APPENDIX D

Station Access Profile - Santa Clara Station

VTA's BART Silicon Valley Phase II Extension Project Transit Oriented Communities Strategy Study

Santa Clara Station Profile

Santa Clara Valley Transportation Authority

Solutions that move you

Final Report
August 2019
DRAFT

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Santa Clara Station Profile

The Santa Clara Valley Transportation Authority's (VTA) BART Silicon Valley Extension project includes a 16-mile, six-station extension of the existing San Francisco Bay Area Rapid Transit District (BART) system into Silicon Valley. The extension is being constructed in two phases. Phase I (Berryessa Extension) is the first 10 miles which includes two stations and is currently planned to open in 2019. Phase II is a 6-mile extension, which includes four stations: Alum Rock/28th Street, Downtown San José, Diridon, and Santa Clara.

As part of VTA's BART Silicon Valley Phase II Extension Project (Phase II), VTA and its partner agencies initiated the *Transit Oriented Communities Strategy Study* (TOCs Strategy Study) to plan and subsequently implement access improvements in the Station Areas to enhance multimodal access to the stations.

The station access planning effort includes four phases: **1) background conditions assessment, 2) identification of opportunities and gaps within the transportation network, 3) recommendation of access improvement projects and on-site station requirements, and 4) implementation and next steps**. The station access effort is being undertaken in conjunction and close coordination with a Transit Oriented Development (TOD) element of the study that is funded by the Federal Transit Administration (FTA) to identify opportunities and policies to promote transit-oriented development in the Station Areas and along the project corridor. These efforts will also inform subsequent development of station access designs. This station profile document will be expanded through each of the phases of project development. This version of the station profile document reflects completion of the final phase of the station access planning and background conditions assessment.

Summary of Existing and Planned Transportation Network

The Santa Clara Station is planned for significant redevelopment activity, and serves as a connection to major attractors, such as Santa Clara University, San José Airport, and Avaya Stadium. The existing roadway network connecting these uses is very auto-centric and lacks adequate pedestrian and bicycle networks. The Santa Clara Station will include a variety of supporting facilities to promote a range of access options. Improvements in the station vicinity should focus on pedestrian and bicycle connections since there are very few existing facilities that serve the station. Creating new roadway connections in coordination with planned development will allow for a more complete transportation network.

I. Background Information

A. Station Description and Location

The VTA's BART Silicon Valley Phase II Extension Project (Phase II) Santa Clara Station is located between Coleman Avenue and El Camino Real in Santa Clara, California. The station will share pedestrian access with the existing Caltrain Station. The Santa Clara Station will be the fourth and terminal station on VTA's BART Silicon Valley Phase II Extension. The Santa Clara Station is located approximately 2.7 miles northwest of Diridon Station and 3 miles northwest of the Downtown Station, as shown in **Figure 1**. The Santa Clara Station is planned to include the BART station, vehicular pick-up/drop-off facilities, vehicular parking, bus facilities, bike access facilities, bike parking, pedestrian pathways, and station access roads. **Figure 2** shows the area in the vicinity of the station. **Figure 3** shows the preliminary station plan from the *Final Subsequent Environmental Impact Report* (SEIR).

The station will be at-grade, centered at the west end of Brokaw Road, and will contain an at-grade boarding platform with a concourse one level below. Access to the boarding platform will be provided via elevators, escalators, and stairs covered by canopy structures. The station is planned to have two entrances. The station entrances will be finalized during further design and will be based on BART Facilities Standards and ridership projections. A pedestrian underpass will connect from the concourse level of the BART station to the Santa Clara Caltrain platforms and plaza. In addition, a pedestrian underpass will connect from the station concourse level to a new BART plaza near Brokaw Road. Pick-up/drop-off, bus, and shuttle loading areas will be provided northeast of the Caltrain corridor.

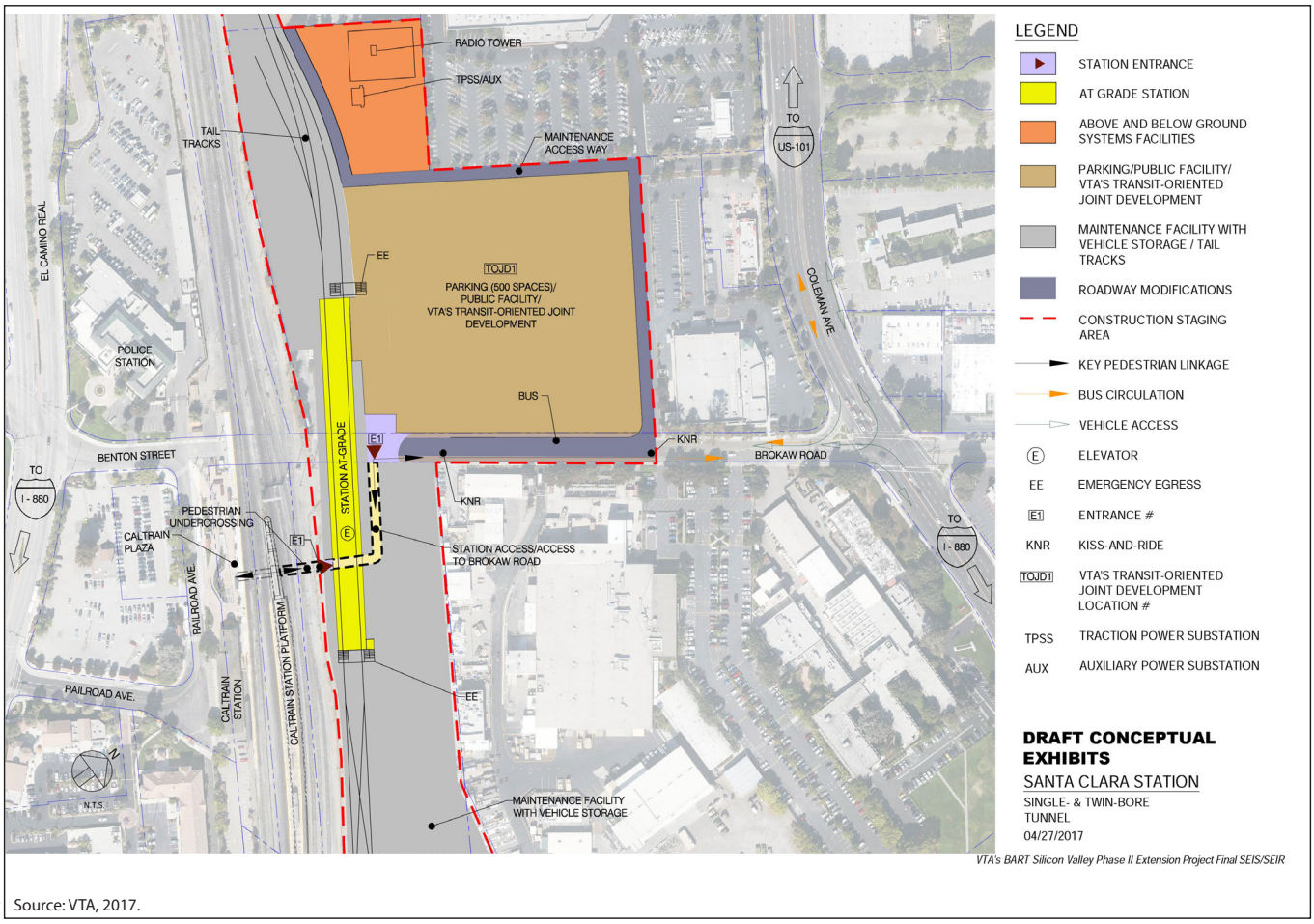
A parking structure of up to five levels will be located north of Brokaw Road and east of the Caltrain tracks within the approximately 10-acre Station Area and will accommodate up to 500 BART park-and-ride (PNR) parking spaces in addition to on-site public facilities.

Figure 1: BART Silicon Valley Phase II Extension

Legend

- Potential Station Entrance Location
- Existing VTA BRT Stop
- Existing VTA Bus Stop
- VTA's BART Phase II Extension Alignment

Figure 2: Station Area



Source: VTA, 2017.

Figure 3: Santa Clara Station Plan from SEIR

B. Background Conditions

1. Previous Planning Efforts

Numerous planning efforts have been completed within the Santa Clara Station Area. The documents summarized below were reviewed and incorporated into the station access planning effort as applicable.

Santa Clara Station Area Plan (VTA, City of Santa Clara, City of San José, August 2010)

The *Santa Clara Station Area Plan* includes land use and transportation planning for a 436-acre area along the existing Caltrain corridor. The Station Area Plan includes the area between Downtown Santa Clara, Santa Clara University, and the Mineta San José International Airport. The Station Area Plan was never formally adopted, but elements are included in the City's General Plan.

The *Santa Clara Station Area Plan* proposes multiple roadway and streetscape improvements. **Figure 4** references the proposed improvements from the *Santa Clara Station Area Plan*.

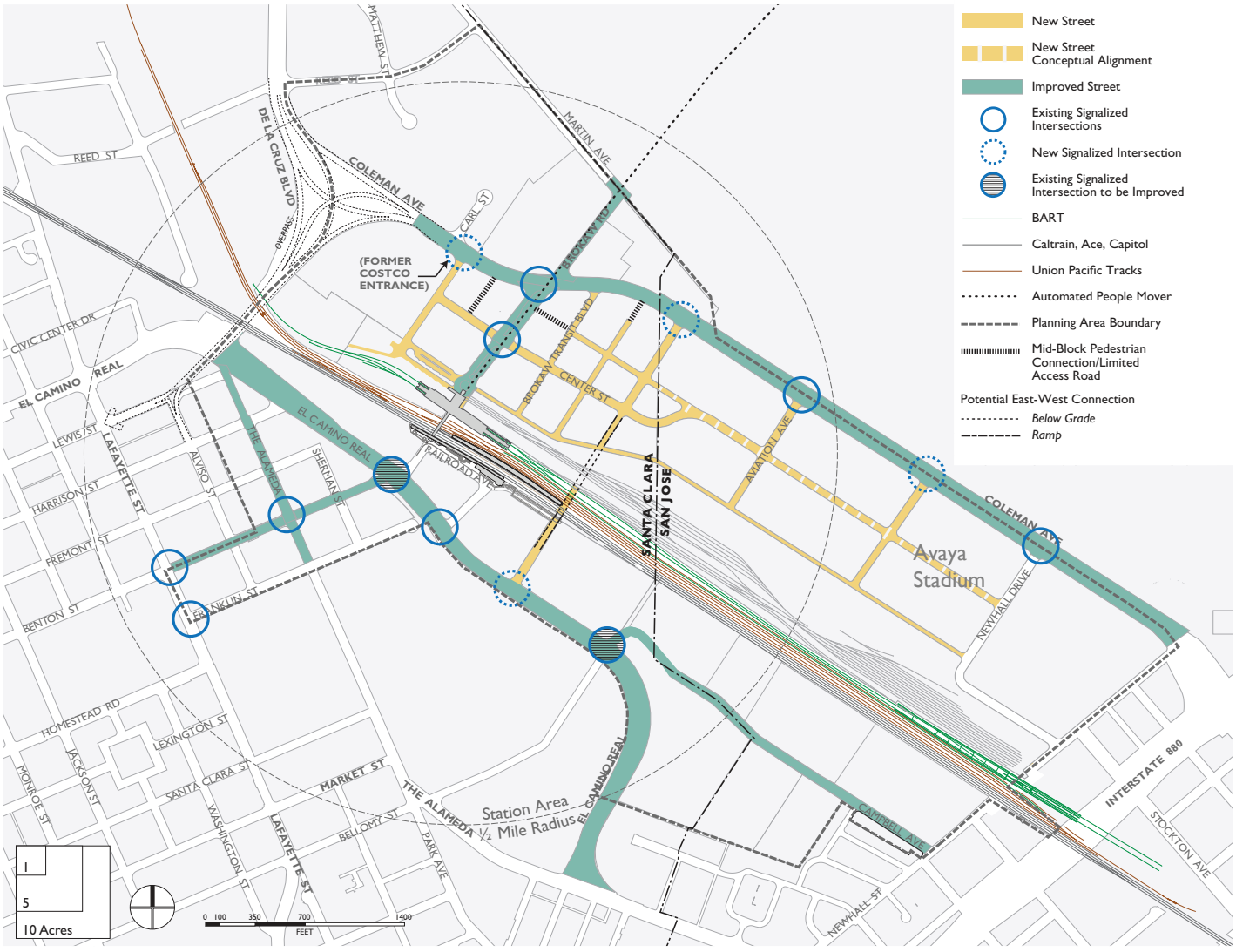


Figure 4: Vision for Internal Street Nework – Santa Clara Station Area Plan

The Plan also identifies several bicycle and pedestrian connectivity improvements. Some key improvements include Class II east-west and north-south bicycle connections to Downtown Santa Clara, Santa Clara University, and along Coleman Avenue. Two pedestrian/bicycle overpasses are proposed: one at Benton Street/Brokaw Road to connect directly to the proposed Santa Clara BART Station, and one along Newhall Street, south of the proposed Newhall Maintenance Facility. Additionally, a pedestrian/bicycle undercrossing was constructed by the VTA to connect El Camino Real to Coleman Avenue just south of the proposed BART Station. **Figure 5** references the potential improvements from the *Santa Clara Station Area Plan*.

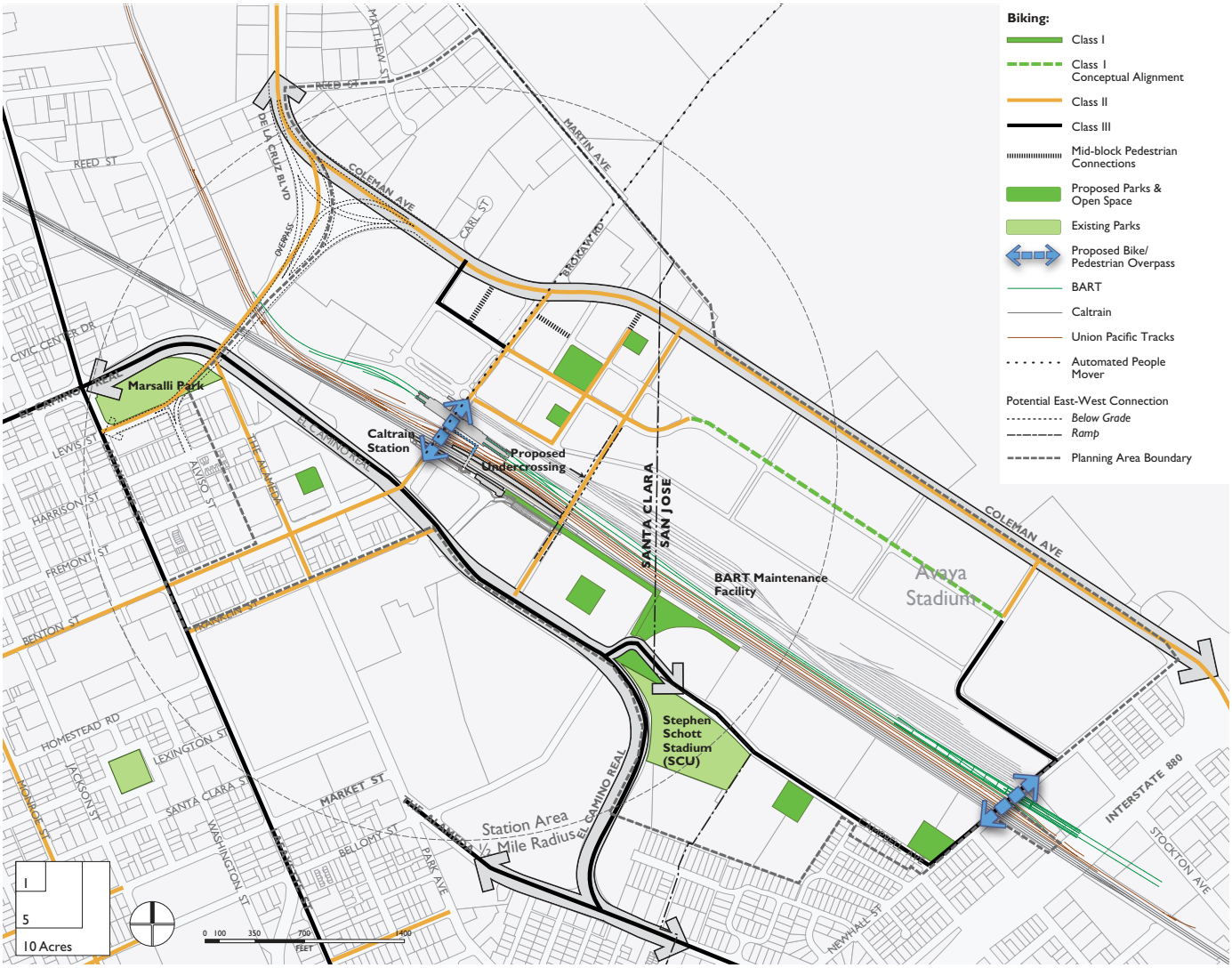


Figure 5: Vision for Pedestrians and Bicycles/Connectivity – Santa Clara Station Area Plan

Bike Plan 2020 (City of San José, 2009)

The *San José Bike Plan 2020* recommends policies, programs, and action items that defines a network of on- and off-street bikeways in San José with a goal of making bicycling in San José more safe, convenient, and common. The plan states that, by 2020, it aims to complete 500 miles of bikeways, achieve a mode share of 5% for all trips taken by bike, reduce the bicycle collision rate by 50%, add 5,000 bike parking spaces, and achieve Gold-level Bicycle Friendly Community status. *Bike Plan 2020* identifies a 500-mile bikeway network, bike parking, support facilities, and rideshare program to implement, and provides recommendations on ways to combine travel via bike and transit as well as best practices and education and enforcement strategies. The Plan identifies action items that should be taken to expand and connect the existing network, eliminate barriers and gaps for bicyclists, provide bicycle-friendly signals and pavement markings, and maintain bicycle facilities. The Plan provides a comprehensive list of proposed bikeway projects, organized by implementation priority as well as a map of existing and proposed bicycle facilities. The City is currently in the process of updating this document. Within the Santa Clara Station Area, the Bike Plan recommends a Class II bike lane on Coleman Avenue to the north of where the existing bike lane ends and a Class II bike lane on the proposed east-west connection between The Alameda and Coleman Avenue.

Better Bikeways (City of San José, current)

The City of San José is rapidly implementing better bikeways throughout the City through this program. The City is using protected bike lanes and calm streets to create a better bikeways network by the end of 2019. Just outside the 1 1/2 mile bikeshed, a better bikeway is recommended on W. Hedding Street as a long-term project, but no projects are currently proposed within the study area.

Bicycle Master Plan Update (City of Santa Clara, current)

The City of Santa Clara is currently in the process of updating its Bicycle Master Plan. The Plan will provide the City with a blueprint for investment in projects and programs that will make bicycling feel safer within Santa Clara and a healthier community. The Plan is currently scheduled to be completed in 2019.

Countywide Bicycle Plan (VTA, 2018)

The purpose of the VTA *Countywide Bicycle Plan* is to create a countywide bicycle network that is safe, convenient, and connected – enabling people of all ages and abilities to easily bike to work, school, shopping, transit, and elsewhere. The Plan updates the 2008 *Countywide Bicycle Plan* and expands the network of Cross County Bicycle Corridors (CCBCs) to include low-stress bikeways, describes a vision of ten connected bicycle superhighways, updates the list of Across Barrier Connections (ABCs), and prioritizes CCBCs and ABCs using criteria approved by the VTA Board of Directors. The CCBCs identified in the study area are: Coleman Avenue, El Camino Real, Brokaw Road, Benton Street. In addition, the Plan emphasizes that major transit stops in Santa Clara County should be served seamlessly by high-quality bikeways. Transit vehicles should provide bicycle accommodations and rail stations and transit centers should have adequate secure bicycle parking.

Envision 2040 General Plan (City of San José, 2018)

The City's General Plan, which is currently being updated, includes transportation network designations and transportation policies. One of its major strategies is designing streetscapes for people, which includes turning seven streets into "Grand Boulevards" to connect neighborhoods and contribute to the City's identity through their design. The seven boulevards are North First Street/Monterey Highway, Capitol Avenue/Capitol Expressway, Alum Rock Avenue/Santa Clara Street/The Alameda, San Carlos Street/Stevens Creek Boulevard, Meridian Avenue, Winchester Boulevard, and Saratoga Avenue. Transit service will be a primary mode on Grand Boulevards. Transportation policies include working toward a balanced transportation system, increasing the focus on walking and bicycling, maximizing public transit usage, improving vehicular circulation, and improving parking and intelligent transportation systems (ITS).

2010-2035 General Plan (City of Santa Clara, 2010)

The City of Santa Clara General Plan presents the vision for the evolution and enhancement of the Santa Clara community through the year 2035. The General Plan's vision is long-range and is supported by strategies and policies to deal with changing priorities and development pressures that the City will experience. The City's General Plan has nine focus areas including the Santa Clara Station Focus Area. The goals for the Santa Clara Station Area Focus Area are: development that capitalizes on transit and results in high-intensity uses, a mix of uses, a link between the Santa Clara Station and a variety of transit options, and pedestrian and bicycle circulation within the Focus Area with transit and vehicular priority to access the station. De La Cruz is a future focus area scheduled to begin planning in 2023 and is near the Santa Clara Station Focus Area.

Pedestrian Master Plan (City of San José, 2008)

The *San José Pedestrian Master Plan* is a companion document to the ADA Transition Plan Update for Sidewalks. The Plan compiles and recommends additions/changes to the City's pedestrian standards, policies, procedures and practices. Key recommendations as they relate to the Access Planning Study for the Santa Clara Station Area are summarized below:

- Continue traffic calming program
- Continue the City's Safe Street Initiative
- Develop methodology for prioritizing pedestrian infrastructure improvements
- Incorporate pedestrian needs into the City's development review process
- Provide walking maps of San José's neighborhoods
- Install wayfinding signage in areas with high pedestrian activity

The document largely outlines policies and procedures, rather than providing specific pedestrian and access-related project recommendations.

Pedestrian Master Plan 2040 (City of Santa Clara, 2018)

The City of Santa Clara is currently in the process of developing its first *Pedestrian Master Plan*. The ultimate goal of the plan is to make walking a more viable and safe transportation option for the entire community. The final plan is scheduled for completion late 2019.

Complete Streets Design Standards & Guidelines (City of San José, 2018)

The *San José Complete Streets Design Standards & Guidelines* have been developed as a guide for the design of San José streets to be safe, efficient, and convenient for users of all modes of travel and all abilities and were adopted as part of the city's transportation planning and policies in 2018. San José complete streets have a goal of being people-oriented, connected, and resilient. As shown in **Figure 6**, the document provides example cross-sections based on street type and details the street design process from identifying and designing for target speed, design hour, year, vehicle, and prioritizing modes by street type. **Figure 6** also depicts the cross-section of a typical Grand Boulevard, which is the designated classification of The Alameda. This document details specific design elements of mixed flow travel lanes, various bicycle facilities, sidewalks, transit facilities, on-street parking facilities, traffic calming measures, stormwater facilities, and green infrastructure elements. Intersection design principles, sidewalk and walking design principles, and bikeway design principles are also detailed in this document. The *Complete Streets Design Standards & Guidelines* should be referenced for specific dimensions of multimodal complete streets within San José.

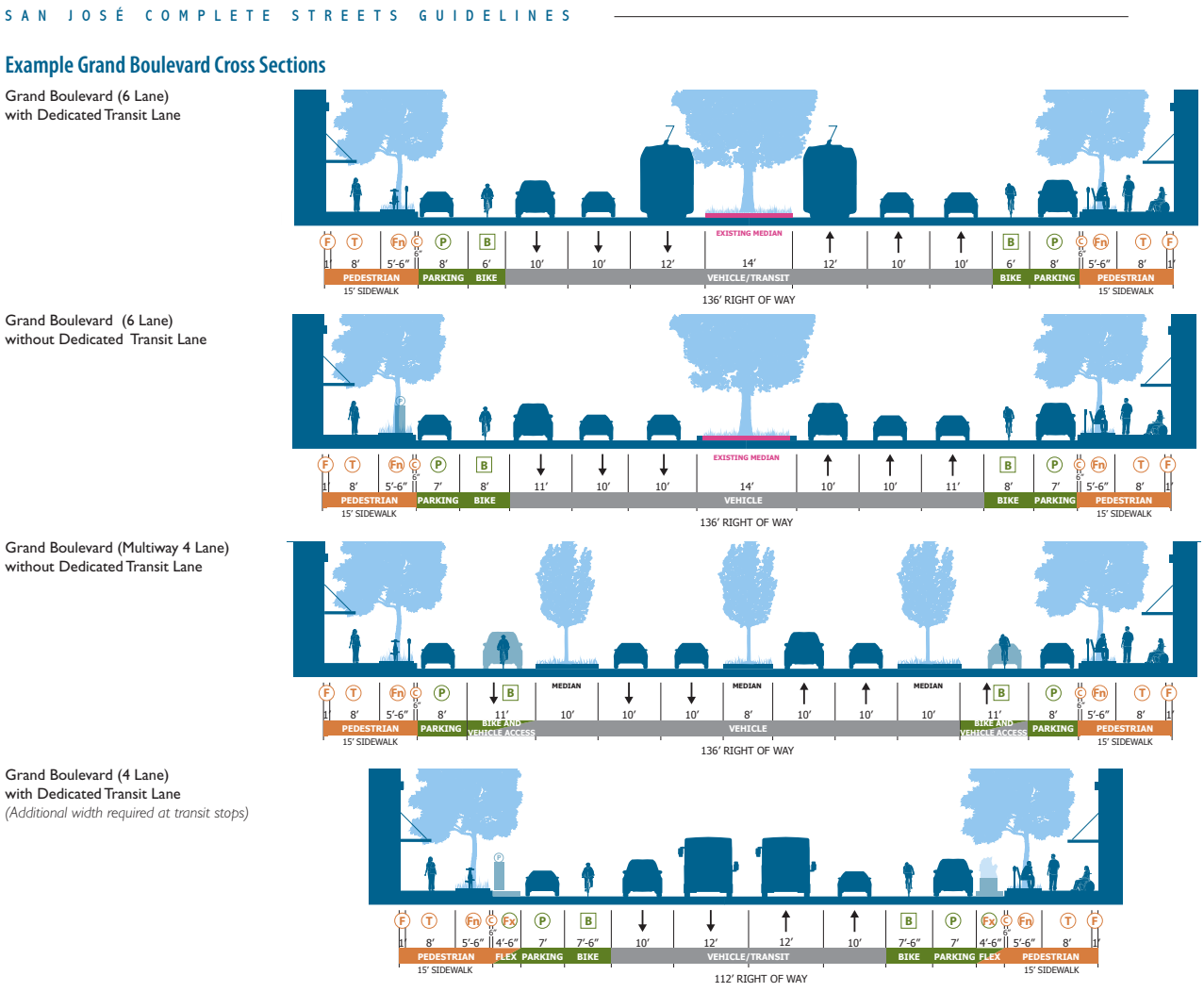


Figure 6: Example Cross-section from Complete Street Guidelines

Pedestrian Access to Transit Plan (VTA, 2017)

VTA's *Pedestrian Access to Transit Plan* aims to "improve the safety, comfort, and convenience of the walking environment for VTA's customers." The Plan integrates recommendations and guidelines from local plans and aims to address the gaps in planning efforts to connect pedestrians to transit. The Plan identifies 12 focus areas, none of which are directly related to the Santa Clara Station but is pertinent to the TOCs Strategy Study.

2019 New Transit Service Plan (VTA, 2019)

VTA has engaged in a years-long process to improve its transit network and effectively connect with Phase I of the BART Silicon Valley Extension. The 2019 New Transit Service Plan (known earlier as Next Network) is expected to be implemented when Phase I begins operation. The Transit Service Plan:

- Increases service levels in high-ridership areas and decreases service levels in low-ridership areas
- Increases frequencies on many routes
- Expands the number of Rapid Routes
- Increases the number of residents and jobs with access to frequent service by 150,000 and 160,000
- Extends service later in the evening on many routes and adds more service on weekends

Valley Transportation Plan 2040 (VTA, 2014)

The Valley Transportation Plan 2040 (VTP) is the long-range transportation plan for Santa Clara County. The objectives of the VTP are (1) to facilitate the creation and support of an integrated multimodal transportation system that serves all socio-economic groups efficiently and sustainably, (2) to pursue, develop, and implement advances in technology, management practices, and policies, and (3) to be the region's foremost advocate for transportation projects, programs, and funding. The VTP identifies 21 transit capital projects for implementation. In addition to the BART Extensions, notable projects that impact the Access Planning Study Area include:

- Caltrain Electrification (Project T13)
- Mineta San José International Airport APM Connector (Project T18)

Multimodal Transportation Investments (MTI) are also included in the *Valley Transportation Plan 2040*. MTI includes projects from Transportation Systems Operations and Management (TSOM), Bicycle Expenditure Program (BEP), streetscape components, pedestrian improvements, and Community Design & Transportation (CDT) Program. The BEP includes over 120 projects, of which the following are within the related to TOCs Strategy Study:

- Multi-use path along the northside of Airport Blvd. from the Guadalupe River Trail to Coleman Avenue (Project B12)
- Brokaw-Coleman Airport Bikeway. Class II Bikeway, and Class I multi-use path connecting Airport Boulevard and the Guadalupe Trail to Airport Boulevard and Coleman Avenue (Project B18)
- Newhall Street Bike/Pedestrian Overcrossing over Caltrain tracks (Project B30)
- Santa Clara Caltrain Station Undercrossing Extension (Project B69)
- De La Cruz Blvd. bike lanes from Central Expressway to Brokaw Road (Project B107)

Caltrans District 4 Bike Plan (Caltrans, 2018)

Freeways and state highways play a substantial role in the comfort and ease of bicycling, given that they are difficult to either ride on or to cross. With nearly 1,400 miles of state highway facilities in District 4, Caltrans is responsible for ensuring that its facilities do not present significant barriers for those choosing non-auto modes. The Caltrans District 4 Bike Plan analyzes existing conditions and proposes a list of improvements, categorized by priority, that would lead to greater rider comfort and safety while using or crossing state-owned highway facilities.

Within the station area, the Bike Plan recommends replacing free-flow highway on- and off-ramps with stop-controlled ramps and providing Class I or IV protected bike lanes through the following interchanges:

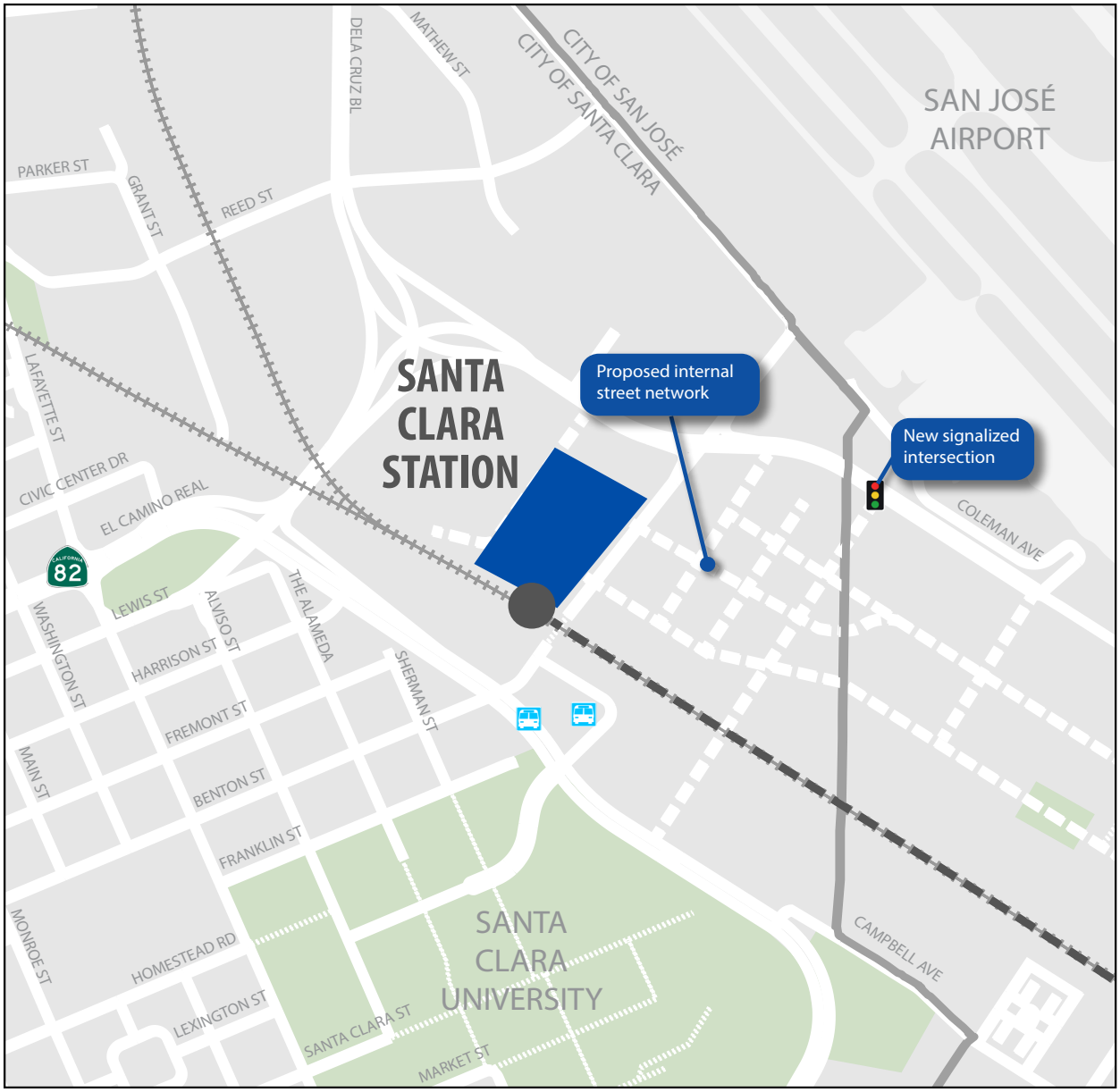
- I-880 and The Alameda
- I-880 and Coleman Avenue

FAST Transit Program (VTA, Ongoing)

VTA's Fast Transit Program identifies several strategies that will be considered by VTA and by the Cities of San José and Santa Clara to improve transit vehicle speeds and reduce passenger delay. Those that could be enacted by VTA include allowing boarding at all bus doors, converting to a headway-based rather than time-based schedule to reduce delay for passengers on ahead-of-schedule buses, and expanding market penetration of Clipper cards among the system's most active riders.

Strategies that could be undertaken by the cities, or with collaboration between the cities and VTA are: the implementation of transit signal priority; consolidation or elimination of redundant stops, with a minimum stop spacing of 800'; installation of bus boarding islands; and piloting of tactical transit lanes, which are bus lanes used over short segments of road for a pre-determined amount of time.

Figure 7 shows a summary of the previous planning efforts.



Legend

- Recommendation from Santa Clara Station Area Plan
- Existing VTA BRT Stops
- City Boundary
- VTA's BART Phase II Extension Alignment

Note: City of Santa Clara sidewalk data not available
Sources: City of San José, Santa Clara County

Figure 7: Previous Planning Efforts Summary

2. Agency Policies

VTA, the City of San José, the City of Santa Clara, and BART all have developed policies and guidelines that are summarized below which were reviewed and incorporated into the station access planning effort as applicable.

Station Access Policy (BART, 2016)

The *BART Station Access Policy* is designed to support the broader livability goals of the Bay Area, reinforce sustainable communities, and enable riders to get to and from stations safely, comfortably, affordably, and cost-effectively. Goals of the *Station Access Policy* are to increase safety, cost efficiency, and public health, and reduce greenhouse gas and pollution emission through improvement of station access, particularly by sustainable modes of transportation. The *Station Access Policy* establishes strategies for systemwide access mode shift to reduce drive alone rates, invest in pedestrian and bicycle assets with a focus on BART property, partner to advance projects off BART property, and plan all BART facilities to be accessible to all users, including users with disabilities. The TOCs Strategy Study serves as the framework to achieve these established goals.

Multimodal Access Design Guidelines (BART, 2017)

The *BART Multimodal Access Design Guidelines* (MADG) aims to provide easy-to-use guidance and recommended standards for pedestrian, bicycle, transit, and vehicle access planning within BART's Station Areas. The goals are to generate more riders, promote healthy communities, increase efficiency and productivity, and provide a better passage experience, provide equitable service, be an innovation leader. BART station access design hierarchy is shown in **Figure 8**.

The MADG includes design standards for sidewalk zones, accessible paths, bikeways, adjacent network connections, station entrance and exit, bus stops, passenger pick-up and drop-off - parallel curbside and angled loading zones. The document summarizes the dimensions for pedestrian facilities, bicycle facilities, bus facilities, street facilities, and parking facilities. The Santa Clara Station is anticipated to be a balanced intermodal station type, as it will have parking, but investments should be focused on pedestrian and bicycle activity. The BART Station Access Framework is shown in **Figure 9.** The MADG will be an input to guide the design of pedestrian and bicycle facilities within the Station Area.

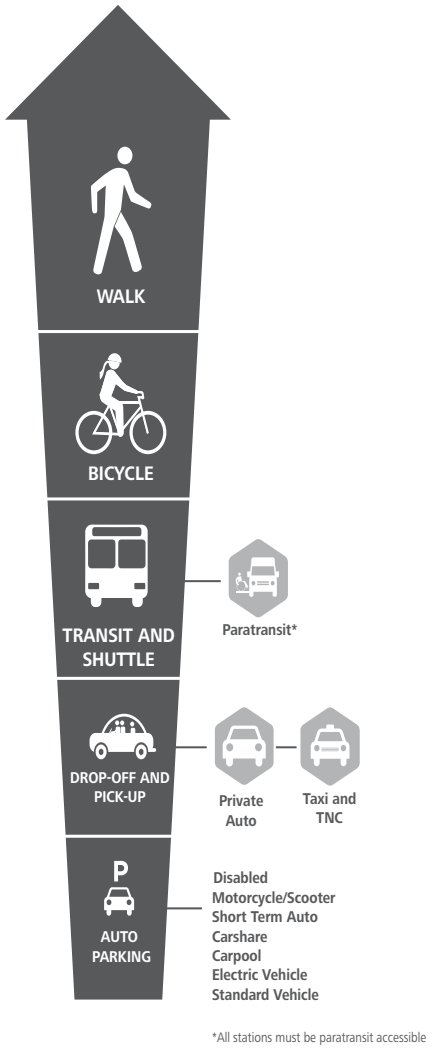


Figure 8: BART Access Hierarchy

Vision Zero (San José, 2015)

San José's Vision Zero uses the 4E's (engineering, enforcement, education, and evaluation) approach to achieving their goal of zero traffic fatalities. The engineering highlights that are most relevant to the Access Planning Study include:

- Install 20 enhanced crosswalks annually on major streets with pedestrian-activated flashing beacons and with center safety islands or curb extensions to decrease street crossing widths
- Construct major "complete street" improvements along Park Avenue, and The Alameda
- Install 70 miles of new and enhanced bikeways to assist in the goal of completing an interconnected 500-mile bikeway network by 2020.

STATION TYPE	PRIMARY INVESTMENTS	SECONDARY INVESTMENTS	ACCOMMODATED	NOT ENCOURAGED
URBAN	Walk, Bicycle	Transit and Shuttle	Taxi and TNC, Drop-Off and Pick-Up	Auto Parking*
URBAN WITH PARKING	Walk, Bicycle	Transit and Shuttle	Taxi and TNC, Drop-Off and Pick-Up	Auto Parking*
BALANCED INTERMODAL	Walk, Bicycle	Transit and Shuttle, Drop-Off and Pick-Up	Taxi and TNC, Auto Parking*	
INTERMODAL/ AUTO RELIANT	Walk	Bicycle, Drop-Off and Pick-Up, Transit and Shuttle	Taxi and TNC, Auto Parking*	
AUTO DEPENDENT	Walk	Bicycle, Drop-Off and Pick-Up, Auto Parking*, Transit and Shuttle	Taxi and TNC	

Figure 9: BART Station Access Investment Framework

VTA Complete Streets Policy (VTA, 2017)

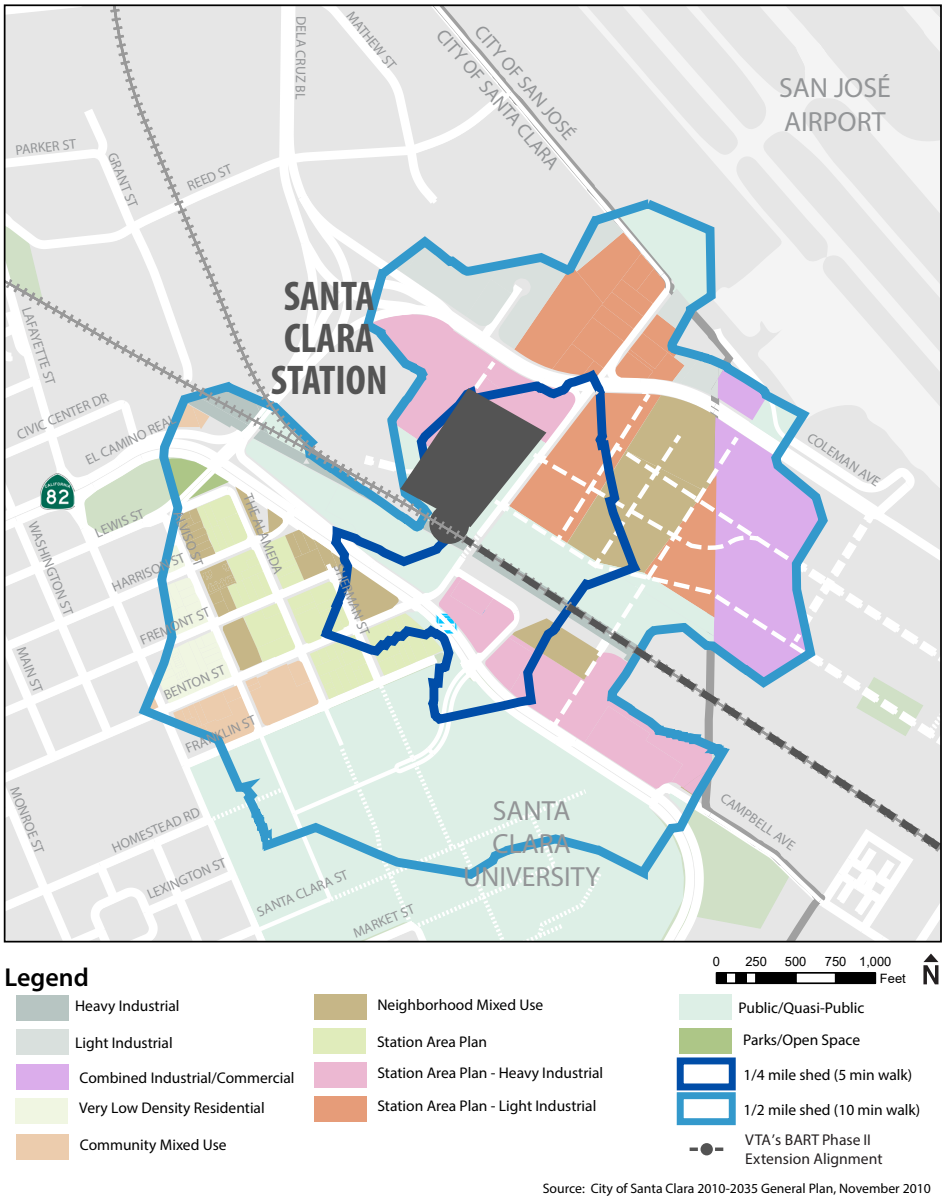
Adopted in 2017, VTA's Complete Streets Policy formalizes the Complete Streets approach in the planning and delivery of VTA's future transportation infrastructure projects. As defined by VTA, a Complete Streets approach requires the following aspects:

1. Serve all users of the roadway, including pedestrians, bicyclists, and transit riders
2. Use context-sensitive design
3. Maintain or enhance network connectivity
4. Incorporate technology to improve operations and enhance safety of all roadway users
5. Are consistent with adopted plans
6. Maintain transportation infrastructure
7. Seek and respond to public input
8. Integrate Complete Streets infrastructure into transportation projects
9. Design using best practice guides and standards

C. Land Use Context

The key land uses near Santa Clara Station are mixed-use and commercial in the historic downtown and the public/quasi-public uses at Santa Clara University and San José Airport. The surrounding area is mixed-use and residential uses. The San José Airport near the station restricts height and potential for density. It also has an impact on noise levels.

Planned development of the Station Area includes higher intensities of regional and commercial mixed-use near the station, capitalizing on the regional transit. This includes an emphasis on office, hotel, and residential uses. Buildings should stepdown in height and intensity towards the historic downtown area to the west to respect the existing scale of development. Major development is ongoing on the Coleman Avenue to the southwest of the Station and a mixed-use project is being planned by VTA on the existing Caltrain lot.



Source: City of Santa Clara 2010-2035 General Plan, November 2010

Figure 10: Planned Station Area Land Use

D. Santa Clara Station Ridership Forecasts

VTA uses a four-step travel demand model, called the C/CAG-VTA Model, that is optimized for the counties of Santa Clara and San Mateo and accounts for transportation impacts from neighboring counties and regional commute shed. The model is based on the BAYCAST-90 travel forecasting system used by the Metropolitan Transportation Commission (MTC).

The travel demand model provides mode of access and egress at each station. The modes of access vary at each station; at the Santa Clara Station, riders will arrive by foot, bicycle, local bus, BRT, or auto. Those arriving by auto may either be using the park-and-ride (PNR) or pick-up/drop-off facilities. The model forecasts transfers between each of the modes of access.

The number of passengers by mode of access is shown in **Table 1** and **Figure 11**. The figure depicts the directional transfers during the morning period. The number of directional transfers for the afternoon period is assumed to be the reverse of the morning period.

The Santa Clara Station Station Area is primarily occupied by industrial uses, Santa Clara University, and single-family residential. This station is generally balanced, serving both as an inbound station for Santa Clara University and nearby employment as well as an outbound station for nearby residential uses.

TABLE 1: FORECAST YEAR 2035 DAILY STATION BOARDINGS AND ALIGHTINGS

	Opening Day	2035
Boardings + Alightings	~7,000	~11,200

Source: VTA's BART Silicon Valley Phase II Extension Project Final Subsequent Environmental Impact Report, 2018

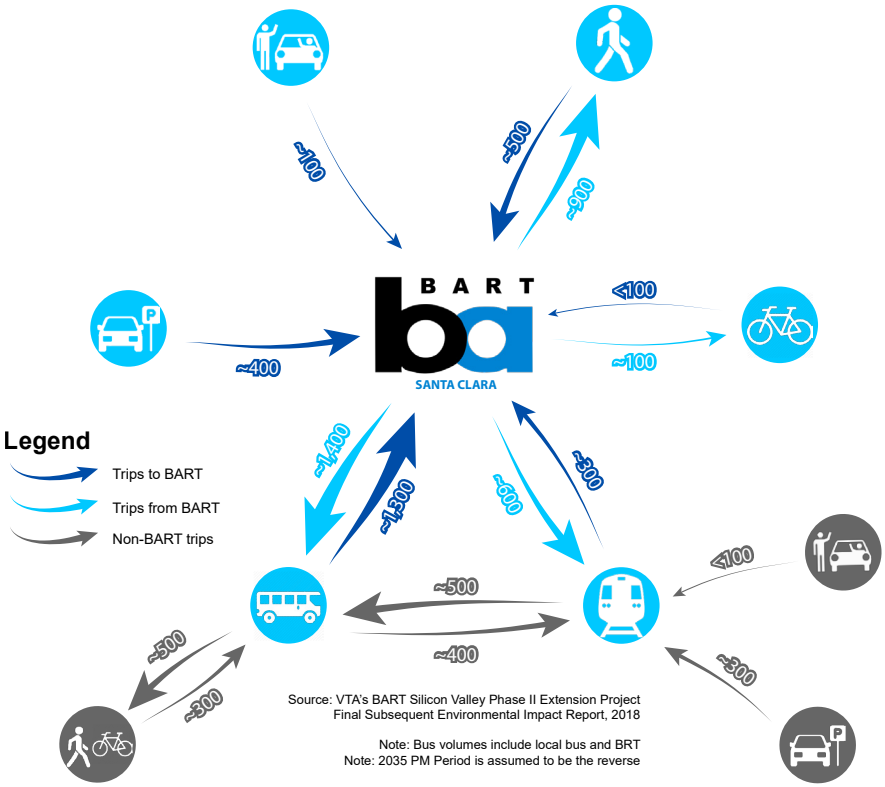


Figure 11: Forecast Year 2035 AM Period Station Boardings and Alightings

II. Existing and Planned Transportation Network

A. Auto

Vehicle access to the Santa Clara Station park-and-ride (PNR) and pick-up/drop-off facilities will use Coleman Avenue and/or El Camino Real, two principal arterials that run east-west and are located to the east and west of the Santa Clara Station. A parking structure of up to five levels would be located north of Brokaw Road and east of the Caltrain tracks within the approximately 10-acre station site and would accommodate up to 500 BART PNR parking spaces. From the north/east, vehicles can access Coleman Avenue via the US-101/W Trimble Road interchange and De La Cruz Boulevard and the I-880/Coleman Avenue interchange. From the south/west, vehicles can access El Camino Real via the I-880/The Alameda interchange and San Tomas Expressway. El Camino Real is located west of the Santa Clara Station across the rail tracks; vehicles will circulate the pick-up/drop-off and park-and-ride facilities through two signalized intersections: Franklin Street and Benton Street. Coleman Avenue is located east of the Santa Clara Station, and provides direct access to the frontage of the station via a signalized intersection at Brokaw Road. Within the Station Area, De La Cruz Boulevard is the only roadway that crosses the railroad tracks. **Figure 12** shows the existing roadway network in the station vicinity.

Existing cross-section of Coleman Avenue east of Brokaw Road

B. Transit

Existing Transit Network

In the vicinity of the Station Area, VTA operates local, BRT, and Express bus service within the Station Area. Local and BRT service provide direct access to the station via the access loop on Railroad Avenue. Local Routes 10, 22, 32, 60, and 81 have stops along Railroad Avenue, and Local Route 10 also provides access on Coleman Avenue at Brokaw Road. Route 10 is a free shuttle service that provides access between the existing Santa Clara Caltrain Station, the San José airport, and VTA LRT. Route 22 is an east-west route that provides access between the Palo Alto Transit Center and Eastridge Transit Center via El Camino Real. Route 32 is an east-west route connecting destinations between the San Antonio Shopping Center and Santa Clara Transit Center. Route 60 is a north-south route connecting destinations between the Winchester Transit Center in Campbell and the Great America LRT Station. Route 81 is an east-west route that connects destinations between the existing Santa Clara Caltrain Station and the Moffett Field/Ames Center. BRT Route 522 provides direct access to the station via the access loop on Railroad Avenue, and serves destinations between the Eastridge Shopping Center

Existing bus stop within bus access loop

and the Palo Alto Transit Center. Express Route 304 runs along Coleman Avenue but does not provide direct access to the station. The bus access loop on Railroad Avenue has stop amenities including shelters, benches, real-time arrival, trash receptacles, lighting, and route/system information. **Figure 13** shows the existing transit network.

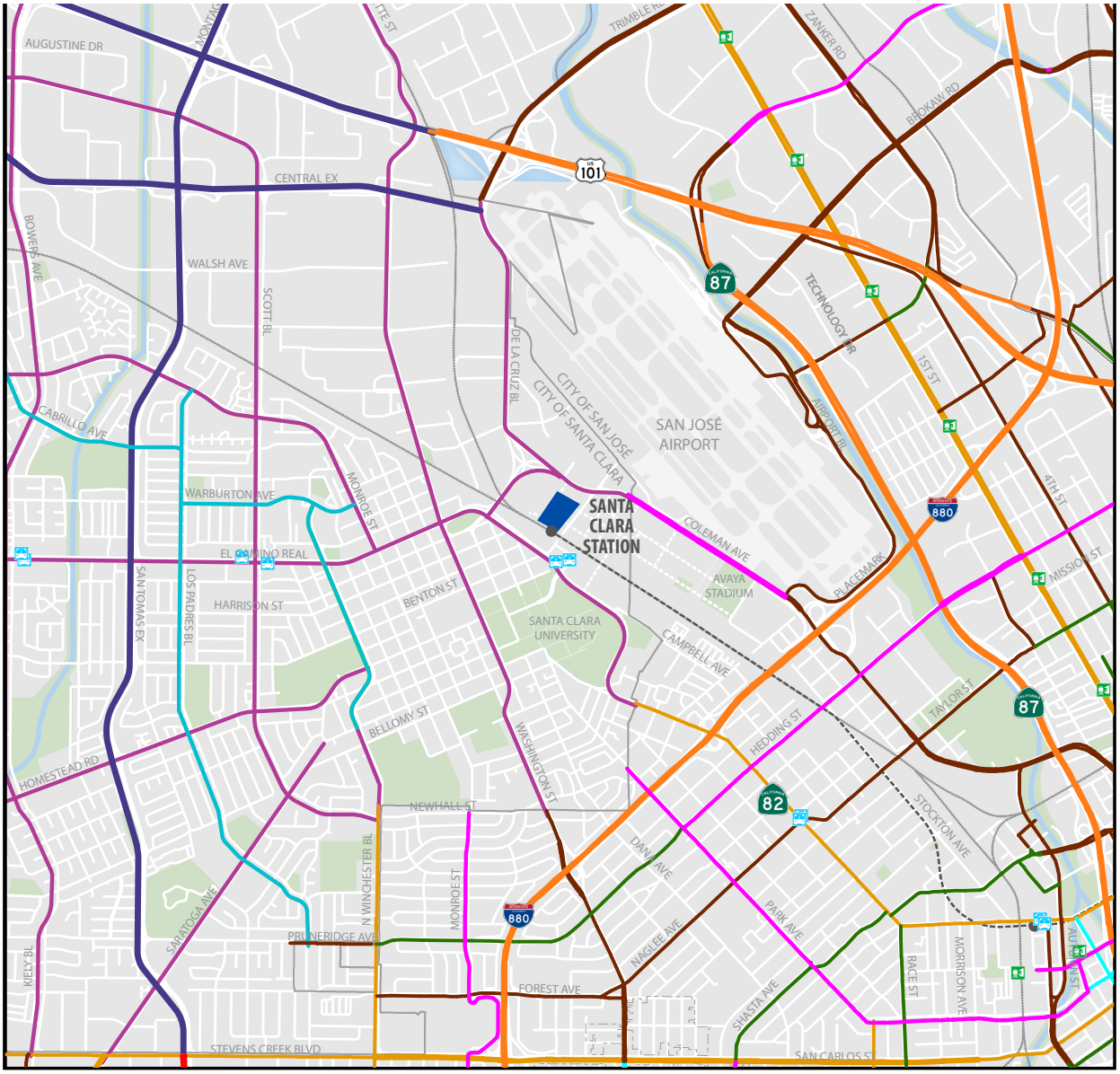
Planned Transit Network

The 2019 New Transit Service Plan will increase service levels in high-ridership areas, and decrease service levels in low-ridership areas. The plan, which will be implemented in conjunction with BART SIlicon Valley Extension Phase I, will extend service later in the evening on many routes and will add more service on weekends. It is anticipated that additional system restructuring will occur in conjunction with BART Silicon Valley Phase II at the time of the project opening. **Table 2** summarizes the 2019 New Transit Service Plan changes that serve the Santa Clara Station. **Figure 14** shows the planned transit network.

TABLE 2: PLANNED SERVICE CHANGES

Route	Current Frequency	Planned Frequency	Planned Change (current service vs. final plan)
10	15 mins	N/A	Combine with new Route 60, which would connect Mineta San José Airport to Milpitas BART Station, Santa Clara Caltrain Station, Valley Fair, Santana Row and Downtown Campbell; improve weekend frequency.
21	N/A	30 mins	Create new route that would connect Palo Alto, San Antonio Transit Center, Mountain View, Sunnyvale and Santa Clara Transit Center.
32	30 mins	N/A	Merge with Route 35 and rename Route 21.
53	60 mins	30 mins	Change alignment to serve Vallco Mall and Santa Clara Transit Center instead of West Valley College, which would replace part of current Route 81.
59	N/A	30 mins	Create new route that would connect Valley Fair, O'Connor Hospital, Santa Clara Caltrain Station, Mission College, Alviso and Baypointe Light Rail Station.
60	30 mins	15 mins	Consolidate with Route 10 to create new Route 60, which would connect Mineta San José Airport to Milpitas BART Station, Metro light rail station, Santa Clara Caltrain Station, Valley Fair, Santana Row, and Downtown Campbell; increase weekday and weekend frequency.
81	20-30 mins	N/A	Replace Moffett Field to De Anza College segment with new Route 51; replace De Anza College to Santa Clara Caltrain Station segment with revised Route 53.

Source: VTA's 2019 New Transit Service Plan



Legend

0 0.25 0.5 0.75 1 Miles N

City of San José Roadway Classification

- Freeway
- Local Connector Street
- City Connector
- Main Street
- Grand Boulevard
- Expressway
- On-Street Primary Bicycle Facility

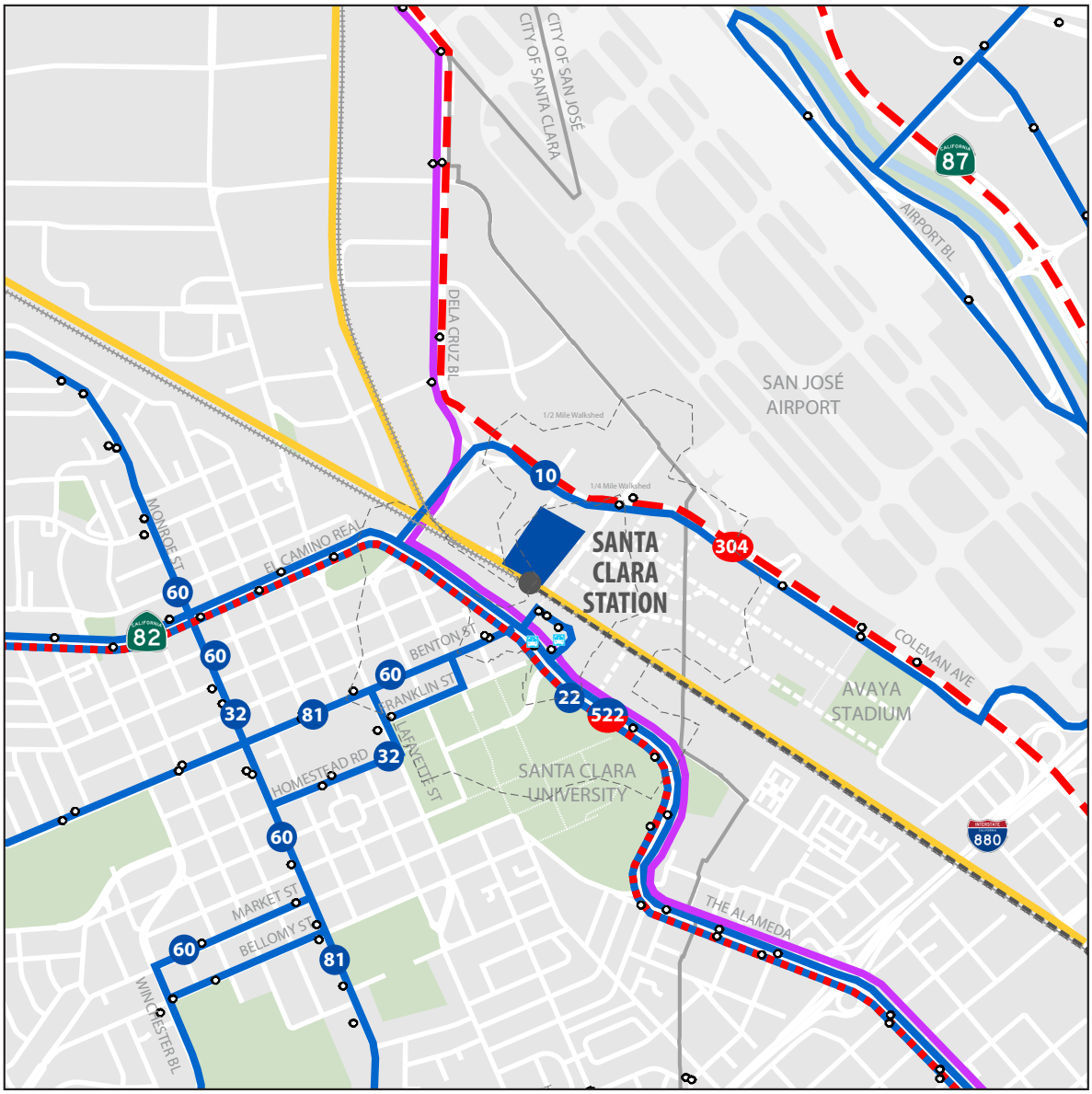
City of Santa Clara Roadway Classification

- Interstate, freeway, expressway
- Other principal arterial
- Collector

- Existing VTA BRT Stops
- Existing VTA LRT Stops
- VTA's BART Phase II Extension
- City Boundary

Sources: City of Santa Clara, City of San José

Figure 12: Existing Roadway Network



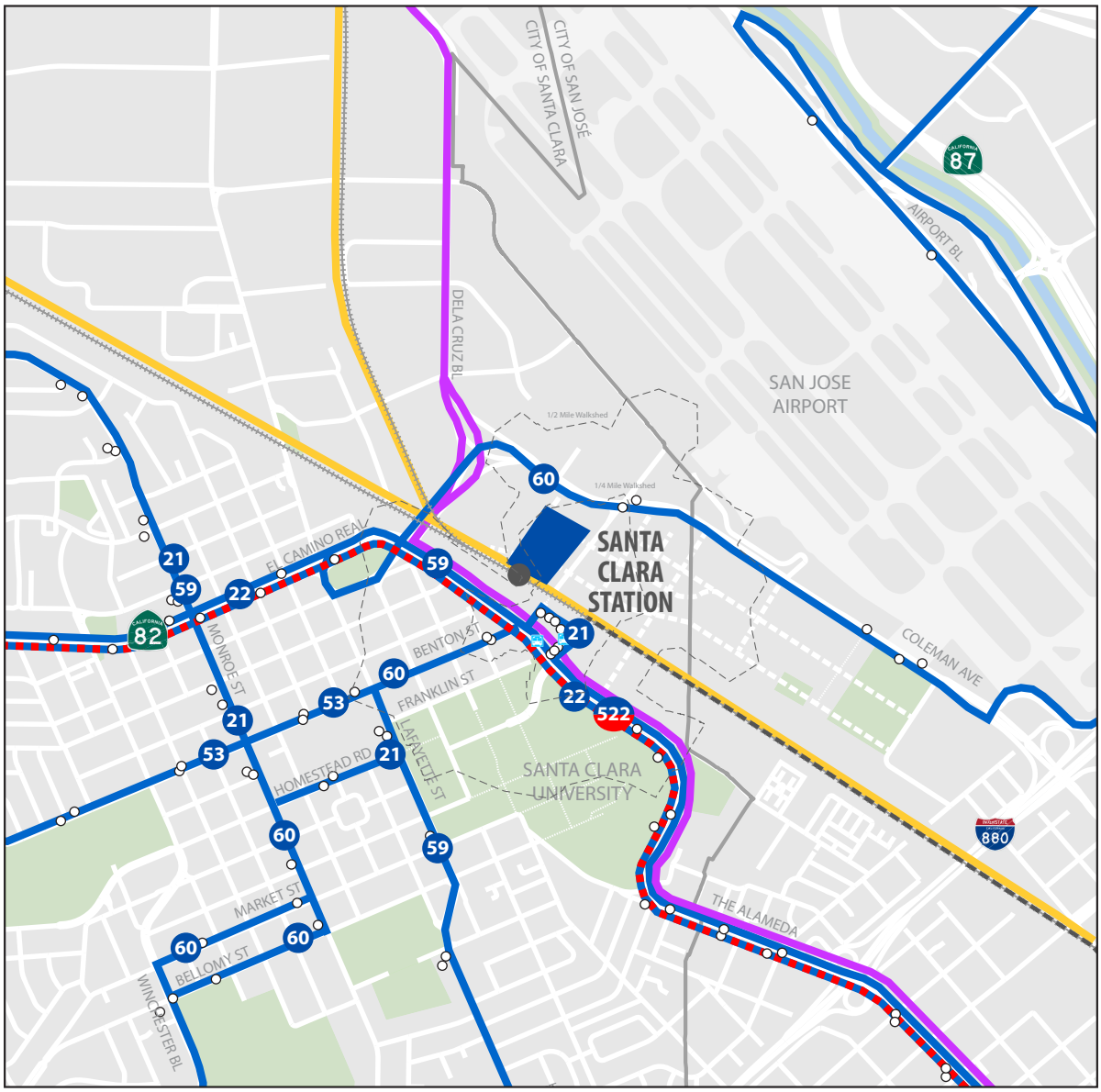
Legend

- VTA BRT
- VTA Local, Core, Community Bus direct service to station
- VTA Local, Core, Community Bus requires transfer to access station
- VTA and Other Express Bus direct service to station
- VTA and Other Express Bus requires transfer to access station
- Shuttle - ACE, Caltrain
- Commuter Rail
- Existing Local Bus Stops
- Existing VTA BRT Stops
- VTA's BART Phase II Extension Alignment
- City Boundary

0 0.1 0.2 0.3 0.4 0.5 Miles N

Sources: VTA BRT/Local Bus/Core/ Community Bus/Express/LRT Data

Figure 13: Existing Transit Network



Legend

- VTA BRT
- VTA Local, Core, Community Bus direct service to station
- VTA Local, Core, Community Bus requires transfer to access station
- VTA and Other Express Bus direct service to station
- VTA LRT
- Shuttle - ACE, Caltrain
- Commuter Rail
- Existing Local Bus Stops
- Existing VTA BRT Stops
- VTA's BART Phase II Extension Alignment

0 0.1 0.2 0.3 0.4 0.5 Miles N

Source: VTA 2019 New Transit Service Plan, June 2019

Figure 14: Planned Transit Network

C. Bicycle

Existing and Planned Bicycle Network

The existing bicycle network is shown within a 1 1/2-mile access area (bikeshed), equivalent to a 10-minute or less bike ride. There is limited bicycle connectivity in the site vicinity, Class II bike facilities are provided on Coleman Avenue north to Earthquakes Way, at the periphery of the 1-mile radius. Class II bike facilities are also provided on Park Avenue leading to the Santa Clara University internal bikeway network. One existing Class III facility is provided on Newhall Street, outside of the 1-mile radius. There are no existing bicycle facilities that provide direct access to the station.

VTA and the City of San José have several planned bikeways in the site vicinity, including on-street bike facilities on Benton Street, and roadways west of Santa Clara University, as well as a planned bike facility extension on Coleman Avenue and on Brokaw Road. The planned bikeways will provide direct access to the station, and feed into the pedestrian/bicycle grade-separated crossing connecting Brokaw Road to the north and Benton Street to the south.

San José has taken the initiative to focus on first mile/last mile solutions through projects such as Better Bikeways for San José. The project is rapidly implementing a network of better bikeways that will transform San José's streets. Just outside the 1 1/2-mile bikeshed, a better bikeway is recommended on W. Hedding Street as a long-term project, but no projects are currently proposed within the study area. Existing and planned bicycle facilities are shown in **Figure 15**.

Bicycle Level of Traffic Stress

Bicycle level of traffic stress (LTS) is a way to assess the comfort and connectivity of bicycle networks. It analyzes how much stress is experienced by bicyclists throughout a bicycle network. LTS is ranked from 1 to 5, with Level 1 being the least stressful and 5 being the most stressful. An example of an LTS 1 facility is a Class I bikeway that is off-street and an LTS 5 facility would be a busy arterial without a bike lane. VTA provided 2015/2016 LTS data for Santa Clara County from 2015 TomTom Streets and 2016 OpenStreetMap data. Some cities, including San José, have significantly upgraded their network since then.

The Santa Clara Station is served by Coleman Avenue and El Camino Real which are LTS 5 facilities. Brokaw Road is a LTS 3 facility and will provide direct station access. There are limited existing options to access the station by comfortable bike facilities. The existing Bicycle Level of Traffic Stress is shown in **Figure 16**.

Legend

Planned Bikeways, San José
- Class I
- Class II
- Class III

Planned Bikeways, VTA
- All Classes

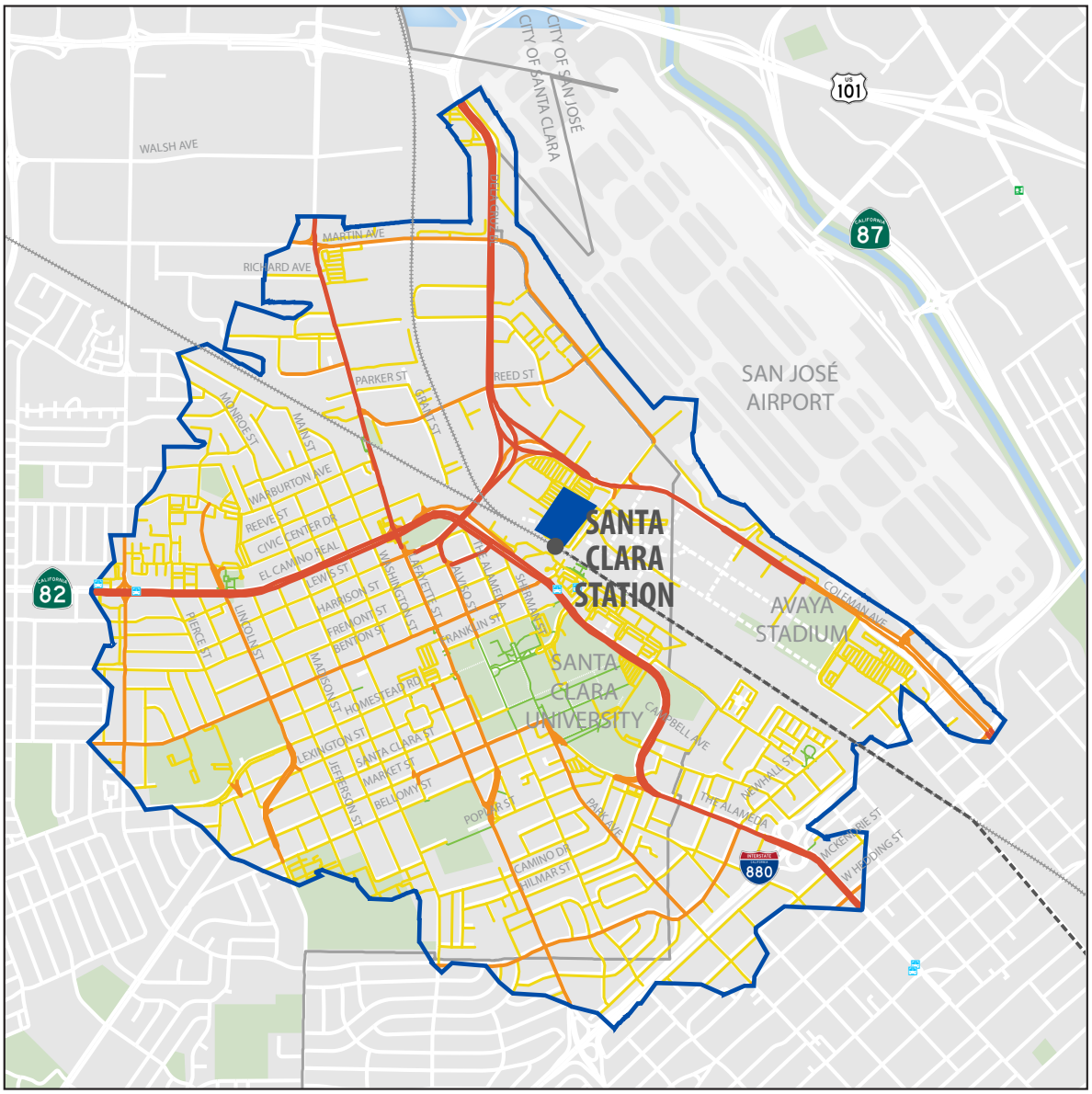
Existing Bikeways
- Class I
- Class II
- Class III

0 0.25 0.5 0.75 1 Miles N

- 1 1/2-mile bikeshed (10 min bike ride)
- Existing VTA LRT Stops
- Existing VTA BRT Stops
- VTA's BART Phase II Extension Alignment

Sources: City of San José, Santa Clara County, VTA Countywide Bike Plan 2018

Figure 15: Existing & Planned Bicycle Facilities



Legend

Level of Traffic Stress (LTS)
- LTS 1
- LTS 2
- LTS 3
- LTS 4
- LTS 5

- 1 1/2-mile bikeshed (10 min bike ride)
- Existing VTA BRT Stops
- Existing VTA LRT Stops
- VTA's BART Phase II Extension Alignment
- City Boundary

0 0.25 0.5 0.75 1 Miles N

Source: VTA*
*Note: LTS Based on 2015/2016 Data

Figure 16: Existing Bicycle Level of Traffic Stress

D. Pedestrian

Existing Pedestrian Network

The existing pedestrian network is shown within a 1/2-mile access area (walkshed), equivalent to a 10-minute or less walk. There is a pedestrian/bicycle undercrossing connecting the east and west side of the railroad corridor. The three main access points to the station, namely Brokaw Road/Coleman Avenue to the east and Benton Street/El Camino Real and Railroad Avenue/El Camino Real to the west, are signalized, thereby providing protected crossings for pedestrians. There are several unprotected crossings within the 1/2-mile area, to the south of El Camino Real. **Figure 17** shows the existing pedestrian network.

Existing pedestrian undercrossing

Bicyclist and Pedestrian-Involved Collisions

Figure 18 shows fatalities, severe injury, and minor injury bicyclist and pedestrian collisions that occurred within the 1/2-mile shed. There was one minor injury bicycle-involved collision and two minor injury pedestrian-involved collisions within the study area between 2013 and 2017.

E. Mobility Services

Mobility service includes Transportation Network Companies (TNCs), carshare, bikeshare, scootershare, and private shuttles. Mobility services provide a variety of options that complement transit networks by addressing the first mile/last mile challenge.

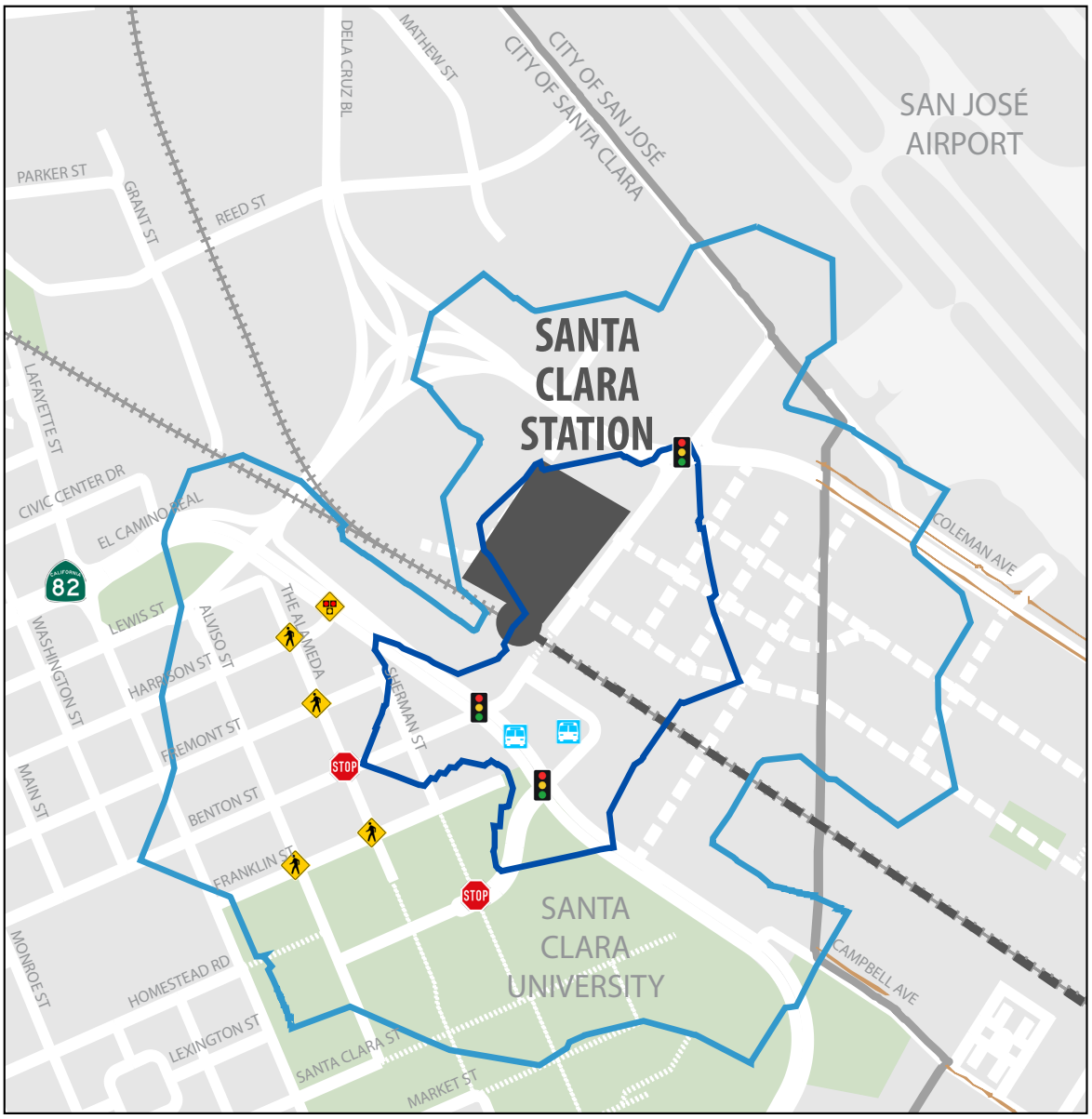
TNCs, including Lyft and Uber, have notably changed the way people travel. Cell phone apps allow users to hail a ride nearly anywhere in urban and suburban environments. Users are charged per ride based on the distance of the trip and the overall demand for rides; as such, rides are more expensive during peak demand periods. With respect to transit stations, TNCs have introduced the need to implement curbside management policies to efficiently and effectively manage passenger pick-up/drop activities while not impacting the flow of traffic in travel lanes.

Carshare is an alternative to car ownership or traditional rental car service. Cell phone apps allow users to locate available cars nearby to rent for a specific amount of time. Several carshare vehicles are available in the access planning area, including those from Zipcar and Getaround. Getaround is a peer-to-peer model which assumes that the person to whom the car belongs has a pre-arranged parking stall. In contrast, Zipcar relies on a public parking space designated for Zipcar parking.

Bikeshare programs in San José include Ford GoBike and LimeBike. Ford GoBike is a bikeshare program based in the Bay Area with stations located throughout San José. Ford GoBike stations are located around the Diridon and Tamien Stations. Ford GoBike bikes need to be docked at defined stations and allow users to locate stations via a cell phone app. The Ford GoBike bikes have different pricing and pass options from Single Ride to Annual Membership. LimeBike is a dockless bikesharing model that removes the need for bike station infrastructure in the study area. LimeBikes are priced based on the time the bike is used.

Dockless rental electric scooter sharing programs are being launched in most major cities. The companies that currently operate in San José and the Bay Area are LimeBike, Bird, and Spin. Similar to dockless bikesharing, the scooters are priced based on the time the scooter is used, and station infrastructure is not necessary. As dockless bikeshare and scootershare programs become more prevalent, policy and strategies are necessary to preserve the public right-of-way.

Private shuttles, operated by major employers or universities such as Google and Stanford, provide door-to-door shuttle services between employment campuses and regional transportation hubs or other destinations. Private shuttles can range in size, from vanpool to coach buses. Accommodating pick-up/drop-off for private shuttles at transit stations is important to manage conflicts with public buses and other motorists.



Legend

- 1/4 mile shed (5 min walk)
- 1/2 mile shed (10 min walk)
- Existing VTA BRT Stops
- Existing Sidewalk
- City Boundary
- VTA's BART Phase II Extension Alignment

Intersection Classifications within 10-Minute Walkshed

- Signalized
- All-way stop controlled
- Unprotected crossing
- HAWK Signal

All unclassified intersections have stop control on minor street or no signal control

Note: City of Santa Clara sidewalk data not available
Sources: City of San José, Santa Clara County

Figure 17: Existing Pedestrian Network

Legend

Bicyclist-Involved Collisions
- Complaint of Pain
- Minor Injury
- Severe Injury
- Fatal Injury

Pedestrian-Involved Collisions
- Complaint of Pain
- Minor Injury
- Severe Injury
- Fatal Injury

- 1/2 mile shed (10 min walk)
- Existing VTA BRT Stops
- Existing Sidewalk
- VTA's BART Phase II Extension Alignment
- City Boundary

Sources: SWITRS Data 2013-2017, City of San José Sidewalk Data
Note: City of Santa Clara Sidewalk Data Not Available

Figure 18: Bicyclist and Pedestrian-Involved Collisions Map

III. Opportunities and Access Routes

A. Auto

Vehicular access to the Santa Clara Station is served by Coleman Avenue on the east side of the station and El Camino Real to the west of the station. Auto pathways were determined in part from pathways identified in VTA's travel demand model used in the environmental analysis for this project. As an end-of-line station, auto access is anticipated to occur primarily from the west and northwest of the Station Area. **Figure 19** shows key auto opportunities and access routes.

B. Transit

VTA has existing Local and BRT routes within the study area and that will serve the proposed Santa Clara Station. There is an existing bus loop on the west side of the station that is accessed from El Camino Real. Bus and shuttle loading areas would be provided on Brokaw Road to provide transit access to both sides of the station. Bus facilities should be designed to facilitate seamless transfers between BART and bus.

The Santa Clara Station is currently served by an ACE Capitol Corridor and Caltrain. Operations should be coordinated to provide seamless transfers between BART and the existing rail services. As an end-of-line station, additional activity may be generated by private shuttle services. Accommodation of shuttle services at this station will be provided at the station. The airport shuttle should use the roadways east of the Santa Clara Station.

Existing Santa Clara Station platform

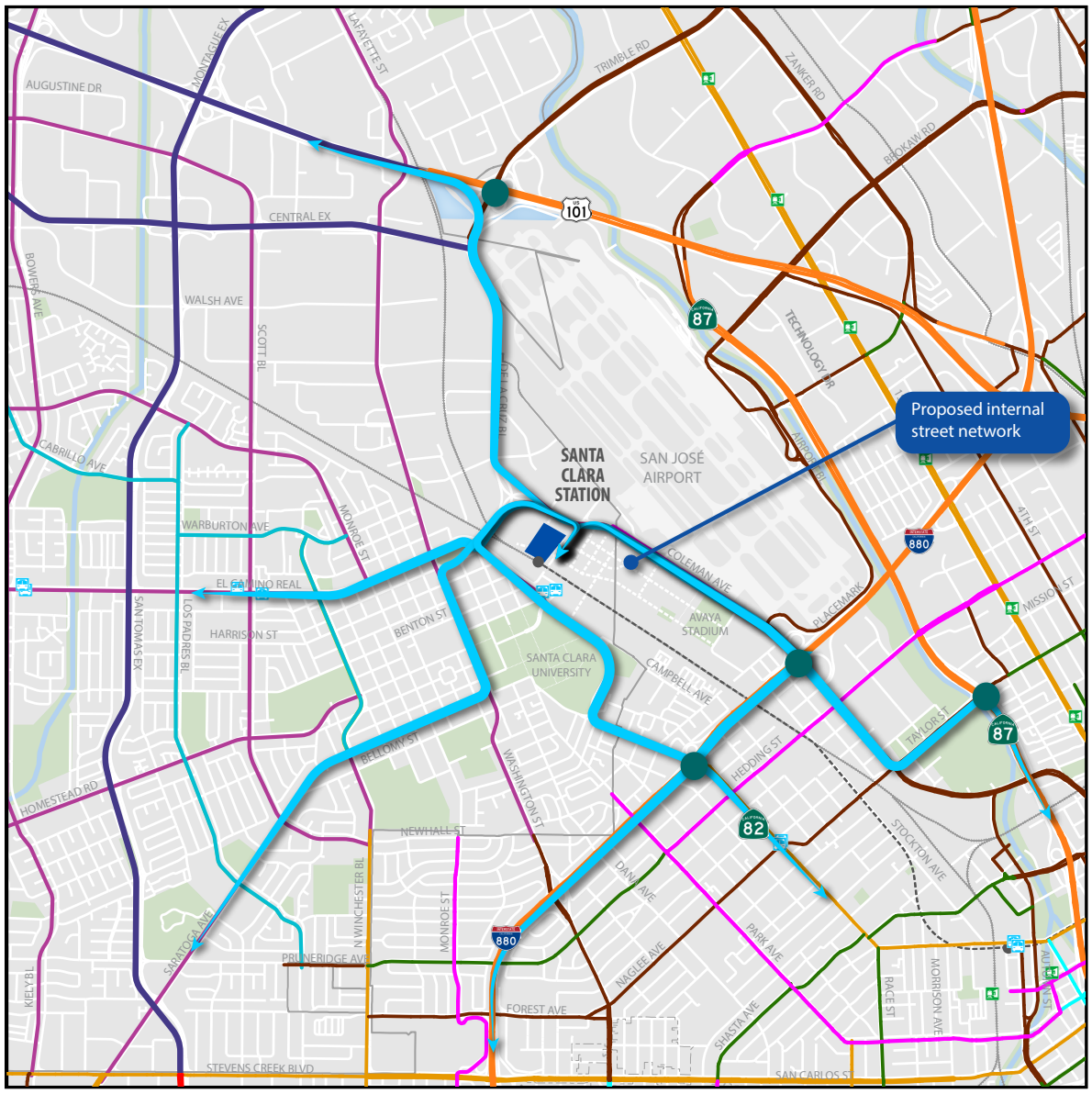
Similar to the current 2019 New Transit Service Plan system redesign that coincides with BART Silicon Valley Phase I's opening, VTA anticipates further studying transit improvements to better serve the BART Silicon Valley Phase II project.

Table 3 summarizes the changes that were incorporated into the project's travel demand model. **Figure 20** shows key transit opportunities and access routes.

TABLE 3: SUMMARY OF CHANGES

Route	Changes Implemented in 2035 Model
10	Connection created to Santa Clara Station; no change from existing headways
22	Connection created to Santa Clara Station; headway increased to 15 mins from 12 mins
32	Connection created to Santa Clara Station; no change from existing headways
60	Connection created to Santa Clara Station; no change from existing headways
81	Connection created to Santa Clara Station; no change from existing headways
522	Connection created to Santa Clara Station; headway decreased to 10 mins from 15 mins
523	Connection created to Santa Clara Station; headway changed to 10 mins

Source: VTA 2035 Equilibrium - SVX



Legend

0 0.25 0.5 0.75 1 Miles N

City of San José Roadway Classification

- Freeway
- Local Connector Street
- City Connector
- Main Street
- Grand Boulevard
- Expressway
- On-Street Primary Bicycle Facility

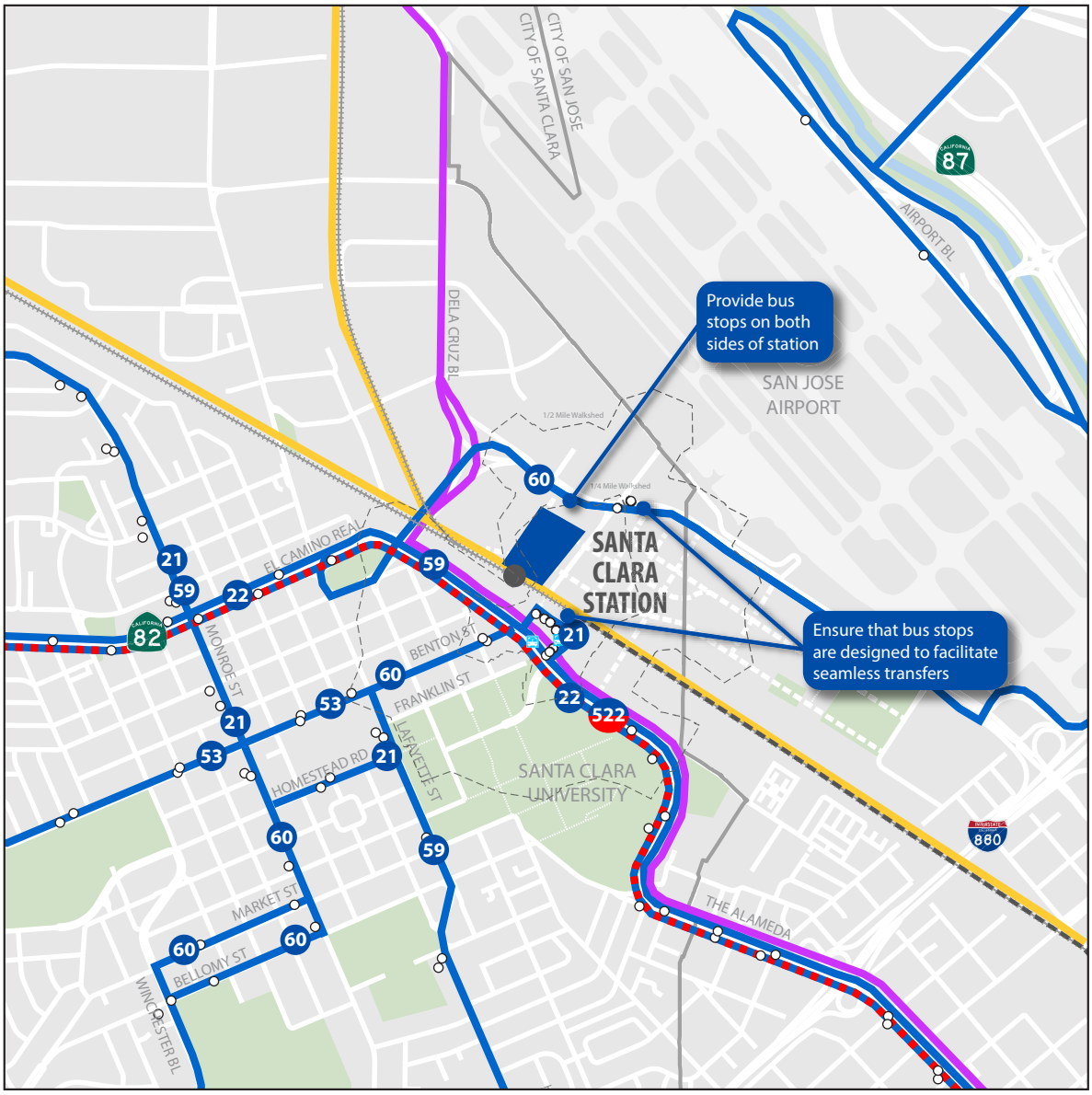
City of Santa Clara Roadway Classification

- Interstate, freeway, expressway
- Other principal arterial
- Collector

- Existing VTA BRT Stops
- Existing VTA LRT Stops
- VTA's BART Phase II Extension Alignment
- City Boundary
- Access pathway
- Interchange to be used to access station

Source: City of Santa Clara, City of San José

Figure 19: Auto Opportunities & Access Routes



Legend

- VTA BRT
- VTA Local, Core, Community Bus direct service to station
- VTA and Other Express Bus direct service to station
- Shuttle - ACE, Caltrain
- Commuter Rail
- Existing Local Bus Stops
- Existing VTA BRT Stops
- VTA/BART Phase II Extension Alignment
- City Boundary

0 0.1 0.2 0.3 0.4 0.5 Miles

N

Source: VTA 2019 New Transit Service Plan, June 2019

Figure 20: Transit Opportunities & Access Routes

C. Bicycle

Bicycle access to the Santa Clara Station is limited in existing conditions. Land use patterns around the airport and the accompanied auto-centric roadway network results in limited roadway network connectivity and high-stress principal arterials. Enhanced bicycle facilities are proposed along the principal arterials. The bike lane along Coleman Avenue ends before reaching the station. The planned bicycle facility along Coleman Avenue that would fill in this gap is critical for accessing the station by bicycle.

There is currently no bicycle facility on El Camino Real, which is another critical pathway to the station. The planned bicycle facility along El Camino Real will benefit bicycle access to the station.

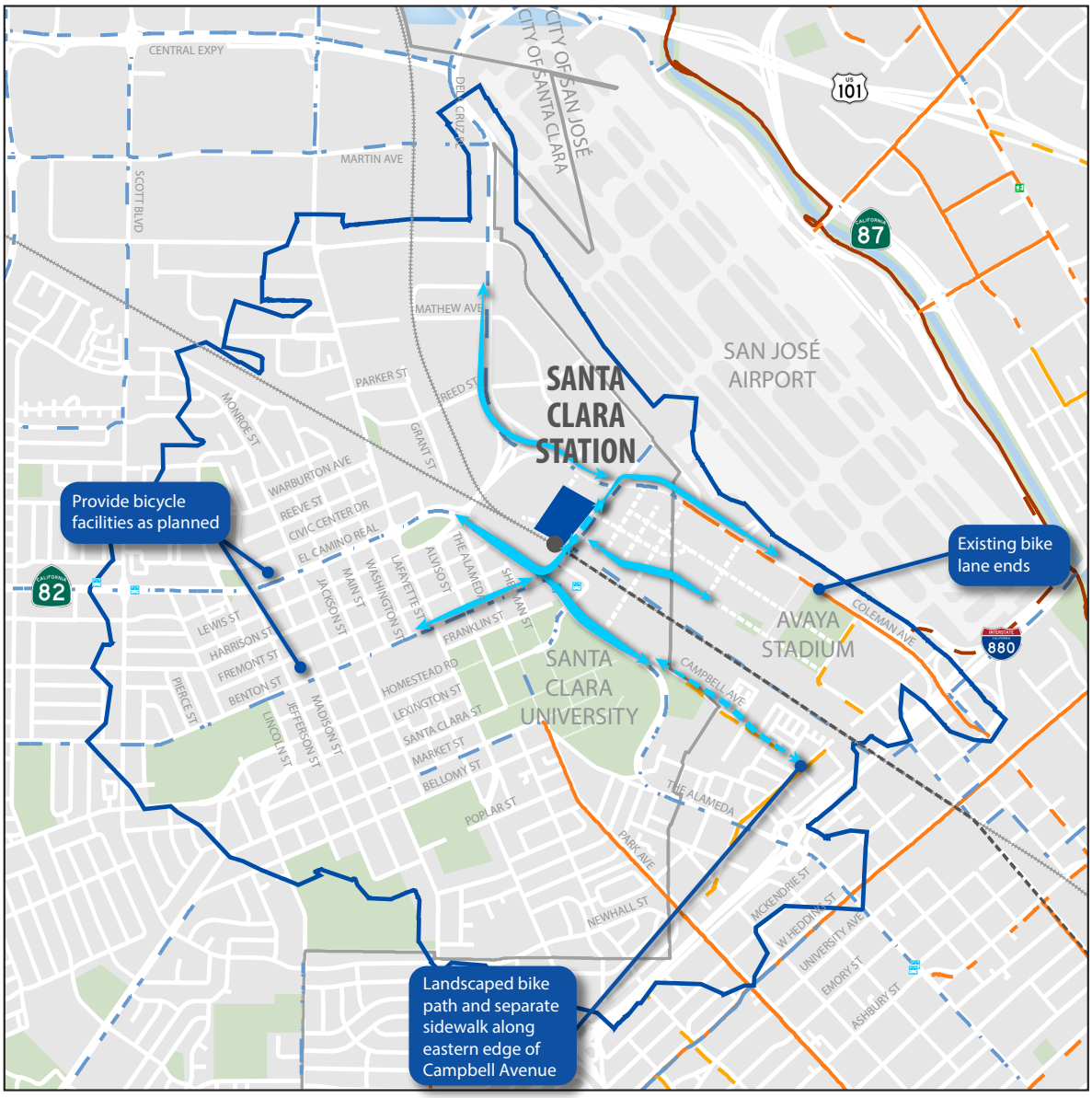
A pedestrian underpass that connects Benton Street to Brokaw Street provides a low stress connection between the two principal arterials. The existing roadway network and overpasses along De La Cruz Boulevard are high stress environments for bicyclists. **Figure 21** shows the key bicycle opportunities and access routes.

D. Pedestrian

Pedestrian connections are critical for successful station access. Everyone is a pedestrian at some point in their trip, whether walking directly to the station, riding/parking a bicycle, taking a bus or shuttle, or driving/parking a car. There are many key destinations in the Station Area including Santa Clara University and Avaya Stadium. The new proposed internal roadway network, as part of the Coleman High Line and Gateway Crossings, will provide connections to Avaya Stadium. The recently constructed underpass will allow pedestrians to connect to both sides of the station. A separated path is recommended on the west side of the railroad right-of-way. This path would allow pedestrians to connect to the station from the south.

Existing signalized pedestrian crossing to Santa Clara University

Improved pedestrian crossings should be considered at the following intersections where unprotected crossings exist: The Alameda at Harrison Street; The Alameda at Fremont Street; The Alameda at Franklin Street; El Camino Real at Benton Street; El Camino Real at Railroad Avenue; and Alviso Street at Franklin Street. Examples of protected pedestrian crossings include rectangular rapid-flashing beacons (RRFBs), HAWK signals, or a signalized intersection. **Figure 22** shows key pedestrian opportunities and access routes.



Legend

Planned Bikeways, San Jose
- Class I
- Class II
- Class III

Planned Bikeways, VTA
- All Classes

Existing Bikeways
- Class I
- Class II
- Class III

1 1/2-mile bikeshed (10 min bike ride)

0 0.25 0.5 0.75 1 Miles N

- Existing VTA BRT Stops
- Existing VTA LRT Stops
- VTA's BART Phase II Extension Alignment
- Access pathway

Sources: City of Santa Clara, City of San Jose, Santa Clara County, VTA

Figure 21: Bicycle Opportunities & Access Routes

Note: City of Santa Clara sidewalk data not available
Sources: City of San José, Santa Clara County

Figure 22: Pedestrian Opportunities & Access Routes

IV. Primary Station Access Routes and Recommended Improvements

This section of the profile identifies primary, multimodal access routes to the Santa Clara Station. These access routes may not be the only pathways that passengers use to arrive at the station, but represent corridors that both serve the majority of the station catchment area and have or are proposed to have the infrastructure to best serve multiple access modes. Access routes are defined for the area within a 10-minute bike ride (1 1/2 mile bikeshed) and 10-minute walk time (1/2 mile walkshed). The report identifies recommended improvements along each access route, referencing both previously planned improvements and new improvements consistent with VTA and local agency goals. Recommendations are intended to close gaps in the transportation network that could inhibit multimodal access and circulation to the station. Wayfinding will direct users to the primary access routes and key destinations along them.

Figure 23 depicts the primary station access routes identified. **Figures 23** through **26** depict the recommended improvements on each access route.

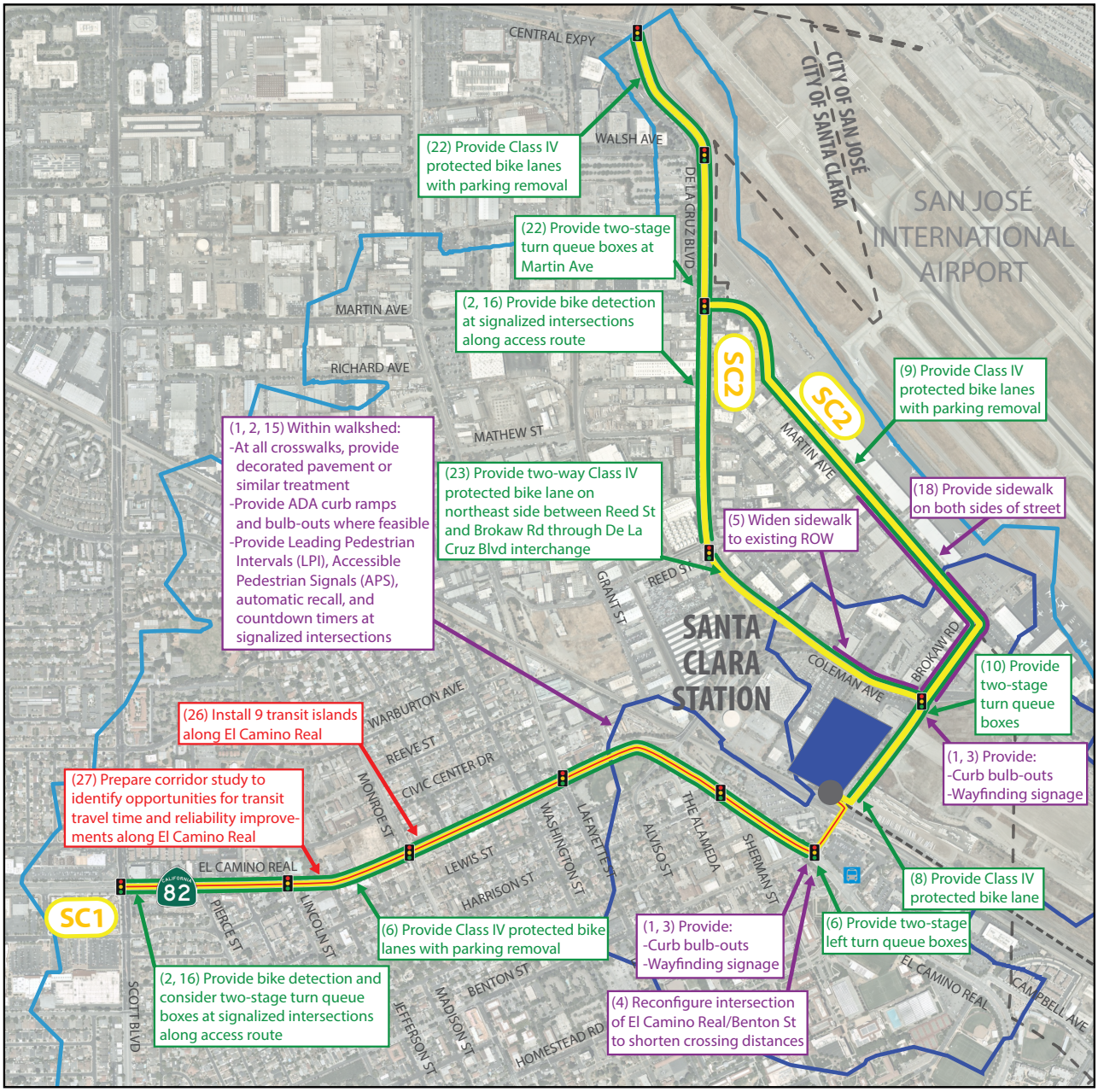
Legend

- SC — Santa Clara Station Access Route
- 1/2-Mile Walkshed (10 min walk)
- 1 1/2-Mile Bikeshed (10 min bike ride)
- VTA's BART Phase II Extension Alignment
- Existing VTA BRT Stops
- Existing VTA LRT Stops
- Existing Ford GoBike Stations
- Existing Local Transit Service

0 0.25 0.5 0.75 1 Miles

N

Figure 23: Santa Clara Station Primary Access Routes



Legend

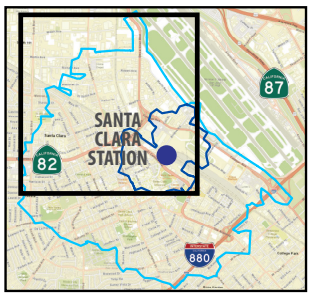
- SC — Santa Clara Station Access Route
- 1/2-Mile Walkshed (10 min walk)
- 1 1/2-Mile Bikeshed (10 min bike ride)
- VTA's BART Phase II Extension Alignment
- Existing Signalized Intersection
- Existing VTA BRT Stops

(#) Recommendation Number

- Pedestrian recommendation
- Bicycle recommendation
- Transit recommendation
- Connection or structure recommendation

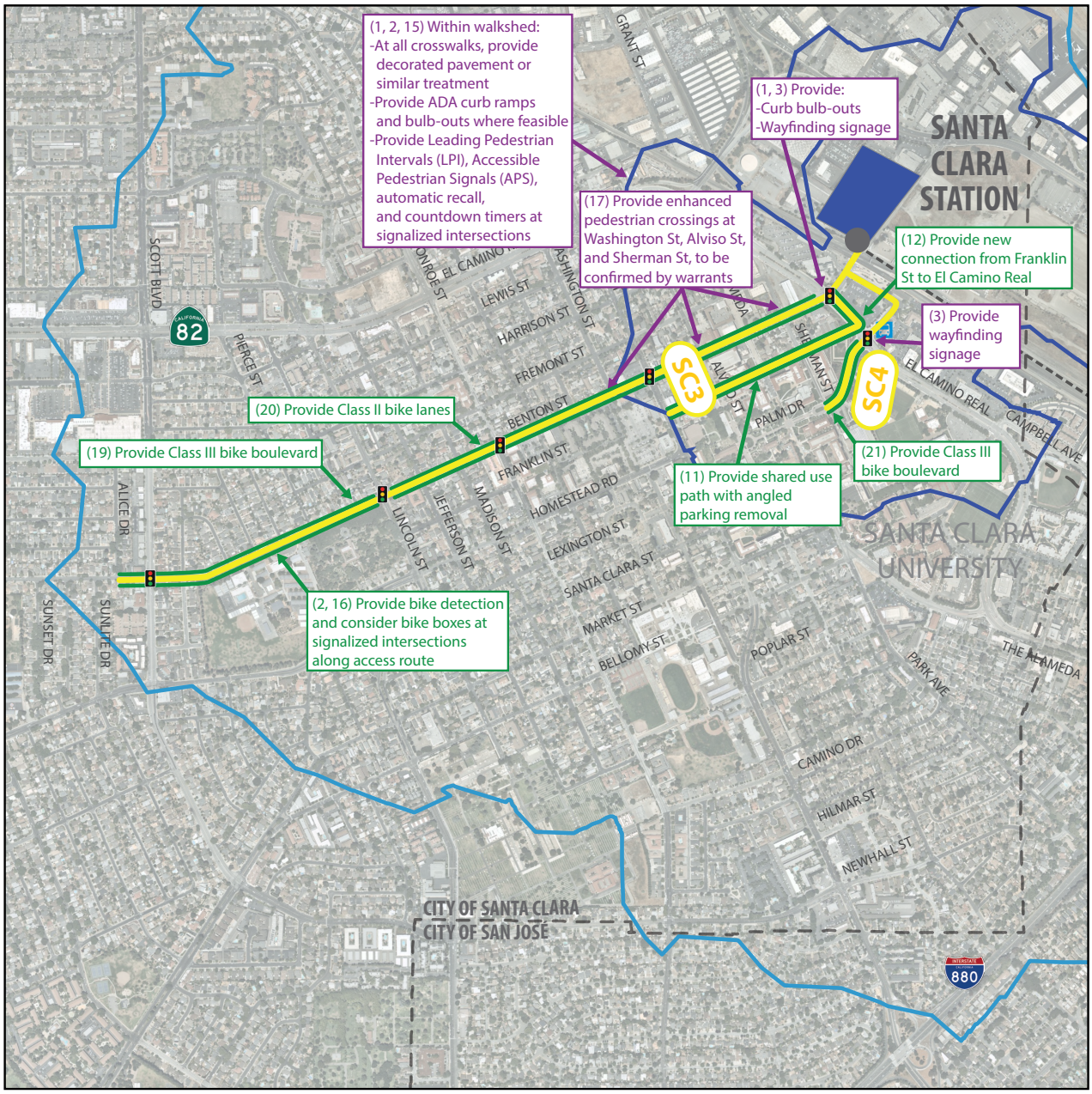
0 0.125 0.25 0.5 Miles

Key Map



N

Figure 24: Recommended Improvements (1 of 3)



Legend

- SC — Santa Clara Station Access Route
- 1/2-Mile Walkshed (10 min walk)
- 1 1/2-Mile Bikeshed (10 min bike ride)
- VTA's BART Phase II Extension Alignment
- Existing Signalized Intersection
- Existing VTA BRT Stops

(#) Recommendation Number

- Pedestrian recommendation
- Bicycle recommendation
- Transit recommendation
- Connection or structure recommendation

0 0.125 0.25 0.5 Miles

Key Map

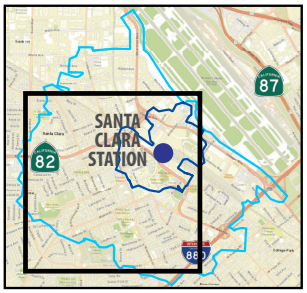


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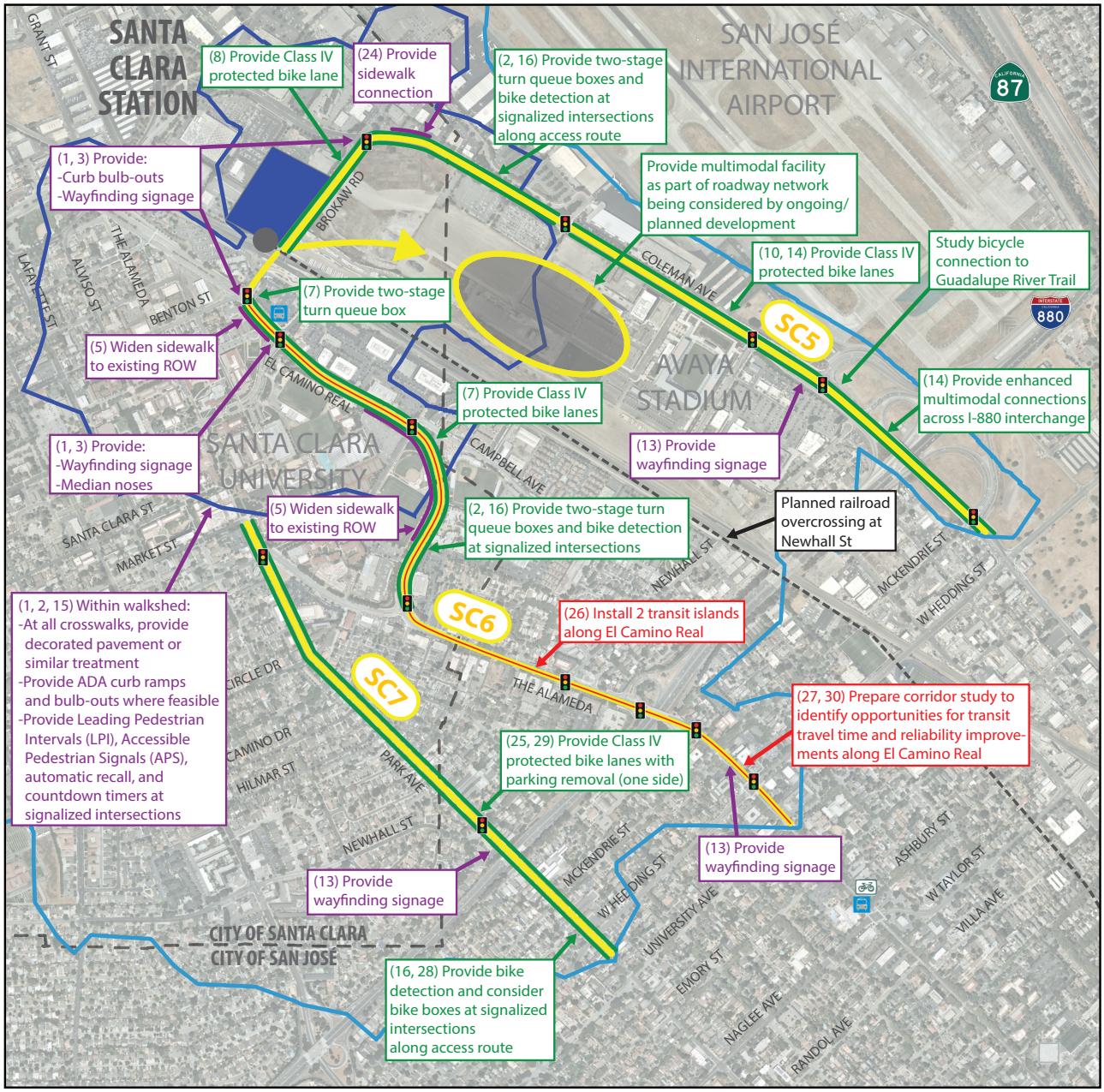
Figure 25: Recommended Improvements (2 of 3)



Legend

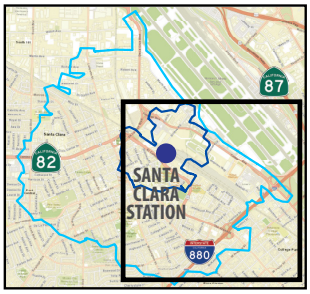
- SC — Santa Clara Station Access Route
- 1/2-Mile Walkshed (10 min walk)
- 1 1/2-Mile Bikeshed (10 min bike ride)
- VTA's BART Phase II Extension Alignment
- Existing Signalized Intersection
- Existing VTA BRT Stops
- Existing Ford GoBike Stations

(#) Recommendation Number

- Pedestrian recommendation
- Bicycle recommendation
- Transit recommendation
- Connection or structure recommendation

0 0.125 0.25 0.5 Miles

Key Map



N

Figure 26: Recommended Improvements (3 of 3)

Access Route SC1 – El Camino Real West of Santa Clara Station Across Scott Boulevard (see Figure 24)

Access Route SC1 connects the area west of the Santa Clara Station via El Camino Real and Benton Avenue. Key destinations along this route include Marsalli Park and the Santa Clara Civic Center. The De La Cruz Boulevard interchange crosses over El Camino Real northwest of Santa Clara Station and is a barrier to bike and pedestrian connections. The interchange is considered a priority Across Barrier Connection (ABC) in the *Countywide Bicycle Plan*.

El Camino Real is a 6-lane divided street classified as a Major Arterial, designated as State Route 82. VTA Rapid 522 operates along this access route. In the *Santa Clara Countywide Bicycle Plan*, El Camino Real is designated as a Cross County Bicycle Corridor (CCBC), a road that should provide a high-quality, cross-jurisdictional route for bicyclists. Class IV protected bike lanes are recommended on El Camino Real between Benton Avenue and Scott Boulevard, consistent with the Draft Project Recommendations contained in the City of Santa Clara's Bicycle Master Plan Update (2018). The Class IV facility may be provided without a reduction in travel lanes. Installation of a Class IV bike facility would require the removal of some on-street parking where it exists along the access route.

It is recommended that bike detection be installed and that two-stage left turn queue boxes be considered at all signalized intersections along the access route. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2 mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2 mile walkshed, but exact locations should be further studied. Curb bulb-outs and pedestrian signage are recommended at the intersection of El Camino Real and Benton Street.

It is recommended that the City of Santa Clara consider a corridor study on El Camino Real/The Alameda to investigate opportunities to improve transit travel time and reliability and accommodate all transportation modes. The proposed corridor study should consider consolidating closely-spaced stops, relocating bus stops to far-side locations, implementing enhanced transit signal priority, providing bus boarding islands or bus curb extensions, and providing dedicated bus-only lanes in high-congestion and frequent service areas. Further analysis will be required to determine the location, extent, and operation of dedicated transit lanes. In addition, transit stop amenities will be upgraded per guidelines included in the VTA Transit Passenger Environment Plan.

Per VTA's adopted Transit Speed Policy, it is recommended that the highest level of Transit Signal Priority (TSP) be provided along all VTA frequent network routes. Leading bus signal phases should be implemented in the most congested areas, such as station entrances and exits, to minimize delay from route deviations into stations. TSP will make service faster and more reliable for passengers, and more cost-effective for VTA, by reducing delay and minimizing the variability in travel speed.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. The only high-visibility crosswalk along this access route exists at the intersection of El Camino Real at Harrison Street. New crosswalks should be installed at the minor street approach of unsignalized two-way stop-controlled intersections where crosswalks do not exist. Sidewalks should be widened to the existing ROW, where available. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

Table 4 below summarizes the existing, planned, and recommended improvements for Access Route SC1.

TABLE 4: IMPROVEMENTS FOR ACCESS ROUTE SC1

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
El Camino Real	Scott Boulevard to Benton Avenue	De La Cruz Interchange	Bike	VTA Countywide Bicycle Plan	None	Class IV	Provide bike detection and consider two-stage turn queue boxes at signalized intersections
			Pedestrian	CSC	6'-8' Sidewalk	Existing	Provide curb bulb-outs, pedestrian signage, leading pedestrian intervals, accessible pedestrian signals, and high-visibility crosswalks at El Camino Real and Benton Avenue
			Transit	2019 New Transit Service Plan	BRT 522 (15 min)	BRT 522 (12 min)	Provide transit travel time and reliability improvements based on corridor study
					Bus 22 (12 min)	Bus 22 (15 min)	
					-	Bus 59 (30 min)	
			Auto	CSC	Principal Arterial	Principal Arterial	Reduce travel lanes to 11', remove parking on one side
Benton Avenue	El Camino Real to Station Entrance	Multimodal, Bus, and Auto Circulation	Bike	VTA Countywide Bicycle Plan	None	None	Provide appropriate bike facility for proper circulation
			Pedestrian	CSC	6'-8' Sidewalk	Existing	None
			Transit	2019 New Transit Service Plan	BRT 522 (15 min)	BRT 522 (12 min)	None
					-	Bus 21 (30 min)	
					Bus 22 (12 min)	Bus 22 (15 min)	
					Bus 32 (30 min)	-	
					-	Bus 53 (30 min)	
					-	Bus 59 (30 min)	
					Bus 60 (15 min)	Bus 60 (15 min)	
					Bus 81 (30 min)	-	
			Auto	CSC	2-Lane Undivided	Existing	None

Access Route SC2 – De La Cruz Boulevard/Coleman Avenue/Martin Avenue Northwest of Santa Clara Station (see Figure 24)

Access Route SC2 connects the area north of Santa Clara Station via De La Cruz Boulevard, Coleman Avenue, Martin Avenue, and Brokaw Road. The De La Cruz interchange act as a barrier to bike and pedestrian travel. Pedestrians on the west side of De La Cruz Boulevard must cross to the east side of the road to traverse the interchange. Bicyclists traveling southbound on De La Cruz Boulevard must cross two lanes of traffic and use a general travel lane on Coleman Avenue in order to traverse the interchange, or use alternate routes.

De La Cruz Boulevard/Coleman Avenue is a 6-lane divided street classified as a Major Arterial. It is considered a Priority Cross County Bicycle Corridor (CCBC) in the *Santa Clara Countywide Bicycle Plan*, a corridor with a high potential for future bicycle ridership and a significant need for low-stress bicycling infrastructure. North of the access route, reconstruction of the US-101/De La Cruz Boulevard interchange is planned, which is intended to remove bicycle and pedestrian barriers there. Class IV protected bike lanes are recommended for De La Cruz Boulevard between Central Expressway and the De La Cruz interchange, consistent with the Draft Project Recommendations of the City of Santa Clara Bicycle Master Plan Update (2018). Between Reed Street and Brokaw Road, a two-way Class IV bike facility is recommended on the north side of the road. The intersections of De La Cruz Boulevard and Reed Street and Coleman Avenue at Brokaw Road will need enhanced bicycle and pedestrian intersection crossings.

Brokaw Road is a 2-lane collector street and is designated as a CCBC. Class IV protected bike lanes are recommended on Brokaw Road between Coleman Avenue and the planned Santa Clara station entrance. The roadway has adequate width to accommodate the recommended bicycle facility while maintaining the existing number of travel lanes and on-street parallel parking. The relation of the facility with station access should be further explored as part of station access concept development.

Martin Avenue may serve as an alternative route from De La Cruz Boulevard to the intersection of Brokaw Road and Coleman Avenue. Martin Avenue is a 2-lane street with parallel on-street parking. Class II bike lanes were recommended on Martin Avenue in the Draft Project Recommendations of the City of Santa Clara Bicycle Master Plan Update (2018). Class IV protected bike lanes are recommended for Martin Avenue between De La Cruz Boulevard and Brokaw Road, and for Brokaw Road between Martin Avenue and Coleman Avenue. Installation of a Class IV facility would require removal of on-street parking along the access route.

It is recommended that bike detection be installed at all signalized intersections along the access route and two-stage turn queue boxes be installed at Martin Avenue. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied. Curb bulb-outs and pedestrian signage are recommended at the intersection of Coleman Avenue and Brokaw Road.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. Sidewalks exist along the access route within the walkshed on Coleman Avenue and on Brokaw Road south of Coleman Avenue. Where they exist, sidewalks should be widened to the existing ROW, where available. Where sidewalks do not exist within the walkshed, such as on Brokaw Road north of Coleman Avenue and on the south side of Martin Avenue, they should be provided. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

Table 5 below summarizes the existing, planned, and recommended improvements for Access Route SC2.

TABLE 5: IMPROVEMENTS FOR ACCESS ROUTE SC2

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
Coleman Avenue / De La Cruz Boulevard	Central Expressway to Brokaw Road	De La Cruz Interchange	Bike	CSC	None	Class IV from Central Expressway to De La Cruz interchange/Class II from De La Cruz interchange to Brokaw Road	Provide two-way Class IV bike facility on north side of Coleman Ave/De LA Cruz Blvd between Reed Street and Brokaw Road
							Provide bike detection at signalized intersections along access route
							Provide two-stage turn boxes at Martin Avenue
			Pedestrian	CSC	5'-6' Sidewalk	Existing	Provide separate bike/ped zones, high-visibility crosswalks, and tightened curb radii at intersections of Coleman Avenue and Brokaw Road and Reed Street
			Transit	2019 New Transit Service Plan	Express 304 (30 min)	-	None
					Bus 10 (15 min)	-	
					-	Bus 60 (15 min)	
			Auto	CSC	Principal Arterial	Principal Arterial	Remove on-street parking
Martin Avenue	De La Cruz Boulevard to Brokaw Road	None	Bike	CSC	None	Class II	Provide Class IV protected bike lane with removal of parking
							Provide bike boxes and bike detection at signalized intersections along access route
			Pedestrian	CSC	None	Existing	Provide sidewalk between Brokaw Road and Reed Street
			Transit	2019 New Transit Service Plan	None	None	None
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel Parking	2-Lane Undivided	Remove on-street parking
Brokaw Road	Martin Avenue to Station Entrance	None	Bike	CSC	None	Class II	Provide Class IV protected bike lane
			Pedestrian	CSC	5'-6' Sidewalk	Existing	Provide sidewalk between Martin Avenue and Coleman Avenue
			Transit	2019 New Transit Service Plan	None	None	None
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel Parking	Existing	None

Access Route SC3 – Benton Street/Franklin Street Southwest of Santa Clara Station Across Scott Boulevard (see Figure 25)

Access Route SC3 connects the area southwest of Santa Clara Station via Benton Street and Franklin Street. Key destinations include downtown Santa Clara, Fremont Park and Senior Center, Santa Clara County Courthouse, Wilson High School, Wilson Preschool, and Santa Clara Adult Education. El Camino Real is a 6-lane divided Major Arterial that acts a barrier to pedestrian and bicycle travel due to the long crossing distances.

Benton Street is classified as a Minor Arterial and is a two-lane undivided street with on-street parallel parking for much of its span within the 1 1/2-mile bikeshed from Santa Clara Station. Between Lafayette Street and Monroe Street, Benton Street has a center turn lane. The access route is designated a Priority Cross County Bicycle Corridor (CCBC) in the *Santa Clara Countywide Bicycle Plan*. Class II bike lanes are recommended between Lincoln Street and the planned Santa Clara station entrance, consistent with the Draft Project Recommendations of the City of Santa Clara Bicycle Master Plan Update (2018). This would not require reducing the number of travel lanes, but would require on-street parking removal on one side of the street in some locations.

Franklin Street connects downtown Santa Clara and Santa Clara Station, extending across the northern edge of the university. The street is viewed as a pedestrian-oriented corridor and segments have recently been closed to through-traffic. In the future, there may be further opportunities to pedestrianize the corridor between Lafayette Street and El Camino Real. In the near term, it is recommended that angled parking on south side of street be replaced with a shared use path.

Per VTA's adopted Transit Speed Policy, it is recommended that the highest level of Transit Signal Priority (TSP) be provided along all VTA frequent network routes. Leading bus signal phases should be implemented in the most congested areas, such as station entrances and exits, to minimize delay from route deviations into stations. TSP will make service faster and more reliable for passengers, and more cost-effective for VTA, by reducing delay and minimizing the variability in travel speed.

It is recommended that bike detection be installed and bike boxes be considered at all signalized intersections along the access route. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied. Curb bulb-outs, pedestrian signage, median noses, and LPI are recommended at the intersection of El Camino Real and Benton Street.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. High-visibility crosswalks exist at the mid-block crosswalk to the Santa Clara Adult Education Center, the intersection of Jackson Street and Benton Street, and Washington Street and Benton Street along the access route. Pedestrian Hybrid Beacons (PHB) or Rectangular Rapid Flash Beacons (RRFB) are recommended at the intersections of Benton Street and Sherman Street, Alviso Street, and Washington Street based on warrants. New crosswalks should be installed at the minor street approach of unsignalized two-way stop-controlled intersections where crosswalks do not exist. Sidewalks exist along the access route and should be widened to the existing ROW, where available. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

Table 6 below summarizes the existing, planned, and recommended improvements for Access Route SC3.

TABLE 6: IMPROVEMENTS FOR ACCESS ROUTE SC3

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
Benton Street	Sunset Drive to Station Entrance	El Camino Real	Bike	VTA Countywide Bicycle Plan	None	Class II from Alice Drive to Lincoln Street/Class III from Lincoln Street to El Camino Real	Provide bike detection and consider bike boxes at signalized intersections along access route
			Pedestrian	CSC	5'-10' Sidewalk	Existing	Provide curb bulb-outs, pedestrian signage, leading pedestrian intervals, accessible pedestrian signals, and high-visibility crosswalks at El Camino Real and Benton Avenue
							Provide PHBs/RRFBs at: Benton St/Sherman St, Benton St/Alviso St, and Benton St/Washington St, based on warrants
							Widen sidewalk to existing ROW on north side of Benton Street between Sherman Street and El Camino Real
			Transit	2019 New Transit Service Plan	-	Bus 21 (30 min)	None
					Bus 32 (30 min)	-	
					-	Bus 53 (30 min)	
					-	Bus 59 (30 min)	
					Bus 60 (15 min)	Bus 60 (15 min)	
					Bus 81 (30 min)	-	
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel Parking	Existing	None
Franklin Street	Alviso Street to El Camino Real	El Camino Real	Bike	VTA Countywide Bicycle Plan	None	None	Provide shared use path, provide new connection to El Camino Real
			Pedestrian	CSC	5' Sidewalk	Existing	
			Transit	2019 New Transit Service Plan	None	None	None
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel and Angled Parking	2-Lane Undivided w/ On-Street Parallel parking	Remove angled parking on south side of street

Access Route SC4 – Palm Drive South of Santa Clara Station to Santa Clara University (see Figure 25)

Access Route SC 4 connects Santa Clara University to Santa Clara Station via Palm Drive. Key destinations include the Santa Clara University campus, including Stevens Stadium.

Palm Drive serves as a main entrance for the university and is a 2-lane divided street with no on-street parking. West of the campus entrance and drop-off point, Palm Drive is a pedestrian path that ends in the central quad at the Mission Santa Clara de Asís. It is recommended to provide bike boulevard enhancements, including signage and vertical or horizontal deflection, that would enhance the comfort of bicycle travel between the campus entrance and Santa Clara Station.

Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. One high-visibility crosswalk exists at the eastbound approach of Palm Drive and El Camino Real along the access route.

Table 7 below summarizes the existing, planned, and recommended improvements for Access Route SC4.

TABLE 7: IMPROVEMENTS FOR ACCESS ROUTE SC4

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
Palm Drive	Sherman Street to Station Entrance	Multimodal, Bus, and Auto Circulation	Bike	VTA Countywide Bicycle Plan	None	Planned (No class specified)	Provide Class III bike boulevard
							Consider bike boxes, two-stage turn queue bike boxes, bicycle phasing bicycle detection, and vertical separation elements
			Pedestrian	CSC	6' Sidewalk	Existing	Provide pedestrian signage, leading pedestrian intervals, accessible pedestrian signals, and high-visibility crosswalks at El Camino Real and Palm Drive
			Transit	2019 New Transit Service Plan	None	None	None
			Auto	CSC	2-Lane Divided	Existing	None

Access Route SC5 – Coleman Avenue East of Santa Clara Station to I-880 (see Figure 26)

Access Route SC5 connects the area east of Santa Clara Station via Coleman Avenue and Brokaw Road. Key destinations include Avaya Stadium and the future Coleman Highline development. There is an existing gap in the sidewalk on the north side of Coleman Avenue near Brokaw Avenue. In addition, the I-880 interchange presents a barrier to both bicycle and pedestrian travel.

Coleman Avenue is a 6-lane Major Arterial street with no on-street parking. The street has existing Class II bike lanes east of Aviation Avenue (City of San José), but no bike facility exists between Brokaw Road and Aviation Avenue. The *Santa Clara Countywide Bicycle Plan* classifies the corridor as a Priority Cross County Bicycle Corridor (CCBC). Class IV protected bike lanes are recommended for the corridor. The Draft Project Recommendations of the City of Santa Clara Bicycle Master Plan Update (2018) include Class II bicycle lanes for this segment.

It is recommended that two-stage turn queue boxes and bike detection be installed at all signalized intersections along the access route. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied. Curb bulb-outs and pedestrian signage are recommended at the intersection of Coleman Avenue and Brokaw Road.

Per VTA's adopted Transit Speed Policy, it is recommended that the highest level of Transit Signal Priority (TSP) be provided along all VTA frequent network routes. Leading bus signal phases should be implemented in the most congested areas, such as station entrances and exits, to minimize delay from route deviations into stations. TSP will make service faster and more reliable for passengers, and more cost-effective for VTA, by reducing delay and minimizing the variability in travel speed.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks. Sidewalks exist along the access route and should be widened to the existing ROW, where available. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

The area between Avaya Stadium and the station is undergoing significant redevelopment and is currently still in the project approval process. As part of that redevelopment, a new internal, public roadway network is being constructed. This roadway network may be a preferred alternative for movements to the east of the station, particularly for bicycle and pedestrian modes. The City of Santa Clara, City of San Jose, and VTA should work with the land owners to provide a high-quality multimodal network as part of those projects.

Table 8 below summarizes the existing, planned, and recommended improvements for Access Route SC5.

TABLE 8: IMPROVEMENTS FOR ACCESS ROUTE SC5

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
Coleman Avenue	McKendrie Street to Brokaw Road	Sidewalk gap to the east of Brokaw Road, I-880 Interchange	Bike	CSJ Bike Plan, VTA Countywide Bicycle Plan	Class II	Class II	Provide Class IV protected bike lane
							Provide two-stage turn queue boxes and bicycle detection at signalized intersections along access route
							Provide enhanced multimodal connections across I-880 Interchange
							Study potential connection to Guadalupe River Trail via Airport Boulevard
			Pedestrian	CSC, CSJ	6'-8' Sidewalk, west side from Aviation to I-880 is 12'	Existing	Provide sidewalk connection on north side of Coleman Avenue immediately east of Brokaw Road. Provide wider sidewalk and buffer where ROW allows
							Provide curb bulb-outs, and pedestrian signage at Coleman Avenue and Brokaw Road
			Transit	2019 New Transit Service Plan	Express 304 (30 min)	-	None
					Bus 10 (15 min)	-	
					-	Bus 60 (15 min)	
			Auto	CSC, CSJ	Principal Arterial	Principal Arterial	None
Brokaw Road	Coleman Avenue to Station Entrance	None	Bike	CSC	None	Class II	Provide Class IV protected bike lane
			Pedestrian	CSC	5'-6' Sidewalk	Existing	None
			Transit	2019 New Transit Service Plan	None	None	None
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel Parking	Existing	None

Access Route SC6 – El Camino Real/The Alameda Southeast of Santa Clara Station (see Figure 26)

Access Route SC6 connects the area southeast of Santa Clara Station via El Camino Real, The Alameda, and Benton Avenue. A key destination along the route is Santa Clara University. The interchange between The Alameda and I-880 is a barrier to bike and pedestrian circulation. This interchange is identified as an Across Barrier Connector (ABC) in the *Countywide Bicycle Plan*.

El Camino Real is a 6-lane divided Major Arterial with parking on one side, and The Alameda is a 4-lane undivided Major Arterial with a center two-way left turn lane (TWLTL) and parking on both sides. VTA Rapid 522 operates along this access route. The corridor is designated as a Cross County Bike Corridor (CCBC). Class IV protected bike lanes are recommended for the corridor between Benton Avenue and the intersection of El Camino Real/The Alameda to provide a low-stress connection for bicyclists, consistent with the Draft Project Recommendations of the City of Santa Clara Bicycle Master Plan Update (2018). This would require removing parking on El Camino Real.

It is recommended that the City of Santa Clara consider a corridor study on El Camino Real/The Alameda to investigate opportunities to improve transit travel time and reliability and accommodate all transportation modes. The proposed corridor study should consider consolidating closely-spaced stops, relocating bus stops to far-side locations, implementing enhanced transit signal priority, providing bus boarding islands or bus curb extensions, and providing dedicated bus-only lanes in high-congestion and frequent service areas. Further analysis will be required to determine the location, extent, and operation of dedicated transit lanes. In addition, transit stop amenities will be upgraded per guidelines included in the VTA Transit Passenger Environment Plan (TPEP).

Per VTA's adopted Transit Speed Policy, it is recommended that the highest level of Transit Signal Priority (TSP) be provided along all VTA frequent network routes. Leading bus signal phases should be implemented in the most congested areas, such as station entrances and exits, to minimize delay from route deviations into stations. TSP will make service faster and more reliable for passengers, and more cost-effective for VTA, by reducing delay and minimizing the variability in travel speed.

Potential locations for boarding islands are recommended on access routes with transit service. For stops where buses already stop in-lane (i.e. where buses would not be required to re-join the flow of traffic), no improvements are recommended. For stops where a Class IV bike facility is proposed (a combined width of at least 24'), a full bus boarding island is recommended. Two bus boarding islands are recommended on El Camino Real.

It is recommended that two-stage turn queue boxes and bike detection be installed at all signalized intersections along the access route. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied.

Wayfinding signage is recommended at the intersections of El Camino Real and Benton Street, and El Camino Real and Palm Drive/Railroad Avenue. Curb bulb-outs are recommended at El Camino Real and Benton Street, but not at El Camino Real and Palm Drive/Railroad Avenue, due to bus turning radius considerations. Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. High-visibility crosswalks exist along the access route at the intersections of The Alameda at Portola Avenue, and The Alameda at Idaho Street. New crosswalks should be installed at the minor street approach of unsignalized two-way stop-controlled intersections where crosswalks do not exist. Sidewalks exist along the access route and should be widened to the existing ROW, where available. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

Table 9 below summarizes the existing, planned, and recommended improvements for Access Route SC6.

TABLE 9: IMPROVEMENTS FOR ACCESS ROUTE SC6

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
El Camino Real / The Alameda	University Avenue to Benton Street	6-Lane Divided Cross Section	Bike	VTA Countywide Bicycle Plan	None	Class IV between Benton Street and The Alameda	Provide two-stage turn queue boxes and bike detection at signalized intersections along access route
			Pedestrian	CSC	8' Sidewalk	Existing	Consider sidewalk buffer as applicable
							Provide high-visibility crosswalks and pedestrian signage at El Camino Real and Railroad Avenue
							Widen sidewalk to existing ROW on south side of El Camino Real between Benton Street and Palm Drive and between Campbell Avenue and The Alameda
			Transit	2019 New Transit Service Plan	BRT 522 (15 min)	BRT 522 (12 min)	Provide transit travel time and reliability improvements based on corridor study
					Bus 52 (12 min)	Bus 52 (15 min)	
			Auto	CSC	Principal Arterial	Principal Arterial	None
Benton Street	El Camino Real to Station Entrance	Multimodal, Bus, and Auto Circulation	Bike	VTA Countywide Bicycle Plan	None	None	Provide bike facility for proper circulation
			Pedestrian	CSC	6'-8' Sidewalk	Existing	None
			Transit	2019 New Transit Service Plan	BRT 522 (15 min)	BRT 522 (12 min)	None
			Auto	CSC	2-Lane Undivided	Existing	None

Access Route SC7 – Park Avenue Southeast of Santa Clara University (see Figure 26)

Access Route SC7 connects the area southeast of Santa Clara University via Park Avenue. The key destination along the route is Santa Clara University. Connecting to the Santa Clara Station requires travel through the university campus.

Park Avenue is a two-lane undivided collector street with Class II bike lanes and on-street parking on both sides of the street. VTA local route 81 (a route that is planned to be discontinued in the 2019 New Transit Service Plan) operates on a short section of this access route, between University Avenue and Newhall Street. The corridor is designated as a Cross County Bicycle Corridor (CCBC) in the Santa Clara County Bicycle Plan. Class IV protected bike lanes are recommended on Park Avenue between University Avenue and Market Street. This would require removal of parking on one side of Park Avenue.

It is recommended that bike boxes and bike detection be installed at all signalized intersections along the access route. Countdown pedestrian heads and accessible pedestrian signals (APS) are recommended at signalized intersections within the 1/2-mile walkshed. Automatic pedestrian recall and leading pedestrian intervals (LPI) are also recommended at signalized intersections within the 1/2-mile walkshed, but exact locations should be further studied.

Wayfinding signage should be provided to any schools, museums, cultural institutions, recreational facilities, and other community landmarks, and should be consistent with agency wayfinding guidelines. Wayfinding should be provided along the access route to direct users to the station.

Along the access route, high-visibility crosswalks are recommended to be installed at all existing crosswalks where they are not installed. High-visibility crosswalks exist along the access route at the intersections of Park Avenue at Locust Street, Poplar Street, and Camino Drive. New crosswalks should be installed at the minor street approach of unsignalized two-way stop-controlled intersections where crosswalks do not exist. Sidewalks exist along the access route and should be widened to the existing ROW, where available. Curb ramps are recommended to be installed or updated to comply with ADA standards within the 1/2-mile walkshed.

Table 10 below summarizes the existing, planned, and recommended improvements for Access Route SC7.

TABLE 10: IMPROVEMENTS FOR ACCESS ROUTE SC7

Street(s)	Limits	Significant Barriers	Mode	Source	Existing (Frequency)	Planned (Frequency)	Further Recommendations
Park Avenue	University Avenue to Market Street	None	Bike	VTA Countywide Bicycle Plan	Class II	Class II	Provide Class IV protected bike lane
							Provide bike detection and consider bike boxes at signalized intersections along access route
			Pedestrian	CSC	8' Sidewalk	Existing	Consider sidewalk buffer as applicable
			Transit	2019 New Transit Service Plan	Bus 81 (30 min)	None	None
			Auto	CSC	2-Lane Undivided w/ On-Street Parallel Parking	Existing	Remove on-street parking (one side)

V. On-Site Station Requirements

Station access facilities are the foundation of a successful, multimodal facility. Providing adequate facilities with flexibility to adapt to future transportation needs maximizes the value of the transit investment. The BART Silicon Valley Phase II Extension stations are planned to be multimodal stations that encourage a wide variety of access means from a broad cross-section of the surrounding community. This document will lay the groundwork for station access concepts by identifying the facilities to be provided in the vicinity of the BART station entrances. It does not include requirements associated within the BART station itself, but rather identifies facilities to support multimodal access to the BART station.

In order to validate many of the on-site station requirements, access characteristics at comparable existing BART stations were analyzed through station observations. For the Santa Clara Station, Daly City and Hayward Stations were used as comparable stations in part due to their "Balanced Intermodal" station classification according to the BART Station Access Design Hierarchy (*BART Station Access Policy*). The *BART Station Access Typology* defines a balanced intermodal station as well-served by transit with parking also provided. These stations typically have both walking and drive alone rates of approximately 25%-40% each. 2015 weekday mode of access data provided by BART was referenced for the comparable stations. The data was used to forecast pick-up/drop-off characteristics at the station.

Automobile/Park-and-Ride Parking

At the Santa Clara Station, a parking structure of up to five levels with 500 spaces is proposed to accommodate BART park-and-ride demand. The number of parking spaces is based on the *Final Subsequent Environmental Impact Report* (SEIR, 2018).

Bicycle Parking

According to the *BART Facilities Standards (BFS) Architecture – Passenger Station Sites*, both Class I and Class II bike parking shall be provided at the station and should be located outside the pedestrian paths of travel. Class I bicycle parking includes bicycle lockers, secured rooms or cages, and attended bicycle parking or bike stations. Bike lockers should be provided at all stations where space for installation exists, such as street level or in an external plaza. Class I lockers can accommodate up to two bicycles each according to the *BART Multimodal Access Design Guidelines* (MADG).

In addition to a secure group parking facility with an attendant, Class II bicycle parking (bicycle racks) may be provided. It should be prioritized inside the paid area or in the free area of the concourse in sight of the station agent and clustered as much as possible for convenience and theft protection (*BFS Architecture – Passenger Station Sites*). For outdoor parking, Class II bicycle racks should be covered with a roof or located under a structural overhang to provide protection from the elements.

Two methodologies were used to compute the required amount of Class I and II bicycle parking. The first method, from the *VTA Bicycle Technical Guidelines*, states that for transit centers, the required number of bike parking spaces is 2% of daily home-based boardings. The second method used the *BART Bicycle Plan*'s systemwide goal of an 8% rideshare of BART passengers to access stations by bicycles by 2022.

No specific guidance exists in the *BFS* for the amount of bicycle parking required except that the required number of lockers should be obtained from the Bicycle Program Manager.

The first method to compute required bicycle parking uses the *VTA Bicycle Technical Guidelines* criteria that

there should be enough bicycle spaces for 2% of daily home-based boardings with 75% of those as Class I and 25% as Class II. For this calculation, the daily home-based boardings were assumed to be all trips entering the station during the 2035 AM Period. According to the travel demand forecast, shown in **Figure 27**, there are projected to be ~2,700 daily station boardings entering the Santa Clara Station during the 2035 AM period (SEIR). The total bicycle parking required would be 2% of the daily home-based boardings, resulting in a minimum of 53 required parking spaces. The minimum facilities that should be provided according to the *VTA Bicycle Technical Guidelines*, are 40 Class I bike parking spaces and 13 Class II bike parking spaces.

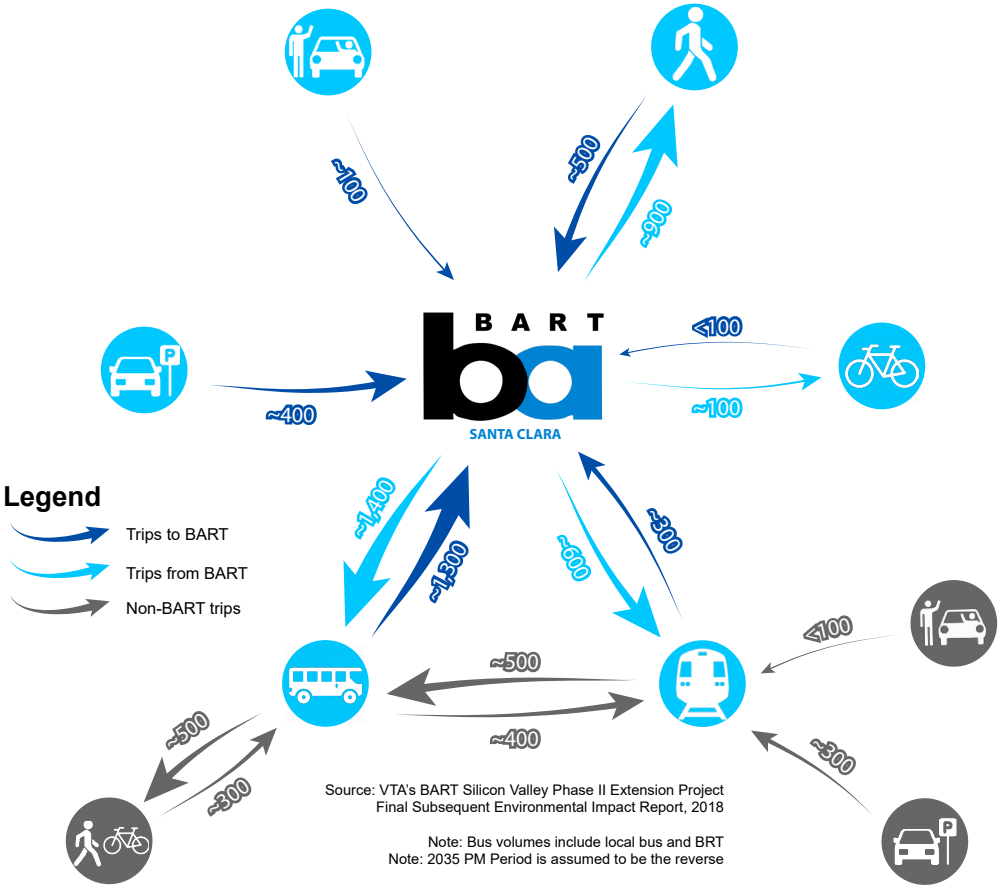


Figure 27: Forecast Year 2035 AM Period Station Boardings and Alightings

The second methodology uses the *BART Bicycle Plan*'s systemwide goal of 8% rideshare of BART passengers to access stations by bike by 2022. The travel demand forecast was used to determine the number of daily station boardings (~2,700 boardings) during the 2035 AM period (SEIR). Assuming BART operates at its goal, there would be 213 bicyclists accessing the station in 2035. The comparable stations, Hayward and Daly City, were then used to determine the percentage of people who parked their bike at the station versus taking it onto the BART trains. Between the comparable stations, the more conservative station, where more users parked their bikes at the station, was used for analysis. At Daly City Station, the *BART Bicycle Plan* shows that 26% of bike access users park their bikes at the station. This results in a total requirement of 55 bicycle parking spaces. The *BART Bicycle Plan* assumes that the percentage of users who park their bikes at stations will need

to increase to approximately 60% by 2022. This assumption is based on the fact that although the new BART fleet (which began going into service in 2018 with complete acceptance of new fleet in 2022) accommodates more bicycles, it is unlikely BART will have space for 11,000 more onboard bicycles, which would be the number required based on the current bicycle parking rate at stations. Using this estimate of 60% users parking their bikes at the station, 128 bicycle parking spaces should be provided.

The two methodologies are summarized in **Table 11** below. The scenario with 60% bicycles parked at the station from the *BART Bicycle Plan* is also shown. It should be noted that the *BART Bicycle Plan* does not have a minimum requirement for bike parking, and it only states that world-class bicycle facilities should be provided.

TABLE 11: MINIMUM PROVIDED BICYCLE PARKING

Plan	Minimum Class I Parking	Minimum Class II Parking	Minimum Total Bicycle Parking
VTA Bicycle Technical Guidelines	40	13	53
BART Bicycle Plan (Comparable Station)	N/A	N/A	55
BART Bicycle Plan (60% Goal)	N/A	N/A	128

As shown in the table above, there is a minimum bicycle parking projection of between 53 and 128 spaces at the Santa Clara Station. The VTA and BART methodologies result in different amounts of minimum bicycle parking. Assuming compatibility with station design, the larger number is recommended as the minimum amount of bicycle parking in order to facilitate non-auto access mode goals. Due to the amount of parking required, bike lockers may not be an efficient use of space due to their large footprint. A secure group parking facility, with an attendant, such as the existing one at BART's Downtown Berkeley Station should be provided. At Downtown Berkeley Station, there are three types of parking provided as part of the bike station program: free valet bike parking during staffed hours (7AM – 9 PM weekdays), 24-hour controlled access parking, and secured Class II bike racks with a total capacity of 334 bikes. Bike repair tools or a bike repair station with an attendant is also encouraged, similar to the one provided at Downtown Berkeley. The *BART Bicycle Plan* recommends multiple payment options, providing enhanced lockers with greater security, and frequently maintaining bicycle facilities.

In planning space for bicycle and scooter parking, minimum areas for covered bike parking, docked bicycle parking, and shared mobility dockless bicycle/scooter parking should be provided, along with flexible space for expanding any one of these areas to meet future needs.

Shared-Use Mobility Considerations

With the growing use of shared-use mobility services such as Lime, Bird, Jump, and others, consideration and planning of these modes is vital to preserve and organize the public right-of-way. Currently, there is no formal guidance provided by BART, VTA, or the City of Santa Clara for shared-use mobility services. The cities of Santa Monica, California; Austin, Texas; Denver, Colorado; among others, have passed regulations limiting the areas that dockless mobility units can operate by utilizing geofencing and enforcing rules to ensure that these shared-use mobility services are compliant with applicable laws and the permitting process. In-street or sidewalk corrals, similar to the ones implemented in Austin, Texas, and Santa Monica,

California, are recommended to reduce sidewalk clutter near station entrances. The National Association of City Transportation Officials (NACTO) has also provided guidelines for cities to regulate and manage shared transportation. This guidance can be referenced until the City of Santa Clara passes its own ordinance.

The 2015 BART mode of access data and the travel demand model does not reflect the growing prevalence of bikeshare and scootershare. These shared-use mobility services have the potential to shift utilization away from private bike utilization. The effect of the growing use of these services should be further studied.

Lime and Bird are currently operating in the area. Ford GoBike is a bikeshare program based in the Bay Area with stations located throughout San José and the greater Bay Area. Ford GoBike bicycles need to be checked-out and returned at defined stations. Ford GoBike also has a dockless program currently being tested in North San José which should be monitored for future expansion to the station area. There are currently no docking stations in the station vicinity but may be provided in the future.

Several cities, including Denver and Santa Monica, have begun to install small corrals for shared-use devices within the roadway or on sidewalks, to encourage users to park vehicles in places where they will not impede pedestrian travel or accessibility. The corrals vary in size and character based on local context, but are typically 6 feet wide and between 10 to 15 feet in length. To encourage proper storage of these devices, it is recommended that 6 feet by 20 feet vehicle corrals be designated near primary station entrances (enough for between 20-30 units). Due to the uncertain future of shared-use mobility, these parking areas could be constructed with paint and other low-impact solutions to permit flexibility of future use and retain the potential to repurpose them for other uses if shared mobility activity significantly increases or decreases.

Pick-up/drop-off Curb Space Requirement

The curb space required for pick-up and drop-off activity for private automobiles, taxis, and TNCs is estimated based on travel demand projections and observations from the comparable BART stations. AM and PM peak observations were made at the comparable stations for cars using the pick-up and drop-off space to determine the average dwell time. This was used to determine the maximum service rate, defined as the number of vehicles per hour able to use the available curb space. A Peak Hour Factor (PHF) was also calculated using the data from the observed stations. There was a higher pick-up/drop-off volume during the AM period, but the duration for the activity was longer during the PM period. The analysis was performed for both AM and PM periods and the more conservative time was chose. With a longer dwell time, the PM period had a greater usage requirement. This was used to project station pick-up/drop-off activity from the 2035 forecast model to estimate curb space required at the Santa Clara Station.

The analysis showed that four curb spaces are required for private automobiles and TNCs in order to provide at least one space available at any time with 90% certainty. To determine curb space that would be needed to account for growth from current conditions to the opening of the station, the BART mode of access data from 2015 was compared to data from 2008. The percentage of people who were dropped off more than doubled for both comparable stations. With increasing use of TNCs and the advent of autonomous vehicles, pick-up/drop-off activity at stations is likely to continue to increase. To account for this growth, an additional four curb spaces for a total of eight curb spaces for private automobiles and TNCs is recommended. This equates to approximately 200 feet of linear curb space using a typical value of 25 feet per vehicle. Taxis had 5 designated spaces, approximately 125 feet of linear curb space, at the comparable BART stations separate from the pick-up/drop-off area.

An additional 600 feet of linear curb space should be allocated for pick-up/drop-off activity from private bus shuttles operated by employers or other private companies to manage conflicts with public buses and

motorists. The 600 feet of linear curb space would be able to accommodate at least 12 concurrent employer shuttles. Most shuttle buses currently in service are smaller vehicles, and thus a larger number of shuttles may be provided. Linear straight curb is recommended to allow flexible vehicle sizing. Permitting and enforcement policies for these areas is still to be determined. The linear feet of curb space was calculated by adjusting ridership from Caltrain at Mountain View to projected BART boardings and alightings at Santa Clara. It is anticipated that employers who currently provide service to Mountain View Transit Center would also provide service to Santa Clara BART. Forty feet of linear curb space should be provided to allow for two paratransit vehicles to be parked back to back. The preferred location of this space is as close to the station elevator as possible.

Private automobile, TNC, private shuttles and taxi pick-up/drop-off areas should have separate designated areas. Where possible, pick-up/drop-off space should be designated in an area close to the faregate entrance, but with circulation separated from public bus transit circulation to minimize delays for transit vehicles (*MADG*). This space should also be located to allow users to access the station entrance without crossing traffic lanes and designed for one-way traffic (*BFS Architecture – Passenger Station Sites*).

Bus Bay Requirements

VTA's 2019 New Transit Service Plan was analyzed to determine which bus routes may serve the station in the near term. The route start and end points, frequency, and whether the Santa Clara stop would serve as a route terminus are shown in **Table 12** below. Routes that terminate at the station may need additional space for layover and driver break facilities/restrooms.

TABLE 12: ANTICIPATED ROUTES SERVING SANTA CLARA STATION

Route	Direction	From	To	Peak Frequency	Route Terminus at Station	Bay Requirements	Access
21	Eastbound/Westbound	Santa Clara BART Station	Palo Alto TC	30 mins	Yes	1 bay	Railroad Avenue (West of Station)
22	Eastbound/Westbound	Eastridge TC	Palo Alto TC	15 mins	No	1 bay	Railroad Avenue (West of Station)
53	Eastbound/Westbound	Santa Clara Caltrain Station	Downtown Sunnyvale	30 mins	Yes	1 bay	Railroad Avenue (West of Station)
59	Northbound/Southbound	Santa Clara Caltrain Station	Baypointe Light Rail Station	30 mins	Yes	1 bay	Railroad Avenue (West of Station)
60a	Northbound/Southbound	Milpitas BART Station	Santa Clara BART Station	15 mins	Yes	2 bays	Brokaw Road (East of Station)
60b	Northbound/Southbound	Santa Clara BART Station	Winchester Station	15 mins	Yes	2 bay	Railroad Avenue (West of Station)
BRT 522	Eastbound/Westbound	Alum Rock TC	Palo Alto TC	12 mins	No	1 bay	Railroad Avenue (West of Station)

There are currently 10 bays in the existing configuration around Railroad Avenue; 2 bays along the east side of El Camino Real, 4 sawtooth bays on Railroad Avenue, 3 linear bays on the east side of Railroad Avenue and one bay on the west side of Railroad Avenue. No new bus bays would need to be developed on the west side of the Caltrain tracks to accommodate the planned transit network. VTA generally uses standard 40-foot buses and 60-foot articulated buses in its fleet. Bus stop amenities, shelters, and facilities consistent with VTA's Transit Passenger Environment Plan should be provided. The current bus routes that stop in the Station Area are shown in **Figure 28**. It should be noted that the placement of the bus stops is based on the current route configuration and not the configuration from 2019 New Transit Service Plan.

As currently figured, all buses with the exception of Route 60a would drop off passengers at the loop on Railroad Avenue, which is located on the west side of the BART station. Route 60a would need to have bays created to the east of the BART station. Four public transit bays, inclusive of an additional bay allocated for future expansion, should be created to the east side of the station and designed to accommodate the larger 60-foot articulated buses.

Faregate, Ticket Vending Machines, and Staffed Kiosks

According to the *BFS Architecture – Passenger Stations*, ticket vending machines should be located in the free area, visible to patrons entering the station but placed so as to not impede the flow between entrances and fare gates. Space or conduits for an additional 33% of ticket vending machines shall be provided for future expansion. The minimum queue space that should be provided in front of ticket vending machines is six feet. A minimum of two bill changers should also be provided in the free area with at least one VTA ticket vending machine.

There should be four types of faregates included at each station: entry consoles, exit consoles, reversible consoles, and accessible consoles. Their orientation and technical specification can be found in the *BFS R3.1.2*. In an array of gates, the right-side gate should be the entry gate, with the right side for the exiting flow being the exit gate. This exiting gate must accommodate users with oversized items and bicycles. The remaining center gates should face the major directional flows and there must be a minimum of six gate aisles per station with one ADA accessible fare gate being provided in each fare gate array per the *BFS Architecture – Passenger Stations*. A minimum queue space of fifteen feet shall be provided in front of the fare gates.

The station agent booth should be located within the line of sight of the gates and centrally located with respect to the gates or the side of the entry gates as circulation dictates. When there are two sets of gates, the station booth should be adjacent to the gate serving the majority of off-peak users (bus and taxi drop off, non-commuter parking). As an additional requirement, the booth should be located adjacent to fare gate arrays and, to the greatest extent possible, be visible from the entire concourse area.

Legend

- Potential Station Entrance Location
- Existing VTA BRT Stop
- Existing VTA Bus Stop
- VTA's BART Phase II Extension Alignment
- # Routes Serving Bus Stop (Direction)
- Santa Clara Station

Figure 28: Existing Bus Stop Locations (Prior to 2019 New Transit Service Plan)

Emergency Access/Egress and Fire Access

Emergency access to stations entrances, pedestrian bridges, facilities, parking structures, and emergency egress locations should be provided from public streets, or an access road with a minimum paved width of 20 feet, and be within 150 feet of an access road in accordance with the *California Fire Code* (CFC) Section 503 and the *MADG*. There should also be an unobstructed vertical clearance of 13 feet 6 inches. An access road to the station should be continuous from a public street to a public street, or a 66-foot outside radius turnaround must be provided. Fire lanes should also be provided from a public street to the station, through parking lots, meeting the requirements of *CFC Section 503* with a minimum radius of 30 feet for the inside path and 50 feet for the outside path.

Access through service gates for maintenance personnel and emergency crews should be provided in the fare gate array for movement between the free and paid areas in accordance with the *California Building Code*. The service gates should be provided along the barrier separating the paid and free area for staff and equipment access, and have a minimum clear opening of 3 feet 6 inches (*BFS*). At least one full size service gate should be located adjacent to the station agent booth for public use; other service gates not adjacent to the station agent booth should have audible visual alarms in close proximity to the gate to prevent unauthorized use.

Wayfinding and Accessibility

Wayfinding serves to guide the public to the station from the surrounding neighborhood and along major access routes. It also informs users of transfer connections and station facilities. Wayfinding should be developed as a part of the architecture and site design and should make stations recognizable within the urban fabric. Redundancy should also be used for wayfinding with both words and pictograms, audio messages repeated on visual message boards, and tactile with message repeated in Braille. Specific design guidelines and standards can be found in the *BART Criteria Architecture – Wayfinding and Signage*. Wayfinding should be provided in coordination with VTA, BART, and the City of Santa Clara to include destinations in the surrounding neighborhood as well.

Bicycle wayfinding signage should be posted on the closest arterial and on all bikeways as they approach the station. Based on adjacent roadway configuration and location of existing bikeways, a separate bicycle entrance to the station may be preferable and available; these entrances should be identified and clearly marked. Wayfinding to both station entrances and bike parking areas should also be provided.

Wayfinding for users accessing the station with automobiles should also be posted on arterials in the Station Area as well as freeway interchanges that provide access to the station. In the vicinity of the station, access route signage, real-time parking availability signage as well as parking wayfinding signage should be provided.

All pedestrian walkways should be paved and free of tripping hazards and Tactile Ground Surface Indicators (TGSI) shall be provided. A TGSI is a minimum 1-foot wide paving feature strip with a material, pattern, or texture detectable for blind and low-vision patrons to orientate themselves at bus loading and pick-up and drop-off areas and through the station entrances and accessible gates (*BFS*). When there are direct connections to commercial, retail, or other facilities, or where they will be used to facilitate future direct connections, an accessible route to boarding platforms and other transportation system elements must be provided to be compliant with the Americans with Disabilities Act (ADA).

Safety and Security

As part of safety for the parking structure, a vertical screen system should be installed at the first level on all sides of the parking structure where the screen is continuous and secure. At vehicle entry and exit points, motorized overhead coiling grilles should be provided; at pedestrian entry and exit points, full height doors with closers, panic hardware, and external access via key in lock cylinder should be provided. Railings should be provided as required by applicable codes to protect the interior slab edges. Pedestrian, bicycle, vehicular access should all be designed to maximize safety of users in accordance with the *BFS Architecture – Passenger Station Sites*.

VI. Implementation and Next Steps

Access improvement recommendations were prioritized to identify near-term and long-term implementation recommendations. Near-term improvements were those deemed most critical to support rider access with the start of project revenue service based on existing and near-term planned development activity. Long-term improvements were oriented around buildout of the overall TOC vision and improved connections between the new/enhanced transit-oriented communities and the station. Station access improvements and their level of priority were developed in close coordination with the Cities of San José and Santa Clara.

Table 13 and **Table 14** below summarize the access improvement recommendations, organized by near- or long-term implementation. It is recommended that ongoing planning projects within in the Cities of San José and Santa Clara, such as the East San José Multimodal Transportation Plan (ESJ MTIP), Downtown Transportation Plan (DTP), and El Camino Real Specific Plan, should consider and carry forward the recommendations of this study. Note that projects that already have received full funding and are advancing towards implementation were excluded from the recommendations list. The Transit Oriented Communities Strategy Study includes funding strategies for the implementation of the projects identified here.

Streetscape improvements were also proposed for the station area. These include widened sidewalks to provide a buffer from the roadway, landscaping, lighting, shade, seating, and other amenities, and vary between the different street typologies recommended for the station area. The recommended street typologies are based on the typologies laid out by the City of San José's Complete Streets Design Standards and Guidelines and can be found in the overall Transit Oriented Communities Strategy Study.

Cost estimates for all access and streetscape improvements provided within this station profile and are included in the overall TOCs Strategy Study.

The on-site station requirements included in this report are intended to inform the station design for automobile and bicycle parking, shared-use mobility considerations, pick-up/drop-off curb space, bus bays, faregates, ticket vending machines, staffed kiosks, emergency access, wayfinding and accessibility, as well as safety and security. A Station Access Concepts development process will build off of the facility requirements identified in this Profile and will serve as an input to future design efforts.

TABLE 13: NEAR-TERM RECOMMENDED IMROVEMENTS

#	Description	Quantity	Unit	Category of Improvement	Previous/Ongoing Planning Document
City of Santa Clara					
1	Construct bulb-outs and ADA ramps within Station Area	26	EA	Pedestrian	
2	Upgrade signals within ½ mile walkshed	6	EA	Bicycle/Pedestrian/Transit	Project Phase II SEIR/SEIS
3	Install wayfinding signage along access routes within Station Area	4	EA	Bicycle/Pedestrian/Transit	
4	Improve El Camino Real/Benton Street intersection	1	LS	Bicycle/Pedestrian	Santa Clara Bike Plan
5	Widen sidewalk on El Camino Real from Benton Street to The Alameda and on Coleman Avenue from De La Cruz interchange to Brokaw Road	13,200	SF	Pedestrian	
6	Install Class IV bike lane on El Camino Real/The Alameda from Scott Boulevard to Benton Street	6,674	LF	Bicycle	Santa Clara Bike Plan
7	Install Class IV bike lane on El Camino Real from Benton Street to The Alameda	3,717	LF	Bicycle	San Clara Bike Plan
8	Install Class IV bike lane on Brokaw Road from Coleman Avenue to Santa Clara Station	1,174	LF	Bicycle	Project Phase II SEIR/SEIS
9	Install Class IV bike lanes on Martin Avenue from De La Cruz Boulevard to Coleman Avenue	4,536	LF	Bicycle	Santa Clara Bike Plan
10	Install Class IV bike lanes on Coleman Avenue from Brokaw Road to City of San José boundary	918	LF	Bicycle	Santa Clara Bike Plan
11	Install Class I bike path on Franklin Street from Lafayette Street to El Camino Real	1,780	LF	Bicycle	
12	Install connection on Franklin Street to El Camino Real	1	LS	Bicycle/Pedestrian	
City of San José					
13	Install wayfinding signage along access routes within Station Area	3	EA	Bicycle/Pedestrian/Transit	
14	Install Class IV bike lanes on Coleman Avenue from City of San José boundary to W. Hedding Street	6,054	LF	Bicycle	San José Bike Plan

TABLE 14: LONG-TERM RECOMMENDED IMROVEMENTS

#	Description	Quantity	Unit	Category of Improvement	Previous/Ongoing Planning Document
City of Santa Clara					
15	Construct bulb-outs and ADA ramps within ½ mile walkshed of Station Area	62	EA	Pedestrian	
16	Upgrade signals within 1½ mile bikeshed	10	EA	Bicycle/Pedestrian/Transit	
17	Install RRFB or PHB at Washington St, Alviso St, and Sherman St	3	EA	Pedestrian	
18	Construct sidewalk on Martin Avenue from De La Cruz Boulevard to Coleman Avenue	42,240	SF	Pedestrian	
19	Install Class III bike boulevard on Benton Street from Alice Drive to Lincoln Street	2,534	LF	Bicycle	Santa Clara Bike Plan
20	Install Class II bike lane on Benton Street from Lincoln Street to El Camino Real	4,377	LF	Bicycle	Santa Clara Bike Plan
21	Install Class III bike boulevard on Palm Drive from Sherman Strett to El Camino Real	733	LF	Bicycle	
22	Install Class IV bike lane on De La Cruz Boulevard from Central Expressway to Reed Street	4,783	LF	Bicycle	Santa Clara Bike Plan
23	Install class IV two-way lane on north side of De La Cruz interchange from Reed Street to Brokaw Road	1	LS	Bicycle	
24	Construct sidewalk on Coleman Avenue from Brokaw Road to City of San José boundary	4,800	SF	Pedestrian	
25	Install Class IV bike lane on Park Avenue from City of San José boundary to Market Street	3,252	LF	Bicycle	
26	Construct transit islands within Station Area	11	EA	Bicycle/Transit	El Camino Real Specific Plan
27	Additional transit enhancements on El Camino Real/The Alameda for transit travel speeds, to be determined based on future corridor study	1	LS	Transit	
City of San José					
28	Upgrade signals within 1½ mile bikeshed	10	EA	Bicycle/Pedestrian/Transit	
29	Install Class IV bike lane on Park Avenue from University Avenue to City of San José boundary	2,245	LF	Bicycle	
30	Additional transit enhancements on El Camino Real/The Alameda for transit travel speeds, to be determined based on future corridor study	1	LS	Transit	

Report Glossary

Accessible Pedestrian Signal (APS)

Accessible Pedestrian Signals communicate in a non-visual format (i.e. by sound) to nearby pedestrians when it is safe to cross an intersection. APS helps ensure the safety of blind or visually-impaired pedestrians.

All-Way Stop Control

An intersection where drivers approaching from all directions are required to stop before proceeding as opposed to a yield- or signal-controlled intersection.

Automatic pedestrian recall

A method of traffic signal timing in which a pedestrian 'walk' signal always accompanies a green light given to drivers moving in the same direction. Without automatic pedestrian recall, a signal activation button must be pressed before the start of the cycle for pedestrians to be allowed to cross the intersection.

Bike box

A painted green box that reserves space between the intersection and the vehicle stop bar (the line indicating where drivers are meant to stop) for bicyclists. When waiting for a green signal, bicyclists may use the box to move in front of waiting vehicles, allowing them to get a head start on vehicles and make a left turn more comfortably.

Bike detection

Technology that triggers a call to a traffic signal when a bicyclist is waiting to turn or proceed straight.

Bulb-out

A widening of the sidewalk, typically at an intersection, used to decrease the length of roadway a pedestrian must cross and to slow the speed of turning vehicles.

Bus Rapid Transit (BRT)

Enhanced bus service typically characterized by all or a subset of features that are frequently associated with rail transit. These include a combination of elements such as dedicated lanes, signal priority, faster travel speeds, off-vehicle payment, enhanced stations/shelters with real-time arrival information, and less frequent stops than local bus routes.

Class I bicycle path

Also known as an off-street path, a Class I Bicycle Facility has exclusive right-of-way for bicyclists or bicyclists and pedestrians, separate from motorized traffic.

Class II bicycle lane

Also known as a standard bike lane, a Class II Bicycle Lane is a painted lane on the street designating an area to be used by bicyclists. These lanes are typically placed adjacent to traffic lanes, either between the traffic lane and parked cars, or against the curb. They may include a striped buffer between the traffic lane and the bicycle lane.

Class III bike route

A route indicated by signage, pavement markings (such as "sharrows"), and depicted on bicycle wayfinding maps along which bicycle activity is encouraged.

Class III bike boulevard

An on-street route specifically designed for comfortable bicycle travel. These boulevards frequently feature traffic calming treatments such as speed humps, neighborhood traffic circles, or traffic diverters to reduce vehicle speed and discourage cut-through auto travel.

Class IV protected bike lane

A bicycle lane physically separated from vehicle traffic via a raised element, such as bollards, curb, planters, or parked cars.

Curb radius

A measurement of the radius of the curb at the corner of an intersection. An intersection with large curb radius (i.e. a gradual curve) allows drivers to make higher-speed turns. An intersection with a small curb radius (i.e. closer to a right angle) may force drivers to slow their speed, reducing risk for pedestrians using the intersection.

Dwell time

The amount of time a vehicle, typically a transit vehicle, taxi, or ridehail vehicle, spends waiting for passengers to load and/or unload.

Leading Pedestrian Interval (LPI)

A leading pedestrian interval gives pedestrians a 'walk' signal before drivers traveling in the same direction are given a green light. This allows pedestrians to get a head-start into the intersection, making them more visible to turning drivers, which improves pedestrian safety.

Level of Traffic Stress (LTS)

An attempt to quantify the degree of stress experienced by bicycle riders, LTS is a measurement applied to a road segment or street crossing. High levels of traffic stress are generally caused by the proximity of fast-moving automobiles and lead to only risk-tolerant travelers riding on the segment. In this report LTS is typically measured on a 1-5 scale, ranging from a physically separated path (LTS 1) to high-speed mixed traffic (LTS 5).

Median refuge

Typically installed on multilane roads, a median refuge provides pedestrians crossing a street with a place to rest outside of the traveled way. These are particularly useful for older adults or those with mobility impairments who are not able to cross an intersection within the duration of a walk and flashing 'don't walk' phase.

Neighborhood traffic circle

A small roundabout, a neighborhood traffic circle is a traffic control device typically used in place of a four-way stop. Approaching vehicles must yield to vehicles currently within the circle before entering, proceeding in a counter-clockwise direction.

Pedestrian Hybrid Beacon (PHB)

A pedestrian-activated traffic signal used to alert drivers to the presence of a person trying to cross the street and requiring them to come to a complete stop. When activated, the beacon cycles through a yellow interval before showing a solid red indicator during the walk phase. It then switches to a flashing red light during the flashing 'don't walk' phase, allowing for vehicles to proceed slowly across the crosswalk if the pedestrian has completed their crossing.

Pedestrian-scale lighting

Street lighting at a lower height than typical street lights specifically intended to improve nighttime visibility for pedestrians rather than for drivers.

Protected crossing

A crosswalk with some type of enhanced signal or active warning sign control, either a Rectangular Rapid Flashing Beacon (RRFB), or Pedestrian Hybrid Beason (PHB), traffic signal, or stop sign. Unprotected crossings, crosswalks with only striping or striping and static signs, tend to have very low yield rates from drivers, especially when vehicles are traveling quickly.

Rectangular Rapid Flash Beacon (RRFB)

A pedestrian-activated traffic signal used to alert drivers to the presence of a person trying to cross the street and encourage them to yield. When activated, the beacon flashes yellow for a period that allows pedestrians to traverse the crosswalk. An RRFB can be activated by the pedestrian actively with a push-button or passively using sensors.

Traffic calming

The broad term for a series of roadway treatments intended to slow the speed of drivers, typically applied in residential zones or areas with large volumes of pedestrian travel. Such measures may include speed humps, raised intersections, neighborhood traffic circles, and reducing lane widths.

Traffic diverter

A roadway feature designed to allow unimpeded travel by pedestrians and cyclists, but require a left- or right-turning movement for the automobile. The purpose of such diverters is to maintain connectivity for pedestrians and cyclists while discouraging cut-through automobile traffic. Diverters are typically designed to preserve all movements for emergency vehicles.

Transit Oriented Development (TOD)

A type of mixed-use development located proximate to high-frequency transit. Such developments often include amenities and facilities that encourage transit and non-auto use.

Transit Oriented Community (TOC)

While TOD generally refers to an individual mixed-use project adjacent to high-quality transit, the concept of a Transit Oriented Community encompasses the neighborhood surrounding the transit station. A TOC is one in which travel via non-auto modes is convenient, seamless, and comfortable.

Transit Signal Priority (TSP)

A traffic signal operation in which transit vehicles are given priority treatment at signalized intersections. This includes a range of treatments such as modifying signal phase timings and providing dedicated transit phases or facilities.

Transportation Network Company (TNC)

The preferred general term for companies such as Uber and Lyft, also known as ridehail or app-based transportation companies.

Two-stage left turn box

A painted green box that helps bicyclists turn left across intersections. Most bikeways travel along the right side of the roadway. This make left turns difficult on multilane roads, as a bicyclist would be required to cross several lanes of auto traffic to position themselves in the left-turn lane. A two-stage left turn box allows a bicyclist to proceed through an intersection to the far right-side corner, where they may wait in the box out of the flow of traffic until the cross traffic is given a green signal, allowing them to complete a left turn in two steps.

Walkshed

The land area that falls within a 10-minute walk of a point, using the existing pedestrian network.