

2 | EXISTING PHYSICAL CONDITIONS

The physical form of the study area is described in the following pages. This includes existing land uses, circulation and parking, development patterns and property ownerships.

In the sections that follow, physical conditions in Sunnyvale and Santa Clara are described under separate headings. Land uses in Santa Clara are being described to set the context of the study. Any land use decisions or changes are the jurisdiction of City of Santa Clara.

LAND USE

The land uses north of the Caltrain tracks differ dramatically from the land uses south of the Caltrain line. As illustrated in Figure 2.1, south of the tracks, land uses are almost exclusively residential, while north of the tracks, land uses are primarily industrial and commercial.

Sunnyvale

South of the Caltrain tracks, in Sunnyvale, most of the parcels north of Reed and East Evelyn Avenues consist of medium-density residential, including townhouses, duplexes and apartments. South of Reed and East Evelyn Avenues, almost all residential is well-established, low-density single-family detached homes with mature landscaping.

Several small pockets of non-residential uses are found scattered throughout the southern neighborhoods. On the Sunnyvale side of Lawrence Expressway (southwest quadrant of the study area), these include manufacturing and light industrial uses fronting Aster Avenue (such as Peninsula Building Materials), a cluster of commercial and retail uses on Willow and Reed Avenues, and a remnant agricultural parcel at the south edge of the study area (near the Corn Palace).

North of the Caltrain tracks there is no residential or neighborhood residential-serving use within the

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study area. This area contains almost entirely light-industrial, manufacturing, R&D and office uses. These uses tend to be located within large blocks and on long street frontages. A limited amount of retail is scattered throughout this northern sector, including large format regional-serving retail (Costco) as well as small, local business-serving merchants, delicatessens and service providers. The other predominant use is parking, with large areas of surface parking throughout the area north of the tracks. Existing land uses in the study area are described in greater detail below.

Santa Clara

South of the Caltrain tracks in Santa Clara, nearly all of the residential uses are low-density single-family detached homes, with the exception of a small amount of multi-family apartments and duplexes backing onto the rail line and fronting Monroe Street. Like their Sunnyvale counterparts, these neighborhoods are well-established and generally well-maintained and of good quality.

A large parcel at the corner of Monroe and French Streets contains the Extreme Networks research-and-development (R&D)/office use and two small parcels contain convenience retail at the intersection of Monroe Street and Lawrence Expressway. The Extreme Networks parcel is likely to be redeveloped with mostly residential uses (see Proposed/Pending Projects). Additional, non residential uses in these neighborhoods include schools, parks and churches.

North of the Caltrain tracks there is no residential or neighborhood residential-serving use within the Santa Clara portion of the study area. As in Sunnyvale, the area is dominated by industrial/office/R&D uses and large surface parking lots.

Table 2.1: Existing Uses

Existing Land Uses: Land Area						
Land Use	Land Use (sf)	Land Use (acres)	Sunnyvale (sf)	Sunnyvale (acres)	Santa Clara (sf)	Santa Clara (acres)
Low Density Residential	3,016,464	69.2	1,532,189	35.2	1,484,275	34.1
Low-Medium Density Residential	469,188	10.8	242,213	5.6	226,975	5.2
Medium Density Residential	2,896,373	66.5	2,384,098	54.7	512,275	11.8
Auto-oriented Retail	1,147,428	26.3	731,681	16.8	415,747	9.5
Auto-serving Retail	137,217	3.2	118,331	2.7	18,886	0.4
Office/Industrial/R&D	13,146,214	301.8	6,852,820	157.3	6,293,394	144.5
Railroads/Utility	898,723	20.6	845,118	19.4	53,605	1.2
Roads	3,713,025	85.2				
Drainage Channel	413,311	9.5	196,662	4.5	216,649	5.0
Religious/Assembly	151,647	3.5	0	0.0	151,647	3.5
Civic Uses	612,074	14.1	213,738	4.9	398,336	9.1
Agriculture	796,645	18.3	796,645	18.3	0	0.0
Total	27,398,309	629	13,913,495	319	9,771,789	224
	sf	acres	sf	acres	sf	acres
			w/o roads	w/o roads	w/o roads	w/o roads

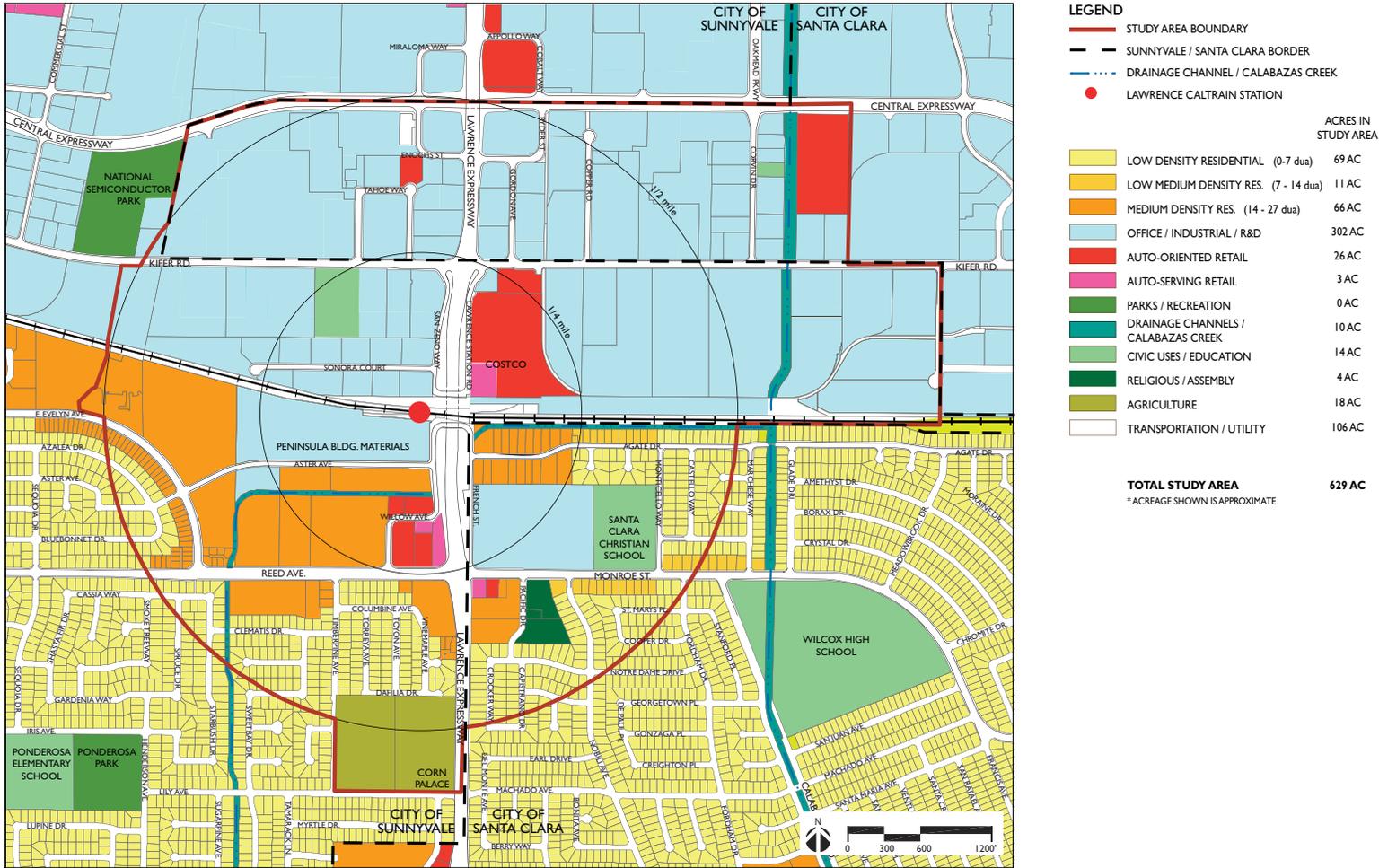
Total Minus Roads	23,685,284	543.7
Total Study Area	27,398,309	629.0
	sf	acres

Existing Uses: Building Square Footage/Dwelling Unit Counts, by City					
	Retail	Residential	Office/Ind/R&D	Civic Uses/Religious	Parking Structure
Sunnyvale	219,081	1,197	2,418,690	50,400	0
Santa Clara	90,735	593	2,813,970	97,655	448,680
TOTAL	309,816	1,790	5,232,660	148,055	448,680
	sf	dus	sf	sf	sf

Land Potentially Available for Change*	7,970,218	183
	sf	acres

* Sunnyvale only. Excludes residential, parks, major utilities, public and civic, railroad lands, drainage canals and lands in Santa Clara.

Figure 2.1: Existing Land Uses





Above: Low-density residential is typical south of the station
 Middle: Low-medium density townhouses on Aster Avenue
 Below: Medium-density residential in Santa Clara.



Above: Costco contains both auto-oriented and auto-serving uses; the gas station is an auto-serving use
 Middle: Retail uses in the study area are auto-oriented, with access and site-planning oriented to access by car
 Below: National Semiconductor is a campus-like R&D use fronting Kifer Road.

Sunnyvale Land Areas and Acreages

Table 2.1 provides acreage totals for the various land uses found in the study area. The characteristics of each land use type are described below.

Residential

Low Density

Single-family detached homes of modest scale on parcels generally below 1/5 acre in size predominate in the study area south of the tracks. Existing homes are at a density of about 6 dwelling units (du) per acre. These neighborhoods consist of well-maintained homes with mature landscape but most do not have a high level of public amenity such as street trees and planting strips. Significant barriers to access between neighborhoods are created by Lawrence Expressway, overly wide roads such as Reed and Monroe, and the drainage channels. Approximately 35 acres of low-density residential uses are found in the study area.

Low Medium Density Residential

This land use category consists of residential areas at a density of approximately 7-14 dwelling units per acre. Low-medium density residential occupies only 6.1 acres in the study area and the prevailing density is 10.7 du per acre. The new townhouses fronting Aster Avenue and zero-lotline single-family dwellings fronting East Evelyn Avenue fall in this category. The character and quality of these residences are similar to the nearby lower density single-family neighborhoods.

Medium Density Residential

Within the study area are 54 acres of medium-density residential consisting mostly of two-story apartments at a densities of about 17 dwelling units per acre. The majority of these residences are located in large parcel, multi-unit complexes with unified landscape and architecture and plentiful on-site resident and guest parking.

Retail

While there are many different types of retail that can serve a neighborhood and a city, for station-area planning purposes it is useful to understand whether existing retail is oriented toward pedestrians or toward automobile users. Auto-oriented uses rely on the automobile for access, often indicated by entrances that open onto a parking lot rather than onto the public sidewalk. These include large retailers as well as smaller establishments such as self-storage facilities, drive-up banks, convenience stores and strip centers that are sited or located in such a way as to favor access by car rather than by foot or bicycle. Auto-serving uses are those that directly service the automobile, such as gas stations, parts stores, car washes and auto-repair shops. Auto-oriented and auto-serving uses tend to be low-scale, typically with one or two story buildings set back from the street with parking fronting the street. Minimal landscaping (other than screening landscaping adjacent to a roadway) or pedestrian amenities exist.

Retail uses in the study area are very limited. Costco is the primary retail use north of the Caltrain tracks. South of the tracks a small retail complex is located along Willow Avenue north of Reed Avenue and just west of Lawrence Expressway. All uses are

auto-oriented or auto-serving and occupy 27 acres at a density of about .27 FAR.

Office/Industrial/R&D

A total of 149.9 acres of office, industrial or research and development (R&D) uses are found in the study area in Sunnyvale, and with the exception of Peninsula Building Materials and a small parcel across Aster Avenue, all are located north of the Caltrain tracks. The prevailing density of these uses is approximately .3 - .35 FAR. All are one- to three-story buildings, typically with extensive on-site parking lots. Building entrances are oriented toward these lots rather than to the street or sidewalk (which is often non-existent). The large parking lots, building orientation to parking, and lack of nearby pedestrian amenities tend to encourage automobile use by employees and clients.

All office/industrial/R&D facilities are characterized by relatively low building and employment densities. R&D facilities typically include office space, manufacturing facilities, receiving and materials storage and staff amenities. Intuitive Surgical is an example of an R&D use that is located on several non-contiguous parcels along the south edge of Kifer Road.

Light industrial uses encompass a wide range of small-scale manufacturing, service, office and complimentary retail. In some areas, such as Sonora Court just north of Lawrence Station, these uses occupy single buildings on individual parcels. In other areas, several businesses may occupy, through lease or ownership, one or more buildings on a larger parcel. There is a large quantity of



Above: Lawrence Caltrain station platform
Middle & Below: Existing industrial land use with expansive surface parking.



Above: One - two story light industrial building with surface parking on Kifer Road
Middle: Peninsula Building Materials occupies a large site adjacent to the station
Below: Sonora Court is predominantly one story buildings.

light industrial use in the study area, distributed throughout the area north of the Caltrain tracks. Manufacturing uses are involved in the direct production of goods and materials. Peninsula Building Materials, located on Aster Road immediately adjacent to the station, is the most recognizable manufacturing use in the area and is notable for its proximity to residences and the train station and its large site size (17 acres).

Public / Institutional

There are few public or institutional uses in or near the study area.

Civic / Education

Educational uses within or near the study area include Ponderosa Elementary (southwest of the study area), and a private post-secondary college, The International Culinary School at the Art Institute of California, which occupies a building on Kifer Road.

Transportation / Utility

Lawrence Station itself, including the station shelters, ticket facility, kiss-and-ride, taxi and shuttle bays, and the station platforms fall in this category. The station contains a limited amount of surface parking north of the tracks, further described under Parking (see below).

Parking

With the exception of on-street parking and the Caltrain station parking, there are no public parking or centralized parking facilities located within the study area. All parking is provided as part of the private uses located throughout the study area. North of the Caltrain tracks, nearly all

commercial and industrial parcels are dominated by surface parking lots.

Open Space

Open space is an amenity for residents and workers that provides “breathing room” in a built-out environment. Its uses can include active and passive recreation, wildlife habitat, food production and simply “visual relief” from the built environment.

The Sunnyvale portion of the study area has no formal open space. Open space accessible to the public is only found at Ponderosa Park and Elementary School, outside of the study area.

Visual open space is found in landscaped areas along the embankments of Lawrence Expressway and within the drainage and creek channels. However, none of these areas contain landscape improvements beyond a few rudimentary plantings and these areas do not contribute positively to the quality and character of the neighborhoods within the study area.

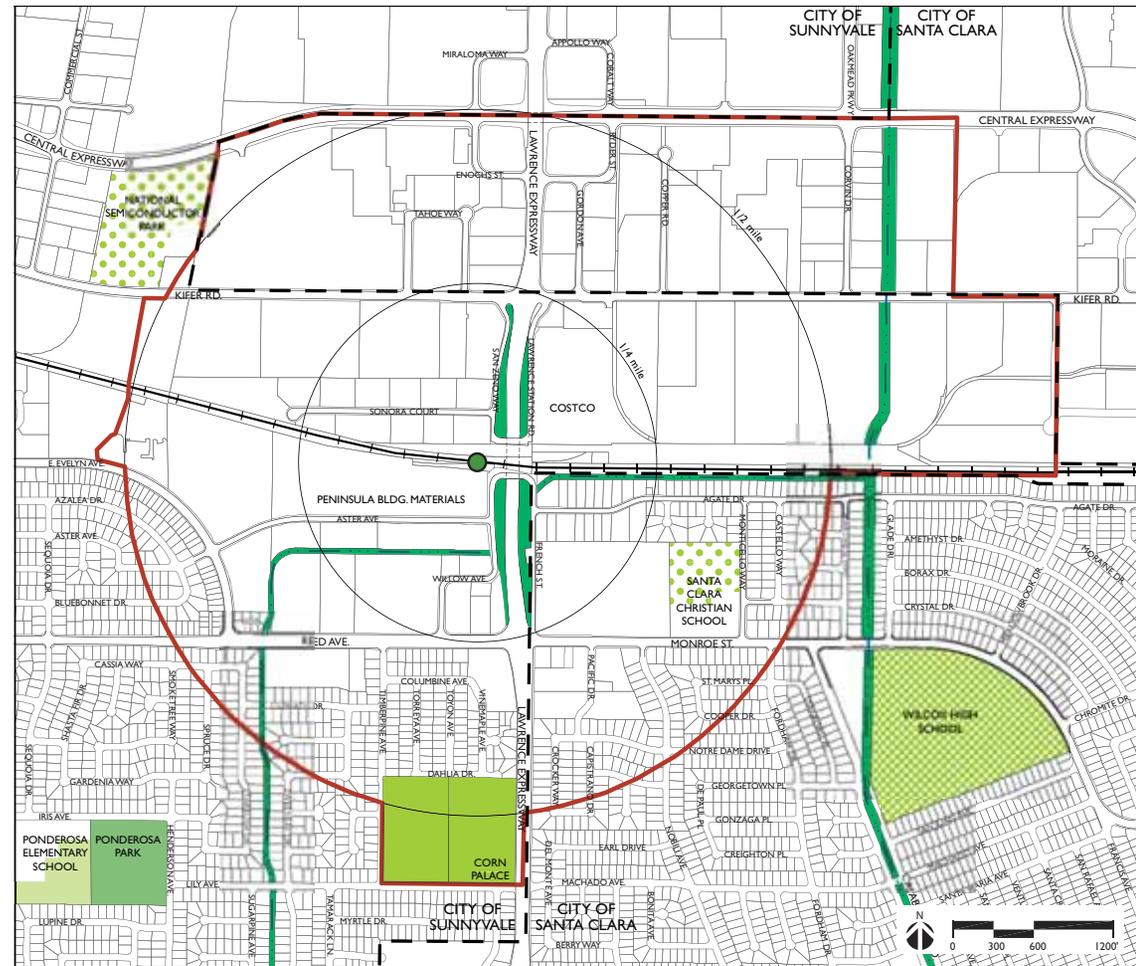
There are areas within the study area that contain attractive, well-maintained landscape improvements. Many of the older residential neighborhoods of include mature, attractive landscape improvements. The Redwood trees on Sonora Court and plantings on Kifer Road (west) are important assets of the study area.

Although it is inaccessible to public use, the agriculture field near the Corn Palace along Lawrence Expressway provides visual relief to its neighbors and Lawrence Expressway motorists. The parcels containing this field are zoned for low-density residential development and may develop in the near term.

Figure 2.2: Open Space Types



Above: Graded berm separating Lawrence Expressway provides opportunity for improved green spaces
 Middle: Drainage channel adjacent to new Aster Avenue townhouses
 Below: French Street has mature trees in wide planting areas.



LEGEND

- STUDY AREA BOUNDARY
- SUNNYVALE / SANTA CLARA BORDER
- - - DRAINAGE CHANNEL / CALABAZAS CREEK
- LAWRENCE CALTRAIN STATION
- PARKS
- SCHOOL YARDS
- AGRICULTURE FIELDS
- CONTROLLED ACCESS - SCHOOL
- PRIVATE PARK / SCHOOL
- INFRASTRUCTURE

Development Pattern

The existing development pattern of the study area, illustrated in Figure 2.3, indicates the relationship of buildings and non-building areas. Buildings are shown as black figures; non-building areas are shown as white and may include roadways, unbuilt areas of parcels, parking or open space.

Generally, there are two distinct patterns that occur within the study area. South of the rail line, the development pattern is dominated by small-scale, finely textured buildings, indicative of the prevailing residential uses. This pattern is interrupted primarily at Peninsula Building Materials, where there are few buildings and large outdoor storage areas.

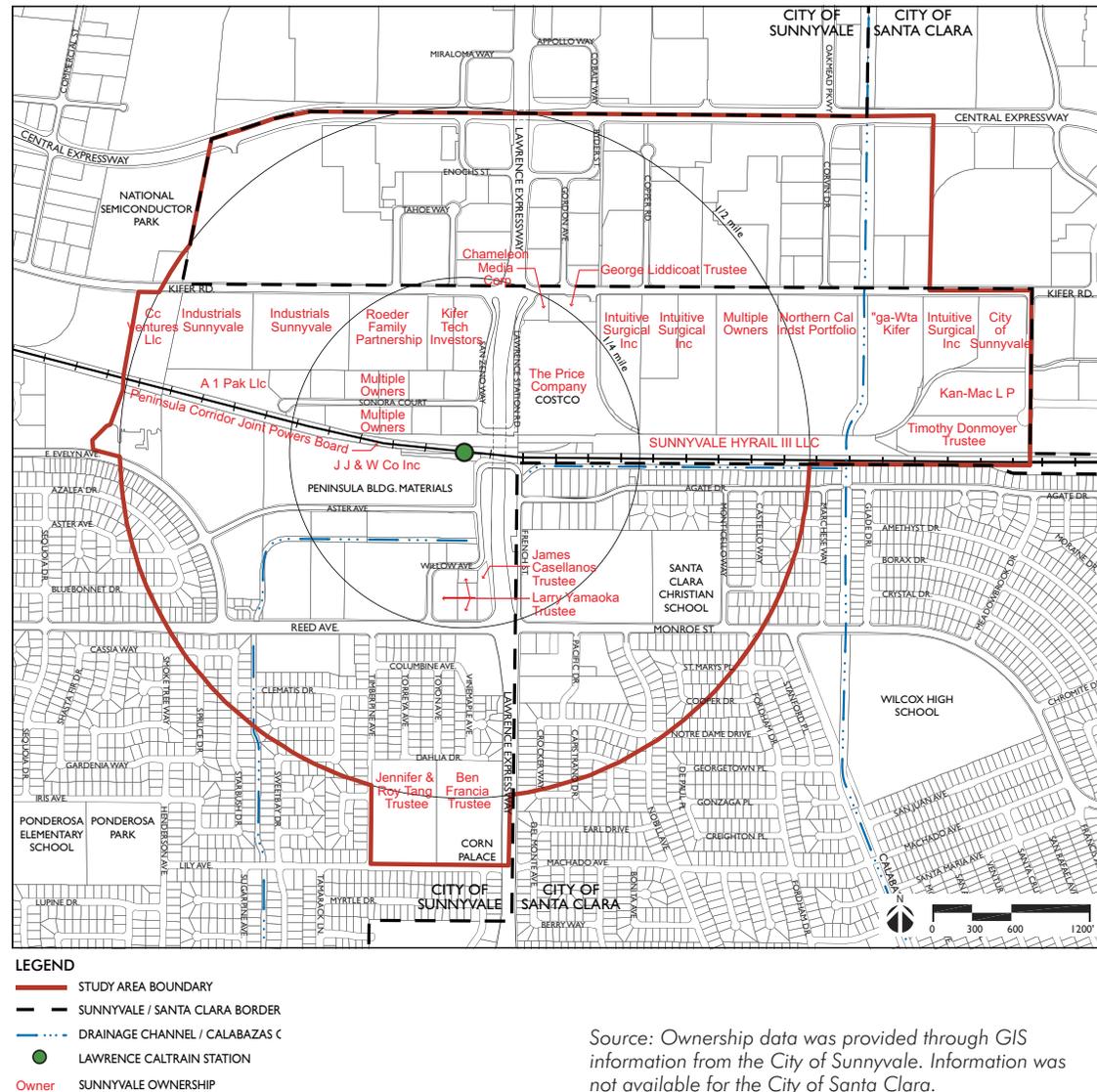
North of the rail line, the development pattern is indicative of the large scale and low-density development of the office, R&D and industrial uses there. In most cases the open areas are occupied by surface parking lots. These lots do not include pedestrian amenities and are generally a unattractive area for pedestrians or bicyclists, including those who may be coming from or heading to the train station.

Figure 2.3: Development Pattern



The large spaces between buildings illustrated in the pattern of development north of the tracks presents the opportunity to consider the introduction of a more fine-grained circulation system into the area if individual owners should desire to redevelop their properties in the future.

Figure 2.4: Property Ownership



Property Ownership Patterns

Ownership patterns are significant to station area planning if they indicate large areas under single ownership where owners may be interested in opportunities for redevelopment appropriate to their proximity to transit. Ownership of residential parcels is not relevant since it is assumed that these areas will be protected from future development. There are several Sunnyvale property owners who hold multiple, large-scale or contiguous properties in the study area. These include:

- *Industrials Sunnyvale* owns two adjacent parcels totaling approximately 17 acres fronting Kifer Road.
- *Intuitive Surgical* owns three adjacent parcels totalling approximately 21 acres fronting Kifer Road east of Costco as well as a parcel further east. *Intuitive Surgical* also owns a parcel just outside the study area on the west.
- *Larry Yamaoka Trustee* owns a three acre parcel serving as the southern gateway to Lawrence Station on Reed Avenue. This parcel contains auto-oriented retail facilities.
- *Peninsula Building Materials* is the long-time owner of an approximately 17 acre site at the south edge of Lawrence Station, identified in Sunnyvale's LUTE as an Industrial-to-Residential transition site.
- *The Price Company* owns a single, large parcel (approx. 12 acres) containing the Costco store, directly north of the Caltrain station.

Proposed and Pending Projects

Within the study area, a limited number of projects are proposed or under review including the following:

Sunnyvale

Corn Palace

The Corn Palace property is a parcel of approximately 18.3 acres fronting Lawrence Expressway between Dahlia Drive and Lily Avenue. It is zoned Planned Development (PD), but the existing use is agricultural production (primarily corn) and a small farm stand. A development application to change the use of half of the property to single-family detached residential has recently been submitted to the City of Sunnyvale.

Santa Clara

Extreme Networks Site

A mixed-use project has been proposed for the 16 acre Extreme Networks site fronting the corner of Monroe Street and French Street in the city of Santa Clara. The property owner and their development partner propose development of 593 residential units, including apartments, live/work lofts, townhouses and single-family detached homes, at an approximate gross site density of 37 dwelling units per acre. In addition, 56,000 square feet of commercial office space and 32,000 square feet of retail are proposed. This project currently is under review by the city of Santa Clara.

Summary: Land Use Issues and Opportunities

Land uses in the vicinity of the Lawrence Station are not of a type or density that are transit-supportive. However, in the long term the Lawrence Station area has the opportunity to transform the mix and intensity of uses that will help support transit ridership and create more complete and vital neighborhoods in this area of Sunnyvale.

The land use challenges include the following:

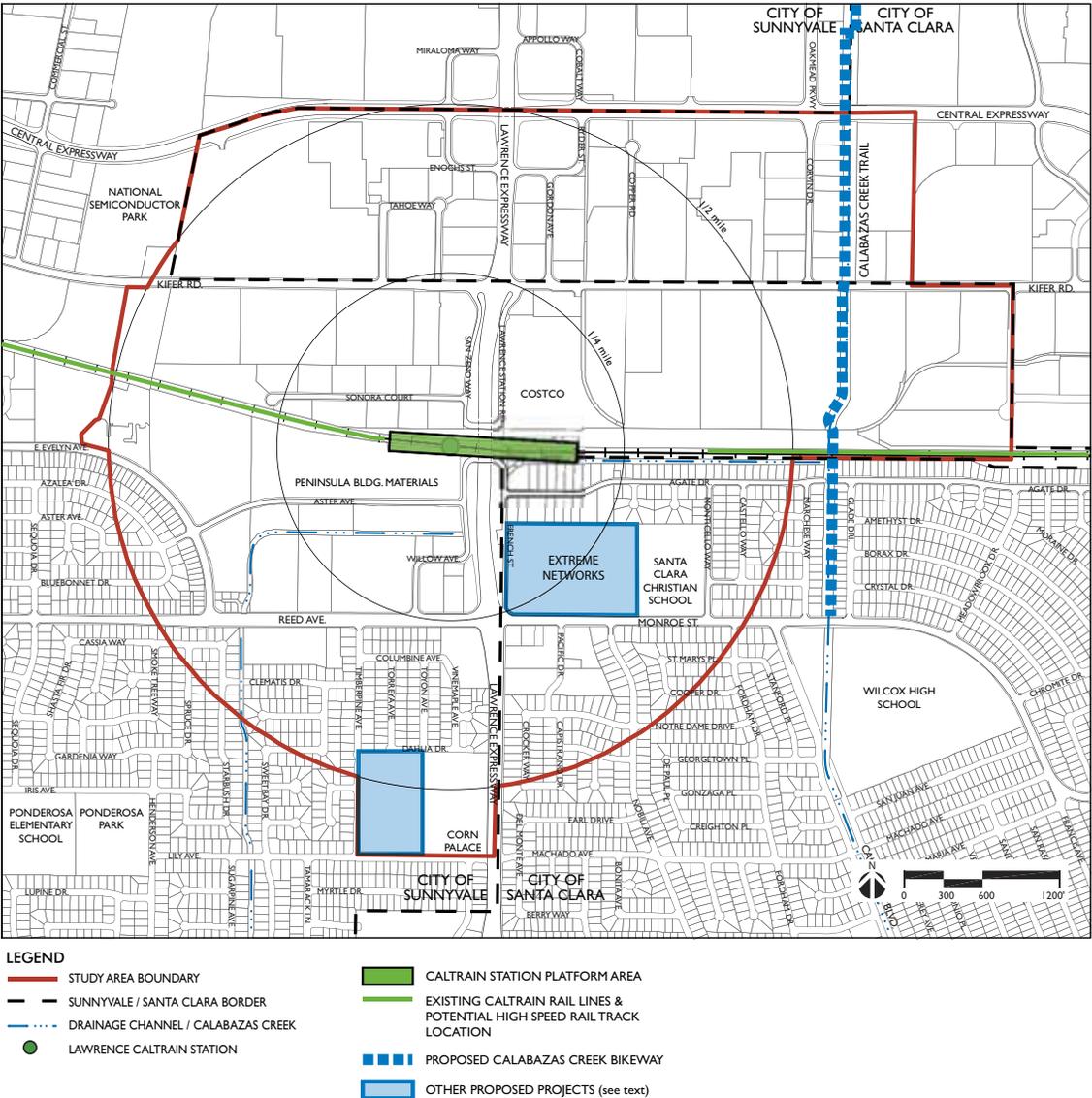
1. Existing land use patterns and densities do not support transit. Today there is a preponderance of low-density, light industrial, one- and two-story uses north of the railroad tracks. These low employment intensity uses are surrounded by surface parking lots. The area south of the tracks is dominated by single-family and some low-density multi-family residential neighborhoods.
2. The individual neighborhoods tend to be separated by overly wide collector streets.
3. There are virtually no services or retail in or near the residential neighborhoods, which requires residents to drive to all destinations.
4. Adjoining the tracks and station, the Calstone/ Peninsula Building Materials site is the only remaining manufacturing/heavy industrial use on the south side of the study area. Its location adjacent to residential uses results in noise and traffic impacts. It is also a poor use to be located directly adjacent to a commuter transit facility.
5. The entire study area, but specifically the residential neighborhoods south of the tracks, lack usable open space in the form of parks or playgrounds.

It is of key importance that the existing residential neighborhoods are protected. This will mean ensuring that these neighborhoods are not

unnecessarily impacted by new development and that amenities such as retail and open space are added that will contribute to their quality of life.

Although few new projects are currently under consideration in the study area, and despite the current economic climate, the age of existing buildings and the low-intensity pattern of development north of Lawrence Station suggest that land use change will be likely in the future. This change should be guided to ensure that the mix of uses and pattern of development supports transit ridership and provides convenient access by all modes (pedestrian, bicycle, transit, and auto) to the station.

Figure 2.5: Proposed and Pending Projects



TRANSPORTATION & CIRCULATION

This section outlines the existing circulation and transportation conditions within the Lawrence Station Area Plan study area and analyzes the existing auto, pedestrian, bicycle and transit facilities.

Travel Characteristics

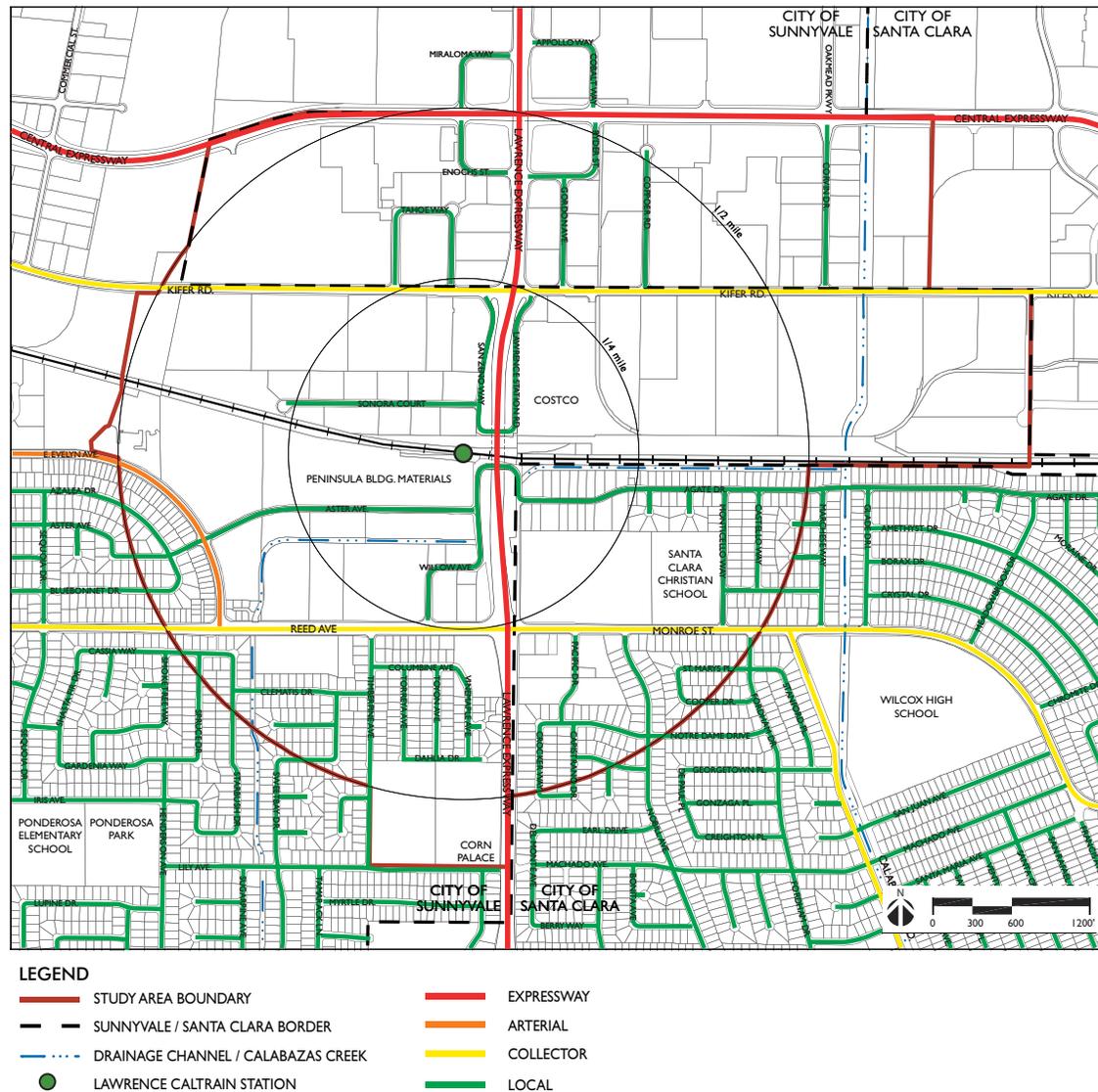
The existing transportation system in Sunnyvale consists of roadways, bicycle and pedestrian facilities, public bus transit system and railroad facilities. Table 2.2 compares the commute characteristics of Sunnyvale residents to those of Santa Clara County, the State of California, and the United States as a whole based on the 2009 American Community Survey (ACS) data. Approximately 85 percent of Sunnyvale residents commute by automobile (includes single occupancy and carpool), which is similar to data for the County but slightly higher than statewide averages.

Sunnyvale’s transit usage is higher than transit usage in Santa Clara County and lower as compared to state and national data. Walking in Sunnyvale represents about 1.5 percent of all commute trips, which is lower than that for the County, State and Nation. The ACS results also indicate that Sunnyvale is comparable to Santa Clara County in the work-from-home category. While the 2009 ACS data groups bicycling with taxis and motorcycles, the 2005 to 2009 ACS 5 year estimates illustrate that approximately 1 percent bicycle to work in Sunnyvale; this is lower than the 1.4 percent countywide average but higher than both California and the United States, at 0.9 percent and 0.5 percent respectively.

Table 2.2: Journey to Work Travel Characteristics - City of Sunnyvale Residents

Commute Mode Choice	Sunnyvale	Santa Clara County	California	United States
<i>Single-Occupant Automobile</i>	75.4%	75.7%	73.0%	76.1%
<i>Carpool</i>	10.5%	11.0%	11.6%	10.0%
<i>Public Transit</i>	4.5%	3.2%	5.2%	5.0%
<i>Bicycle*</i>	1.0%	1.4%	0.9%	0.5%
<i>Walk</i>	1.5%	2.1%	2.8%	2.9%
<i>Work At Home</i>	4.5%	4.5%	5.1%	4.3%
<i>Other</i>	2.6%	2.1%	1.4%	1.2%
Source: American Community Survey, 2009. * ACS 2005-2009 5 year estimates; ACS 2009 does not have bicycle mode share as a separate category				

Figure 2.6: Roadway Types & Classifications



While the ACS data illustrates one aspect of travel patterns (i.e. for commuters), it is important to understand because commute trips make up a significant proportion of traffic volumes during peak periods.

Roadway Network

Sunnyvale consists of approximately 300 miles of roads including 13 miles of freeways/expressways, 35 miles of arterials, 58 miles of collectors and 194 miles of local streets. Caltrans owns and maintains the freeways, the County of Santa Clara operates the expressways. Lawrence Expressway is a major north-south corridor within the City, in addition to SR 85, Mathilda Avenue/Sunnyvale-Saratoga Road, and Fair Oaks Avenue/Wolfe Road. East-west corridors within the City include SR 237, US 101, Central Expressway, SR 82 and I 280.

Roadway Types and Classifications

Roadway types and classifications in and around the study area are illustrated on Figure 2.6. The three regional roadways that run through Sunnyvale are US 101, SR 237 and SR 85. US 101 consists of three mixed flow lanes and one high occupancy vehicle lane in each direction within Sunnyvale. The HOV lanes are restricted to two or more persons or motorcycles between 5:00 AM to 9:00AM and 3:00PM to 7:00PM. SR 85 is another north-south freeway that has two mixed flow lanes and one HOV in each direction within Sunnyvale. SR 237 provides access east/west with two mixed flow lanes and one HOV lane in each direction within the City. The Lawrence Caltrain Station is located south of US 101 and north of SR 85 and SR 237.

Expressways

Expressways have high operating speeds and provide mobility throughout the City. Lawrence Expressway runs directly through the station area, has a current 50 mph speed limit, and has HOV lanes that operate from 6:00 to 9:00 AM and 3:00 to 7:00 PM. According to the Countywide Expressway Study update in 2008, Lawrence Expressway has the best performing HOV lanes, meeting all performance measures in the PM, southbound direction, except violation rate, and is very close to meeting all measures in the other direction (measures include: persons/HOV lane, productivity ratio, HOV vehicle peak hour, seconds saved per mile, etc.). According to the VTA 2010 Congestion Management Program Monitoring and Conformance Report, travel times on Lawrence Expressway increased for the AM northbound and PM southbound direction from 2008; meanwhile, the AM southbound direction recorded a decrease in travel time and the PM northbound direction recorded the same travel time as in 2008. Average travel speeds on Lawrence Expressway from 2005 to 2008 were in the 25 to 33 mile per hour range, comparable to most other expressways in Santa Clara County.

Arterial streets

There are no designated arterial streets in the study area.

Collector streets

Collectors provide internal traffic movement access and enhance connections to arterial streets within Sunnyvale. They often provide access to properties. For example, within the study area Kifer Road provides access to commercial properties and Reed

Avenue and Monroe Street both provide residential property access.

Local streets

Local streets have a primary purpose to provide access to adjacent properties and generally have low speeds. These streets typically are configured with two travel lanes and often contain parking lanes on one or both sides.

Lawrence Station Access

Lawrence Station is served by a set of poorly connected local streets, with confusing and difficult access. These local streets are confined by the railroad tracks near Lawrence Station and by Lawrence Expressway. On the north side of the railroad tracks, for example, the station can be accessed through limited access intersections on Kifer Road at San Zeno Way and Lawrence Station Road, two-lane streets that form a loop from Kifer Road to the station. Vehicles traveling south on Lawrence Expressway have indirect access to the station by turning left on Kifer and right on Lawrence Station Road.

Similarly, vehicles traveling north on Lawrence Expressway cannot access French Street to get to the Caltrain station, but must turn left on Reed Avenue and right on Willow Avenue. French Street is unique because it is restricted to one-way northbound traffic for half of the block. Vehicles can access French Street from Monroe Street traveling towards the station, however, vehicles leaving the station can only travel south for half of the street length before it becomes one way, restricting vehicles from connecting back to Monroe Street. This vehicle circulation is indirect,

confusing, and inconvenient for vehicles, bicyclists and pedestrians.

Planned Roadway Improvements

The City of Sunnyvale's Deficiency Plan indicates that the Lawrence Expressway and Reed Avenue intersection is a Congestion Management Program (CMP) intersection. This intersection, along with Kifer and Lawrence Expressway, are planned roadway improvement projects for grade separation, expected to cost \$118 million according to existing conditions analysis undertaken for the General Plan Land Use and Transportation Element (LUTE) update. The *Comprehensive Countywide Expressway Planning Study* indicates that the interchanges at Lawrence and Monroe and Kifer are Tier 1B projects. The County does not currently have any specific conceptual plans for these interchanges, but they still plan to move forward in the future to mitigate congestion. They will collaborate with Lawrence Station and High Speed Rail plans to ensure any track realignment or new developments connect with potential grade separation designs.

Traffic Volumes

The daily traffic volumes in Table 2.3 represent average weekday volumes collected between 2008 and 2010 as part of the 2011 LUTE update. Comparing these results from the 2011 LUTE to the 1997 LUTE (using 1995 data) shows that Lawrence Expressway has seen an increase in the level of traffic volume it serves. Not all major roadways experienced an increase during this period, such as Fair Oak Avenue and El Camino Real, which continue to serve the same levels of vehicular traffic. According to the LUTE existing conditions analysis, average citywide weekday vehicle miles

Table 2.3: Existing Average Weekday Daily Traffic Volumes

Roadway Segment	Average Daily Traffic Volume
<i>Kifer between Wolfe and Lawrence</i>	9,200
<i>Reed between Wolfe and Lawrence</i>	11,400
<i>Central Expressway between Lawrence and Bowers</i>	40,000
<i>Lawrence between El Camino Real and Reed</i>	71,000
<i>Lawrence between Arques Ave and U.S. 101</i>	67,000
<i>Source: 2008-2010 values from City of Sunnyvale 2010 LUTE Update existing conditions analysis</i>	

traveled were 2.23 million in 2005, decreasing to 1.83 million in 2009 in part due to economic conditions within the City and County.

The 2010 Santa Clara General Plan Draft EIR indicates that Lawrence Expressway, between Kifer Road and Monroe Street, has existing daily average traffic volumes of 68,000 and operates at LOS¹ D. This verifies the data collected by the City of Sunnyvale and presented in Table 2.3. Comparatively, Central Expressway between Lawrence Expressway and Bowers Avenue has 40,000 ADT and also operates at LOS D.

Traffic Conditions (LOS)

The City of Sunnyvale's General Plan specifies LOS as the appropriate analysis method for signalized intersections, which is consistent with the guidelines adopted by VTA in Santa Clara County. This method is based on the average control vehicular delay expressed in seconds per vehicle. The City's current General Plan LUTE identifies the LOS ratings listed in Table 2.4.

Table 2.5 demonstrates the existing LOS at Kifer Road and Reed Avenue at Lawrence Expressway from the CMP Monitoring Report utilizing 2006 data and 2010 where available. The acceptable LOS

standard for CMP intersections is LOS E while the current City standard is LOS D for non-regionally significant roads. However, since Lawrence Expressway is a regionally significant road, the LOS standard is LOS E for the CMP intersections listed in Table 2.5. Consequently, these intersections are operating at an acceptable LOS.

LOS does not consider the potential impact on walking, bicycling and transit. Pedestrians, bicyclists and transit riders are all users of the roadway system but may not be fully recognized in the traffic operations analysis and the calculation of LOS. Identifying the need for intersection improvements based on the resulting LOS can have unintended impacts to other modes such as increasing the crossing distance for pedestrians. In evaluating the roadway system, a lower vehicle LOS may be desirable when balanced against other community values related to resource protection, social equity, economic development and consideration of pedestrians, bicyclists and transit users.

¹ Traffic operations are traditionally measured using a qualitative measure called level of service (LOS). LOS is a general measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving, including indicators such as speed, travel time, traffic interruptions, and freedom to maneuver.

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Roadway Character

The technical analysis of roadways in the study area focused on issues of throughput and vehicular circulation efficiency. Streets do more, however, than move vehicles, passengers and freight. They are elements of a city's public space framework, typically providing more public space than parks and other open spaces. Their design and character contribute to the perception and experience of a city.

With the exception of the local streets in the mature neighborhoods, most streets in the study area give the impression that passing through is of greater importance than experiencing the place as a set of neighborhoods or destinations. The design of the streets - including wide travel lanes, large radius intersections and curb-cuts, dedicated right turn lanes, and widely spaced controlled intersections - prioritizes motorist efficiency but does not create an attractive or memorable streetscape or encourage pedestrian and bicycle circulation to transit. As discussed below (see Pedestrian Network), the area's minimal pedestrian amenities also indicate that this is not a place where pedestrian travel is considered a priority. Improvement to overall street design in many instances will be necessary if the study area is to capitalize on the transit opportunities in the station area.

Table 2.4: Sunnyvale Level of Service Ratings

LOS	Intersection Delay (Seconds)	Traffic Flow Conditions
A	0 - 5	Free flow
B	5 - 15	Some restricted speed
C	15 - 25	Restricted speed; intersection left-turn backups
D	25 - 40	Some extensive delays; little freedom to maneuver
E	40 - 60	Traffic approaching full capacity; some stoppage
F	More than 60	Long stoppages; low operating speeds

Source: 1997 Sunnyvale General Plan LUTE

Table 2.5: Existing Intersection Level of Service (LOS)

Intersection	Count Year	Peak Hour	Average Delay (Second)	LOS
Kifer Road / Lawrence Expressway	2006	AM	21	C
		PM	47	D
Lawrence Expressway / Reed Ave (CMP)	2006 (AM)	AM	58	E
	2010 (PM)	PM	38	D

Source: 2010 CMP Annual Monitoring and Conformance Report; Sunnyvale LUTE Update Existing Conditions Report (2006)

Table 2.6: Automobile Accessibility Characteristics

AUTOMOBILE ACCESSIBILITY CHARACTERISTICS		
	¼ Mile to Lawrence Station	½ Mile to Lawrence Station
Total Households	500	1,860
Average Vehicle per Household	1.60	1.73
Percent households with 0-1 vehicles available	46	42
Source: US Census 2000; Center for Transit-Oriented Development.		
Note: Average Citywide number of vehicles per household is: 1.76 (US Census 2000).		

The table above demonstrates, the average number of vehicles per household within a quarter mile of the Caltrain station, or a typical 5-minute “walk-shed” range, is 1.60. Of these residents, approximately 46 percent have access to either zero or one vehicles. This is important because it demonstrates that much of the existing population within the Station Area depend on non-automobile forms of transportation. Vehicle ownership can be a strong indication of the travel characteristics of the existing neighborhood.

Lawrence Station Parking

The *Caltrain Strategic Plan 2004-2023* identifies the importance of addressing station access needs and finding effective solutions for parking demand. Currently, there are 122 parking spaces at the Lawrence Caltrain station. Observations in early 2011 indicated the average utilization of these spaces is around 10-20 percent.

Generally, the streets surrounding the station area have ample parking opportunities. The local streets south of the Caltrain tracks have fewer restrictions than those to the north. On-street parking restrictions exist on San Zeno Way and Lawrence Station Road to the north of station, however, Sonora Court and the Costco parking lot provide other opportunities for parking. Willow Avenue has partial restrictions, while French Street and Agate Drive have none. Observations indicate that although the Caltrain parking lot does not reach full occupancy, there is spillover into the local neighborhoods and these streets are often near capacity, particularly in the middle of the weekday. This may indicate that Caltrain passengers are parking on surrounding streets to avoid Caltrain parking charges.

Transit Network

Sunnyvale’s low- to medium-density land use pattern tends to disperse jobs and housing. This type of land use pattern creates many challenges to creating an efficient transit system that can compete in time and convenience with automobile travel.

Bus Service

VTA provides bus service in the City of Sunnyvale, and according to the City’s LUTE existing conditions analysis, there are nearly 16,000 citywide daily bus boardings and deboardings in Sunnyvale. No bus routes directly access the station, however two VTA bus routes serve the Lawrence Station study area, and one runs just north of the study area along Arques Avenue:

- VTA Route 32 (Community Route)
- VTA Route 304 (Limited Stop Route)
- VTA Route 328 (Limited Stop Route)

Route 32 runs along Reed/Monroe Avenue and has a stop at Lawrence Expressway. The VTA *Short Range Transit Plan (2010)* identifies this route as a “community” line, which has a standard of 16.7 boardings per revenue hour and provides services to residential streets, community activity centers, and neighborhood/downtown circulators. Route 32 has 22.5 boardings per revenue hour, exceeding VTA’s service standard. Route 32 has 30-minute headways in the morning before about 9:00am and in the afternoons after 3:00pm, with hourly headways in the middle of the day. The bus also runs on Saturdays with one-hour headways.

Routes 304 and 328 provide limited-stop service in the station area. Route 304 runs along Arques

Figure 2.7: Transit Network

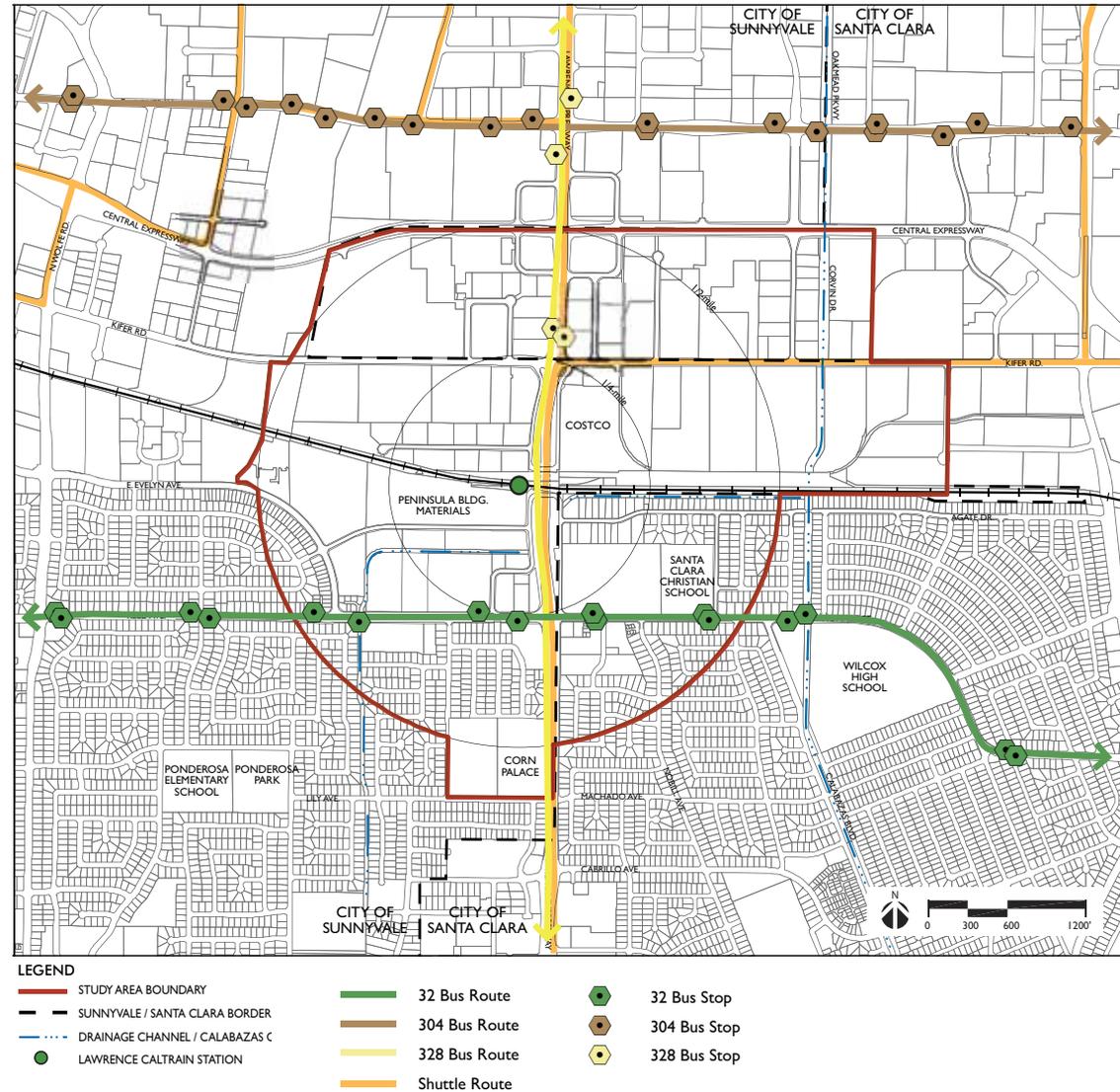


Figure 2.8: Caltrain Average Weekday Boardings

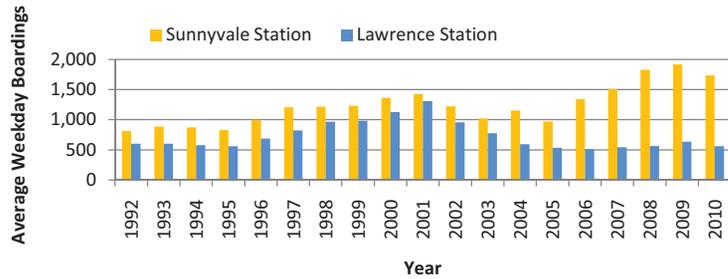


Figure 2.9: Lawrence Station Northbound Boardings and Alightings

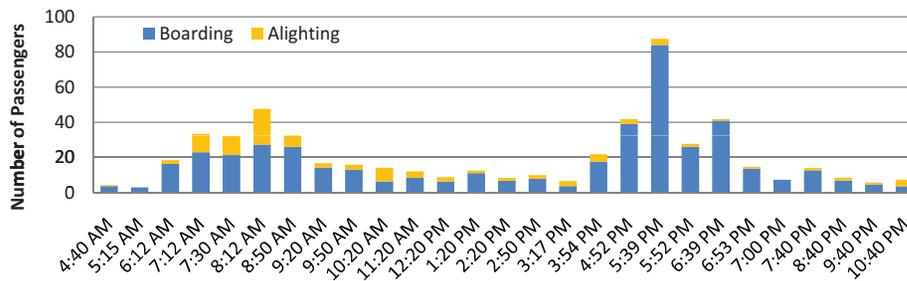
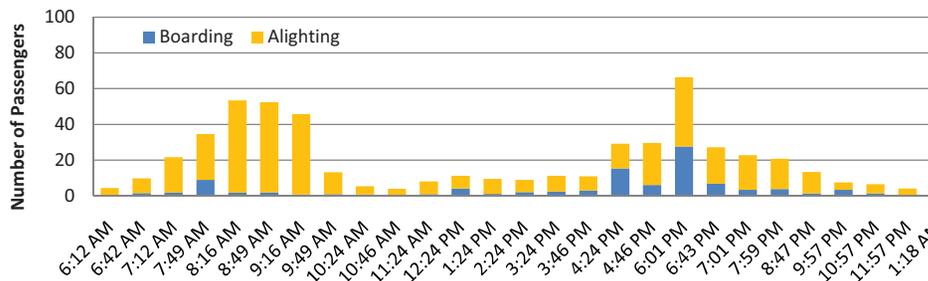


Figure 2.10: Lawrence Station Southbound Boardings and Alightings



Avenue, north of Central Expressway with stops near Lawrence Expressway. Route 304 is a “limited” bus, meaning it has a standard of at least 15 boardings per revenue hour and serves as a commuter-oriented service. Route 304 averaged 16.4 boardings per revenue hour in FY 2009. Four buses run in the morning northbound during the week from 5:55am to 7:23am with 30 minute headways. In the afternoons, buses run southbound from 3:30pm to 5:35pm with 30 minute headways.

Route 328 runs along Lawrence Expressway from either end of the City. The closest stop along this line is just north of Kifer Road. In FY 2009, it averaged 15.7 boardings per revenue hour. VTA operates one bus northbound in the morning starting at 6:00am and one southbound bus starting at 5:06pm during the week.

Caltrain Commuter/Passenger Rail

Caltrain operates two stations within Sunnyvale: the downtown Sunnyvale Station and Lawrence Station. Sunnyvale Station is the busier of the two due to its downtown location and proximity to other City amenities, as well as being a “Baby Bullet” train stop.

Caltrain Ridership Statistics

Since the Baby Bullet express service began providing limited stop express trains to primary destinations on the Caltrain corridor in 2004, average weekday ridership has grown substantially at the Sunnyvale Station while at Lawrence it has remained relatively constant (Figure 2.8). As of the January 2011 Caltrain schedule, the station serves 50 weekday trains.