities), and off-site mitigation costs.

Hard Costs – Project hard costs reflect construction labor and materials. For vertical construction, EPS reviewed construction cost estimating data from both Saylor and RS Means, inhouse pro forma financial analyses for comparable development projects, and recent construction cost escalation estimates. Both housing densities are achievable using woodframe construction, so the hard costs per building square foot are similar. The primary difference between the two densities is in the parking costs, as wrapped parking is assumed to cost less per stall than podium parking.

Soft Costs – Soft costs include professional services associated with planning, design, and project approval; permits and fees; assumptions regarding taxes and insurance and financing costs; and general and administrative costs borne by the project developer.

Specific figures for each of these assumptions are shown on Tables 13 and 14.

Residual Land Value Calculation

The analysis estimates residual land value by subtracting the full development budget from the project's estimated market value. The development budget is calculated based on the above cost assumptions and the project's estimated market value is calculated by determining the maximum supportable development budget based on an estimated net operating income and yield requirement. Subtracting the development budget excluding land from that maximum supportable budget reveals the residual land value.

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Feasibility Findings

The estimated residual land value of a 65-unit-per acre project in the current LSAP is approximately \$3.04 million per acre, which means we would expect a developer intending to build a rental product to pay no more than \$3.04 million per acre for the land. The estimated residual land value of a 100-unit-per-acre project in a high density LSAP is approximately \$3.94 million per acre. The higher density product thus yields higher land value per acre, but not higher per unit, because the unit values are essentially the same while the cost per unit is higher for the higher density project. Again, this finding is largely related to the added cost of podium parking rather than a wrapped parking structure.

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Table 13 Summary of Financial Feasibility Analysis, Current LSAP

DEVELOPMENT PROGRAM ASSUMPTIONS				TOTAL	Per Unit
Development Site (Acres)				4	
Dwelling Units ¹	65.1	DU / Acre		260	
Net Building Area (Square Feet) ²	1.000	GBA / DU		260.325	
Gross Rentable Square Feet	80%	Efficiency Factor		325,407	1,250
Total Parking Spaces	1.125	Spaces / DU		293	
Surface Parking Spaces	0%	of total parking		0	
Structured Parking Spaces	100%	of total parking		293	
BUILDING OPERATING INCOME (ANNUAL)			PER GBA	TOTAL	Per Unit
Market Rate Rental ⁴					
Dwelling Units	85%	of total units		221	
Market Rate Net Building Area (Square Feet)	1,000	GBA / DU		221,277	
Gross Rentable Square Feet	80%	Efficiency Factor		276,596	1,250
Gross Potential Rent	\$3.66	per SE/Month	\$35	\$9 718 468	\$43.920
Gross Potential Parking Incomo ⁵	¢3.00	per Space (Month	¢1	\$224.042	\$1.012
Gross Potential Parking Income	\$75 5.0%	of Gross Incomo	\$2	\$224,045	\$1,015
Gross Recidential Revenue	5.0%	of dross income	624	C0 445 295	\$47.696
Operating Expenses	\$13,176	per Unit/ Year	-\$11	-\$2,915,540	-\$13,176
Net Operating Income (NOI) Supportable Development Cost	4.5%	Project Yield Rate (on NOI)	\$24	\$6,529,845	\$29,510
BMR Rental					
Dwelling Units	15%	of total units		39	
BMR Net Building Area (Square Feet)	1,000	GBA / DU		39,049	
Gross Rentable Square Feet	80%	Efficiency Factor		48,811	1,250
Gross Potential Rent	\$1.95	per SF/Month	\$19	\$913,742	\$23,400
Gross Potential Parking Income	\$75	per Space/Month	\$1	\$39,537	\$1,013
Losses to Vacancy	5.0%	of Gross Income	<u>-\$1</u>	-\$47,664	-\$1,221
Gross Residential Revenue			\$19	\$905,615	\$23,192
Operating Expenses	\$11,000	per Unit/ Year	-\$9	-\$429,537	-\$11,000
Net Operating Income (NOI)			\$10	\$476,078	\$12,192
Supportable Development Cost	4.5%	Project Yield Rate (on NOI)	\$217	\$10,579,516	\$270,931
Total Supportable Development Cost			\$478	\$155,687,176	\$598,048
				TOTAL	Deslinit
PROJECT DEVELOPMENT COSTS			PERGBA	TOTAL	Per Unit
Construction Cost					
Basic Site Work	\$22	per SF (Site)	\$12	\$3,781,008	\$14,524
Building Direct Cost	\$285	Cost/SF (GBA)	\$285	\$92,740,926	\$356,250
Surrace Parking Direct Cost	\$5,000	per Space	\$U \$26	\$U \$11 714 643	\$U ¢45.000
Total Construction Cost	\$40,000	per space	\$333	\$108,236,577	\$415,774
Soft Cost			64.7	64.000 (646.62
Architecture and Engineering	4.0%	of Construction Cost	\$13	\$4,329,463	\$16,631
Uther Soft Costs	2.0%	of Construction Cost	\$7	\$2,164,732	\$8,315
Permits and Fees"	\$56,500	per DU	\$45	\$14,708,385	\$56,500
laxes and Insurance	2.0%	of Construction Cost	\$7	\$2,164,732	\$8,315
Marketing/Leasing	4.0%	of Construction Cost	\$10 \$10	\$3,247,007	\$12,051
Developer Fee	3.0% A 0%	of Construction Cost	\$13	\$4,329,442	\$16.631
Total Soft Costs		2. 22.30 dellon cost	\$108	\$35,273,335	\$135,497
Total Cost without Land			\$441	\$143,509,913	\$551,271
Residual Land Value	Total Value less	Total Cost	\$37	\$12,177,263	\$46,777
per acre				\$3,044,316	,
Total Project Cost			\$478	\$155,687,176	\$598,048

(1) Dwelling Units per Acre derived using existing Greystar development density of 520 units on a site of 7.99 gross acres.

(2) Unit size of 1,000 SF is an industry standard assumption.

(3) Parking Standards based on Sunnyvale Off-Street Vehicle Parking Space Requirements. Figure used is an average of the parking

(a) rating standards based on summyore OFFStreet vehicle rating space requirements, right doed is an average of the parking standard for 1 bedroom units and 2 bedroom units.
(4) In line with Summyore's existing affordable housing policies, the analysis assumes 15 percent of rental units will be affordable to

low- and very low- income (80 and 50 percent of Area Median Income, respectively) households. This calculation assumes an average 70 percent of Area Median Income

(5) Parking price is an industry standard assumption.(6) Excludes inclusionary housing fee.

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Table 14 Summary of Financial Feasibility Analysis, Proposed LSAP

DEVELOPMENT PROGRAM ASSUMPTIONS					Per Unit
Development Site (Acres)				4	
Dwelling Units ¹	100.0	DU / Acre		400	
Net Building Area (Square Feet) ²	1.000	GBA / DU		400.000	
Gross Rentable Square Feet	80%	Efficiency Factor		500,000	1,250
Total Parking Spaces ³	1.125	Spaces / DU		450	
Surface Parking Spaces	0%	of total parking		0	
Structured Parking Spaces	100%	of total parking		450	
BUILDING OPERATING INCOME (ANNUAL)			PER GBA	TOTAL	Per Unit
Market Rate Rental ⁴					
Dwelling Units	85%	of total units		340	
Market Rate Net Building Area (Square Feet)	1,000	GBA / DU		340,000	
Gross Rentable Square Feet	80%	Efficiency Factor		425,000	1,250
Gross Potential Rent	\$3.66	per SF/Month	\$35	\$14,932,800	\$43,920
Gross Potential Parking Income ⁵	\$75	per Space/Month	\$1	\$344,250	\$1,013
Losses to Vacancy	5.0%	of Gross Income	-\$2	-\$763,853	-\$2,247
Gross Residential Revenue			\$34	\$14,513,198	\$42,686
Operating Expenses	\$13,176	per Unit/ Year	-\$11	-\$4,479,840	-\$13,176
Net Operating Income (NOI)			\$24	\$10,033,358	\$29,510
Supportable Development Cost	4.5%	Project Yield Rate (on NOI)	\$525	\$222,963,500	\$655,775
BMR Rental					
Dwelling Units	15%	of total units		60	
BMR Net Building Area (Square Feet)	1,000	GBA / DU		60,000	
Gross Rentable Square Feet	80%	Efficiency Factor		75,000	1,250
Gross Potential Rent	\$1.95	per SF/Month	\$19	\$1,404,000	\$23,400
Gross Potential Parking Income	\$75	per Space/Month	\$1	\$60,750	\$1,013
Losses to Vacancy	5.0%	of Gross Income	-\$1	-\$73,238	-\$1,221
Gross Residential Revenue			\$19	\$1,391,513	\$23,192
Operating Expenses	\$11,000	per Unit/ Year	-\$9	-\$660,000	-\$11,000
Net Operating Income (NOI)			\$10	\$731,513	\$12,192
Supportable Development Cost	4.5%	Project Yield Rate (on NOI)	\$217	\$16,255,833	\$270,931
Total Supportable Development Cost			\$478	\$239,219,333	\$598,048
PROJECT DEVELOPMENT COSTS			PER GRA	τοται	Perlinit
PROJECT DEVELOPMENT COSTS			PERGBA	TOTAL	Per Olin
Construction Cost					
Basic Site Work	\$22	per SF (Site)	\$8	\$3,781,008	\$9,453
Building Direct Cost	\$285	COST/SF (GBA)	\$285	\$142,500,000	\$356,250
Surrace Parking Direct Cost	\$5,000	per Space	ŞU	\$0 \$22,500,000	656.350
Total Construction Cost	\$50,000	per space	\$338	\$168,781,008	\$421,953
Soft Cost					
Architecture and Engineering	4.0%	of Construction Cost	\$14	\$6,751,240	\$16,878
Other Soft Costs	2.0%	of Construction Cost	\$7	\$3,375,620	\$8,439
Permits and Fees ⁶	\$56,500	per DU	\$45	\$22,600,000	\$56,500
Taxes and Insurance	2.0%	of Construction Cost	\$7	\$3,375,620	\$8,439
Financing	4.0%	of Construction Cost	\$14	\$6,751,240	\$16,878
Marketing/Leasing	3.0%	of Construction Cost	\$10	\$5,063,430	\$12,659
Developer Fee	4.0%	of Construction Cost	<u>\$14</u>	\$6,751,240	\$16,878
Total Soft Costs			\$109	\$54,668,392	\$136,671
Total Cost without Land			\$447	\$223,449,400	\$558,623
Residual Land Value	Total Value less	Total Cost	\$32	\$15,769,934	\$39,425
			4475	\$3,342,483	4500.045
i otai Project Cost			\$478	\$239,219,333	\$598,048

(1) Dwelling Units per Acre derived using existing Greystar development density of 520 units on a site of 7.99 gross acres.

Unit size of 1,000 SF is an industry standard assumption.
 Parking Standards based on Sunnyvale Off-Street Vehicle Parking Space Requirements. Figure used is an average of the parking

standard for 1 bedroom units and 2 bedroom units.

(4) In line with Sunnyvale's existing affordable housing policies, the analysis assumes 15 percent of rental units will be affordable to low- and very low- income (80 and 50 percent of Area Median Income, respectively) households. This calculation assumes an average

70 percent of Area Median Income. (5) Parking price is an industry standard assumption.

(6) Excludes inclusionary housing fee.

APPENDICES

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In just 2018-2019, 14 properties sold in the LSAP area. Some of these transactions have been for property acquisitions related to Intuitive Surgical's corporate expansion plans, while other properties have been purchased for other uses, potentially including new development. While purchase price data was not available for all 14 transactions, a review of available data shows many properties transacting at per acre prices well above EPS's estimated \$3.0-\$4.0 million per acre value for residential development (see **Table 15**). Additionally, although the transaction occurred six years ago, in November 2013, we consider the Greystar property currently under construction in the LSAP, as a comparable sale because of the intended residential use. In 2013 the property transacted for \$3.50 million per acre, a value between the residual land values for the two prototypes modeled above. We posit that the 2013 transaction figure remains relevant: we expect general stability in the cost of developable residential land since 2013 because increases in rents have been outpaced by increases in construction costs, which applies downward pressure on real land prices.

Table 15 Representative LSAP Transactions by Property Type, 2018-2019

Address ¹	Existing Property Type	Total Building Square Feet	Total Acres Sold	Lot Coverage	Sale Price	Sale F per A
1130 Kifer Rd ³	Flex	100,400	7.99	0.351	\$28,000,000	\$3,50(
818-824 Kifer Rd	Flex	47,272	3.09	0.351	\$30,400,000	\$9,838
1159 Sonora Ct	Flex	16,830	1.14	0.339		
923-925 Kifer Rd	Flex	12,000	0.61	0.452	\$4,680,000	\$7,672
1090 Kifer Rd (Part of Multi-Property Sale)	Flex	101,731	16.84	0.478		
1170 Sonora Ct	Flex	15,000	1.09	0.316	\$8,900,000	\$8,16
1484 Kifer Rd	Industrial	128,628	4.77	0.619	\$33,000,000	\$6,918
100-120 San Lucar Ct	Industrial	47,200	2.42	0.448		
932 Kifer Rd (Part of Multi-Property Sale)	Industrial	63,035	26.73	0.146		
1175 Aster Ave (Part of Multi-Property Sale)	Land (unimproved)	NA	39.87	NA		
1202 Kifer Rd	Office	8,156	0.51	0.184		
1388 Kifer Rd	Office	88,924	5.28	0.129	\$33,000,000	\$6,250
1294 Kifer Rd, 703	Office	25,360	0.23	1.784	\$840,000	\$3,652
1210 Kifer Rd	Retail	7,800	1.6	0.112	\$5,900,100	\$3,68
Weighted Average Price/Acre						\$5,861

Where address is part of multi-property sale, sales and acreage figures apply to all properties included in transaction.
 Sale price not available for all transactions.

(3) Greystar property, transacted in 2013.

Sources: Costar, Santa Clara County Assessor and Recorder

These data suggest that many existing uses in the LSAP area are worth more as leasable or occupiable buildings or as development sites for commercial development than their underlying land is worth for residential development. That residual land values for residential development are lower than nonresidential building market values suggest demand to convert existing LSAP real estate to residential will be modest in the near term. Given the demand and high market values for housing in the region and local area, residential development should be feasible with appropriately priced land, but the LSAP properties that will turn over sonest are likely to be older properties that are not commanding top pricing in the market. Even then, it is possible that such properties will be acquired as a speculative purchase awaiting improved residential use in the near term.

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As such, this finding suggests that the residential development prospects in the LSAP area – whether under the existing Plan or the higher density LSAP – may not indicate a major windfall to property owners or developers that can be leveraged to achieve greater community benefits. Such benefits – be they more affordable housing, more open space, or other conditions – tend to add to development costs and/or reduce development values, either of which may pose a still greater feasibility hurdle for new residential development aiming to compete to acquire property in the LSAP area. Still, the higher density residential project (100 units per acre) does appear to increase the land value by a significant margin relative to the lower density project (65 units per acre), so it may be worthwhile pursuing the higher density LSAP because it can potentially yield more housing sooner and does indicate a preferable fiscal impact as discussed earlier in this document.

APPENDICES

APPENDIX C | HOUSING EXPANSION INFRASTRUCTURE IMPACT STUDY

LAWRENCE STATION AREA PLAN

PROPOSED INCREASE IN HOUSING POTENTIAL

WITHIN THE LSAP

(HOUSING EXPANSION BUILDOUT)

INFRASTRUCTURE IMPACT STUDY

June 22, 2020



255 Shoreline Drive, Suite 200 Redwood City, CA 94065 650.482.6300

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APPENDICES

Appendix A – Block Book Pages for Lawrence Station Area Plan

Appendix B – LSAP Parcels with Development Assumptions

Appendix C – LSAP Potable Water Model Reports

Appendix D – LSAP Sewer Model Reports

Appendix E – Potable Water System Demand Calculations

Appendix F – Sanitary Sewer System Demand Calculations

Appendix G – Cost Estimate for City Sanitary Sewer System Recommendations

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SECTION 1: INTRODUCTION AND PROJECT DESCRIPTION

1.1 **Project Overview**

The proposed Lawrence Station Area Plan (LSAP) Amendment Project (Project) is generally centered around a ¹/₂ mile radius of the existing Lawrence Caltrain Station at 137 San Zeno Way in Sunnyvale, California and is approximately 252.09 acres. The overall LSAP project is divided into two study areas: the Housing Expansion Study Area (i.e. proposed modifications to the adopted LSAP would allow for an addition of 3,612 net new units within portions of the adopted LSAP) and the Office Expansions Study Area. This Infrastructure Study will address the Housing Expansion Study Area which is bounded by the City of Santa Clara to the north and east, Reed Avenue, Aster Avenue, and the railroad right of way (ROW) to the south, and the Intuitive Surgical (ISI) offices to the west. The project site is located in the far eastern area of the City of Sunnyvale around the Lawrence Caltrain station. Figure 1.1 - Project Location - illustrates the regional location of the Project.

The Housing Expansion Study Area is approximately 219.70 acres that include 25.27 acres of public ROW, 17.94 acres of railroad ROW, and 176.49 acres of existing developments.

The Office Expansion Study Area is approximately 32.39 acres industrial land owned by ISI that is proposed for redevelopment as office/R&D that encompasses existing developments for ISI and an industrial site. The office LSAP is bounded by Central Expressway and Kifer Road to the north, City of Santa Clara and the Housing Expansion Study Area to the east, railroad ROW to the south, and commercial developments east of Commercial Street and San Lucar Court. Figure 1.2 - Project Study Area and Context - illustrates the Study Area Boundaries and the location of the Project within the City. Please refer to the Office Expansion Buildout Infrastructure Impact Study for analysis within the Office Expansion Study Area.





The housing expansion study area includes a mixed-use community with a wide range of residential, retail, and office. Existing utility infrastructure requiring upgrades to serve the

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Lawrence Station Area Plan Amendment Housing Expansion Buildout Infrastructure Impact Study June 22, 2020 Page 1 proposed increase in allowable housing potential within the adopted LSAP (i.e. the addition of 3,612 net new units within the LSAP) will be identified in this study.

1.2 Lawrence Station

1.2.1 Existing Conditions and Land Use

The LSAP area is approximately 252.09 acres. The study area includes portions of the Lawrence Caltrain station as well as existing commercial, industrial, and residential properties. Existing conditions and Land Uses within the LSAP include several development projects under construction, including new office buildings, mixed-use residential and retail, and self-storage.

1.2.2 Adopted LSAP Conditions

In December 2016, the Sunnyvale City Council approved the LSAP and its associated General Plan Amendment and Rezoning. The LSAP consisted of primarily residential redevelopment with office and research and development (R&D) developments interspersed. The adopted LSAP includes 2,323 residential units and 1,200,000 square feet (sf) of net new office/R&D development.

1.2.3 Proposed Conditions

At the time of the City's LSAP adoption (December 2016), the Sunnyvale City Council directed staff to return with a plan to study additional housing opportunities within the LSAP area. There are no planned increases to office/R&D development potential. The City Council subsequently selected a preferred land use alternative on June 26, 2018, which studies an increase in the residential density allowance for both MXD-I (Flexible Mixed-Use I) and MXD-II (Flexible Mixed-Use II) zoned areas, and expands the area where housing may be considered to the M-S/LSAP (Industrial and Service, LSAP Combining District) and O-R (Office/Retail) zoning districts.

Residential development capacity under the adopted LSAP allows for a maximum of 2,323 net new dwelling units under the plan's 'Estimated Likely Development Scenario'. A

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total of 1,261 net new housing units have been approved by the City since the LSAP was adopted in December 2016; therefore, a balance of 1,062 net new housing units currently remains for buildout within the adopted LSAP. With implementation of the proposed LSAP Update, the addition of 3,612 net new units would be allowable within the plan area. In addition, the maximum density allowance (with incentives) for MXD-I and MXD-II zoned areas within the LSAP would increase from 68 dwelling units per acre (du/ac) to 100 du/ac. The project would also expand where new housing may be considered to the M-S/LSAP zoning district with a maximum density allowance (with incentives) of 100 du/ac and O-R zoning district with a maximum density allowance (with incentives) of 54 du/ac. The housing expansion study area for the LSAP update is shown in Figure 1.3 – Proposed LSAP Study Area Layout.

1.3 Project Datum

All elevations referenced herein are based on the following:

- Vertical datum used in the City of Sunnyvale's Utility and GIS Maps
- Record drawings provided by the City for Aster Avenue and Willow Avenue
- Manhole survey data provided by the City for Lawrence Expressway

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SECTION 2: POTABLE WATER SYSTEM

2.1 Potable Water System Design Criteria

The design criteria used for the development of the potable water model is based upon established industry operations standards and regulatory agency requirements. The potable water system will be designed in accordance to the City of Sunnyvale's Standard Plans and Specifications and to applicable City, State, and Federal water and fire codes and standards unless otherwise permitted. Since the City of Sunnyvale does not have written standards for water generation, this report will use Redwood City's Design Standards to estimate project water demands based on correspondence between the City and BKF. The one exception is that this analysis will calculate residential demand using 55 gallons per day per capita based on correspondence between BKF and the City of Sunnyvale. The intent of this study is to identify which existing City water mains will need to be upgraded in order to provide adequate water supply to the LSAP. All existing water mains are located within the City Right-of-Way except for an existing 12-inch main running between Kifer Road and Sonora Court located in a public utility easement.

The design criteria are dependent on the demand scenario. Table 2.1 – Potable Water System Demand and Peaking Factor presents the potable water system demand and peaking factor for the demand scenario. Assumed peaking factors for max day demand and peak hour demand scenarios are based on correspondence between BKF and the City of Sunnyvale.

Table 2.1

Potable Water System Demand and Peaking Factor

Parameter	Value			
Average Day Demand (ADD)	1,319,228 gpd			
Fire Flow Demand (FF)	4,500 gpm			
Maximum Day Demand (MDD)	MDD = 2.0 ADD			
Peak Hour Demand (PHD) PHD = 3.0 ADD				
Notes: 1. Fire flow demand based on an assumed R-2 Occupancy type building and construction Type III-A,				

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assuming 25% fire flow reduction for sprinkling. 2. gpd = gallons per day 3. gpm = gallons per minute

Table 2.2 – Potable Water System Design Criteria presents the potable water system design criteria.

Criteria

Table 2.2	
Potable Water System	Design

Parameter	Value		
Pipe size	Pipe diameters of 8, 10, 12, and 16 inches shall be used for all distribution and feeder mains.		
Pipe Material	For water mains 12-inches and smaller shall be C900 DR14 PVC pipe or AWWA C-151/A21.51 ductile iron pipe (DIP). Water mains larger than 12-inches shall be C905 DR14 PVC or AWWA C-151/A21.51 DIP.		
Hazen Williams C-value for recommended pipes	140 for DIP, 150 for PVC		
Maximum static pressure	120 psi		
Maximum velocity during PHD	7 fps		
Maximum velocity during MDD+FF	15 fps		
Minimum system pressure during MDD+FF	20 psi		

Notes:

fps = feet per second

psi = pounds per square inch

2.2 Potable Water System Layout

Potable water is supplied to the LSAP by the City of Sunnyvale through an existing 12-inch diameter cast iron pipe (CIP) in Lawrence Expressway from the north and a 12-inch diameter asbestos-concrete pipe from the south. Additionally, there is an existing 12-inch diameter CIP in Kifer Road. Aster Avenue and Reed Avenue both contain existing 10-inch diameter CIPs. Existing potable water system layout is shown on Figure 2.1 – Existing Potable Water System.

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2.3 Upgraded Potable Water System

2.3.1 Proposed Water Demand Factors

The potable water demand factors used for the Project's various land uses are shown in Table 2.3 – LSAP Potable Water Demand Factors (ADD). The total estimated water demands for the Project land uses are shown on Table 2.4 – Total Buildout Potable Water Demand Summary (ADD). Water demands are derived from Redwood City's Design Standards with the exception of indoor water demands. Per capita demands for indoor residential demand was determined based on input from the City of Sunnyvale.

Table 2.3					
LSAP Potable	Water	Demand	Factors	(ADD))

Land Use	Indoor Potable Water Demand Factors (ADD)	Outdoor Potable Water Demand Factors (ADD)	Total Water Demand (ADD)
Residential ¹	121 gpd/unit	37.4 gpd/unit	158.4 gpd/unit
Office/R&D	0.13 gpd/sf	0.072 gpd/sf	0.202 gpd/sf
Industrial	0.21 gpd/sf	0 gpd/sf	0.21 gpd/sf
Restaurant	30 gpd/seat	0 gpd/seat	30 gpd/seat
Storage Facility	0.003 gpd/sf	0 gpd/sf	0.003 gpd/sf

Notes:

 Indoor potable water demand based on 55 gpd/person * 2.2 persons/unit. Outdoor potable water demand based on 17 gpd * 2.2 persons/unit. 55 gpd/person was determined after a phone conversation between BKF and Eric Evans with the City of Sunnyvale.

2. sf = square feet

2.3.2 Model Results Discussion

The existing potable water system is sufficient to supply the potable water demands as well as provide fire flow to the study area. Under the scenario of max day demand and fire flow, the water model analysis determined that the flow demand would be at its highest of any scenario at 4,820 gpm as seen in Appendix C-3 – Model Demand Scenario 3: Max Day Demand + Fire Flow. However, the existing potable water system is able to provide a flow between 5,000 and 6,000 gpm, which sufficiently meets the max day and fire flow demands. The impact of the proposed LSAP indicates that no improvements are required for the City's potable water system.

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2.4 Potable Water System Model Water Demands

2.4.1 Sources of Land Use Water Demand Data

Potable water demand factors for the model analyses are shown in Table 2.3 – LSAP Potable Water Demand Factors (ADD) and were applied to the project program to develop the project potable water demand total. Table 2.4 – Total Buildout Potable Water Demand Summary (ADD) provides water demands by land use including proposed sites associated with the LSAP and existing parcels expected to remain within the LSAP area.

See Appendix E – Potable Water System Demand Calculations, for model demand calculations on a block by block basis. Total project development will not exceed the demands presented in Table 2.4 – Total Buildout Potable Water Demand Summary.

2.4.2 Average Day Demand (ADD)

The demand factors are presented in Table 2.3 – LSAP Project Potable Water Demand Factors (ADD). The demand summary for the overall LSAP Housing Expansion including proposed sites associated with the LSAP and existing parcels to remain is presented in Table 2.4 – Total Buildout Potable Water Demand Summary (ADD). Table 2.5 – Office Expansion Study LSAP Potable Water Demand Summary (ADD) reflects the average day demand for the Office Expansion Study.

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Table 2.4	
Total Buildout Potable Water Demand Summary (ADD)	

Land Use	Number	Unit	Demand/Unit (gpd)	Total (gpd)
Residential	5,935	Units	158.4	940,104
Office/R&D	1,212,374	sf	0.202	244,900
Industrial	614,598	sf	0.21	129,065
Restaurant ^{1,2}	156	seat	30	4,680
Storage Facility	159,637	sf	0.003	532
			Total	1,319,281

Notes:

 Existing restaurant located at 1210 Kifer Road is assumed to have 156 seats. This is based on the assumption that 50% of restaurant space (7,800 sf total) is for patrons and one 10'x10' table has seating for 4 people. The calculation is as follows:

$$(7,800 \ sf \times 0.5) \times \left(\frac{4 \ seats}{100 \ sf}\right) = 156 \ seats$$

- 2. Restaurant is defined as employee amenity space.
- 3. The square footage numbers provided in this table present the project buildout numbers and the existing parcels expected to remain.

Table 2.5

Office Expansion Study LSAP Potable Water Demand Summary (ADD)

Land Use	Number	Unit	Demand/Unit (gpd)	Total (gpd)
Office/R&D	351,000	sf	0.202	70,902
Industrial	831,000	sf	0.21	174,510
Restaurant ^{1,3}	580	seat	30	17,400
			Total	262,812

Notes:

 Total restaurant seating is assumed to be 580 seats. This is based on the assumption that 50% of restaurant space (29,000 sf total) is for patrons and one 10'x10' table has seating for 4 people. The calculation is as follows:

$$(29,000 \ sf \times 0.5) \times (\frac{4 \ seats}{100 \ sf}) = 580 \ seats$$

2. Block by block water demand calculations shown in Appendix E.

3. Restaurant is defined as employee amenity space.

2.4.3 Maximum Day Demand

Maximum Day Demand (MDD) represents the maximum volume of water used in a 24hour period for the entire year. A water system is typically evaluated under a maximum day plus fire flow demand condition as this condition allows the system to be stressed at a higher demand rate to ascertain if pipeline carrying capacities are adequate in a fire emergency. As identified in Table 2.1 – Potable Water System Demand and Peaking Factor, a peaking factor of 2 was applied to ADD.

2.4.4 Peak Hour Demand

Peak Hour Demand (PHD) represents the highest hourly demand for the entire system, and simulates the highest flow rate expected. To determine the PHD, a peaking factor was applied to increase the ADD. Peaking factors represent the increase above ADD and are a statistical concept typically obtained from historical data. As identified in Table 2.1 – Potable Water System Demand and Peaking Factor, a peaking factor of 3 was applied to ADD.

2.4.5 Fire Flow Demand

The fire flow (FF) demand is assumed to be 4,500 gallons per minute (gpm) based on correspondence between the City of Sunnyvale, Ascent Environmental, and BKF Engineers.

2.5 Potable Water System Model Boundary Conditions

The recommended potable water system is modeled based on calibrated boundary conditions and fire hydrant flow data received from the city completed for the LSAP Project. Since the LSAP Project is redeveloping existing lots, the recommended water model is analyzing existing City water mains and identifying which water mains will need to be upgraded in order to provide adequate water supply for the redevelopment.

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2.6 Potable Water System Model Scenario

The LSAP water model was created in Bentley Water CAD V8i SELECT series 1. A series of model scenarios were created to reflect the range of demand usage patterns and confirm conformance to the Potable Water System Design Criteria outline in Table 2.2 – Potable Water System Design Criteria. Three model runs are prepared for the Housing Expansion Study Area and are shown in Table 2.6 – LSAP Project Model Runs – Housing Expansion Study.

Table 2.6 LSAP Project Model Runs – Housing Expansion Study

Run	Description	
1	Static Pressures	
2	Peak Hour Demand	
3	Maximum Day Demand + Fire Flow	

See Appendix C - LSAP Potable Water Model Reports for model run results.

2.7 Recommended Potable Water System Model Results

The existing potable water system, as shown in Appendix C – LSAP Potable Water Model Reports, is designed to meet the design criteria outlined in Table 2.2 – Potable Water System Design Criteria. Table 2.7 – Potable Water System Results for Housing Expansion Study summarizes the pressure and velocity results for the referenced model scenarios listed in Table 2.6 – LSAP Project Model Runs – Housing Expansion Study. Refer to Appendix C – LSAP Potable Water Model Reports for detailed results of model scenarios.

Table 2.7 Potable Water System Results for Housing Expansion Study

Parameter	Requirement	Minimum	Maximum
Static ADD Pressure (psi)	120 max	68	85
PHD Velocity (fps)	7 max	-	2.96
MDD+FF Pressure (calculated system lower limit at total flow available) (psi)	20 min	33	-
MDD+FF Velocity (fps)	15 max	-	< 15

Note:

MDD+FF pressure was 4,820 gpm, however the model was allowed to run with flows higher than 5,000 gpm, which resulted in it stopping at 15 fps.

2.8 Potable Water System Conclusion

Based on the results shown in Appendix C-2 – Model Demand Scenario: Peak Hour Demand and C-3 – Model Demand Scenario: Max Day Demand + Fire Flow, the existing potable water system is sufficient to meet proposed potable water and fire flow (FF) demands during average day demand (ADD), max day demand (MDD), and peak hour demand (PHD). No new upgrades to the potable water system were determined to be needed at this time. A water supply analysis will be prepared by Ascent Environmental.

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ØBKF Engineers , Dool in TT PL EX 8" PW EX 8" PW CITY OF SUNNYVALE CENTRAL CENTRAL EXPWY CITY OF SANTA CLARA ts EX 12" PW COMMERCIA No. EX 12" PW **KIFER RD** KIFER RD EX 12" PW EX 12" PW EXPWY CALABAZAS CREEK ĸ SAN ZENO WAY фwр JPB RIGHT-OF-WAY l≥ å System. LAWRENCE E --Nater LAWRENCE STATION RD 目 S SONORA CT EX 10" PW EX 10" P VTA STATION EX 10" PW E EVELYN AVE X JPB RIGHT-OF-WAY-Å SAP 出 0 AGATE DR ASTER AVE 日日日 EL CAMINO CHANNEL ang WILLOW AVE EL CAMINO 12mm EP CHANNEE B FRENCH ST EX 10' PW EX 10" PW REED AVE MONROE ST ARA **NYVAL** Jamm P < SAN' GRAPHIC SCALE Ŀ 600 600 2 ≻ 0 LEGEND DATE: 06/22/2020 LSAP HOUSING EXPANSION BUILDOUT 1"=600' SCALE: CITY BOUNDARY EX 8" PW INFRASTRUCTURE REPORT ð, DESIGN: BPB DRAWN BY: NRF ENGINEERS / SURVEYORS / PLANNER 255 SHORELINE DRIVE SUITE 200 REDWOOD CITY, CA 94065 650/482-6300 650/482-6399 (FAX)____ EX 10" PW **BkF** FIGURE 2.1 - EXISTING APPROVED: TRM EX 12" PW JOB NO: 20180080 POTABLE WATER SYSTEM PLOT

APPENDICES

SECTION 3: SANITARY SEWER SYSTEM

3.1 Sanitary Sewer System Design Criteria

The design criteria used for the development of the sanitary sewer model is based upon established industry operations standards and regulatory agency requirements. The sanitary sewer system will be designed in accordance to the City of Sunnyvale's Standard Plans and Specifications and to applicable City, State, and Federal water codes and standards unless otherwise permitted. At certain locations within the project area, City design guidelines were supplemented with manhole survey data and record drawings provided by the City. Sanitary sewer generation is assumed to be 95% of indoor potable water demands. This infrastructure study will identify which existing City sewer mains will need to be upgraded in order to support the anticipated sewer flows from the development within Housing Expansion Study Area. All existing sewer mains are located within the City right-of-way. The pipe material of existing sewer mains is vitrified clay pipe (VCP). The design criteria are dependent on the demand scenario. Table 3.1 – Sanitary Sewer System Design Criteria presents the sanitary sewer system design criteria based on the supplemental information received from the City.

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Table 3.1 Sanitary Sewer System Design Criteria

Parameter	Value
Minimum pipe size	8-inch inside diameter
Pipe Material	PVC SDR-26 or better
Manning's coefficient, n, for recommended PVC pipes	0.01
Minimum Slope	0.5% (0.005 feet/feet) for sewer diameters 8-inches and smaller, 0.4% (0.004 feet/feet) for sewer diameters 10-inches and larger.
Maximum Slope	14.0% (0.14 feet/feet)
PWWF Maximum Pipe Flow Depth Ratio, <i>d/D</i>	0.5 for sewer diameters 10-inches and smaller, 0.75 for sewer diameters 12-inches and larger
Minimum Depth of Cover	5 feet below finished grade
Sewer Generation	95% of indoor potable water demand

Notes

ADWF = Average Dry Weather Flow

d/D = ratio of depth of flow (*d*) to the pipe inside diameter (*D*) fps = feet per second

PWWF = Peak Wet Weather Flow

Four flow conditions were analyzed:

1. Average Dry Weather Flow (ADWF) in Existing City Sewer System

2. ADWF in Recommended City Sewer System

3. Peak Wet Weather Flow (PWWF) in Existing City Sewer System

4. PWWF in Recommended City Sewer System

The ADWF is 95% of the indoor potable water demand. To account for existing flows entering the project area from other areas of the city, existing sewer flows collected from flow monitoring sites at Lawrence Road north of Warburton Avenue, Kifer Road west of Lawrence Expressway, and Aster Avenue west of Willow Avenue were incorporated into the sanitary sewer model analysis. Existing sewer flow data collected from the flow monitoring sites were received

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from the City on February 6, 2020. According to the City of Sunnyvale's Sanitary Sewer Systems Design Standards, the PDWF peaking factor is dependent upon ADWF. We have assumed a Peak Dry Weather Flow (PDWF) peaking factor that varies between 2.5 and 3.5 which is based on individual parcel demands. PWWF is based on PDWF and a design inflow and infiltration rate based on a 10-year storm event that is 65% of the ADWF. Table 3.2 – Sanitary Sewer System Peaking Factor summarizes the peaking factor to achieve PWWF based on the supplemental information received from the City.

Table 3.2

Sanitary Sewer System Peaking Factor

Parameter		Value
Indoor Potable Water Demand		1,010,021 gpd
Average Dry V V	Veather Flow (95% of Indoor Vater Demand)	959,520 gpd
	PDWF ¹	PDWF = (varies between 2.5 and 3.5) * ADWF
	PWWF	PWWF = ADWF * (PDWF peaking factor + 0.65)

Notes:

PDWF peaking factor is dependent upon ADWF for each parcel. PDWF = Peak Dry Weather Flow PWWF = Peak Wet Weather Flow ADWF = Average Dry Weather Flow

3.2 Sanitary Sewer Collection System

3.2.1 Existing Sanitary Sewer Collection System

The existing sanitary sewer collection system within the vicinity of the LSAP consists of sewer mains that vary in size between 6-inches to 27-inches and a single lift station on Kifer Road located at the crossing over Calabazas Creek. Pipe material of the existing sewer mains is VCP. The lift station consists of a wet well system.

The existing sanitary sewer system within the LSAP boundary consists of a single drainage area. Sanitary sewer flows generally drain by gravity and ultimately drain to the existing 27-inch sanitary sewer main in Lawrence Expressway. The City provided BKF with record drawings, sewer manhole survey data and construction documents for sanitary

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sewer mains in Lawrence Expressway, Willow Avenue, and Aster Avenue. A layout of the existing sanitary sewer system is shown on Figure 3.1 – Existing Sanitary Sewer System and existing sanitary sewer manholes are represented on Figure 3.2 – Existing Sanitary Sewer Manholes.

3.3 Recommended Sanitary Sewer System Layout

Figure 3.3 – Recommended Sanitary Sewer Pipe Sizing and Figure 3.4 – Recommended Sanitary Sewer Model Pipe Labels shows the sanitary sewer system collection system with recommended sewer main upgrades required for the LSAP. Figure 3.3 – Recommended Sanitary Sewer Pipe Sizing shows which existing sanitary sewer mains will require upgrades in order to handle the increased sanitary sewer demands from the proposed LSAP.

3.3.1 Kifer Road Lift Station

The analysis of the existing Kifer Lift Station involved reviewing the existing and proposed sanitary sewer ADWF flows into the lift station. The existing sanitary sewer flow during ADWF was determined to be 83 gpm as derived from the building square footages from the M-S/LSAP zone adjacent to Uranium Drive as shown on Figure 3.2 – Existing Sanitary Sewer Manholes. The proposed sanitary sewer ADWF flow into the lift station was determined to be 160 gpm based on the sewer analysis model used throughout this report. BKF provided the existing and proposed sewer flows to the city. The City reviewed the information provided and confirmed the existing Kifer Road Lift Station has enough capacity to serve the LSAP buildout condition.

3.4 Sanitary Sewer System Model Sewer Flows

3.4.1 Land Use Sewer Generation Data

The sanitary sewer flows used are based on the indoor potable water for each land use. Outdoor water demands are not included in sanitary sewer flows because outdoor drains connect to the storm drain system.

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3.4.2 Average Dry Weather Flow

The sanitary sewer ADWF is intended to be representative of the average day sanitary sewer generation. The sanitary sewer ADWF is a function of the indoor water use ADD. Table 3.3 – Total Buildout Sanitary Sewer Demand Summary represents the indoor water use ADD and sanitary sewer demands generated for each land use shown in Table 2.4 – Total Buildout Potable Water Demand Summary (ADD) including proposed sites associated with the LSAP and existing parcels to remain. The sanitary sewer ADWF is based on 95% of the indoor potable water ADD. Total sewer demand use for each development is detailed in Appendix F - Sanitary Sewer Demand Calculations. Sewer generation (gpm) that was calculated for each parcel was applied to each sewer line in the street that was adjacent to that particular parcel. This allows an even distribution of sewer generated for a particular parcel to account for existing sanitary sewer lines in the street. Table 3.6 – Office Expansion Study LSAP Sanitary Sewer Demand Summary represents the indoor water use and sanitary sewer demands generated from the office expansion.

Table 3.3		
Total Buildout Sanitar	y Sewer Demand	Summary

Land Use ¹	Number	Unit	Indoor Domestic Water Demand (gpd)	Sanitary Sewer Demand (gpd)
Residential	5,935	sf	718,135	682,228
Office/R&D	1,212,374	sf	157,609	149,728
Industrial	614,598	sf	129,065	122,612
Restaurant ²	156	seat	4,680	4,446
Storage Facility	159,637	sf	532	506
		Total	1,010,021	959,520

Notes:

 Existing restaurant located at 1210 Kifer Road is assumed to have 156 seats. This is based on the assumption that 50% of restaurant space (7,800 sf total) is for patrons and one 10'x10' table has seating for 4 people. The calculation is as follows:

$$(7,800 \ sf \times 0.5) \times \left(\frac{4 \ seats}{100 \ sf}\right) = 156 \ seats$$

2. Restaurant is defined as employee amenity space.

The square footage numbers provided in this table represent project buildout numbers including nonresidential buildings expected to remain.

3.4.3 Peak Dry Weather Flow (PDWF)

The sanitary sewer PDWF is the highest sanitary sewer generation during the day due to diurnal peaks associated with higher water usage in the morning and early evening hours. PDWF is determined by applying a peaking factor to ADWF. City of Sunnyvale has varying peaking factors for PDWF which is dependent upon ADWF for each parcel. Peaking factors for the LSAP vary between 2.5 and 3.5.

3.3.3 Peak Wet Weather Flow (PWWF)

The sanitary sewer PWWF incorporates infiltration and inflow rate at 65% of the ADWF. This rate is added to the PDWF peaking factor.

Inflow is surface water that enters the wastewater system from yards, roof drains, downspouts, storm drain cross connections, or through manhole covers due to overland flow runoff. Similar to infiltration, inflow is a result of storm events, and peak inflow

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flow runoff. Similar to infiltration, inflow is a result of storm events, and peak inflow typically occurs during heavy storm events or prolonged periods of precipitation.

Infiltration is groundwater that enters sewer facilities such as pipelines, laterals, and manholes through holes, breaks, joint/connection failures, and other openings. Infiltration is directly correlated to the total amount of piping and appurtenances in the ground. Infiltration quantities vary due to seasonal variation in the groundwater levels influenced by storm events, surface and soil conditions, condition of sanitary sewer systems, and type of pipe joints. The highest infiltration flows are typically observed following significant storm events and during the winter or peak precipitation months, when groundwater levels are high.

3.5 Sanitary Sewer Flow Distribution

Each parcel's total sanitary sewer generation was determined by reviewing the planned parcel land use and applying applicable land use sanitary sewer generation. The parcel land use summary is included in Appendix F – Sanitary Sewer System Demand Calculations for reference. Sanitary sewer flows from the proposed LSAP Office Expansion (i.e. ISI project) was included in the model results due to the LSAP Office Expansion located within the LSAP Housing Expansion Buildout Infrastructure on Kifer Road. Refer to the Lawrence Station Area Plan Office Expansion Buildout Infrastructure Impact Study for a detailed analysis with the expanded office use.

Each parcel's total sanitary sewer flow was divided equally amongst the sanitary sewer manholes bordering the parcel as shown in Figures 3.2 – Existing Sanitary Sewer Manholes and 3.4 – Recommended Sanitary Sewer Model Pipe Labels. The parcel flow entering a manhole represents a sanitary sewer lateral point of connection.

3.6 Hydraulic Grade Line Considerations

The analysis of the sanitary sewer system is assumed to be a free outfall condition.

3.7 Sanitary Sewer Boundary Conditions

In addition to the flow monitoring survey data provided by the City, the recommended sanitary sewer system is modeled based on boundary conditions taken from Technical Memorandum 7 attached to the City of Sunnyvale's 2015 Wastewater Collection System Master Plan. Since the LSAP Project is redeveloping existing lots, the proposed sewer model is analyzing existing City sewer mains and identifying the sewer mains that will need to be upgraded in order to abide by supplemental information provided by the City.

3.8 Model Scenario Results and Analysis

The LSAP sanitary sewer model was created using a Bentley StormCAD V8i SELECT series 5.

The following sanitary sewer model flow conditions were developed:

- 1. Average Dry Weather Flow (ADWF) in Existing City Sewer System
- 2. ADWF in Recommended City Sewer System
- 3. Peak Wet Weather Flow (PWWF) in Existing City Sewer System
- 4. PWWF in Recommended City Sewer System

Sanitary sewer model inside diameters were based on JM Eagle PVC Pipe Size for SDR 26 (160 psi). Installation of the sewer system should be based on the modeling of the product.

3.8.1 Pipe Diameter

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The recommended sanitary sewer pipe sizes are shown on Figure 3.3 – Recommended Sanitary Sewer Pipe Sizing. The recommended sanitary sewer system consists of 12-inch to 30-inch diameter pipes. Exhibits show nominal pipe diameters. The sewer systems were modelled with the inside pipe diameters. Pipe upgrades for portions of the sanitary sewer system were based on the d/D exceeding the allowable depth of flow of 0.50 for pipe sizes 10-inches and smaller, and 0.75 for pipe sizes greater than 12-inches per the supplemental information the City provided.

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3.8.2 Flow Velocity

The flow velocities through the pipes were calculated using the Manning's equation. The Manning's equation calculates the flow velocities using the pipe's roughness coefficient, the hydraulic radius, and the slope of the pipe.

While most of the existing sewer mains are able to provide 2 fps during PWWF conditions, this was not achievable for all existing sewer mains. For sewer mains that flowed under 2 fps during PWWF conditions, these sewer mains are flowing at less than half pipe capacity. Therefore, these existing sewer mains will not be upgraded as it has sufficient capacity for future sewer demands and will achieve minimum 2 fps flow velocity requirements when flowing half-full. The existing sewer mains are upsized if found to be flowing greater than the d/D at PWWF requirements (0.5 or 0.75).

3.8.2.1 Average Dry Weather Flow (ADWF)

Figure 3.5 – Average Dry Weather Flow Pipe Velocity illustrates the ADWF pipe velocities for the sanitary sewer system. The sanitary sewer system ADWF pipe velocity results are detailed in Appendix D – LSAP Sewer Model Reports. The results shown in this appendix account for flows from the overall LSAP area including the office and housing expansion areas. The results of the analysis show LSAP ADWF velocities ranging from approximately 0.61 fps to 7.36 fps in the City's existing sewer system. ADWF velocities in the recommended City sewer system range from approximately 0.84 fps to 7.28 fps.

3.8.2.2 Peak Wet Weather Flow (PWWF)

Figure 3.6 – Peak Wet Weather Flow Pipe Velocity illustrates the PWWF pipe velocities for the sanitary sewer system. The sanitary sewer system PWWF pipe velocity results are detailed in Appendix D – LSAP Sewer Model Reports. The results shown in this appendix account for flows from the overall LSAP area including the office and housing expansion areas. The results of the analysis

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show LSAP PWWF velocities ranging from approximately 0.25 fps to 11.04 fps in the City's existing sewer system. PWWF velocities in the recommended City sewer system range from approximately 1.27 fps to 10.94 fps.

3.9 Sanitary Sewer System Conclusion

The existing Sanitary Sewer system had three pipes that did not meet design criteria based on the supplemental information provided by the City for maximum pipe flow depth (d/D). These pipes were the following:

- Existing 10-inch VCP sewer main located in San Zeno Way connecting into Kifer Road between manholes 305-201 and 336-201 has an existing pipe flow depth of 0.53 during PWWF conditions as seen in Appendix D LSAP Sewer Model Reports. Per supplemental information provided by the City, maximum depth for pipes 10-inches and smaller is 0.5. BKF recommends upsizing to 12-inch PVC sewer main to provide sufficient capacity.
- Existing 10-inch VCP sewer main located at the intersection of Willow Avenue and Aster Avenue between manholes 296-208 and 296-209 has an existing pipe flow depth of 1.06 during PWWF conditions as seen in Appendix D – LSAP Sewer Model Reports. Per supplemental information provided by the City, maximum depth for pipes 10-inches and smaller is 0.5. BKF recommends upsizing to a 18-inch PVC sewer main to provide sufficient capacity.
- Existing 27-inch VCP sewer main is in Santa Clara, but the City of Sunnyvale has jurisdiction over the pipe segment. It is located in Lawrence Expressway north of Kifer Road between manholes 336-202 and 336-207. It has an existing pipe flow depth of 0.80 during PWWF conditions as seen in Appendix A – LSAP Sewer Model Reports. Per supplemental information provided by the City, maximum depth for pipes 12-inches and larger is 0.75. BKF recommends upsizing the existing 27-inch VCP to a 30-inch PVC sewer main to provide sufficient capacity.

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SECTION 4: CONSTRUCTION COSTS

4.1 Sanitary Sewer System Construction Costs

The associated construction costs to complete the recommended pipe upsizing upgrades are based off of the cost estimates prepared by Schaaf & Wheeler for the Downtown Specific Study prepared in September 2019. The anticipated construction cost based on linear footage has been prepared in Table 4.1 – Anticipated Construction Cost. The unit cost provided includes the costs associated with mobilization, demobilization, traffic control, shoring, trenching, manholes, laterals, bypass pumping, offhaul and disposal.

Table 4.1 Anticipated Construction Cost

Pipe Diameter	Recommended Costs (\$/LF) ²
12" PVC pipe	\$700
18" PVC pipe	\$900
30" PVC pipe ¹	\$2000

Note:

 The 30" PVC pipe recommended unit cost has been adjusted to account increased costs for construction work required on Lawrence Expressway including sewer bypass pumping, expressway traffic control, and pavement thickness.

2. Unit cost values are derived from 2019 Downtown Specific Plan Amendments Utility Impact Study.

Total project construction was estimated by factoring expected additional costs related to construction contingency, design, inspection, miscellaneous costs, and city administration. These additional project costs have been provided in Table 4.2 – Additional Project Costs shown below.

Table 4.2

Additional Project Costs

Project Item	Percentage of Total Cost
Construction Contingency	25%
Design	20%
Inspection	10%
Miscellaneous Costs	10%
City Administration	5%

The sewer analysis model finds that a total of 671 linear feet of 27-inch VCP sewer pipe in Lawrence Expressway must be upsized to a 30-inch PVC sewer pipe, which creates an estimated cost of \$1,342,000. With additional costs, the total cost for upsizing sewer pipe in Lawrence Expressway amounts to \$2,214,300. The model concludes that a total of 324 linear feet of 10-inch VCP sewer pipe in San Zeno Way must be upsized to a 12-inch PVC sewer pipe, which creates an estimated cost of \$226,800. With additional costs, the total cost for upsizing the sewer pipe in San Zeno Way amounts to \$374, 220. For Willow Avenue, a total of 69 linear feet of 10-inch VCP sewer pipe must be upsized to 18-inch PVC sewer pipe, which creates an estimated cost of \$62,100. With additional costs, the total cost for upsizing the sewer pipe in Willow Avenue amounts to \$102,465. The total cost associated with the recommended sewer upgrades for the LSAP Housing Expansion is \$2,690,985. A detailed breakdown of the project's cost estimate can be seen in Appendix G – Cost Estimate for City Sanitary Sewer System Upgrades.

SECTION 5: STORM DRAIN SYSTEM

5.1 Existing Storm Drain Layout

The existing storm drain for LSAP is shown on Figure 4.1 – Existing Storm Drain System. Existing storm drain mains are maintained by the City of Sunnyvale. The LSAP area is currently served by existing storm drain mains that vary in size between 12-inches to 60-inches. Within the vicinity of the LSAP, there are four points where the existing storm drain system discharges into a City flood easement (El Camino Channel) listed below.

- Discharge point #1 located near Reed Avenue and East Evelyn Avenue
- Discharge point #2 located at Aster Avenue east of East Evelyn Avenue
- Discharge point #3 located at French Street south of Agate Drive
- Discharge point #4 located at the intersection of French Street and Willow Avenue.

There are also two points where the existing storm drain system discharges into Calabazas Creek at Kifer Road coming from the West and East (Discharge points #5 and #6 respectively). Discharge points are shown in Figure 4.1 – Existing Storm Drain System.

5.2 Storm Drain System Conclusion

While the project does not have pervious/impervious areas of the existing developments, it is assumed that the pervious areas in the existing development are below 20% pervious. The existing LSAP site, using Google Earth aerial images, show significant impervious surfaces throughout the project area consisting primarily of existing buildings and surface parking for each lot. While the project does not have a pervious/impervious area breakdown for the proposed development, the City of Sunnyvale's Municipal Code requires a minimum of 20% landscaping for each development parcel. It is also assumed that stormwater flows from the proposed developments within the LSAP will be designed to infiltrate within their own development site. Therefore, the proposed Housing Expansion Study Area project assumes no increase in stormwater runoff to the existing storm drain system.
ØBKF Engineers ם לבבבה Н EX 39" RCP-EX 42" RCP-EX 54" RCP CENTRAL EXPWY CITY OF SUNNYVALE EX 60" RCP CENTRAL EXPWY EX 30" RCP TY OF SANTA CLARA 36 FX EX 18" RCF EX 24" RC ts ICIAL Solution DISCHARGE POINT #6 EX 24" DISCHARGE POINT #5 ROP EX 27" RCP EX 27" RCP EX 27 RCP KIFER RD KIFER RD EX 30" RCP EX 33 RCP EX 18" RCP EX 18" RCP EX 30" RCF EX 24" RCP IPS RIGHT-OF-WAY EX 27" RCP EXPW CALABAZAS CREEK ď SAN ZENO WAY Que C NIUM. JPB RIGHT e ue LAWRENCE LAWRENCE STATION RD System ŝ TEX 36" RCP SONORA CT EX 33" RCP VTA STATION i K sor EX 48" RCP Ē EVELYNAVE EX 39" RCP RCP Existi EX 39" RCP JPB RIGHT-OF-WAY EX 60" RCP-21 EX 24" RCP-EX 18" RCP-4 AGATE DR h 70. ASTER AVE EL CAMINO CHANNEL PCs DISCHARGE POINT #4 H - DISCHARGE POINT #3 SCP -EX 42" CMP 1.62 DISCHARGE POINT #2 CHANNEL FRENCH ST ١Ľ EX 42" RCP REED AVE EX 24 ROP EX 54" CMP MONROE ST EX 12" RC CLARA YVALE DISCHARGE POINT #1 到出生 ₹ SAN-GRAPHIC SCALE 4\2018\18008 PLOTTED BY: ЧO 600 600 dтY \\bkt-rc\\ 06-19-20 06/22/2020 LEGEND DATE: LSAP HOUSING EXPANSION BUILDOUT SCALE: 1"=600' CITY BOUNDARY EX 42" STORM EX 48" STORM EX 27" STORM **INFRASTRUCTURE REPORT** EX 30" STORM DESIGN: BPB EX 12" STORM ING NAME: DATE: ENTITIERS / SURVEYORS / PLANNERS 255 SHORELINE DRIVE SUITE 200 REDWOOD CITY, CA 94065 650/482-8300 650/482-8300 DRAWN BY: EYS EX 18" STORM EX 33" STORM EX 54" STORM **BkF** FIGURE 4.1 - EXISTING APPROVED: TRM EX 21" STORM EX 36" STORM EX 60" STORM JOB NO: 20180080 STORM DRAIN SYSTEM PLOT 1 - EX 24" STORM EX 39" STORM ----- CHANNEL/CREEK

APPENDICES

APPENDIX A



Block Book Pages for Lawrence Station Area Plan









APPENDICES





APPENDICES

















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APPENDIX B

LSAP Parcels with Development Assumptions

Appendix B Lawrence Station Area Plan LSAP Parcels with Devleopment Assumptions Received from George Schroeder of the City of Sunnyvale on March 16, 2019

Residential d	levelopment cap u	nder	2,323			Total net new housing unit cap					
the adopted	LSAP (net new dw	elling units)				Addition of net	proposed with implementation of				
Net new hou the City since	ising units approve ELSAP adoption in	d by 2016	1261			LSAP update					
Balance of n	et new housing uni	ts that				3,612	5,935				
currently rer	nain for buildout w	ithin the adopted	1,062								
LSAP											
Existing		Parcels highlighted i	in green will be	analyzed as	the existing condition	on.					
Proposed		Parcels highlighted i	in blue will be	analyzed as ti	ne proposed conditi	on.					
Parcels not e	xpected to redevel	lop to residential or	change (Caltra	in properties	also excluded)						
APN	Addr #	Street	St. Type	Lot Sq. Ft.	Lot Acres	Zoning District					
20549008	960	Kifer	Rd	214 751	4.93	MXD-2					

20549008	960	Kifer	Rd	214,751	4.93	MXD-2
20550001	1016-1020	Kifer	Rd	344,734	7.91	MXD-2
20550036	1050-1090	Kifer	Rd	426,364	9.79	MXD-1
20550029	1127	Sonora	Ct	175,982	4.04	MXD-2
20550004	1120-1130	Kifer	Rd	348,698	8.01	MXD-1
21627018	1202	Kifer	Rd	21,621	0.50	MXD-1
21627053	1210	Kifer	Rd	69,696	1.60	MXD-1
21627052	150	Lawrence Station	Rd	561,052	12.88	MXD-1
21627059	106	Lawrence Station	Rd	321,037	7.37	MXD-2
Various	1286-1298	Kifer	Rd	501,498	11.51	MXD-2
Various	1171-1193	Buttercup	Tr	32,800	0.75	RS
21301034	1155	Aster	Av	708,198	16.26	MXD-3
21301032	-			7,841	0.18	MXD-3
21201022	ter .	**		21 244	0.49	MYD-2

East of Calba	zas Creek - 50% of	these sites develop	ed at 100 du/a	ac								
APN	Addr #	Street	St. Type	Lot Sq. Ft.	Lot Acres	Zoning District	Existing or Approved Land Use	Existing SF (Nonres)	Estimated Units for Proposed LSAP			
21627023	1484	Kifer	Rd	207,781	4.77	MS/LSAP	Industrial	128,628	382			
21627068	1382-1388	Kifer	Rd	155,191	3.56	MS/LSAP	Office	88,222	338			
21627069	1400	Kifer	Rd	276,231	6.34	MS/LSAP	Industrial	76,905	634			
21627033				30,492	0.70	MS/LSAP	N/A, Rail Spur	N/A	0			
21627035				43,124	0.99	MS/LSAP	N/A. Rail Spur	N/A	0			
21627044	1450	Kifer	Rd	234,353	5.38	MS/LSAP	Office	78,000	0			
21627045	123	Uranium	Dr	250,470	5.75	MS/LSAP	Industrial	105,000	0			
21627047	111	Uranium	Dr	252,212	5.79	MS/LSAP	Industrial	126,788	328			
21627048				16,117	0.37	MS/LSAP	N/A, Rail Spur	N/A	0			
					Total of all sites							
	50% of total											

Lawrence/R	Lawrence/Reed/Willow - developed at 54 du/ac												
APN	N Addr # Street		St. Type	Lot Sq. Ft.	Lot Acres	Zoning District	Existing or Approved Land Use	Existing SF (Nonres)	Estimated Units for Proposed LSAP	Estimated Retail under Proposed LSAP (SF)			
21301001	1170	Willow	Av	10,550	0.24	OR	Commercial	19,145	13	1000			
21301002	1165	Reed	Av	41,700	0.96	OR	Commercial	16,750	52	2000			
21301003	1155	Reed	Av	67,082	1.54	OR	Commercial	11,448	83	2000			
21301004	21301004 1164 Willow Av 14,8		14,849	0.34	OR	Commercial	6,500	18	2000				
Total of all sites 166 7,000													

Kifer/Sonora	a - developed at 100 du/ac				Adopted LSAP DEC 2016					
APN	Addr # Street	St. Type	Lot Sq. Ft.	Lot Acres	Existing Max @ 68 du/ac	g Max @ 68 du/ac Delta Existing or Approved Land Use Existing SF (Nonres)		Existing SF (Nonres)	Estimated Units for Proposed LSAP	Estimated Retail under Proposed LSAP (SF)
20550013	1178 Sonora	Ct	54,88	1.26	86	40	Industrial	19,440	126	1000
20550014	1170 Sonora	ct Ct	47,48	1.09	74	35	Industrial	14,850	109	N/A
20550015	1162 Sonora	Ct	51,40	1.18	80	38	Industrial	19,463	0	N/A
20550016	1154 Sonora	ct Ct	82,32	1.89	129	60	Industrial	41,062	168	N/A
20550017	1146 Sonora	Ct	32,67	0.75	51	24	Industrial	11,055	0	N/A
20550019	1175 Sonora	ct Ct	57,06	1.31	89	42	Industrial	19,098	111	N/A
20550022	1151 Sonora	Ct	55,75	1.28	87	41	Industrial	19,512	0	N/A
20550024	1171 Sonora	ct Ct	56,62	1.30	88	42	Industrial	19,512	130	N/A
20550025	1159 Sonora	Ct	49,65	1.14	78	36	Industrial	16,830	0	N/A
20550026	1145 Sonora	ct Ct	54,451	1.25	85	40	Industrial	19,990	0	N/A
20550028	1135 Sonora	Ct	64,03	1.47	100	47	Industrial	24,000	125	N/A
20550034	1150 Kifer	Rd	114,12	2.62	178	84	Office	46,849	262	2500
20550035	1170 Kifer	Rd	139,39	3.20	218	102	Office	57,649	320	2500
21627037	1360 Kifer	Rd	635,10	14.58	991	467	Industrial	286,800	1458	N/A
21627042	1256 Kifer	Rd	182,51	4.19	285	134	Industrial	61,758	0	N/A
21627043	1272 Kifer	Rd	426,45	9.79	666	313	Industrial	147,842	0	N/A
21627067	7067 1242 Kifer Rd 297,384 6.83		6.83	464	218	Office 152,758		0	N/A	
Total of all				Total of all sites	3,749	1,764			2,810	6,000

R-5 Site - no change, 16 units allowed												
APN	Addr #	Street	St. Type	Lot Sq. Ft.	Estimated Units for Proposed LSAP							
21301023	1159	Willow	Av	20708	0.48	RS	16					

Railroad Pro	perties	
APN	Lot Sq. Ft.	Lot Acres
21627058	10,019	0.23
21627056	23,522	0.54
21627057	13,939	0.32
20550038	N/A	N/A
20550039	N/A	N/A
20550040	N/A	N/A
20550043	532,739	12.23
20550032	111,514	2.56

Note: 1. The square footage numbers provided in these tables represent project buildout numbers including nonresidential buildings expected to remain.

APPENDIX C

LSAP Potable Water Model Reports



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APPENDIX C-1

Model Demand Scenario 1: Static

Node Report												
NedelD	Elevation	Hydraulic Grade	Pressure									
Node ID	(ft)	(ft)	(psi)									
J-1	63.00	240.00	77									
J-2	60.00	240.00	78									
J-3	57.00	240.00	79									
J-4	49.24	240.00	83									
J-6	61.00	240.00	77									
J-7	61.00	240.00	77									
J-8	61.00	240.00	77									
J-9	61.00	240.00	77									
J-10	65.00	240.00	76									
J-11	68.00	240.00	74									
J-12	69.95	240.00	74									
J-13	72.00	240.00	73									
J-14	77.00	240.00	71									
J-15	83.00	240.00	68									
J-16	83.00	240.00	68									
H-1	63.00	240.00	77									
H-2	57.00	240.00	79									
H-3	44.00	240.00	85									
H-4	72.00	240.00	73									
H-5	61.00	240.00	77									
H-6	50.00	240.00	82									
H-7	72.00	240.00	73									
H-8	68.00	240.00	74									
H-9	77.00	240.00	71									
H-10	83.00	240.00	68									
H-11	82.00	240.00	68									
H-12	77.00	240.00	71									
H-13	63.00	240.00	77									
H-14	67.00	240.00	75									

APPENDIX C-2

Model Demand Scenario 2: Peak Hour Demand

Node Report													
Label	Demand (gpm)	Available Flow with System-wide Constraint * (gpm)	Minimum Residual Pressure @ PHD (psi)	Maximum Pipe Velocity (ft/s)	Satisfies Criteria?								
J-1	500	1,000	76	1.73	TRUE								
J-2	500	1,000	77	1.32	TRUE								
J-3	500	1,000	79	1.87	TRUE								
J-4	500	1,000	80	1.57	TRUE								
J-6	500	1,000	76	1.80	TRUE								
J-7	500	1,000	77	2.03	TRUE								
J-8	500	1,000	77	2.66	TRUE								
J-9	500	1,000	77	0.80	TRUE								
J-10	500	1,000	75	1.86	TRUE								
J-11	500	1,000	74	1.87	TRUE								
J-12	500	1,000	72	2.55	TRUE								
J-13	500	1,000	72	1.85	TRUE								
J-14	500	1,000	70	1.84	TRUE								
J-15	500	1,000	67	1.69	TRUE								
J-16	500	1,000	66	2.96	TRUE								
H-1	500	1,000	77	0.18	TRUE								
H-2	500	1,000	79	0.42	TRUE								
H-3	500	1,000	85	0.06	TRUE								
H-4	500	1,000	73	0.14	TRUE								
H-5	500	1,000	77	0.29	TRUE								
H-6	500	1,000	82	0.26	TRUE								
H-7	500	1,000	73	0.38	TRUE								
H-8	500	1,000	74	0.30	TRUE								
H-9	500	1,000	71	0.08	TRUE								
H-10	500	1,000	68	0.15	TRUE								
H-11	500	1,000	68	0.36	TRUE								
H-12	500	1,000	71	0.06	TRUE								
H-13	500	1,000	77	0.29	TRUE								
H-14	500	1,000	75	0.10	TRUE								

* Available flow reported is based on system-wide constraint of 20 psi and 15 fps applied every where in the system. During simulation, if the pressure were to drop below 20 psi or velocity exceed 15 fps at any location system-wide due to demand placed at that specific node in question, then the simulation ends and the resulting flow calculated at the end of that simulation is reported for that node in question.

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Model Demand Scenario 3: Max Day Demand + Fire Flow

Node Report

Label	Demand (gpm)	Available Flow with System-wide Constraint * (gpm)	Minimum Residual Pressure @ MDD (psi)	Maximum Pipe Velocity (ft/s)	Satisfies Criteria?
J-1	4,820	6,000	73	10.40	TRUE
J-2	4,820	6,000	61	7.93	TRUE
J-3	4,820	6,000	74	11.25	TRUE
J-4	4,820	5,788	38	9.09	TRUE
J-6	4,820	6,000	56	10.78	TRUE
J-7	4,820	6,000	68	12.17	TRUE
J-8	4,820	5,648	70	15.00	TRUE
J-9	4,820	6,000	74	4.80	TRUE
J-10	4,820	6,000	62	11.16	TRUE
J-11	4,820	6,000	63	11.23	TRUE
J-12	4,820	5,881	49	15.00	TRUE
J-13	4,820	6,000	68	11.10	TRUE
J-14	4,820	6,000	62	11.02	TRUE
J-15	4,820	6,000	47	10.12	TRUE
J-16	4,820	5,065	33	15.00	TRUE
H-1	4,820	6,000	76	1.06	TRUE
H-2	4,820	6,000	78	2.50	TRUE
H-3	4,820	6,000	85	0.33	TRUE
H-4	4,820	6,000	72	0.87	TRUE
H-5	4,820	6,000	77	1.75	TRUE
H-6	4,820	6,000	82	1.56	TRUE
H-7	4,820	6,000	72	2.30	TRUE
H-8	4,820	6,000	74	1.80	TRUE
H-9	4,820	6,000	70	0.45	TRUE
H-10	4,820	6,000	68	0.90	TRUE
H-11	4,820	6,000	67	2.15	TRUE
H-12	4,820	6,000	70	0.33	TRUE
H-13	4,820	6,000	76	1.77	TRUE
H-14	4,820	6,000	75	0.59	TRUE

* Available flow reported is based on system-wide constraint of 20 psi and 15 fps applied every where in the system. During simulation, if the pressure were to drop below 20 psi or velocity exceed 15 fps at any location system-wide due to demand placed at that specific node in question, then the simulation ends and the resulting flow calculated at the end of that simulation is reported for that node in question.

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APPENDIX D

LSAP Sewer Model Reports

Appendix D Lawrence Station Area Plan																		
					S	anitary S	ewer - Average	Dry Weather Fl	ow (ADWF) I	Hydraulics - Exi	sting System	L						
Pine ⁽⁵⁾	Unstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	Ir	ivert	Gro	und/Rim	I	IGL	Unstream	Unstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	Fl	evation	Ele	vation	Eraaboard (2)	Cover	Velocity	d/D
	rtode	riode	(mm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Unstream	Downstream	Unstream	Downstream	Unstream	Downstream	(feet)	(feet)	(ft/s)	u/D
EX-AA-P1	294-206	294-207	1173.61	6027 72	24	278.00	0.004	0.013	59.36	58 38	73 50	71.62	59.96	58 98	13 54	12.14	3 31	0.30
EX-AA-P2	294-207	295-201	1173.61	6002.76	24	320.40	0.003	0.013	58.38	57.26	71.62	69.20	58,98	57.86	12.64	11.24	3.30	0.30
EX-AA-P3	295-201	295-202	1173.61	5982.64	24	293.80	0.003	0.013	57.26	56.24	69.20	67.30	57.86	56.85	11.34	9.94	3.29	0.30
EX-AA-P4	295-202	295-203	1203.25	6012.36	24	305.10	0.004	0.013	56.24	55.17	67.30	62.64	56.85	55.78	10.45	9.06	3.33	0.31
EX-AA-P5	295-203	295-207	1203.25	5946.41	24	29.20	0.003	0.013	55.17	55.07	62.64	62.42	55.78	55.68	6.86	5.47	3.30	0.31
EX-AA-P6	295-207	295-208	1203.25	6011.31	24	119.80	0.004	0.013	55.07	54.65	62.42	61.50	55.68	55.26	6.74	5.35	3.33	0.31
EX-AA-P7	295-208	295-209	1203.25	6015.10	24	131.10	0.004	0.013	54.65	54.19	61.50	61.30	55.26	54.79	6.24	4.85	3.33	0.31
EX-AA-P8	295-209	295-204	1203.25	6076.51	24	19.50	0.004	0.013	54.19	54.12	61.30	61.50	54.79	54.73	6.51	5.11	3.36	0.30
EX-AA-P9	295-204	295-210	1203.25	6012.78	24	111.20	0.004	0.013	54.12	53.73	61.50	61.30	54.73	54.34	6.77	5.38	3.33	0.31
EX-AA-P10	295-210	295-211	1203.25	6020.16	24	130.80	0.004	0.013	53.73	53.27	61.30	60.40	54.34	53.87	6.96	5.57	3.33	0.31
EX-AA-P11	295-211	295-212	1203.25	6063.28	24	58.90	0.004	0.013	53.27	53.06	60.40	60.33	53.87	53.67	6.53	5.13	3.35	0.30
EX-AA-P12	295-212	296-211	1203.25	5948.20	24	81.60	0.003	0.013	53.06	52.78	60.33	59.45	53.67	53.39	6.66	5.27	3.30	0.31
EX-AA-P13	296-211	296-212	1232.89	6020.30	24	130.80	0.004	0.013	52.78	52.32	59.45	59.45	53.39	52.93	6.06	4.67	3.36	0.31
EX-AA-P14	296-212	296-209	1232.89	6030.04	24	90.70	0.004	0.013	52.32	52.00	59.45	63.00	52.93	52.58	6.52	5.13	3.36	0.31
EX-CR-PI	337-202	337-201	24.75	8049.63	10	5.00	0.670	0.013	44.81	41.45	54.00	54.00	44.91	41.89	9.09	8.36	7.36	0.12
EX-CR-P2	337-201	337-206 (EX)	338.45	1/86.38	18	524.00	0.001	0.013	41.45	40.95	54.00	53.00	41.89	41.27	12.11	11.05	1.73	0.29
EX-KR-P1	333-200	334-201	336.11	2809.64	18	534.90	0.004	0.013	57.49	55.59	07.80	66.70	57.84	50.04	10.02	8.8/	2.39	0.23
EX-KR-P2 EV KD D2	334-201	334-202	492.82	2505.55	18	020.00	0.003	0.013	51.09	51.08	65.20	64.50	54.54	54.54	10.00	9.61	2.45	0.30
EX-KK-F3	225 201	333-201	519.57	2502.16	10	930.00	0.003	0.013	51.20	19 50	64.50	61.20	51.77	40.06	11.20	10.22	2.55	0.31
EV KD D5	335-201	335-202	624.29	2382.10	10	602.00	0.003	0.013	48.50	46.39	61.20	57.50	49.06	49.00	12.75	11./1	2.01	0.32
EX-KR-P6	336-202	336-202	733 54	6905.33	18	180.90	0.004	0.013	45.59	45.82	57.50	57.04	49.00	40.50	11.14	10.18	5.67	0.31
EX-KR-P7	336-203	336-202	3.09	296.15	8	335.40	0.003	0.013	46.80	45.80	55.00	56.50	46.85	45.90	8.15	7 53	0.61	0.08
EX-KR-P8	336-204	337-202	16.19	538.35	10	330.30	0.003	0.013	45.80	44.81	56.50	54.00	45.90	44.91	10.60	9.87	0.98	0.12
EX-KR-P9	337-203	337-201	313.70	1858.32	18	328.20	0.002	0.013	41.96	41.45	52.80	54.00	42.38	41.89	10.00	9.34	1.74	0.28
EX-KR-P10	337-204	337-203	293.22	1764.29	18	328.50	0.001	0.013	42.52	42.06	52.50	52.80	42.93	42.38	9.57	8.48	1.65	0.27
EX-KR-P11	337-208	337-204	276.10	1963.22	18	86.50	0.002	0.013	42.77	42.62	52.40	52.50	43.15	42.93	9.25	8.13	1.75	0.25
EX-KR-P12	337-205	337-208	276.10	1686.94	18	242.10	0.001	0.013	43.08	42.77	52.20	52.40	43.49	43.15	8.71	7.62	1.57	0.27
EX-KR-P13	338-201	337-205	276.10	1765.25	18	328.10	0.001	0.013	43.64	43.18	51.50	52.20	44.04	43.49	7.46	6.36	1.62	0.27
EX-KR-P14	338-202	338-201	159.71	1758.45	18	265.90	0.001	0.013	44.11	43.74	51.00	51.50	44.42	44.04	6.58	5.39	1.38	0.21
EX-KR-P15	338-203	338-204 (EX)	159.71	5139.47	12	28.20	0.088	0.012	32.18	29.70	51.00	49.00	32.43	29.82	18.57	17.82	6.61	0.25
EX-KR-P16	338-207	338-203	159.71	783.86	12	387.00	0.002	0.013	33.11	32.18	49.80	51.00	33.42	32.43	16.38	15.69	1.75	0.31
EX-KR-P17	338-209	338-207	82.12	828.07	12	324.40	0.003	0.013	34.08	33.21	49.60	49.80	34.29	33.42	15.31	14.52	1.50	0.21
EX-KR-P18	339-201	338-209	71.31	828.61	12	324.00	0.003	0.013	35.05	34.18	49.20	49.60	35.25	34.34	13.95	13.15	1.44	0.20
EX-KR-P19	339-202	339-201	56.02	825.85	12	326.10	0.003	0.013	36.02	35.15	47.60	49.20	36.20	35.29	11.40	10.58	1.34	0.18
EX-LE-PI	265-204	296-203	1539.58	10356.75	27	706.10	0.006	0.013	56.12	52.20	67.83	69.82	56.75	52.79	11.08	9.46	4.16	0.28
EX-LE-P2	296-203	296-202	1539.58	10321.07	27	526.00	0.006	0.013	52.20	49.30	69.82	61.19	52.83	50.15	16.99	15.37	4.15	0.28
EX-LE-P3	296-202	305-207	2787.60	9722.92	27	400.60	0.005	0.013	49.30	47.34	61.19	60.50	50.15	48.16	11.04	9.64	4.70	0.38
EX-LE-P4	305-207	305-208	2/8/.60	102/6.48	27	142.70	0.005	0.013	47.34	46.56	60.50	58.98	48.19	4/.41	12.31	10.91	4.90	0.38
EX-LE-P3	205-208	305-209	2793.45	10397.94	21	222.70	0.006	0.013	40.30	43.09	56.09	57.04	47.41	44.54	11.57	10.17	4.94	0.38
EX-LE-P0 EVIE D7	305-209	330-202 336-207 (EV)	2/99.50	10219.40	27	525.70	0.005	0.013	43.09	41.94	57.04	5/.04	44.54	42.90	12.44	12.85	4.88	0.38
EX-LE-F/	306 201	306 202	0.08	082.14	10	300.70	0.005	0.013	41.94	52.72	64.00	52.40	42.90	52.87	8.06	7 20	1.20	0.45
EX-SC-P2	306-201	306-202	9.90	902.14 616.32	10	300.70	0.010	0.013	53.78	52.60	62.40	60.85	53.87	52.72	8.53	7 79	1.50	0.07
EX-SC-P3	306-202	306-203	30.30	595 79	10	299.60	0.004	0.013	52.60	51.50	60.85	60.80	52.73	51.64	8.12	7.42	1.04	0.11
EX-SC-P4	306-203	305-205	35.42	595.39	10	300.00	0.004	0.013	51.50	50.40	60.80	59.50	51.64	50.58	9.16	8.47	1.33	0.17
EX-SC-P5	305-205	305-204	54.50	507.31	10	300.60	0.003	0.013	50.40	49.60	59.50	59.40	50.58	49.77	8.92	8.27	1.35	0.22
EX-S7W-P1	305-205	305 201	10.14	544.00	10	173.20	0.003	0.013	50.13	49.60	60.20	59.10	50.21	49.77	0.00	0.27	0.86	0.10

LSAP Housing Expansion Buildout Infrastructure Impact Study Average Dry Weather Flow Existing Sanitary Sewer System

	Appendix D Lawrence Station Area Plan Sanitary Sewer - Average Dry Weather Flow (ADWF) Hydraulics - Existing System																	
Pipe ⁽⁵⁾	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	I	nvert	Gro	und/Rim	H	łGL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	Ele	evation	Ele	vation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
EX-SZW-P2	305-204	305-203	73.50	832.77	10	41.80	0.007	0.013	49.60	49.30	59.40	59.60	49.77	49.50	9.63	8.97	2.10	0.20
EX-SZW-P3	305-203	305-202	73.50	568.08	10	209.70	0.003	0.013	49.30	48.60	59.60	59.80	49.50	48.79	10.10	9.47	1.60	0.24
EX-SZW-P4	305-202	305-201	73.50	663.21	10	321.00	0.005	0.013	48.60	47.14	59.80	59.70	48.79	47.31	11.01	10.37	1.79	0.23
EX-SZW-P5	305-201	336-201	86.38	602.90	10	324.50	0.004	0.013	47.04	45.82	59.70	57.50	47.25	46.30	12.45	11.83	1.75	0.25
EX-UD-P1	302-201	302-202	26.18	563.71	10	234.30	0.003	0.013	38.89	38.12	50.00	49.00	39.01	38.27	10.99	10.28	1.17	0.14
EX-UD-P2	302-202	302-203	40.73	553.58	10	306.10	0.003	0.013	38.12	37.15	49.00	47.50	38.27	37.28	10.73	10.05	1.32	0.18
EX-UD-P3	302-203	339-203	56.02	566.65	10	295.10	0.003	0.013	37.10	36.12	47.50	47.60	37.28	36.27	10.22	9.57	1.48	0.22
EX-UD-P4	339-203	339-202	56.02	972.06	10	10.20	0.010	0.013	36.12	36.02	47.60	47.60	36.27	36.20	11.33	10.65	2.16	0.18
EX-WA-P1	266-210	266-204	6.80	342.80	8	245.30	0.004	0.013	56.27	55.29	68.00	67.00	56.34	55.35	11.66	11.06	0.86	0.11
EX-WA-P2	266-204	266-205	6.80	627.96	10	61.30	0.004	0.013	55.29	55.04	67.00	66.00	55.35	55.11	11.65	10.88	0.84	0.07
EX-WA-P3	266-205	265-206	8.08	622.31	10	299.60	0.004	0.013	55.04	53.84	66.00	65.00	55.11	53.93	10.89	10.13	0.88	0.08
EX-WA-P4	265-206	296-207	14.01	617.62	10	114.10	0.004	0.013	53.84	53.39	65.00	62.50	53.93	53.48	11.07	10.33	1.04	0.11
EX-WA-P5	296-207	296-213	15.13	633.75	10	36.10	0.004	0.013	53.39	53.24	62.50	61.40	53.48	53.33	9.02	8.28	1.08	0.11
EX-WA-P6	296-213	296-208	15.13	620.62	10	326.40	0.004	0.013	53.24	51.94	61.40	63.60	53.33	52.40	8.07	7.33	1.07	0.11
EX-WA-P7	296-208	296-209	15.13	628.88	10	34.20	0.004	0.013	51.94	51.80	63.60	63.00	52.40	52.40	11.20	10.83	1.07	0.55
EX-WA-P8	296-209	296-201	1248.02	6427.38	24	309.40	0.004	0.013	51.80	50.56	63.00	62.00	52.40	51.16	10.60	9.20	3.53	0.30
EX-WA-P9	296-201	296-202	1248.02	6413.14	24	315.80	0.004	0.013	50.56	49.30	62.00	61.19	51.16	50.15	10.84	9.44	3.52	0.30

Note: The system accounts for flows from the overall LSAP area including the existing areas to remain for the proposed housing expansion scenario.

Lawrence Station Area Pair Bailtary Sewer - Average Dry Weather Flow (ADWF) Hybraulis - Proposed System Pipe ⁽⁵⁾ Upstream Downstream Total (gem) Capacity © Slope (gem) Pipe (inches) Constructed (feet) Slope (fb(ft)) Roughness (Mith) Im-rt Gorult Gorult HGL (Elevation) Upstream Downstream Upstream Outh (feet) Upstream Downstream Upstream <	Appendix D												
Pipe (5) Upstream Node Total Capacity @ Pipe Constructed Pipe Invert Groun-Rim Elevation HGL Upstream Downstream <t< td=""><td></td></t<>													
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Image: Note (gpm) Sippe (gpm) (inches) (fee) (ft/f) (Mannings n) Upstream Downstream Upstream	d/D												
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PR-AA-P2 294-207 (P) 295-201 (P) 1173.61 6003.00 24.00 320.40 0.003 0.013 58.38 57.26 71.62 69.20 58.98 57.86 12.64 11.24 3.30 PR-AA-P3 295-201 (P) 295-202 (P) 1173.61 5982.68 24.00 293.80 0.003 0.013 57.26 56.24 69.20 67.30 56.85 51.78 10.45 9.90 3.39 PR-AA-P4 295-202 (P) 295-207 (P) 1203.25 6012.41 24.00 305.10 0.004 0.013 55.17 55.07 62.64 62.42 55.78 10.45 9.06 3.33 PR-AA-P5 295-207 (P) 1203.25 6916.35 24.00 19.80 0.004 0.013 55.07 62.64 62.42 55.78 10.45 9.06 3.33 PR-AA-P6 295-207 (P) 1203.25 6017.01 14.80 0.004 0.013 55.07 54.65 62.42 61.50 55.85 85.78 10.45	0.30												
PR-AA-P3 295-201 (P) 295-202 (P) 1173.61 5982.68 24.00 293.80 0.003 0.013 57.26 56.24 69.20 67.30 57.86 56.85 11.34 9.94 3.29 PR-AA-P4 295-203 (P) 295-203 (P) 1203.25 6012.41 24.00 305.10 0.004 0.013 55.17 67.30 62.64 56.85 55.78 10.45 9.06 3.33 PR-AA-P5 295-203 (P) 295-203 (P) 1203.25 504.63 24.00 19.20 0.003 0.013 55.17 67.30 62.64 62.42 55.78 55.68 6.86 5.47 3.30 PR-AA-P6 295-207 (P) 295-208 (P) 1203.25 6019.41 24.00 119.80 0.004 0.013 55.07 54.65 62.42 61.50 55.25 6.74 5.35 3.33 PR-AA-P6 295-209 (P) 1203.25 6079.61 11.10 0.004 0.013 54.15 61.20 54.80 54.73 6.5	0.30												
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PR-AA-F10 239-210 (F) 239-211 (F) 1206-25 0024.08 24.00 150-00 0.004 0.013 35.75 35.27 01.50 00.40 34.34 35.67 6.53 5.13 3.35 PR-AA-F11 295-210 (F) 295-210 (F) 1203-25 6062.16 24.00 150-00 0.004 0.013 35.75 35.27 53.06 60.40 65.38 53.13 35.35	0.31												
rR-AA-F11 295-211 (r) 295-212 (r) 1205-25 0002.10 24.00 56.90 0.004 0.015 55.27 55.00 00.40 00.55 55.67 55.07 0.55 5.15 5.55	0.31												
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PR-CR-I 357-201(P) 357-201(P) 247-3 755-27 10.00 5.10 0.004 0.015 44.01 41.45 34.00 54.00 44.51 41.67 2.07 0.00 7.20 1.20 1.20 1.20 1.20 1.20 1.20 1.20 1	0.29												
PR-CR12 337-201(1) 357-201(1) 357-201(1) 30-41 10:53 10:00 347.10 0.001 0.013 41.40 40.53 34.00 556.00 41.00 41.01 12.11 11:00 13.0 13.0 11.0 12.0 10.0 10.0 10.0 10.0 10.0 10	0.23												
PR-KR-P2 334_201(P) 334_201(P) 402.82 200541 200547 10.00 304/0 0.004 0.013 57.49 3052 0.066 0.076 57.00 57.60 50.60 54.54 10.66 9.61 24.5	0.30												
PR-KR-P3 334-20(2) 515302 (2) 5102 20011 1 100 20100 0003 0013 5408 5129 6580 6450 544 5177 1126 1022 255	0.31												
PR-KR-P4 335-202 (P) 571.01 2582.22 18.00 900.00 0.003 0.013 51.29 48.59 664.50 61.20 51.77 49.06 12.73 11.71 262	0.32												
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PR-KR-P6 336-201 (P) 336-202 (P) 733.54 6904.37 18.00 180.90 0.021 0.013 45.82 41.94 57.50 57.04 46.30 42.87 11.20 10.18 5.67	0.32												
PR-KR-P7 336-203 (P) 336-204 (P) 3.09 529.77 8.00 335.40 0.010 0.013 49.00 45.80 55.00 56.50 49.04 45.90 5.96 5.33 0.92	0.06												
PR-KR-P8 336-204 (P) 337-202 (P) 16.19 538.33 10.00 330.30 0.003 0.013 45.80 44.81 56.50 54.00 45.90 44.91 10.60 9.87 0.98	0.12												
PR-KR-P9 337-203 (P) 337-201 (P) 313.70 1858.54 18.00 328.20 0.002 0.013 41.96 41.45 52.80 54.00 42.38 41.89 10.42 9.34 1.74	0.28												
PR-KR-P10 337-204 (P) 337-203 (P) 293.22 1764.27 18.00 328.50 0.001 0.013 42.52 42.06 52.50 52.80 42.93 42.38 9.57 8.48 1.65	0.27												
PR-KR-P11 337-208 (P) 337-204 (P) 276.10 1963.59 18.00 86.50 0.002 0.013 42.77 42.62 52.40 52.50 43.15 42.93 9.25 8.13 1.75	0.25												
PR-KR-P12 337-205 (P) 337-206 (P) 276.10 1686.95 18.00 242.10 0.001 0.013 43.08 42.77 52.20 52.40 43.49 43.15 8.71 7.62 1.57	0.27												
PR-KR-P13 338-201 (P) 337-205 (P) 276.10 1765.17 18.00 328.10 0.001 0.013 43.64 43.18 51.50 52.20 44.04 43.49 7.46 6.36 1.62	0.27												
PR-KR-P14 338-202 (P) 338-201 (P) 159.71 1758.49 18.00 265.90 0.001 0.013 44.11 43.74 51.00 51.50 44.42 44.04 6.58 5.39 1.38	0.21												
PR-KR-P15 338-203 (P) Kifer Lift Station 159.71 5132.80 12.00 28.20 0.088 0.012 32.18 29.70 51.00 49.00 32.43 29.82 18.57 17.82 6.60	0.25												
PR-KR-P16 338-207 (P) 338-203 (P) 159.71 783.86 12.00 387.00 0.002 0.013 33.11 32.18 49.80 51.00 33.42 32.43 16.38 15.69 1.75	0.31												
PR-KR-P17 338-209 (P) 338-207 (P) 82.12 828.11 12.00 324.40 0.003 0.013 34.08 33.21 49.60 49.80 34.29 33.42 15.31 14.52 1.50	0.21												
PR-KR-P18 339-201 (P) 338-209 (P) 71.31 827.69 12.00 324.70 0.003 0.013 35.05 34.18 49.20 49.60 35.25 34.34 13.95 13.15 1.44	0.20												
PR-RR-P19 339-202 (P) 339-201 (P) 56.02 825.91 12.00 326.10 0.003 0.013 36.02 35.15 47.60 49.20 36.20 35.29 11.40 10.58 1.34	0.18												
PR-LE-F1 205-204 (P) 279-203 (P) 1539-58 10560.65 27.00 705.50 0.006 0.013 56.12 52.20 67.83 69.82 56.75 52.79 11.08 9.46 4.17	0.28												
PK-LE-P2 296-203 (P) 296-203 (P) 1539-58 10316.54 27.00 526.40 0.006 0.013 52.20 49.30 69.82 61.19 52.83 50.15 16.99 15.37 4.15	0.28												
PR-LE-F3 296-202 (P) 505-200 (P) 2787.60 9/15.82 27.00 401.10 0.005 0.013 49.50 47.54 61.19 60.50 50.15 48.16 11.04 9.64 4.70	0.38												
PR-LET-P 303-20/ (T) 303-200 (T) 201-00 (T) 201-00 (T) 10300-34 2/100 (T) 0.003 0.013 4/.34 40.30 00.30 38.96 47.11 12.51 10.91 4.91 DD LE DS 205 200 (D) 270 (D) 10300-32 (D) 0.002 0.012 4/.34 40.30 00.30 38.96 48.19 4/.41 12.51 10.91 4.91 DD LE DS 205 200 (D) 270 (D) 12.00 0.02 4/.34 40.30 00.30 38.96 48.19 4/.41 12.51 10.91 4.91 DD LE DS 205 200 (D) 270 (D) 12.00 0.002 0.12 46.55 47.60 50.00 55.00 47.11 44.51 11.27 10.97 40.01	0.38												
PR-LEF3 303-200 (T) 303-200 (T) 200-200 (T) <	0.38												
IP D2 230-207 (F) 2372-00 10/200.00 2/1.40 0.003 0.013 43.09 41.94 30.96 5/1.04 44.34 42.61 12.44 11.04 4.05 DD LE D7 236.200 (D) 232.52 1750-00 10.10 57.00 0.010 41.04 28.22 57.04 53.92 47.20 10.11 17.55 63.01	0.38												
INTEGED 200 201 (1) 200 201 (1) 200 201 (1007.10 201.17 010.20 0.002 0.010 41.74 20.22 21.04 24.20 32.00 14.11 12.23 0.24 20.24 20.21 20.24 20.2	0.07												
PRSC-12 306-201 (1) 307-201 (1) 307-201 (1) 307-201 (1) 100 3007/0 0.010 0.010 307/0 307/0 0.010 307/0 0.010 307/0 0.010 307/0 0.010 307/0 0.010 1.20 1.20 1.20 1.20 1.20 1.20 1.	0.07												
PR.SC/P2 306.2047 2002047 2002 1000 2007 0000 0007 0015 550 550 550 550 550 550 550 550 55	0.16												
PR-SC-24 306-204 (P) 305-205 (P) 35.42 595.40 10.00 20100 0004 0013 51.50 50.40 60.80 59.50 51.64 50.58 91.6 8.47 133	0.17												
PR-SC-P5 305-205 (P) 305-204 (P) 54-50 507 2 10.00 300.60 0.003 0.013 50.40 49.60 59.50 59.40 505 8 49.77 8.92 8.77 135	0.22												
PR-SZW-P1 305-206 (P) 305-204 (P) 10.14 707.09 10.00 173.20 0.003 0.010 50.13 49.60 60.20 59.40 50.00 49.77 10.00 9.24 1.04	0.08												

LSAP Housing Expansion Buildout Infrastructure Impact Study

1 of 2

Average Dry Weather Flow Proposed Sanitary Sewer System

	Appendix D Lawrence Station Area Plan Sanitary Sewer - Average Dry Weather Flow (ADWF) Hydraulics - Proposed System																	
Pipe ⁽⁵⁾	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	I	nvert	Gro	und/Rim	I	IGL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	Ele	evation	Ele	evation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
PR-SZW-P2	305-204 (P)	305-203 (P)	73.50	833.08	10.00	41.80	0.007	0.013	49.60	49.30	59.40	59.60	49.77	49.50	9.63	8.97	2.10	0.20
PR-SZW-P3	305-203 (P)	305-202 (P)	73.50	568.20	10.00	209.60	0.003	0.013	49.30	48.60	59.60	59.80	49.50	48.79	10.10	9.47	1.60	0.24
PR-SZW-P4	305-202 (P)	305-201 (P)	73.50	662.80	10.00	321.40	0.005	0.013	48.60	47.14	59.80	59.70	48.79	47.31	11.01	10.37	1.78	0.23
PR-SZW-P5	305-201 (P)	336-201 (P)	86.38	1148.49	11.54	324.50	0.004	0.010	47.04	45.82	59.70	57.50	47.22	46.30	12.48	11.70	2.07	0.19
PR-UD-P1	302-201 (P)	302-202 (P)	26.18	563.74	10.00	234.30	0.003	0.013	38.89	38.12	50.00	49.00	39.01	38.27	10.99	10.28	1.17	0.14
PR-UD-P2	302-202 (P)	302-203 (P)	40.73	567.61	10.00	306.10	0.003	0.013	38.12	37.10	49.00	47.50	38.27	37.28	10.73	10.05	1.35	0.18
PR-UD-P3	302-203 (P)	339-203 (P)	56.02	566.91	10.00	294.90	0.003	0.013	37.10	36.12	47.50	47.60	37.28	36.27	10.22	9.57	1.48	0.22
PR-UD-P4	339-203 (P)	339-202 (P)	56.02	975.12	10.00	10.20	0.010	0.013	36.12	36.02	47.60	47.60	36.27	36.20	11.33	10.65	2.16	0.18
PR-WA-P1	266-210 (P)	266-204 (P)	6.80	342.80	8.00	245.30	0.004	0.013	56.27	55.29	68.00	67.00	56.34	55.35	11.66	11.06	0.86	0.11
PR-WA-P2	266-204 (P)	266-205 (P)	6.80	628.19	10.00	61.30	0.004	0.013	55.29	55.04	67.00	66.00	55.35	55.11	11.65	10.88	0.84	0.07
PR-WA-P3	266-205 (P)	265-206 (P)	8.08	622.28	10.00	299.60	0.004	0.013	55.04	53.84	66.00	65.00	55.11	53.93	10.89	10.13	0.88	0.08
PR-WA-P4	265-206 (P)	296-207 (P)	14.01	617.62	10.00	114.10	0.004	0.013	53.84	53.39	65.00	62.50	53.93	53.48	11.07	10.33	1.04	0.11
PR-WA-P5	296-207 (P)	296-213 (P)	15.13	634.18	10.00	36.10	0.004	0.013	53.39	53.24	62.50	61.40	53.48	53.33	9.02	8.28	1.08	0.11
PR-WA-P6	296-213 (P)	296-208 (P)	15.13	620.91	10.00	326.10	0.004	0.013	53.24	51.94	61.40	63.60	53.33	52.40	8.07	7.33	1.07	0.11
PR-WA-P7	296-208 (P)	296-209 (P)	15.13	3466.83	17.20	34.30	0.004	0.010	51.94	51.80	63.60	63.00	52.40	52.40	11.20	10.23	1.19	0.32
PR-WA-P8	296-209 (P)	296-201 (P)	1248.02	6431.76	24.00	309.00	0.004	0.013	51.80	50.56	63.00	62.00	52.40	51.16	10.60	9.20	3.53	0.30
PR-WA-P9	296-201 (P)	296-202 (P)	1248.02	6424.85	24.00	314.70	0.004	0.013	50.56	49.30	62.00	61.19	51.16	50.15	10.84	9.44	3.53	0.30

Note: The system accounts for flows from the overall LSAP area including the existing areas to remain for the proposed housing expansion scenario.

	Appendix D																	
								Lawrence Sta	tion Area Plan	L								
						Sanitary S	Sewer - Peak V	Vet Weather Flo	w (PWWF) Hy	draulics - Exis	ting System							
mi (5)	** .	D. I	m - 1	a :	D.	1	a 1	D.	Y.,		C		T	ICI	¥¥ .	** .		
Pipe (*)	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	In	vert	Gro	und/Rim	1	IGL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	El	evation	Ele	evation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
EX-AA-P1	294-206	294-207	3110.07	6027.72	24	278.00	0.004	0.013	59.36	58.38	73.50	71.62	60.38	59.40	13.12	12.14	4.31	0.51
EX-AA-P2	294-207	295-201	3110.07	6002.76	24	320.40	0.003	0.013	58.38	57.26	71.62	69.20	59.40	58.28	12.22	11.24	4.30	0.51
EX-AA-P3	295-201	295-202	3110.07	5982.64	24	293.80	0.003	0.013	57.26	56.24	69.20	67.30	58.28	57.28	10.92	9.94	4.28	0.51
EX-AA-P4	295-202	295-203	3203.44	6012.36	24	305.10	0.004	0.013	56.24	55.17	67.30	62.64	57.28	56.21	10.02	9.06	4.33	0.52
EX-AA-P5	295-203	295-207	3203.44	5946.41	24	29.20	0.003	0.013	55.17	55.07	62.64	62.42	56.21	56.11	6.43	5.47	4.30	0.52
EX-AA-Po	295-207	295-208	3203.44	6011.31	24	119.80	0.004	0.013	55.07	54.65	62.42	61.50	56.11	55.69	6.31	5.35	4.55	0.52
EX-AA-P/	295-208	295-209	3203.44	6015.10	24	131.10	0.004	0.013	54.65	54.19	61.50	61.30	55.69	55.22	5.81	4.85	4.55	0.52
EX-AA-P8	295-209	295-204	3203.44	6076.51	24	19.50	0.004	0.013	54.19	54.12	61.30	61.50	55.22	55.16	6.08	5.11	4.57	0.52
EX-AA-P9	295-204	295-210	3203.44	6012.78	24	111.20	0.004	0.013	54.12	53.73	61.50	61.30	55.16	54.77	6.34	5.38	4.55	0.52
EX-AA-P10	295-210	295-211	3203.44	6020.16	24	130.80	0.004	0.013	53.75	53.27	61.30	60.40	54.77	54.50	0.55	5.57	4.54	0.52
EX-AA-PII	295-211	295-212	3203.44	6063.28	24	58.90	0.004	0.013	53.27	53.06	60.40	60.33	54.30	54.11	6.10	5.13	4.50	0.51
EX-AA-P12	295-212	296-211	3203.44	5948.20	24	81.00	0.003	0.013	53.00	52.78	60.33	59.45	54.11	53.84	6.22	3.27	4.30	0.52
EX-AA-P15	296-211	296-212	3290.81	6020.30	24	130.80	0.004	0.013	52.78	52.32	59.45	59.45	53.84	53.37	5.01	4.67	4.37	0.53
EX-AA-P14	290-212	296-209	3290.81	8040.62	24	90.70	0.004	0.013	32.32	52.00	59.45	63.00	55.57	52.90	6.08	5.13	4.57	0.52
EX-CR-P1	337-202	337-201 227 206 (EV)	94.00	8049.03	10	248.20	0.670	0.013	44.81	41.45	54.00	52.00	45.01	42.32	8.99	8.30	2 20	0.24
EX-UK-F2	222.206	224 201	057.01	1780.38	10	524.00	0.001	0.013	57.40	40.93	54.00	55.00	42.32	41.30	0.77	0.07	2.39	0.50
EX-KK-F1	224.201	224 202	1460.66	2609.04	10	524.90	0.004	0.013	55.50	51.09	66 70	65.90	56.09	54.02	9.77	0.67	2.20	0.40
EA-KR-F2 EV VD D2	334-201	225 201	1400.00	2503.55	10	020.00	0.003	0.013	54.09	51.00	65.80	64.50	54.02	52.10	10.29	9.01	2.41	0.55
EX-KK-F5	334-202	335-201	1720.26	2582.16	10	930.00	0.003	0.013	51.20	18 50	64.50	61.20	52.10	49.47	12.31	10.22	3.41	0.50
EX KD D5	335-201	335=202	1940.67	2082.10	10	602.00	0.003	0.013	48.50	46.59	61.20	57.50	40.47	49.47	11.73	11.71	4.00	0.00
EX-KK-FJ EV KP P6	335-202	336-201	2314 80	6905.33	10	180.00	0.004	0.013	46.39	43.82	57.50	57.04	49.47	40.09	10.81	10.18	7.84	0.59
EX-KR-P7	336-201	336-202	12.81	296.15	8	335.40	0.003	0.013	45.82	41.94	55.00	56.50	46.89	45.00	8 11	7.53	0.94	0.30
EX-KR-P8	336-204	337-202	60.63	538.35	10	330.30	0.003	0.013	45.80	44.81	56.50	54.00	45.99	45.01	10.51	9.87	1.46	0.14
EX-KR-P9	337-203	337-202	1053 19	1858.32	18	328.20	0.002	0.013	41.96	41.61	52.80	54.00	42.77	42.32	10.03	9.34	2.42	0.54
EX-KR-P10	337-204	337-203	978.43	1764.29	18	328.50	0.001	0.013	42.52	42.06	52.50	52.80	43 31	42.77	9 19	8.48	2.12	0.53
EX-KR-P11	337-208	337-204	915.93	1963.22	18	86.50	0.002	0.013	42.77	42.62	52.40	52.50	43.48	43.31	8.92	8.13	2.43	0.47
EX-KR-P12	337-205	337-208	915.93	1686.94	18	242.10	0.001	0.013	43.08	42.77	52.20	52.40	43.86	43.48	8.34	7.62	2.17	0.52
EX-KR-P13	338-201	337-205	915.93	1765.25	18	328.10	0.001	0.013	43.64	43.18	51.50	52.20	44.40	43.86	7.10	6.36	2.25	0.51
EX-KR-P14	338-202	338-201	549.31	1758.45	18	265.90	0.001	0.013	44.11	43.74	51.00	51.50	44.69	44.40	6.31	5.39	1.96	0.39
EX-KR-P15	338-203	338-204 (EX)	549.31	5139.47	12	28.20	0.088	0.012	32.18	29.70	51.00	49.00	32.65	29.92	18.35	17.82	9.51	0.47
EX-KR-P16	338-207	338-203	549.31	783.86	12	387.00	0.002	0.013	33.11	32.18	49.80	51.00	33.73	32.65	16.07	15.69	2.41	0.62
EX-KR-P17	338-209	338-207	285.50	828.07	12	324.40	0.003	0.013	34.08	33.21	49.60	49.80	34.49	33.73	15.11	14.52	2.13	0.41
EX-KR-P18	339-201	338-209	246.06	828.61	12	324.00	0.003	0.013	35.05	34.18	49.20	49.60	35.42	34.49	13.78	13.15	2.05	0.37
EX-KR-P19	339-202	339-201	194.09	825.85	12	326.10	0.003	0.013	36.02	35.15	47.60	49.20	36.35	35.42	11.25	10.58	1.91	0.33
EX-LE-P1	265-204	296-203	4079.89	10356.75	27	706.10	0.006	0.013	56.12	52.20	67.83	69.82	57.16	53.18	10.67	9.46	5.46	0.46
EX-LE-P2	296-203	296-202	4079.89	10321.07	27	526.00	0.006	0.013	52.20	49.30	69.82	61.19	53.24	50.77	16.58	15.37	5.44	0.46
EX-LE-P3	296-202	305-207	7437.78	9722.92	27	400.60	0.005	0.013	49.30	47.34	61.19	60.50	50.77	48.76	10.42	9.64	6.00	0.65
EX-LE-P4	305-207	305-208	7437.78	10276.48	27	142.70	0.005	0.013	47.34	46.56	60.50	58.98	48.76	47.98	11.74	10.91	6.27	0.63
EX-LE-P5	305-208	305-209	7459.14	10397.94	27	512.90	0.006	0.013	46.56	43.69	58.98	56.98	47.98	45.12	11.00	10.17	6.34	0.63
EX-LE-P6	305-209	336-202	7480.50	10219.40	27	323.70	0.005	0.013	43.69	41.94	56.98	57.04	45.12	43.71	11.86	11.04	6.25	0.64
EX-LE-P7	336-202	336-207 (EX)	9798.29	10208.70	27	671.10	0.005	0.013	41.94	38.32	57.04	54.28	43.71	39.96	13.33	12.85	6.51	0.79
EX-SC-P1	306-201	306-202	38.92	982.14	10	300.70	0.010	0.013	56.78	53.78	64.90	62.40	56.91	53.95	7.99	7.29	1.95	0.16
EX-SC-P2	306-202	306-203	56.77	616.32	10	300.40	0.004	0.013	53.78	52.60	62.40	60.85	53.95	52.85	8.45	7.79	1.57	0.20
EX-SC-P3	306-203	306-204	116.94	595.79	10	299.60	0.004	0.013	52.60	51.50	60.85	60.80	52.85	51.77	8.00	7.42	1.89	0.30
EX-SC-P4	306-204	305-205	137.81	595.39	10	300.00	0.004	0.013	51.50	50.40	60.80	59.50	51.77	50.78	9.03	8.47	1.98	0.32
EX-SC-P5	305-205	305-204	212.52	507.31	10	300.60	0.003	0.013	50.40	49.60	59.50	59.40	50.78	49.95	8.72	8.27	1.98	0.46
EX-SZW-P1	305-206	305-204	39.56	544.00	10	173.20	0.003	0.013	50.13	49.60	60.20	59.40	50.28	49.95	9.92	9.24	1.29	0.18

LSAP Housing Expansion Buildout Infrastructure Impact Study

1 of 2

Peak Wet Weather Flow Existing Sanitary Sewer System

					:	Sanitary S	Sewer - Peak W	Apper Lawrence Stat /et Weather Flo	ndix D ion Area Pla w (PWWF) H	ı ydraulics - Exist	ting System							
Pipe (5)	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	I	nvert	Gro	und/Rim	H	łGL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	Ele	evation	Ele	vation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
EX-SZW-P2	305-204	305-203	286.64	832.77	10	41.80	0.007	0.013	49.60	49.30	59.40	59.60	49.95	49.72	9.45	8.97	3.08	0.42
EX-SZW-P3	305-203	305-202	286.64	568.08	10	209.70	0.003	0.013	49.30	48.60	59.60	59.80	49.72	48.98	9.88	9.47	2.33	0.50
EX-SZW-P4	305-202	305-201	286.64	663.21	10	321.00	0.005	0.013	48.60	47.14	59.80	59.70	48.98	47.49	10.82	10.37	2.61	0.46
EX-SZW-P5	305-201	336-201	330.43	602.90	10	324.50	0.004	0.013	47.04	45.82	59.70	57.50	47.48	46.69	12.22	11.83	2.52	0.53
EX-UD-P1	302-201	302-202	89.02	563.71	10	234.30	0.003	0.013	38.89	38.12	50.00	49.00	39.11	38.41	10.89	10.28	1.68	0.26
EX-UD-P2	302-202	302-203	142.12	553.58	10	306.10	0.003	0.013	38.12	37.15	49.00	47.50	38.41	37.44	10.59	10.05	1.89	0.35
EX-UD-P3	302-203	339-203	194.09	566.65	10	295.10	0.003	0.013	37.10	36.12	47.50	47.60	37.44	36.41	10.06	9.57	2.10	0.41
EX-UD-P4	339-203	339-202	194.09	972.06	10	10.20	0.010	0.013	36.12	36.02	47.60	47.60	36.41	36.35	11.19	10.65	3.10	0.35
EX-WA-P1	266-210	266-204	26.51	342.80	8	245.30	0.004	0.013	56.27	55.29	68.00	67.00	56.40	55.41	11.60	11.06	1.30	0.19
EX-WA-P2	266-204	266-205	26.51	627.96	10	61.30	0.004	0.013	55.29	55.04	67.00	66.00	55.41	55.17	11.59	10.88	1.27	0.14
EX-WA-P3	266-205	265-206	31.81	622.31	10	299.60	0.004	0.013	55.04	53.84	66.00	65.00	55.17	54.01	10.83	10.13	1.33	0.16
EX-WA-P4	265-206	296-207	56.42	617.62	10	114.10	0.004	0.013	53.84	53.39	65.00	62.50	54.01	53.56	10.99	10.33	1.57	0.20
EX-WA-P5	296-207	296-213	61.08	633.75	10	36.10	0.004	0.013	53.39	53.24	62.50	61.40	53.56	53.42	8.94	8.28	1.64	0.20
EX-WA-P6	296-213	296-208	61.08	620.62	10	326.40	0.004	0.013	53.24	51.94	61.40	63.60	53.42	52.83	7.98	7.33	1.61	0.22
EX-WA-P7	296-208	296-209	61.08	628.88	10	34.20	0.004	0.013	51.94	51.80	63.60	63.00	52.83	52.83	10.77	10.83	0.25	1.07
EX-WA-P8	296-209	296-201	3357.89	6427.38	24	309.40	0.004	0.013	51.80	50.56	63.00	62.00	52.83	51.59	10.17	9.20	4.61	0.52
EX-WA-P9	296-201	296-202	3357.89	6413.14	24	315.80	0.004	0.013	50.56	49.30	62.00	61.19	51.59	50.77	10.41	9.44	4.60	0.52

Note: The system accounts for flows from the overall LSAP area including the existing areas to remain for the proposed housing expansion scenario.

								Apper	dix D									
								Lawrence Stat	ion Area Plan	1								
					:	Sanitary S	Sewer - Peak W	et Weather Flow	(PWWF) Hy	draulics - Prop	osed System							
						-					-							
Pipe ⁽⁵⁾	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	In	ivert	Gro	und/Rim	H	GL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	El	evation	Elev	ation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
PR-AA-P1	294-206 (P)	294-207 (P)	3110.07	6028.52	24.00	278.00	0.004	0.013	59.36	58.38	73.50	71.62	60.38	59.40	13.12	12.14	4.31	0.51
PR-AA-P2	294-207 (P)	295-201 (P)	3110.07	6003.00	24.00	320.40	0.003	0.013	58.38	57.26	71.62	69.20	59,40	58.28	12.22	11.24	4.30	0.51
PR-AA-P3	295-201 (P)	295-202 (P)	3110.07	5982.68	24.00	293.80	0.003	0.013	57.26	56.24	69.20	67.30	58.28	57.28	10.92	9.94	4.28	0.51
PR-AA-P4	295-202 (P)	295-203 (P)	3203.44	6012.41	24.00	305.10	0.004	0.013	56.24	55.17	67.30	62.64	57.28	56.21	10.02	9.06	4.33	0.52
PR-AA-P5	295-203 (P)	295-207 (P)	3203.44	5946.35	24.00	29.20	0.003	0.013	55.17	55.07	62.64	62.42	56.21	56.11	6.43	5.47	4.30	0.52
PR-AA-P6	295-207 (P)	295-208 (P)	3203.44	6011.14	24.00	119.80	0.004	0.013	55.07	54.65	62.42	61.50	56.11	55.68	6.31	5.35	4.33	0.52
PR-AA-P7	295-208 (P)	295-209 (P)	3203.44	6079.61	24.00	131.10	0.004	0.013	54.65	54.18	61.50	61.30	55.68	55.24	5.82	4.85	4.37	0.52
PR-AA-P8	295-209 (P)	295-204 (P)	3203.44	5624.90	24.00	19.50	0.003	0.013	54.18	54.12	61.30	61.50	55.24	55.16	6.06	5.12	4.12	0.53
PR-AA-P9	295-204 (P)	295-210 (P)	3203.44	6012.26	24.00	111.20	0.004	0.013	54.12	53.73	61.50	61.30	55.16	54.77	6.34	5.38	4.33	0.52
PR-AA-P10	295-210 (P)	295-211 (P)	3203.44	6020.88	24.00	130.80	0.004	0.013	53.73	53.27	61.30	60.40	54.77	54.30	6.53	5.57	4.34	0.52
PR-AA-P11	295-211 (P)	295-212 (P)	3203.44	6062.16	24.00	58.90	0.004	0.013	53.27	53.06	60.40	60.33	54.30	54.11	6.10	5.13	4.36	0.51
PR-AA-P12	295-212 (P)	296-211 (P)	3203.44	5948.96	24.00	81.60	0.003	0.013	53.06	52.78	60.33	59.45	54.11	53.84	6.22	5.27	4.30	0.52
PR-AA-P13	296-211 (P)	296-212 (P)	3296.81	6020.86	24.00	130.80	0.004	0.013	52.78	52.32	59.45	59.45	53.84	53.37	5.61	4.67	4.37	0.53
PR-AA-P14	296-212 (P)	296-209 (P)	3296.81	6040.64	24.00	90.40	0.004	0.013	52.32	52.00	59.45	63.00	53.37	52.96	6.08	5.13	4.38	0.52
PR-CR-P1	337-202 (P)	337-201 (P)	94.00	7952.27	10.00	5.10	0.654	0.013	44.81	41.45	54.00	54.00	45.01	42.32	8.99	8.36	10.94	0.24
PR-CR-P2	337-201 (P)	337-206 (P)	1147.19	1789.33	18.00	347.10	0.001	0.013	41.45	40.95	54.00	53.00	42.32	41.56	11.68	11.05	2.39	0.58
PR-KR-P1	333-206 (P)	334-201 (P)	957.91	2809.84	18.00	534.90	0.004	0.013	57.49	55.59	67.86	66.70	58.09	56.41	9.77	8.87	3.21	0.40
PR-KR-P2	334-201 (P)	334-202 (P)	1460.66	2505.44	18.00	534.60	0.003	0.013	55.59	54.08	66.70	65.80	56.41	54.92	10.29	9.61	3.28	0.55
PR-KR-P3	334-202 (P)	335-201 (P)	1557.58	2582.15	18.00	930.00	0.003	0.013	54.08	51.29	65.80	64.50	54.92	52.19	10.88	10.22	3.41	0.56
PR-KR-P4	335-201 (P)	335-202 (P)	1720.26	2582.22	18.00	900.00	0.003	0.013	51.29	48.59	64.50	61.20	52.19	49.47	12.31	11.71	3.48	0.60
PR-KR-P5	335-202 (P)	336-201 (P)	1940.67	2981.31	18.00	692.70	0.004	0.013	48.59	45.82	61.20	57.50	49.47	46.69	11.73	11.11	4.00	0.59
PR-KR-P6	336-201 (P)	336-202 (P)	2314.89	6904.37	18.00	180.90	0.021	0.013	45.82	41.94	57.50	57.04	46.69	43.53	10.81	10.18	7.84	0.58
PR-KR-P7	336-203 (P)	336-204 (P)	12.81	529.77	8.00	335.40	0.010	0.013	49.00	45.80	55.00	56.50	49.08	45.99	5.92	5.33	1.42	0.12
PR-KR-P8	336-204 (P)	337-202 (P)	60.63	538.33	10.00	330.30	0.003	0.013	45.80	44.81	56.50	54.00	45.99	45.01	10.51	9.87	1.46	0.23
PR-KR-P9	337-203 (P)	337-201 (P)	1053.19	1858.54	18.00	328.20	0.002	0.013	41.96	41.45	52.80	54.00	42.77	42.32	10.03	9.34	2.42	0.54
PR-KR-P10	337-204 (P)	337-203 (P)	978.43	1764.27	18.00	328.50	0.001	0.013	42.52	42.06	52.50	52.80	43.31	42.77	9.19	8.48	2.28	0.53
PR-KR-P11	337-208 (P)	337-204 (P)	915.93	1963.59	18.00	86.50	0.002	0.013	42.77	42.62	52.40	52.50	43.48	43.31	8.92	8.13	2.43	0.47
PR-KR-P12	337-205 (P)	337-208 (P)	915.93	1686.95	18.00	242.10	0.001	0.013	43.08	42.77	52.20	52.40	43.86	43.48	8.34	7.62	2.17	0.52
PR-KR-P13	338-201 (P)	337-205 (P)	915.93	1765.17	18.00	328.10	0.001	0.013	43.64	43.18	51.50	52.20	44.40	43.86	7.10	6.36	2.25	0.51
PR-KR-P14	338-202 (P)	338-201 (P)	549.31	1758.49	18.00	265.90	0.001	0.013	44.11	43.74	51.00	51.50	44.69	44.40	6.31	5.39	1.96	0.39
PR-KR-P15	338-203 (P)	Kifer Lift Station	549.31	5132.80	12.00	28.20	0.088	0.012	32.18	29.70	51.00	49.00	32.65	29.92	18.35	17.82	9.50	0.47
PR-KR-P16	338-207 (P)	338-203 (P)	549.31	783.86	12.00	387.00	0.002	0.013	33.11	32.18	49.80	51.00	33.73	32.65	16.07	15.69	2.41	0.62
PR-KR-P17	338-209 (P)	338-207 (P)	285.50	828.11	12.00	324.40	0.003	0.013	34.08	33.21	49.60	49.80	34.49	33.73	15.11	14.52	2.13	0.41
PR-KR-P18	339-201 (P)	338-209 (P)	246.06	827.69	12.00	324.70	0.003	0.013	35.05	34.18	49.20	49.60	35.42	34.49	13.78	13.15	2.05	0.37
PR-KR-P19	339-202 (P)	339-201 (P)	194.09	825.91	12.00	326.10	0.003	0.013	36.02	35.15	47.60	49.20	36.35	35.42	11.25	10.58	1.91	0.33
PR-LE-P1	265-204 (P)	296-203 (P)	4079.89	10360.63	27.00	705.50	0.006	0.013	56.12	52.20	67.83	69.82	57.16	53.18	10.67	9.46	5.46	0.46
PR-LE-P2	296-203 (P)	296-202 (P)	4079.89	10316.94	27.00	526.40	0.006	0.013	52.20	49.30	69.82	61.19	53.24	50.77	16.58	15.37	5.44	0.46
PR-LE-P3	296-202 (P)	305-207 (P)	7437.78	9715.82	27.00	401.10	0.005	0.013	49.30	47.34	61.19	60.50	50.77	48.76	10.42	9.64	6.00	0.65
PR-LE-P4	305-207 (P)	305-208 (P)	7437.78	10306.34	27.00	141.90	0.005	0.013	47.34	46.56	60.50	58.98	48.76	47.98	11.74	10.91	6.29	0.63
PR-LE-P5	305-208 (P)	305-209 (P)	7459.14	10400.80	27.00	512.60	0.006	0.013	46.56	43.69	58.98	56.98	47.98	45.12	11.00	10.17	6.34	0.63
PR-LE-P6	305-209 (P)	336-202 (P)	7480.50	10208.66	27.00	324.40	0.005	0.013	43.69	41.94	56.98	57.04	45.12	43.53	11.86	11.04	6.25	0.64
PR-LE-P7	336-202 (P)	336-207 (P)	9798.29	17889.16	30.19	670.50	0.005	0.010	41.94	38.32	57.04	54.28	43.53	39.65	13.51	12.58	8.20	0.63
PR-SC-P1	306-201 (P)	306-202 (P)	38.92	982.15	10.00	300.70	0.010	0.013	56.78	53.78	64.90	62.40	56.91	53.95	7.99	7.29	1.95	0.16
PR-SC-P2	306-202 (P)	306-203 (P)	56.77	616.25	10.00	300.40	0.004	0.013	53.78	52.60	62.40	60.85	53.95	52.85	8.45	7.79	1.57	0.20
PR-SC-P3	306-203 (P)	306-204 (P)	116.94	595.86	10.00	299.60	0.004	0.013	52.60	51.50	60.85	60.80	52.85	51.77	8.00	7.42	1.89	0.30
PR-SC-P4	306-204 (P)	305-205 (P)	137.81	595.40	10.00	300.00	0.004	0.013	51.50	50.40	60.80	59.50	51.77	50.78	9.03	8.47	1.98	0.32
PR-SC-P5	305-205 (P)	305-204 (P)	212.52	507.29	10.00	300.60	0.003	0.013	50.40	49.60	59.50	59.40	50.78	49.95	8.72	8.27	1.98	0.46
DD C7W D1	1 205 20C (D)	1 205 204 (D)	20 57	707.00	10.00	1 172 20	0.002	0.010	50.12	40.00		50.40	50.00	10.05	0.04	1 0 0 4	1 1 5 6	0.17

LSAP Housing Expansion Buildout Infrastructure Impact Study

1 of 2

Peak Wet Weather Flow Proposed Sanitary Sewer System

	Appendix D Lawrence Station Area Plan Sanitary Sewer - Peak Wet Weather Flow (PWWF) Hydraulics - Proposed System																	
Pipe ⁽⁵⁾	Upstream	Downstream	Total	Capacity @	Pipe		Constructed	Pipe	I	nvert	Gro	und/Rim	H	łGL	Upstream	Upstream		
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	evation	Ele	evation	Ele	vation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
PR-SZW-P2	305-204 (P)	305-203 (P)	286.64	833.08	10.00	41.80	0.007	0.013	49.60	49.30	59.40	59.60	49.95	49.72	9.45	8.97	3.09	0.42
PR-SZW-P3	305-203 (P)	305-202 (P)	286.64	568.20	10.00	209.60	0.003	0.013	49.30	48.60	59.60	59.80	49.72	48.98	9.88	9.47	2.33	0.50
PR-SZW-P4	305-202 (P)	305-201 (P)	286.64	662.80	10.00	321.40	0.005	0.013	48.60	47.14	59.80	59.70	48.98	47.49	10.82	10.37	2.61	0.46
PR-SZW-P5	305-201 (P)	336-201 (P)	330.43	1148.49	11.54	324.50	0.004	0.010	47.04	45.82	59.70	57.50	47.40	46.69	12.30	11.70	3.04	0.37
PR-UD-P1	302-201 (P)	302-202 (P)	89.02	563.74	10.00	234.30	0.003	0.013	38.89	38.12	50.00	49.00	39.11	38.40	10.89	10.28	1.68	0.26
PR-UD-P2	302-202 (P)	302-203 (P)	142.12	567.61	10.00	306.10	0.003	0.013	38.12	37.10	49.00	47.50	38.40	37.44	10.60	10.05	1.93	0.34
PR-UD-P3	302-203 (P)	339-203 (P)	194.09	566.91	10.00	294.90	0.003	0.013	37.10	36.12	47.50	47.60	37.44	36.41	10.06	9.57	2.10	0.41
PR-UD-P4	339-203 (P)	339-202 (P)	194.09	975.12	10.00	10.20	0.010	0.013	36.12	36.02	47.60	47.60	36.41	36.35	11.19	10.65	3.11	0.35
PR-WA-P1	266-210 (P)	266-204 (P)	26.51	342.80	8.00	245.30	0.004	0.013	56.27	55.29	68.00	67.00	56.40	55.41	11.60	11.06	1.30	0.19
PR-WA-P2	266-204 (P)	266-205 (P)	26.51	628.19	10.00	61.30	0.004	0.013	55.29	55.04	67.00	66.00	55.41	55.17	11.59	10.88	1.27	0.14
PR-WA-P3	266-205 (P)	265-206 (P)	31.81	622.28	10.00	299.60	0.004	0.013	55.04	53.84	66.00	65.00	55.17	54.01	10.83	10.13	1.33	0.16
PR-WA-P4	265-206 (P)	296-207 (P)	56.42	617.62	10.00	114.10	0.004	0.013	53.84	53.39	65.00	62.50	54.01	53.56	10.99	10.33	1.57	0.20
PR-WA-P5	296-207 (P)	296-213 (P)	61.08	634.18	10.00	36.10	0.004	0.013	53.39	53.24	62.50	61.40	53.56	53.42	8.94	8.28	1.64	0.20
PR-WA-P6	296-213 (P)	296-208 (P)	61.08	620.91	10.00	326.10	0.004	0.013	53.24	51.94	61.40	63.60	53.42	52.83	7.98	7.33	1.61	0.22
PR-WA-P7	296-208 (P)	296-209 (P)	61.08	3466.83	17.20	34.30	0.004	0.010	51.94	51.80	63.60	63.00	52.83	52.83	10.77	10.23	1.82	0.62
PR-WA-P8	296-209 (P)	296-201 (P)	3357.89	6431.76	24.00	309.00	0.004	0.013	51.80	50.56	63.00	62.00	52.83	51.59	10.17	9.20	4.61	0.52
PR-WA-P9	296-201 (P)	296-202 (P)	3357.89	6424.85	24.00	314.70	0.004	0.013	50.56	49.30	62.00	61.19	51.59	50.77	10.41	9.44	4.61	0.52

Note: The system accounts for flows from the overall LSAP area including the existing areas to remain for the proposed housing expansion scenario.

APPENDICES |

APPENDIX E

Potable Water System Demand Calculations

Potable Water System Demand Calculations

LSAP Housing Expansion Study

Lot ³	Residential Units	Commercial/Office/Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	LPW (GPD)	LPW (GPM)
3			96,000			20,160	14.00
4		154,540				31,217	21.68
5		602.173				121.639	84.47
6							
7	520	7,400				83,863	58.24
8	262	2,500				42,006	29.17
9	320	2,500				51,193	35.55
10	125					19,800	13.75
11			19,990			4,198	2.92
12			19,512			4,098	2.85
13			16,830			3,534	2.45
14	130					20,592	14.30
15	111					17,582	12.21
16			11,055			2,322	1.61
17	168					26,611	18.48
18			19,463			4,087	2.84
19	109					17,266	11.99
20	126	1,000				20,160	14.00
21							
22							
23							
24							
25	741	1,500				117,677	81.72
26	16					2,534	1.76
27	16						
28	83	2,000				13,551	9.41
29	18	2,000				3,255	2.26
30	52	2,000				8,641	6.00
31	13	1,000				2,261	1.57
32		8,156				1,648	1.14
33				7,800		4,680	3.25
34		136,438				27,560	19.14
35		152,758				30,857	21.43
36			61,758			12,969	9.01
37			147,842			31,047	21.56
38		136,409	39,148			35,776	24.84
39	1,458					230,947	160.38
40	634					100,426	69.74
41	338					53,539	37.18
42			78,000			16,380	11.38
43	383					60,667	42.13
44							
45			105,000			22,050	15.31

Appendix E Lawrence Station Area Plan Potable Water System Demand Calculations

Lot ³	Residential Units	Commercial/Office/Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	LPW (GPD)	LPW (GPM)
46							
47	328					51,955	36.08
48		-					
49					159,637	532	0.37
50							
51							
52							
Subtotal	5,935	1,212,374	614,598	7,800	159,637	1,319,281	916.17

LSAP Office Expansion Study

Lot	Residential Units	Commercial/Office/Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	LPW (GPD)	LPW (GPM)
1 & 2		351,000		13,000		78,702	54.65
53			831,000	16,000		184,110	127.85
Subtotal		351,000	831,000	29,000		262,812	182.51

Note:

1. The square footage numbers provided in these tables represent project buildout numbers including nonresidential buildings expected to remain.

2. Residential units within Lot 27 existed prior to the LSAP and have not been included within the total residential numbers.

3. Lots 11, 12, 13, 16, 18, 35, 36, 37, 42, and 45 are existing parcels within the LSAP area expected to remain.

Abbreviations:

Symbol	Description
GPD	gallons per day
GPM	gallons per minute
LPW	low pressure water
sf	square footage

APPENDIX F

Sanitary Sewer System Demand Calculations

LSAP Housing Expansion Study	£								
L of ³	Residential	Commercial/Office/	Industrial	Restaurant	Storage Facility	SS (CPD)	SS (CPM)	SS PDWF (CPM)	SS PWWF (CPM)
Lot	Units	Retail (sf)	(sf)	(sf)	(sf)	55 (GI D)	55 (GI M)	551DWF(01M)	551 W WF (01 M)
3			96,000			19,152	13.30	39.90	48.55
4		154,540				19,086	13.25	39.76	48.38
5		602,173				74,368	51.64	129.11	162.68
6									
7	520	7,400		'		60,688	42.14	115.90	143.29
8	262	2,500				30,426	21.13	63.39	77.12
9	320	2,500				37,093	25.76	70.84	87.58
10	125					14,369	9.98	32.43	38.92
11	<u> </u>		19,990			3,988	2.77	9.69	11.49
12			19,512			3,893	2.70	9.46	11.22
13			16,830			3,358	2.33	8.16	9.68
14	130		'	'		14,944	10.38	33.73	40.47
15	111		'	'		12,759	8.86	28.80	34.56
16			11,055	'		2,205	1.53	5.36	6.36
17	168	-	'	'		19,312	13.41	40.23	48.95
18			19,463			3,883	2.70	9.44	11.19
19	109					12,530	8.70	28.28	33.93
20	126	1,000				14,607	10.14	32.97	39.56
21									
22									
23	!	-	'	'					
24			1						
25	741	1,500	1			85,363	59.28	148.20	186.73
26	16					1,839	1.28	4.47	5.30
27	16								
28	83	2,000				9,788	6.80	22.09	26.51
29	18	2,000				2,316	1.61	5.63	6.67
30	52	2,000				6,224	4.32	15.13	17.94
31	13	1,000				1,618	1.12	3.93	4.66
32		8,156				1,007	0.70	2.45	2.90
33	!		⁻	7,800		4,446	3.09	10.81	12.81
34	I	136,438	· '			16,850	11.70	35.10	42.71
35	t t	152,758				18,866	13.10	39.30	47.82
36	tt		61.758			12.321	8.56	27.81	33.37
37	I		147.842			29,494	20.48	61.45	74.76
38		136,409	39.148			24.657	17.12	51.37	62.50
39	1 458					167.597	116 39	290.97	366.62
40	634					72.878	50.61	139.18	172.07
41	338					38,853	26.98	74.20	91.74

Appendix F Lawrence Station Area Plan Sanitary Sewer System Demand Calculations

Appendix F Lawrence Station Area Plan Sanitary Sewer System Demand Calculations

Lot ³	Residential Units	Commercial/Office/ Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	SS (GPD)	SS (GPM)	SS PDWF (GPM)	SS PWWF (GPM)
42			78,000			15,561	10.81	32.42	39.44
43	383					44,026	30.57	84.08	103.95
44									
45		-	105,000			20,948	14.55	43.64	53.10
46									
47	328					37,704	26.18	72.00	89.02
48									
49					159,637	506	0.35	1.23	1.46
50									
51									
52									
Subtotal	5,935	1,212,374	614,598	7,800	159,637	959,520	666.33	1,862.89	2,296.00

LSAP Office Expansion Study

Lot	Residential Units	Commercial/Office/ Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	SS (GPD)	SS (GPM)	SS PDWF (GPM)	SS PWWF (GPM)
1 & 2		351,000		13,000		50,759	35.25	96.93	119.85
53			831,000	16,000		174,905	121.46	303.65	382.60
Subtotal		351,000	831,000	29,000		225,663	156.71	400.59	502.45

Note:

1. The square footage numbers provided in these tables represent project buildout numbers including nonresidential buildings expected to remain.

2. Residential units within Lot 27 existed prior to the LSAP and have not been included within the total residential numbers.

3. Lots 11, 12, 13, 16, 18, 35, 36, 37, 42, and 45 are existing parcels within the LSAP area expected to remain.

Abbreviations:

Symbol	Description
GPD	gallons per day
GPM	gallons per minute
LPW	low pressure water
PDWF	peak dry weather flow
PWWF	peak wet weather flow
sf	square footage
PDWF PWWF sf	peak dry weather flow peak wet weather flow square footage

APPENDIX G

Cost Estimate for City Sanitary Sewer System

BKF Engineers

255 Shoreline Drive, Suite 200 Redwood City, California 94065

APPENDIX G ESTIMATE OF CONSTRUCTION COSTS FOR CITY SANITARY SEWER UPGRADES

Abbreviations: Symbol Des

PVC VCP Description polyvinyl chloride

vitrified clay pipe

LAWRENC	E EXPRESSWAY SANITARY SEWER IMPROVEMENTS				
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST ⁵	TOTAL COST
1	Replace existing 27" VCP main with proposed 30" PVC SS main	671	LF	\$2,000.00	\$1,342,000
	L	LAWRENCE EXPRESSWAY SUBTOTAL			

ADDITION/	AL PROJECT COSTS (PERCENTAGE OF LAWRENCE EXPRESSWAY SUBTOTAL	-)	
ITEM	DESCRIPTION	QUANTITY	TOTAL COST
1	Construction Fees	25%	\$335,500
2	Design Fees	20%	\$268,400
3	Inspection Fees	10%	\$134,200
4	Miscellaneous Costs	5%	\$67,100
5	City Administration Fees	5%	\$67,100
		ADDITIONAL COSTS SUBTOTAL	\$872,300
		LAWRENCE EXPRESSWAY TOTAL	\$2.214.300

SAN ZENC	WAY SANITARY SEWER IMPROVEMENTS				
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
1	Replace existing 10" VCP main with proposed 12" PVC SS main	324	LF	\$700.00	\$226,800
	SAN ZENO WAY SUBTOTAL		\$226,800		

ADDITION	AL PROJECT COSTS (PERCENTAGE OF SAN ZENO WAY SUBTOTAL)		
ITEM	DESCRIPTION	QUANTITY	TOTAL COST
1	Construction Fees	25%	\$56,70
2	Design Fees	20%	\$45,36
3	Inspection Fees	10%	\$22,68
4	Miscellaneous Costs	5%	\$11,34
5	City Administration Fees	5%	\$11,34
		ADDITIONAL COSTS SUBTOTAL	\$147,42

SAN ZENO WAY TOTAL \$374,220

	WILLOW A	VENUE SANITARY SEWER IMPROVEMENTS				
	ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
	1	Replace existing 10" VCP main with proposed 18" PVC SS main	69	LF	\$900.00	\$62,100
Ì			WILLOW AVENUE SUBTOTAL			\$62,100

ADDITION	AL PROJECT COSTS (PERCENTAGE OF WILLOW AVENUE SUBTOTAL)		
ITEM	DESCRIPTION	QUANTITY	TOTAL COST
1	Construction Fees	25%	\$15,525
2	Design Fees	20%	\$12,420
3	Inspection Fees	10%	\$6,210
4	Miscellaneous Costs	5%	\$3,105
5	City Administration Fees	5%	\$3,105
		ADDITIONAL COSTS SUBTOTAL	\$40,365
		WILLOW AVENUE TOTAL	\$102,465

LSAP HOUSING TOTAL \$2,690,985

Notes:

1. For location of Sanitary Sewer improvements, refer to Figure 3.3 - LSAP Proposed Sanitary Sewer Pipe Sizing.

2. This cost estimate does not include the costs associated with the installation of intermediary manholes for segments of sanitary sewer main that violate City requirements for running length of sewer mains between manholes.

3. Unit cost values are derived from 2019 Downtown Specific Plan Amendments Utility Impact Study.

4. Unit cost for the sewer main upgrades includes cost for mobilization, demobilization, traffic control, shoring, trenching, manholes, laterals, bypass pumping, offhaul, and disposal.

5. Unit cost for sewer main upgrade within Lawrence Expressway has been adjusted to account higher anticipated costs for increased pavement thickness, expressway traffic control, bypass pumping, and tunneling in addition to the

costs listed in Note 4.

6. This cost estimate is approximate and may not be representative of actual construction costs.

APPENDIX D | INTUITIVE CORPORATE CAMPUS INFRASTRUCTURE IMPACT STUDY

APPENDICES

LAWRENCE STATION AREA PLAN

PROPOSED INTUITIVE SURGICAL CORPORATE CAMPUS PROJECT AT 932, 945, 950, AND 955 KIFER ROAD (OFFICE EXPANSION BUILDOUT)

INFRASTRUCTURE IMPACT STUDY

June 22, 2020



255 Shoreline Drive, Suite 200 Redwood City, CA 94065 650.482.6300

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- Appendix A Block Book Pages for Lawrence Station Area Plan
- Appendix B LSAP Parcels with Development Assumptions
- Appendix C LSAP Potable Water Model Reports
- Appendix D LSAP Sewer Model Reports
- Appendix E Potable Water System Demand Calculations
- Appendix F Sanitary Sewer System Demand Calculations

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SECTION 1: INTRODUCTION AND PROJECT DESCRIPTION

1.1 Project Overview

The proposed Lawrence Station Area Plan (LSAP) Amendment Project (Project) is generally centered around a ¹/₂ mile radius of the existing Lawrence Caltrain Station at 137 San Zeno Way in Sunnyvale, California and is approximately 252.09 acres. For the purposes of the infrastructure studies, the LSAP Update project is divided into two study areas: the Housing Expansion Study Area and the Proposed Intuitive Surgical Corporate Campus Project at 932, 945, 950, and 955 Kifer Road (herein referred to as the Office Expansion) Study Area. This Infrastructure Study will address the Office Expansion Study Area which composes of two parcels south of Kifer Road and one parcel north of Kifer Road. The north parcel is bounded by Central Expressway to the north, Texas Instruments campus to the east, Kifer Road to the south, and numerous commercial offices to the west. The south parcel is bounded by Kifer Road to the north, the proposed LSAP Housing Expansion to the east, railroad right of way (ROW) to the south, and two large commercial offices to the west. The project site is located in the far eastern area of the City of Sunnyvale northwest of the Lawrence Caltrain station.

The Office Expansion Study Area site is approximately 32.39 acres of industrial land owned by Intuitive Surgical, Inc. (ISI) that is proposed for redevelopment as office/research and development.

The Housing Expansion Study Area is approximately 219.70 acres encompassing existing developments, railroad ROW, and public ROW. The residential LSAP is bounded by the City of Santa Clara to the north and east, Reed Avenue, Aster Avenue, and the railroad ROW to the south, and the Intuitive Surgical offices to the west. Please refer to the Housing Expansion Buildout Infrastructure Impact Study for the infrastructure analysis associated with the proposed increase of allowable housing potential within the LSAP.

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Figure 1.1 - Project Location - illustrates the regional location of the Project.

Figure 1.2 - Project Site and Context - illustrates the Study Area Boundaries and the location of the Project within the City.



Lawrence Station Area Plan Amendment Office Expansion Buildout Infrastructure Impact Study June 22, 2020 Page 2 This study will discuss the office expansion located across three parcels. The Project includes two office/R&D buildings, a parking structure, an amenities building, and two central utility plants. Existing utility infrastructure requiring upgrades to serve the Project will be identified in this study.

1.2 Lawrence Station

1.2.1 Existing Conditions and Land Use

Existing conditions and Land Uses within the 32.39 acre office expansion LSAP includes an office/research building, an industrial building, a fitness center, an equipment enclosure, and a recreational park for employees. The ISI project site is currently designated for industrial uses in the City's General Plan.

1.2.2 Proposed ISI Project Component of the LSAP Update

The LSAP Update consists of two primary components: (1) modifications to the adopted LSAP (i.e. an increase in housing potential within the LSAP, expansion of the western LSAP boundary, and a Sense of Place Plan that would function as a policy document for LSAP area circulation, open space, and streetscape improvements) and (2) an office/research development (R&D) and manufacturing redevelopment project in the western LSAP boundary expansion area for the ISI project. This infrastructure study analyzes the second component of the LSAP update: the ISI project. A detailed breakdown of the land uses are shown in Table 2.4 – Office Expansion Study LSAP Potable Water Demand Summary (ADD). The proposed LSAP layout is shown in Figure 1.3 – Proposed Site Layout.

1.3 Project Datum

All elevations referenced herein are based on the following:

- Vertical datum used in the City of Sunnyvale's Utility and GIS Maps.
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- Record drawings provided by the City for Aster Avenue and Willow Avenue
- Manhole survey data provided by the City for Lawrence Expressway



APPENDICES

SECTION 2: POTABLE WATER SYSTEM

2.1 Potable Water System Design Criteria

The design criteria used for the office expansion development of the potable water model is based upon established industry operations standards and regulatory agency requirements. The potable water system will be designed in accordance to the City of Sunnyvale's Standard Plans and Specifications and to applicable City, State, and Federal water and fire codes and standards unless otherwise permitted. Since the City of Sunnyvale does not have written standards for water generation, this report will use Redwood City's Design Standards to estimate project water demands. The intent of this study is to identify which existing City water mains will need to be upgraded in order to provide adequate water supply to the LSAP. All existing water mains are located within the City Right-of-Way.

The design criteria are dependent on the demand scenario. Table 2.1 – Potable Water System Demand and Peaking Factor presents the potable water system demand and peaking factor for the demand scenario. Assumed peaking factors for max day demand and peak hour demand scenarios are based on correspondence between BKF and the City of Sunnyvale.

Table 2.1

Potable Water System Demand and Peaking Factor

Parameter	Value
Average Day Demand (ADD)	262,812 gpd
Fire Flow Demands (FF)	4,500 gpm
Maximum Day Demand (MDD)	MDD = 2.0 ADD
Peak Hour Demand (PHD)	PHD = 3.0 ADD

Notes:

1. Fire flow demand based on an assumed R-2 Occupancy type building and construction Type III-A, assuming 25% fire flow reduction for sprinkling.

2. gpd = gallons per day

3. gpm = gallons per minute

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Table 2.2 – Potable Water System Design Criteria presents the potable water system design criteria.

Table 2.2 Potable Water System Design Criteria

Parameter	Value
Pipe size	Pipe diameters of 8, 10, 12, and 16 inches shall be used for all distribution and feeder mains.
Pipe Material	For water mains 12-inches and smaller shall be C900 DR14 PVC pipe or AWWA C-151/A21.51 ductile iron pipe (DIP). Water mains larger than 12-inches shall be C905 DR14 PVC or AWWA C-151/A21.51 DIP.
Hazen Williams C-value for recommended pipes	140 for DIP, 150 for PVC
Maximum static pressure	120 psi
Maximum velocity during PHD	7 fps
Maximum velocity during MDD+FF	15 fps
Minimum system pressure during MDD+FF	20 psi
Notes:	

fps = feet per second

psi = pounds per square inch

2.2 Potable Water System Layout

Potable water is supplied to the LSAP by the City of Sunnyvale through an existing 12-inch diameter cast iron pipe (CIP) in Kifer Road. Commercial Street also contains an existing 8-inch diameter CIP. Existing potable water system layout is shown on Figure 2.1 – LSAP Existing Potable Water System.

2.3 Upgraded Potable Water System

2.3.1 Proposed Water Demand Factors

The potable water demand factors used for the Project's various land uses are shown in Table 2.3 – LSAP Potable Water Demand Factors (ADD). The total estimated water

Lawrence Station Area Plan Amendment Office Expansion Buildout Infrastructure Impact Study June 22, 2020 Page 6 demands for the Project land uses are shown on Table 2.4 – Office Expansion Study LSAP Potable Water Demand Summary (ADD). Water demands are derived from Redwood City's Design Standards.

Table 2.3

LSAP Potable Water Demand Factors (ADD)

Land Use	Indoor Potable Water Demand Factors	Outdoor Potable Water Demand Factors	Total Water Demand
	(ADD)	(ADD)	(ADD)
Office/R&D	0.13 gpd/sf	0.072 gpd/sf	0.202 gpd/sf
Industrial	0.21 gpd/sf	0 gpd/sf	0.21 gpd/sf
Restaurant	30 gpd/seat	0 gpd/seat	30 gpd/seat
Note:			

sf = square feet

2.3.2 Model Results Discussion

The existing potable water system is sufficient to supply the potable water demands as well as provide fire flow to the site. Under the scenario of max day demand and fire flow, the water model analysis determined that the flow demand would be at its highest of any scenario at 4,820 gpm as seen in Appendix C-3 – Model Scenario 3: Max Day Demand + Fire Flow. However, the existing potable water system is able to provide a flow of 6,000 gpm, which is well above the necessary flow to meet the demands in this scenario. Refer to Appendix C-3 – Model Scenario 3: Max Day Demand + Fire Flow for water model results. The overall proposed ISI development indicates that no improvements are required for the City's potable water system.

2.4 Potable Water System Model Water Demands

2.4.1 Sources of Land Use Water Demand Data

Potable water demand factors for the model analyses are shown in Table 2.3 – LSAP Potable Water Demand Factors (ADD) and were applied to the project program to develop the project potable water demand total. Table 2.4 – Office Expansion Study LSAP Potable Water Demand Summary (ADD) provides water demands by land use.

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See Appendix E – Potable Water System Demand Calculations, for model demand calculations on a block by block basis. Total project development will not exceed the demands presented in Table 2.4 – Office Expansion Study LSAP Potable Water Demand Summary (ADD).

2.4.2 Average Day Demand

The demand factors presented in Table 2.3 – LSAP Potable Water Demand Factors (ADD) and the demand summaries presented in Table 2.4 – Office Expansion Study LSAP Potable Water Demand Summary (ADD) reflect average day demand (ADD) for the Office Expansion Study.

Table 2.4					
Office Expansion Study L	SAP Potable Wat	ter Der	nand	Summary	(ADD

Land Use	Number	Unit	Demand/Unit (gpd)	Total (gpd)
Office/R&D	351,000	sf	0.202	70,902
Industrial	831,000	sf	0.21	174,510
Restaurant ^{1,3}	580	seat 30		17,400
Total				262,812

Notes:

 Total restaurant seating is assumed to be 580 seats. This is based on the assumption that 50% of restaurant space (29,000 sf total) is for patrons and one 10'x10' table has seating for 4 people. The calculation is as follows: <u>4 seats</u>
 <u>4 seats</u>
 <u>500</u>

$$29,000 \ sf \times 0.5) \times (\frac{100 \ sf}{100 \ sf}) = 580 \ seats$$

- 2. Block by block water demand calculations shown in Appendix E Potable Water System Demand Calculations.
- 3. Restaurant is defined as employee amenity space.

2.4.3 Maximum Day Demand

Maximum Day Demand (MDD) represents the maximum volume of water used in a 24hour period for the entire year. A water system is typically evaluated under a maximum day plus fire flow demand condition as this condition allows the system to be stressed at a higher demand rate to ascertain if pipeline carrying capacities are adequate in a fire emergency. As identified in Table 2.1 – Potable Water System Demand and Peaking Factor, a peaking factor of 2 was applied to ADD.

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2.4.4 Peak Hour Demand

Peak Hour Demand (PHD) represents the highest hourly demand for the entire system, and simulates the highest flow rate expected. To determine the PHD, a peaking factor was applied to increase the ADD. Peaking factors represent the increase above ADD and are a statistical concept typically obtained from historical data. As identified in Table 2.1 – Potable Water System Demand and Peaking Factor, a peaking factor of 3 was applied to ADD.

2.4.5 Fire Flow Demand

The fire flow (FF) demand is assumed to be 4,500 gallons per minute (gpm) as noted in correspondence between the City of Sunnyvale, Ascent Environmental, and BKF Engineers.

2.5 Potable Water System Model Boundary Conditions

The recommended potable water system is modeled based on calibrated boundary conditions and fire hydrant flow data received from the City completed for the LSAP Project. Since the LSAP Project is redeveloping existing lots, the recommended water model is analyzing existing City water mains and identifying which water mains will need to be upgraded in order to provide adequate water supply for the redevelopment.

2.6 Potable Water System Model Scenario

The LSAP water model was created in Bentley Water CAD V8i SELECT series 1. A series of model scenarios were created to reflect the range of demand usage patterns and confirm conformance to the Potable Water System Design Criteria outline in Table 2.2 – Potable Water System Design Criteria. Three model runs are prepared for the ISI Project and are shown in Table 2.5 – LSAP Project Model Runs – Office Expansion Study.

Table 2.5 LSAP Project Model Runs – Office Expansion Study

Run	Description
1	Static Pressures
2	Peak Hour Demand
3	Maximum Day Demand + Fire Flow

See Appendix C - LSAP Potable Water Model Reports for model run results.

2.7 Potable Water System Recommendations

The existing potable water system, as shown in Appendix C – LSAP Potable Water Model Reports, is designed to meet the design criteria outlined in Table 2.2 – Potable Water System Design Criteria. Table 2.6 – Potable Water System Results for Office Expansion Study summarizes the pressure and velocity results for the referenced model scenarios listed in Table 2.5 – LSAP Project Model Runs – Office Expansion Study. Refer to Appendix C – LSAP Potable Water Demand Results for detailed results of model scenarios. In conclusion, no upgrades to the existing potable water system are required since the water model reflects the system being adequately supplied during maximum daily demand plus fire flow. A water supply analysis memorandum prepared by Ascent Environmental will follow this report and will similarly state that the existing potable water system is sufficient to meet proposed water and fire flow demands.

Table 2.6 Potable Water System Results for Office Expansion Study

Parameter	Requirement	Minimum	Maximum
Static ADD Pressure (psi)	120 max	75	77
PHD Velocity (fps)	7 max	-	1.73
MDD+FF Pressure (calculated system lower limit at total flow available) (psi)	20 min	73	-
MDD+FF Velocity (fps)	15 max	-	10.40

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APPENDICES



SECTION 3: SANITARY SEWER SYSTEM

3.1 Sanitary Sewer System Design Criteria

The design criteria used for the office expansion development of the sanitary sewer model is based upon established industry operations standards and regulatory agency requirements. The sanitary sewer system will be designed in accordance to the City of Sunnyvale's Standard Plans and Specifications and to applicable City, State, and Federal water and fire codes and standards unless otherwise permitted. At certain locations within the project area, City design guidelines were supplemented with updated pipe slope and invert information provided by the City. Sanitary sewer generation is assumed to be 95% of indoor potable water demands. This infrastructure study will identify which existing City sewer mains will need to be upgraded in order to support the anticipated sewer flows from the development within Office Expansion Study Area. All existing sewer mains are located within the City ROW. The pipe material of existing sewer mains is vitrified clay pipe (VCP). The design criteria are dependent on the demand scenario. Table 3.1 – Sanitary Sewer System Design Criteria presents the sanitary sewer system design criteria based on the supplemental information from the City.

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Table 3.1			
Sanitary Sewer	System	Desian	Criteria

Parameter	Value
Minimum pipe size	8-inch inside diameter
Pipe Material	PVC SDR-26 or better
Manning's coefficient, n, for recommended PVC pipes	0.01
Minimum Slope	0.5% (0.005 feet/feet) for sewer diameters 8- inches and smaller, 0.4% (0.004 feet/feet) for sewer diameters 10-inches and larger.
Maximum Slope	14.0% (0.14 feet/feet)
PWWF Maximum Pipe Flow Depth Ratio, <i>d/D</i>	0.5 for sewer diameters 10-inches and smaller, 0.75 for sewer diameters 12-inches and larger
Minimum Depth of Cover	5 feet below finished grade
Sewer Generation	95% of indoor potable water demand

Notes:

ADWF = Average Dry Weather Flow PDWF = Peak Dry Weather Flow PDWF = Peak Wet Weather Flow d/D = ratio of depth of flow (*d*) to the pipe inside diameter (*D*) fps = feet per second PWWF = Peak Wet Weather Flow

Four flow conditions were analyzed:

- 1. ADWF in Existing City Sewer System
- 2. ADWF in Recommended City Sewer System
- 3. PWWF in Existing City Sewer System
- 4. PWWF in Recommended City Sewer System

The ADWF is based on the potable water average daily demand described in Section 2.4.2. To account for existing flows entering the project area from other areas of the City, existing sewer flows collected from flow monitoring sites at Lawrence Road north of Warburton Avenue, Kifer Road west of Lawrence Expressway, and Aster Avenue west of Willow Avenue were incorporated into the sanitary sewer model analysis. Existing sewer flow data collected from the flow monitoring cites were received from the City on February 6, 2020. According to the City of

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Sunnyvale's Sanitary Sewer Systems Design Standards, the PDWF peaking factor is dependent upon ADWF. We have assumed a PDWF peaking factor that varies between 2.5 and 2.75 which is based on individual parcel demands. PWWF is based on PDWF and a design inflow and infiltration rate based on a 10-year storm event that is 65% of the ADWF. Table 3.2 - Sanitary Sewer System Peaking Factor summarizes the peaking factor to achieve PWWF based on the supplemental information from the City.

Table 3.2

Sanitary Sewer System Peaking Factor

Parameter	Value
Average Dry Weather Flow	225,663 gpd
PDWF ¹	PDWF = (varies between 2.5 and 2.75) * ADWF
PWWF	PWWF = ADWF * (PDWF peaking factor + 0.65)
Note:	

PDWF peaking factor is dependent upon ADWF for each parcel.

3.2 Sanitary Sewer Collection System

3.2.1 Existing Sanitary Sewer Collection System

The existing sanitary sewer collection system within the vicinity of the LSAP consists of sewer mains that vary in size between 8-inches to 18-inches. Pipe material of the existing sewer mains is VCP. The existing sanitary sewer system within the LSAP boundary consists of a single drainage area. Sanitary sewer flows generally drain by gravity and ultimately drain to the existing 27-inch sanitary sewer main in Lawrence Expressway. All existing sewer mains are assumed to have adequate slope and that the pipe velocity can meet the minimum 2 fps. For 8-inch pipes, pipe slope was assumed to be 0.4%. Additional record drawings, manhole survey data, and construction documents were provided by the City to update pipe invert and slope information used in this sewer analysis model. Existing sanitary sewer system layout is shown on Figure 3.1 - LSAP Existing Sanitary Sewer System and existing manholes shown on Figure 3.2 - LSAP Existing Sanitary Sewer Manholes.

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3.3 Sanitary Sewer System Model Sewer Flows

3.3.1 Land Use Sewer Generation Data

The sanitary sewer flows used are based on the indoor potable water for each land use. Outdoor water demands are not included in sanitary sewer flows because outdoor drains connect to the storm drain system.

3.3.2 Average Dry Weather Flow

The sanitary sewer ADWF is intended to be representative of the average day sanitary sewer generation. The sanitary sewer ADWF is a function of the indoor water use ADD. Table 3.3 – Office Expansion Study LSAP Sanitary Sewer Demand Summary represents indoor water use ADD for each land use shown in Table 2.4 - Office Expansion Study LSAP Potable Water Demand Summary (ADD). The sanitary sewer ADWF is based on 95% of the indoor potable water ADD. Total sewer demand use for each development is detailed in Appendix F – Sanitary Sewer System Demand Calculations. Sewer generation (gpm) that was calculated for each parcel was applied to each sewer line in the street that was adjacent to that particular parcel. This allows an even distribution of sewer generated for a particular parcel to account for existing sanitary sewer lines in the street.

Table 3.3 Office Expansion Study LSAP Sanitary Sewer Demand Summary

Land Use	Number	Unit	Indoor Domestic Water Demand (gpd)	Sanitary Sewer Demand (gpd)
Office/R&D	351,000	sf	45,630	43,349
Industrial	831,000	sf	174,510	165,784
Restaurant ^{1,2}	580	seat	17,400	16,530
Total	-	-	237,540	225,663

Notes:

1. Total restaurant seating is assumed to be 580 seats. This is based on the assumption that 50% of restaurant (29,000 sf total) is for patrons and one 10'x10' table has seating for 4 people. The calculation is as follows:

$$(29,000 \ sf \times 0.5) \times (\frac{4 \ seats}{100 \ sf}) = 580 \ seats$$

Restaurant is defined as employee amenity space.

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3.3.3 Peak Dry Weather Flow (PDWF)

The sanitary sewer PDWF is the highest sanitary sewer generation during the day due to diurnal peaks associated with higher water usage in the morning and early evening hours. PDWF is determined by applying a peaking factor to ADWF. City of Sunnyvale has varying peaking factors for PDWF which is dependent upon ADWF for each parcel. Peaking factors for the LSAP vary between 2.5 and 2.75.

3.3.4 Peak Wet Weather Flow (PWWF)

The sanitary sewer PWWF incorporates infiltration and inflow rate at 65% of the ADWF. This rate is added to the PDWF peaking factor.

Inflow is surface water that enters the wastewater system from yards, roof drains, downspouts, storm drain cross connections, or through manhole covers due to overland flow runoff. Similar to infiltration, inflow is a result of storm events, and peak inflow typically occurs during heavy storm events or prolonged periods of precipitation.

Infiltration is groundwater that enters sewer facilities such as pipelines, laterals, and manholes through holes, breaks, joint/connection failures, and other openings. Infiltration is directly correlated to the total amount of piping and appurtenances in the ground. Infiltration quantities vary due to seasonal variation in the groundwater levels influenced by storm events, surface and soil conditions, condition of sanitary sewer systems, and type of pipe joints. The highest infiltration flows are typically observed following significant storm events and during the winter or peak precipitation months, when groundwater levels are high.

3.4 Sanitary Sewer Flow Distribution

Each parcel's total sanitary sewer generation was determined by reviewing the planned parcel land use and applying applicable land use sanitary sewer generation rate to it. The parcel land use summary is included in Appendix F – Sanitary Sewer System Demand Calculations for

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reference.

Each parcel's total sanitary sewer flow was divided equally amongst the sanitary sewer manholes bordering the parcel as shown in Figure 3.2 – Existing Sanitary Sewer Manholes. The parcel flow entering a manhole represents a sanitary sewer lateral point of connection.

3.5 Hydraulic Grade Line Considerations

The analysis of the sanitary sewer system is assumed to be a free outfall condition.

3.6 Sanitary Sewer Boundary Conditions

In addition to the flow monitoring survey data provided by the City, the recommended sanitary sewer system is modeled based on boundary conditions taken from Technical Memorandum 7 attached to the City of Sunnyvale's 2015 Wastewater Collection System Master Plan. Since the LSAP Project is redeveloping existing lots, the recommended sewer model is analyzing existing City sewer mains and identifying which sewer mains will need to be upgraded in order to abide by City sanitary sewer standards.

3.7 Model Scenario Results and Analysis

The LSAP sanitary sewer model was created in Bentley StormCAD V8i SELECT series 5. The following sanitary sewer model flow conditions were developed:

- 1. Average Dry Weather Flow (ADWF) in Existing City Sewer System
- 2. ADWF in Recommended City Sewer System
- 3. Peak Wet Weather Flow (PWWF) in Existing City Sewer System
- 4. PWWF in Recommended City Sewer System

Sanitary sewer model inside diameters were based on JM Eagle PVC Pipe Size for SDR 26 (160 psi).

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3.7.1 Pipe Diameter

The sewer systems were modelled with the inside pipe diameters. Pipe diameters were reviewed based on the d/D exceeding the allowable depth of flow of 0.50 for pipe sizes 10-inches and smaller, and 0.75 for pipe sizes greater than 12-inches per the supplemental information from the City.

3.7.2 Flow Velocity

The flow velocities through the pipes were calculated using the Manning's equation. The Manning's equation calculates the flow velocities using the pipe's roughness coefficient, the hydraulic radius, and the slope of the pipe.

3.7.2.1 Average Dry Weather Flow (ADWF)

Figure 3.3 – LSAP Average Dry Weather Flow Pipe Velocity illustrates the ADWF pipe velocities for the sanitary sewer system. The sanitary sewer system ADWF pipe velocity results are detailed in Appendix D – LSAP Sewer Model Reports. The results shown in this appendix account for flows from the overall LSAP area including the office and housing expansion areas. The recommended system described falls under the housing expansion infrastructure impact study. The results of the analysis show LSAP ADWF velocities ranging from approximately 2.39 fps to 5.67 fps in the City's existing sewer system. ADWF velocities in the recommended City sewer system range from approximately 2.39 fps to 6.24 fps.

3.7.2.2 Peak Wet Weather Flow (PWWF)

Figure 3.4 – LSAP Peak Wet Weather Flow Pipe Velocity illustrates the PWWF pipe velocities for the sanitary sewer system. The sanitary sewer system PWWF pipe velocity results are detailed in Appendix D – LSAP Sewer Model Reports. The results shown in this appendix account for flows from the overall LSAP area including the office and housing expansion areas. The recommended system described falls under the housing expansion infrastructure impact study. The

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results of the analysis show LSAP PWWF velocities ranging from approximately fps 3.21 to 7.84 fps in the City's existing sewer system. PWWF velocities in the recommended City sewer system range from approximately 3.21 fps to 8.20 fps.

3.8 Sanitary Sewer System Recommendations

The existing sanitary sewer system, as shown in Appendix D – LSAP Sewer Model Reports, is designed to meet the design criteria outlined in Table 3.1 – Sanitary Sewer System Design Criteria. Refer to Appendix D – LSAP Sewer Model Reports for detailed results of model scenarios. In conclusion, no upgrades to the existing sanitary sewer system are required since the model results display no issues with pipe capacity and flow under various demand scenarios and the existing pipe system abides by City design standards.

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APPENDICES





ØBKF Engineers -/ CENTRAL EXPWY P OF SUNNYVALE 5 COMMERCIAL Flow Pipe Velocity - Office.dwg 945 KIFER À LO 955 KIFER Weather KIFER RD KIFER RD Wet Peak 932 KIFER EXPWY LSAP 4.5 950 KIFER LAWRENCE gure SAN ZENO WAY JPB ROW EE SONORA CT Λ A S GRAPHIC SCALE E EVELYN AVE 300 300 SS GRAVITY MAIN VELOCITY 2.00 FT/S TO 9.99 FT/S 06/22/2020 1"=300' LEGEND DATE: SCALE: LSAP OFFICE EXPANSION BUILDOUT /bkr 06-19 CITY BOUNDARY **INFRASTRUCTURE REPORT** DESIGN: BPB HOUSING EXPANSION STUDY AREA DRAWING NAME: PLOT DATE: DRAWN BY: NRF ENGINEERS / SURVEYORS / PLANNERS 255 SHORELINE DRIVE SUITE 200 REDWOOD CITY, CA 94065 650/482-6300 650/482-6309 (FAX) OFFICE EXPANSION STUDY AREA FIGURE 3.4 - LSAP PEAK WET APPROVED: TRM BkF EX SEWER JOB NO: 20180080 WEATHER FLOW PIPE VELOCITY

APPENDICES

SECTION 4: STORM DRAIN SYSTEM

4.1 Existing Storm Drain Layout

The existing storm drain for LSAP is shown on Figure 4.1 – LSAP Existing Storm Drain System. Existing storm drain mains are maintained by the City of Sunnyvale. The LSAP area is currently served by existing storm drain mains that vary in size between 18-inches to 30-inches.

4.2 Storm Drain System for Developed Projects

The existing site is approximately 719,000 sf (51%) of impervious surfaces and 692,100 sf (49%) of pervious surfaces. The north site, located at 945/955 Kifer Road, composes of 447,500 sf (66%) of pervious surfaces and 230,600 sf (34%) of impervious surface. The south site, located at 932/950 Kifer Road, composes of 244,600 sf (33%) of pervious surfaces and 488,400 sf (67%) of impervious surface.

The office expansion LSAP is proposed to have approximately 862,900 sf (61%) of impervious surfaces and 548,100 sf (39%) of pervious surface. The north site proposes 371,600 sf (55%) of pervious surfaces and 306,400 sf (45%) of impervious surface. The south site proposes 176,500 sf (24%) of pervious surfaces and 556,500 sf (76%) of impervious surface. The proposed developments abide by the City of Sunnyvale's Municipal Code requirements for a minimum of 20% landscaped surfaces for each development parcel. The north and south sites proposes bio-treatment areas on-site to treat impervious surfaces. The remainder of the pervious surfaces are assumed to be self-treating and infiltrate within their own development site.

4.3 Storm Drain System Recommendations

With on-site treatment areas for impervious surfaces and self-treating pervious surfaces elsewhere throughout the site, the proposed developments would abide by the City of Sunnyvale's Municipial Code requirements for a minimum of 20% landscaped surfaces for each parcel. Therefore, the proposed Office Expansion Study Area project assumes no increase in stormwater runoff to the existing storm drain system.

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APPENDIX A

Block Book Pages for Lawrence Station Area Plan



A.112 LAWRENCE STATION AREA PLAN







APPENDIX B

LSAP Parcels with Development Assumptions

Appendix B Lawrence Station Area Plan LSAP Parcels with Devleopment Assumptions Received from George Schroeder of the City of Sunnyvale on March 16, 2020

Existing Proposed Parcels highlighted in green will be analyzed as the existing condition. Parcels highlighted in blue will be analyzed as the proposed condition.

Proposed Intuitive Surgical Properties to add to LSAP Boundaries - nonresidential only. See GPA/RZ 2018-7723

APN	Addr #	Street	St. Type	Lot Sq. Ft.	Lot Acres	Existing FAR	Proposed Bldg Sq. Ft.
20540001,							
20540002	945-955	Kifer	Rd	678048	15.57	2%	364,000
20549005,							
20549012	932-950	Kifer	Rd	732897	16.83	22%	847,000
			Totals	1410945	32.39		

A.116 LAWRENCE STATION AREA PLAN

APPENDIX C

LSAP Potable Water Model Reports



APPENDIX C-1

Model Demand Scenario 1: Static

Node ID	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)
J-1	63.00	240.00	77
H-1	63.00	240.00	77
H-13	63.00	240.00	77
H-14	67.00	240.00	75

APPENDIX C-2

Model Demand Scenario 2: Peak Hour Demand

Label	Demand (gpm)	Available Flow with System-wide Constraint * (gpm)	Minimum Residual Pressure @ PHD (psi)	Maximum Pipe Velocity (ft/s)	Satisfies Criteria?
J-1	500	1,000	76	1.73	TRUE
H-1	500	1,000	77	0.18	TRUE
H-13	500	1,000	77	0.29	TRUE
H-14	500	1,000	75	0.10	TRUE

* Available flow reported is based on system-wide constraint of 20 psi and 15 fps applied every where in the system. During simulation, if the pressure were to drop below 20 psi or velocity exceed 15 fps at any location system-wide due to demand placed at that specific node in question, then the simulation ends and the resulting flow calculated at the end of that simulation is reported for that node in question.

APPENDIX C-3

Model Demand Scenario 3: Max Day Demand + Fire Flow

Label	Demand (gpm)	Available Flow with System-wide Constraint * (gpm)	Minimum Residual Pressure @ MDD (psi)	Maximum Pipe Velocity (ft/s)	Satisfies Criteria?
J-1	4,820	6,000	73	10.40	TRUE
H-1	4,820	6,000	76	1.06	TRUE
H-13	4,820	6,000	76	1.77	TRUE
H-14	4,820	6,000	75	0.59	TRUE

* Available flow reported is based on system-wide constraint of 20 psi and 15 fps applied every where in the system. During simulation, if the pressure were to drop below 20 psi or velocity exceed 15 fps at any location system-wide due to demand placed at that specific node in question, then the simulation ends and the resulting flow calculated at the end of that simulation is reported for that node in question.

APPENDIX D

LSAP Sewer Model Reports

	Appendix D Lawrence Station Area Plan Sanitary Sewer - Average Dry Weather Flow (ADWF) Hydraulics - Existing System																	
Pipe (5)	Pipe ⁽⁵⁾ Upstream Downstream Total Capacity @ Pipe Constructed Pipe Invert Ground/Rim HGL Upstream Upstream (
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Elevation El		Elevation		vation Elevati		Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
EX-KR-P1	333-206	334-201	336.11	2809.64	18	534.90	0.004	0.013	57.49	55.59	67.86	66.70	57.84	56.04	10.02	8.87	2.39	0.23
EX-KR-P2	334-201	334-202	492.82	2505.53	18	534.60	0.003	0.013	55.59	54.08	66.70	65.80	56.04	54.54	10.66	9.61	2.45	0.30
EX-KR-P3	334-202	335-201	519.37	2582.18	18	930.00	0.003	0.013	54.08	51.29	65.80	64.50	54.54	51.77	11.26	10.22	2.55	0.31
EX-KR-P4	335-201	335-202	571.01	2582.16	18	900.00	0.003	0.013	51.29	48.59	64.50	61.20	51.77	49.06	12.73	11.71	2.61	0.32
EX-KR-P5	335-202	336-201	634.28	2982.83	18	692.00	0.004	0.013	48.59	45.82	61.20	57.50	49.06	46.30	12.14	11.11	2.99	0.31
EX-KR-P6	336-201	336-202	733.54	6905.33	18	180.90	0.021	0.013	45.82	41.94	57.50	57.04	46.30	42.90	11.20	10.18	5.67	0.32
EX-LE-P7	336-202	336-207 (EX)	3533.54	10208.70	27	671.10	0.005	0.013	41.94	38.32	57.04	54.28	42.90	39.23	14.14	12.85	5.20	0.43

Note: EX-LE-P7 pipe segment is not within the office expansion scope. It is analyzed as part of the housing expansion scope.

	Appendix D Lawrence Station Area Plan Sanitary Sewer - Average Dry Weather Flow (ADWF) Hydraulics - Proposed System																	
Pipe (5)	Pipe (5) Upstream Downstream Total Capacity @ Pipe Constructed Pipe Invert Ground/Rim HGL Upstream Upstream																	
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Ele	vation	Ele	evation	Ele	evation	Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
PR-KR-P1	333-206 (P)	334-201 (P)	336.11	2809.84	18.00	534.90	0.004	0.013	57.49	55.59	67.86	66.70	57.84	56.04	10.02	8.87	2.39	0.23
PR-KR-P2	334-201 (P)	334-202 (P)	492.82	2505.44	18.00	534.60	0.003	0.013	55.59	54.08	66.70	65.80	56.04	54.54	10.66	9.61	2.45	0.30
PR-KR-P3	334-202 (P)	335-201 (P)	519.37	2582.15	18.00	930.00	0.003	0.013	54.08	51.29	65.80	64.50	54.54	51.77	11.26	10.22	2.55	0.31
PR-KR-P4	335-201 (P)	335-202 (P)	571.01	2582.22	18.00	900.00	0.003	0.013	51.29	48.59	64.50	61.20	51.77	49.06	12.73	11.71	2.62	0.32
PR-KR-P5	335-202 (P)	336-201 (P)	634.28	2981.31	18.00	692.70	0.004	0.013	48.59	45.82	61.20	57.50	49.06	46.30	12.14	11.11	2.99	0.31
PR-KR-P6	336-201 (P)	336-202 (P)	733.54	6904.37	18.00	180.90	0.021	0.013	45.82	41.94	57.50	57.04	46.30	42.87	11.20	10.18	5.67	0.32
PR-LE-P7	336-202 (P)	336-207 (P)	3533.54	17889.16	30.19	670.50	0.005	0.010	41.94	38.32	57.04	54.28	42.87	39.08	14.17	12.58	6.24	0.37

Note: EX-LE-P7 pipe segment is not within the office expansion scope. It is analyzed as part of the housing expansion scope.

Appendix D Lawrence Station Area Plan Sanitary Sewer - Peak Wet Weather Flow (PWWF) Hydraulics - Existing System																		
Pipe ⁽⁵⁾	Pipe ⁽⁵⁾ Upstream Downstream Total Capacity @ Pipe Constructed Pipe Invert Ground/Rim HGL Upstream Upstream														í			
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Elevation		Elevation		Elevation		Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	1
EX-KR-P1	333-206	334-201	957.91	2809.64	18	534.90	0.004	0.013	57.49	55.59	67.86	66.70	58.09	56.41	9.77	8.87	3.21	0.40
EX-KR-P2	334-201	334-202	1460.66	2505.53	18	534.60	0.003	0.013	55.59	54.08	66.70	65.80	56.41	54.92	10.29	9.61	3.28	0.55
EX-KR-P3	334-202	335-201	1557.58	2582.18	18	930.00	0.003	0.013	54.08	51.29	65.80	64.50	54.92	52.19	10.88	10.22	3.41	0.56
EX-KR-P4	335-201	335-202	1720.26	2582.16	18	900.00	0.003	0.013	51.29	48.59	64.50	61.20	52.19	49.47	12.31	11.71	3.48	0.60
EX-KR-P5	335-202	336-201	1940.67	2982.83	18	692.00	0.004	0.013	48.59	45.82	61.20	57.50	49.47	46.69	11.73	11.11	4.00	0.59
EX-KR-P6	336-201	336-202	2314.89	6905.33	18	180.90	0.021	0.013	45.82	41.94	57.50	57.04	46.69	43.71	10.81	10.18	7.84	0.58
EX-LE-P7	336-202	336-207 (EX)	9798.29	10208.70	27	671.10	0.005	0.013	41.94	38.32	57.04	54.28	43.71	39,96	13.33	12.85	6.51	0.79

Note: EX-LE-P7 pipe segment is not within the office expansion scope. It is analyzed as part of the housing expansion scope.

Appendix D Lawrence Station Area Plan Sanitary Sewer - Peak Wet Weather Flow (PWWF) Hydraulics - Proposed System																		
Pipe ⁽⁵⁾	Pipe ⁽⁵⁾ Upstream Downstream Total Capacity @ Pipe Constructed Pipe Invert Ground/Rim HGL Upstream Upstream																	
#	Node	Node	Flow	Constructed	Size	Length	Slope	Roughness	Elevation		Elevation		Elevation		Freeboard (2)	Cover	Velocity	d/D
			(gpm)	Slope (gpm)	(inches)	(feet)	(ft/ft)	(Mannings n)	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	(feet)	(feet)	(ft/s)	
PR-KR-P1	333-206 (P)	334-201 (P)	957.91	2809.84	18.00	534.90	0.004	0.013	57.49	55.59	67.86	66.70	58.09	56.41	9.77	8.87	3.21	0.40
PR-KR-P2	334-201 (P)	334-202 (P)	1460.66	2505.44	18.00	534.60	0.003	0.013	55.59	54.08	66.70	65.80	56.41	54.92	10.29	9.61	3.28	0.55
PR-KR-P3	334-202 (P)	335-201 (P)	1557.58	2582.15	18.00	930.00	0.003	0.013	54.08	51.29	65.80	64.50	54.92	52.19	10.88	10.22	3.41	0.56
PR-KR-P4	335-201 (P)	335-202 (P)	1720.26	2582.22	18.00	900.00	0.003	0.013	51.29	48.59	64.50	61.20	52.19	49.47	12.31	11.71	3.48	0.60
PR-KR-P5	335-202 (P)	336-201 (P)	1940.67	2981.31	18.00	692.70	0.004	0.013	48.59	45.82	61.20	57.50	49.47	46.69	11.73	11.11	4.00	0.59
PR-KR-P6	336-201 (P)	336-202 (P)	2314.89	6904.37	18.00	180.90	0.021	0.013	45.82	41.94	57.50	57.04	46.69	43.53	10.81	10.18	7.84	0.58
PR-LE-P7	336-202 (P)	336-207 (P)	9798.29	17889.16	30.19	670.50	0.005	0.010	41.94	38.32	57.04	54.28	43.53	39.65	13.51	12.58	8.20	0.63

Note: EX-LE-P7 pipe segment is not within the office expansion scope. It is analyzed as part of the housing expansion scope.

APPENDIX E

Potable Water System Demand Calculations

Appendix E Lawrence Station Area Plan Potable Water System Demand Calculations

LSAP Office Expansion Study

Lot	Residential Units	Commercial/Office/Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	LPW (GPD)	LPW (GPM)
1 & 2		351,000		13,000		78,702	54.65
53			831,000	16,000		184,110	127.85
Subtotal	Subtotal 35		831,000	29,000		262,812	182.51

APPENDIX F

Sanitary Sewer System Demand Calculations

Appendix F Lawrence Station Area Plan Sanitary Sewer System Demand Calculations

LSAP Office Expansion Study

Lot	Residential Units	Commercial/Office/ Retail (sf)	Industrial (sf)	Restaurant (sf)	Storage Facility (sf)	SS (GPD)	SS (GPM)	SS PDWF (GPM)	SS PWWF (GPM)
1 & 2		351,000		13,000		50,759	35.25	96.93	119.85
53			831,000	16,000		174,905	121.46	303.65	382.60
Subtotal		351,000	831,000	29,000		225,663	156.71	400.59	502.45

APPENDIX E | ACKNOWLEDGEMENTS

The original 2016 plan was prepared under the guidance and review of the following:

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LAWRENCE STATION AREA PLAN Updated 2021