Chapter 2
Alternatives

2.1 Introduction

VTA's BART Silicon Valley Program consists of the extension of the Bay Area Rapid Transit (BART) system from its ~~planned~~ terminus at Warm Springs Station in southern Fremont in Alameda County, which ~~is currently under construction and scheduled to open in~~opened in March 2017, into Santa Clara County through the Cities of Milpitas, San Jose, and Santa Clara. The BART Silicon Valley Program is being implemented in two phases: the Phase I Berryessa Extension Project (Phase I) and the Phase II Extension Project (Phase II) as shown on Figures 2-1 and 2-2. The Phase I Project is currently under construction and scheduled to be operational in ~~late 2017~~2018. The remaining approximately 6 miles of the BART Silicon Valley Program are the subject of this combined Supplemental Environmental Impact Statement and Subsequent Environmental Impact Report (SEIS/SEIR), which includes both a National Environmental Policy Act (NEPA) and a California Environmental Quality Act (CEQA) analysis. The alternatives analyzed in accordance with NEPA and CEQA are described below. For environmental analysis purposes, the study years include 2015 Existing, 2025 Opening Year, and 2035 Forecast Year.

There are two alternatives evaluated in this document in accordance with NEPA: the No Build Alternative and the BART Extension Alternative.

1. The NEPA No Build Alternative consists of planned and programmed transit and roadway improvements, but does not include the 6-mile BART Extension to Santa Clara.
2. The NEPA BART Extension Alternative consists of a 6-mile extension of the BART system from the Berryessa/North San Jose ~~BART~~ Station, currently under construction, through downtown San Jose to the Santa Clara Caltrain Station.

There are three alternatives evaluated in this document in accordance with CEQA: the No Build Alternative, the BART Extension Alternative, and the BART Extension with TOJD Alternative. The proposed TOJD is not included in the NEPA Build Alternative because the TOJD is proposed independent action by VTA and no federal action is involved. The proposed TOJD serves a separate purpose and need than the BART Extension Alternative as described below and has independent utility. It is included as an alternative under CEQA to support local and regional land use planning. The proposed TOJD may be constructed at the same time as the BART Extension Alternative or later in time, dependent on the availability of funding and subject to market forces. However, the design of the stations and structures would not preclude TOJD. No private developer has been identified at this time, and the proposed TOJD by VTA may be subject to refinement once a private developer is identified. Any proposed TOJD by VTA, should the Board decide to implement this alternative, would

be separately funded and would not include federal funding. The proposed TOJD by VTA is intended to be consistent with the City of San Jose and City of Santa Clara general plans and approved area plans, as applicable.

1. The CEQA No Build Alternative is the same as the NEPA No Build Alternative.
2. The CEQA BART Extension Alternative is the same as the NEPA BART Extension Alternative described above.
3. The CEQA BART Extension with TOJD Alternative consists of the 6-mile BART Extension as described above (see NEPA BART Extension Alternative) along with transit-oriented joint development (TOJD) at the four proposed BART stations and at the two mid-tunnel ventilation structure sites. ~~The proposed TOJD is not included in the NEPA Build Alternative because the TOJD is a potential future independent action by VTA and the TOJD project serves a separate purpose and need than the BART Extension Alternative as described below. The proposed TOJD has independent utility and is included to support local and regional land use planning. The TOJD may be constructed at the same time as the BART Extension Alternative or later in time, dependent on the availability of funding and subject to market forces. However, the design of the stations and structures would not preclude TOJD. No specific TOJD development plan or private developer has been identified, and any proposed TOJD project would be separately funded and would not include federal funding.~~

The 6-mile BART Extension under the NEPA and CEQA BART Extension Alternatives and the CEQA BART Extension with TOJD Alternative would begin at the terminus of the Phase I Project east of U.S. Highway 101 (U.S. 101) and south of Mabury Road in the City of San Jose.

The BART Extension would descend into an approximately 5-mile-long subway tunnel, continue through downtown San Jose, and terminate at grade in the City of Santa Clara near the Caltrain Station. Four stations are proposed: Alum Rock/28th Street, Downtown San Jose, Diridon, and Santa Clara. The BART Extension, as described below, begins from the connection to the Phase I Project in the east, then westward through downtown San Jose, to the new BART terminus in Santa Clara. Passenger service for the BART Extension would start in 2026, assuming funding is available.

The TOJD under the CEQA BART Extension with TOJD Alternative would consist of retail, office, and residential uses. The Alum Rock/28th Street and Santa Clara Stations would include retail, office, and residential uses. The Downtown San Jose and Diridon Stations would incorporate retail and office uses. The two ventilation structures would have retail uses on the street frontage. The proposed TOJD is consistent with the Public Utilities Code 100130.5 (b) (1) definition of TOJD, which includes commercial, residential or mixed-use development. TOJD is further described in Section 2.3.3.

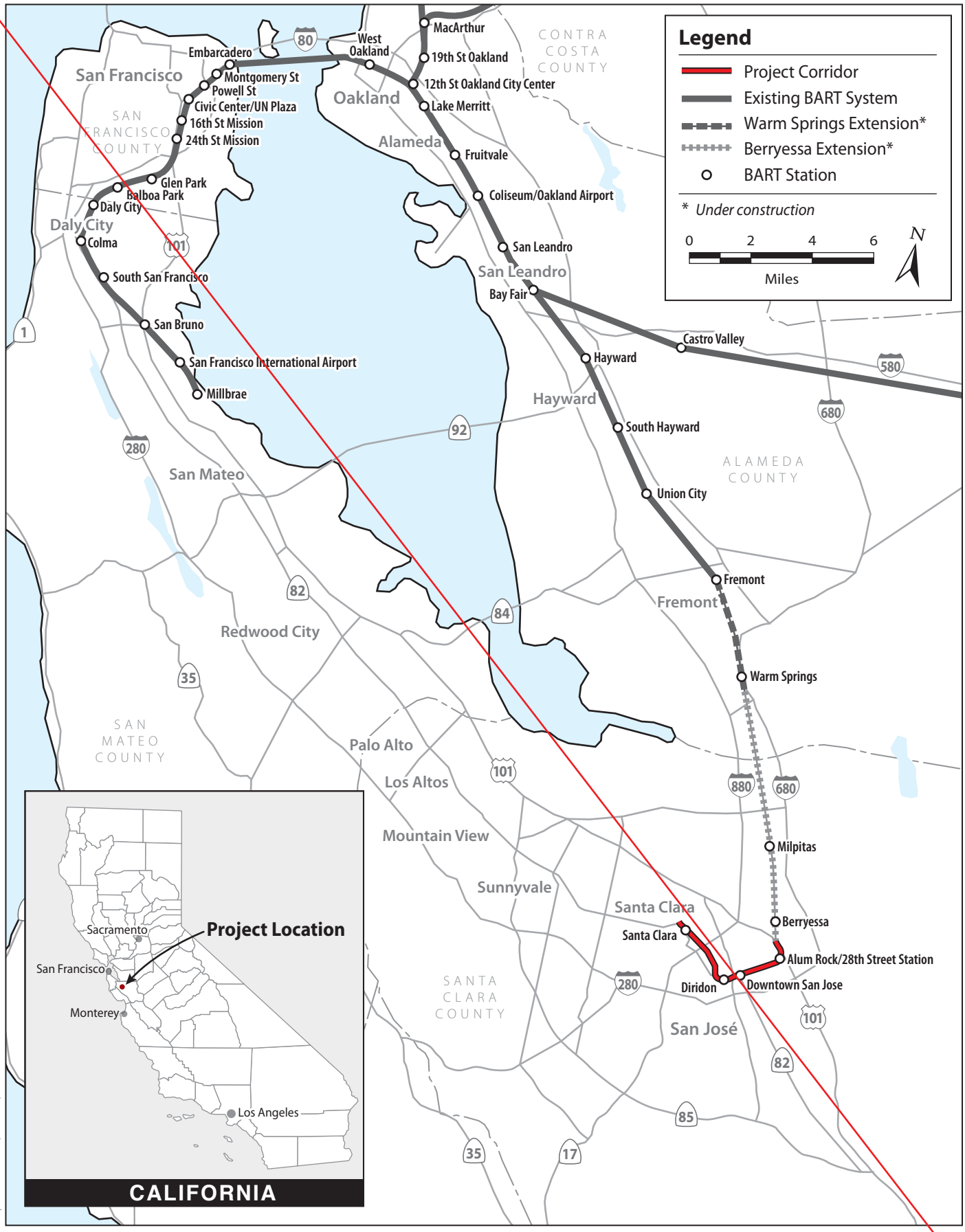

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Figure 2-1
Regional Location
VTA's BART Silicon Valley–Phase II Extension Project

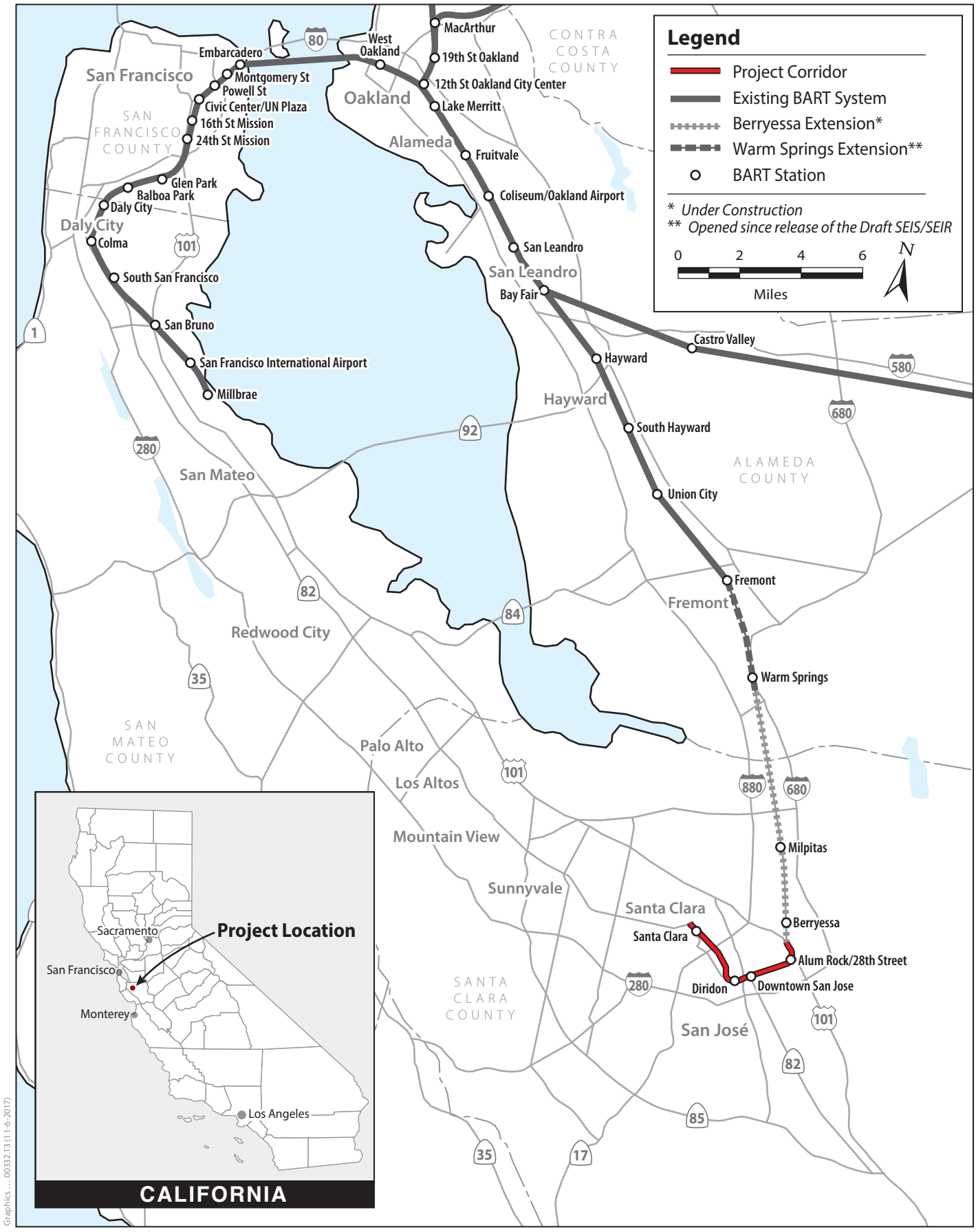

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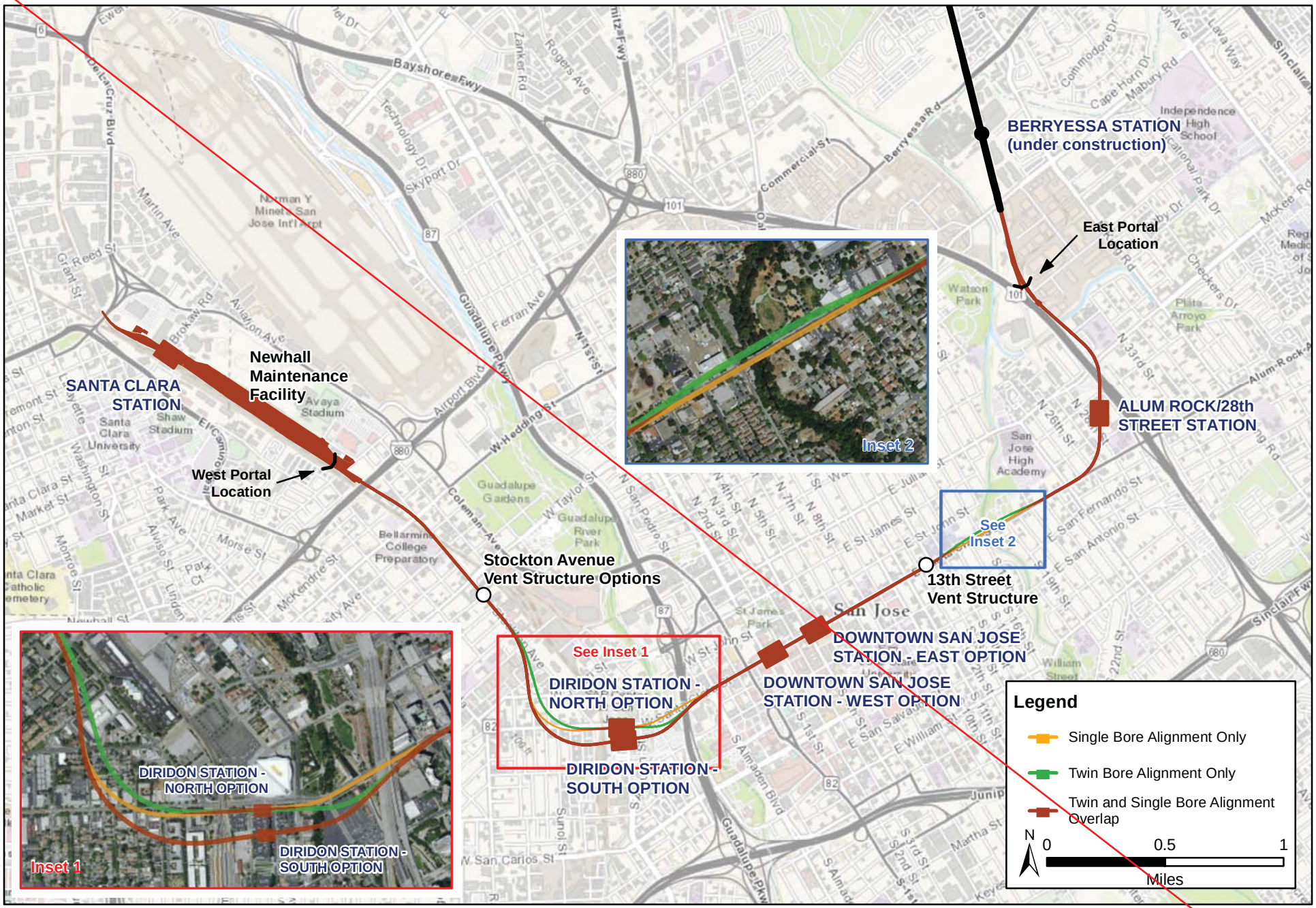
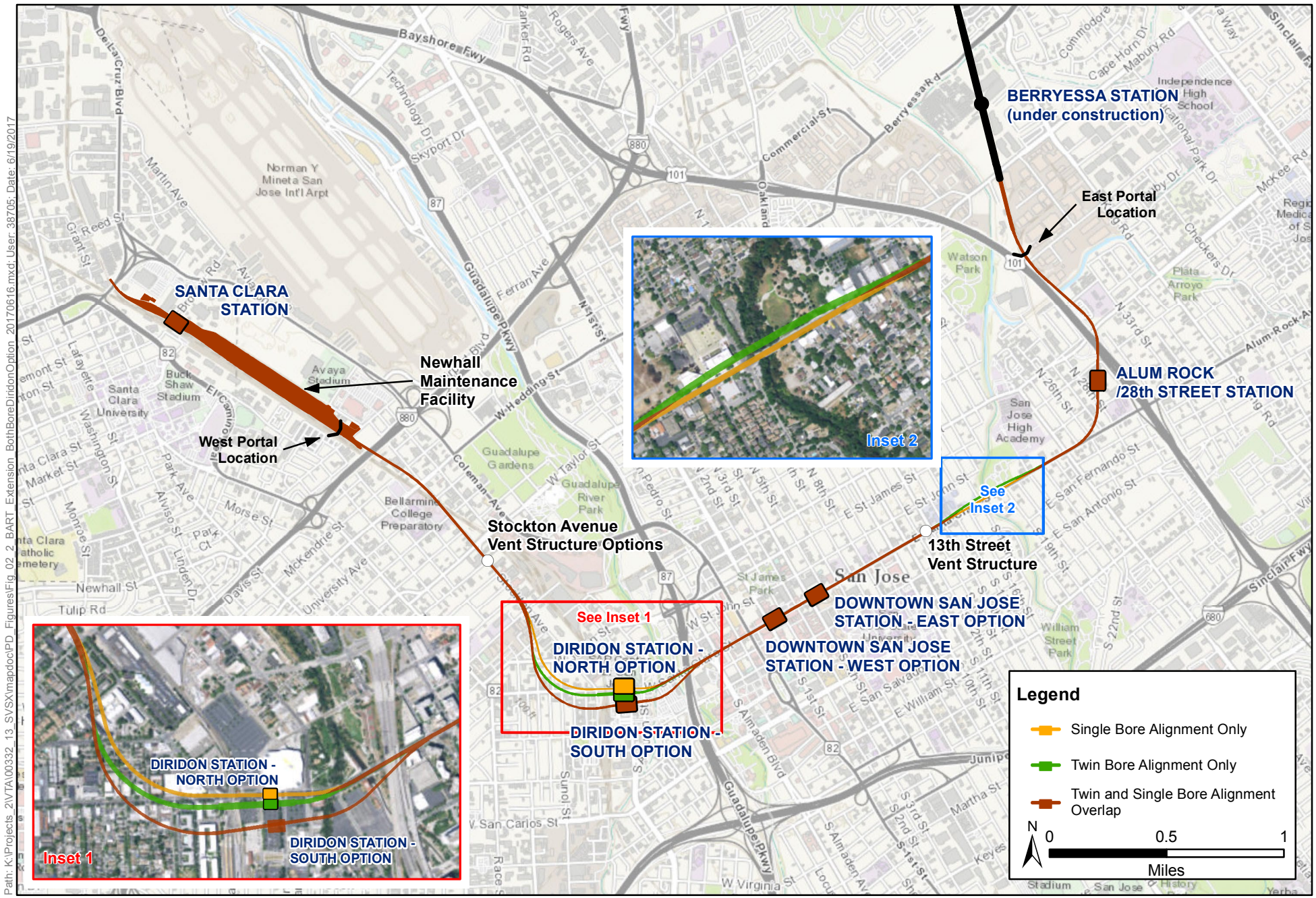
Figure 2-1
Regional Location (Revised)
VTA's BART Silicon Valley–Phase II Extension Project



Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Figure 2-2
BART Extension Alternative
VTA's BART Silicon Valley – Phase II Extension Project



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Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Figure 2-2
BART Extension with Options (Revised)
VTA's BART Silicon Valley – Phase II Extension Project

In addition, this section also describes the modifications and design refinements made to the BART Extension Alternative since the Draft SEIS/SEIR was released to the public in December 2016. These changes involve the Single- and Twin-Bore Options construction staging areas, station configurations and concepts for the underground stations and the plans and profiles and alignment for the Diridon Station North Option.

2.2 NEPA Alternatives

2.2.1 NEPA No Build Alternative

The No Build Alternative consists of the existing transit and roadway networks and planned and programmed improvements in the corridor that are identified in the Bay Area's Regional Transportation Plan (RTP), *Transportation 2035 Plan for the San Francisco Bay Area* (Transportation 2035 Plan), adopted by the Metropolitan Transportation Commission (MTC) in April 2009; the *Valley Transportation Plan 2040* (VTP 2040), adopted by VTA in October 2014; and the *Expressway Plan 2040 Study* (County of Santa Clara Roads and Airports Department 2015). Future land uses would be consistent with the General Plans and area plans for the Cities of San Jose and Santa Clara.

2.2.1.1 Transit System

Existing Transit System

Existing transit services consist of bus services, light rail transit (LRT), shuttle services, paratransit service, and inter-county services, and are briefly described below with the ridership provided in Chapter 3, Section 3.4, *2035 Forecast Year Transit Ridership*. A complete description of existing services is included in VTA's *Short Range Transit Plan FY 2014–2023* (Santa Clara Valley Transportation Authority 2014b).

VTA currently operates 70 bus routes, which consist of 17 core routes, 1 rapid route, 18 local routes, 18 community bus routes, 12 express routes, and 4 limited stop routes.

VTA also operates three LRT routes: Ohlone/Chynoweth to/from Almaden, Alum Rock to/from Santa Teresa, and Mountain View to/from Winchester. Total fleet size to operate the LRT service is 99 low-floor light rail vehicles. VTA provides shuttle service to LRT stations and major Silicon Valley employment destinations, activity centers, and transit facilities and offers accessible paratransit services for seniors and the disabled community.

VTA is a member of the Peninsula Corridor Joint Powers Board, which operates Caltrain service in Santa Clara, San Mateo, and San Francisco Counties. VTA is also a member of the Capitol Corridor Joint Powers Board, which operates train service from Placer County to Santa Clara County.

BART currently operates five routes: the Pittsburg/Bay Point to/from San Francisco International Airport, Fremont to/from Richmond, Fremont to/from Daly City, Richmond

to/from Millbrae and to Daly City during evenings and weekends, and Dublin/Pleasanton to/from Daly City. Figure 1-2 in Chapter 1, *Purpose and Need*, shows these existing and planned BART systems. The total existing fleet size to operate BART service is 669 cars.

Planned and Programmed Improvements through 2035

New transit services and capital projects planned and programmed for the corridor through 2035 are identified in Table 2-1. These consist of bus rapid transit projects, an LRT extension, rail service upgrades, and the Airport People Mover to Mineta San Jose International Airport.

Table 2-1: 2035 No Build Alternative Transit Improvements in BART Silicon Valley Area

Transit Projects	**Project Sponsor**	**Notes**
1. VTA's BART Silicon Valley—Berryessa Extension Project (Phase I)	VTA	Project connects the existing BART system from the Warm Springs Station in Southern Fremont through Milpitas to the Berryessa District of San Jose.
2. Bus Rapid Transit (BRT) Line 523 – Stevens Creek Boulevard (previously Line 23)	VTA	Berryessa ~~BART~~/North San Jose Station through Downtown San Jose to Cupertino, offering 10-minute service each direction.
3. El Camino BRT Line 522 (previously Lines 22/Line 300)	VTA	Limited stop service at 10-minute intervals; target is minimum 15% travel time reduction on El Camino Real from Downtown San Jose to Palo Alto (Line 22).
4. Santa Clara/Alum Rock BRT	VTA	Project provides enhancements in Santa Clara County's highest ridership corridor, including 2 miles of dedicated lanes. Limited stop service at 10-minute intervals.
5. Capitol Corridor Commuter and Intercity Rail	Capital Corridor Joint Powers Authority	Expanded service to 11 round trips/day between Sacramento and San Jose; new Union City intermodal station in service.
6. LRT – Guadalupe Express Service	VTA	A Guadalupe Express service between Ohlone/Chynoweth and San Jose Convention Center.
7. LRT – Additional Line, Alum Rock to Mountain View	VTA	An additional line that would travel from Downtown Mountain View to Alum Rock all day.
8. Caltrain Modernization/Electrification Projects	Peninsula Corridor Joint Powers Board	Electrify the existing rail line from San Francisco to 2 miles south of Tamein Station. Improve train performance and increase service, shorten headways and increase travel speeds, and reduce noise and air pollution.
9. Caltrain/HSR Station Improvements: Diridon Station	California High Speed Rail Authority	Provide station improvements needed to accommodate and support proposed high-speed rail service.
10. Mineta San Jose International Airport	City of San Jose	Project would provide transit link to San Jose International Airport from VTA's Guadalupe LRT line, and from Caltrain

Transit Projects	Project Sponsor	Notes
Automated People Mover (APM) Connector		and future BART stations in Santa Clara using APM technology.
Sources: Metropolitan Transportation Commission 2009; Santa Clara Valley Transportation Authority 2014a.		

VTA's LRT service map for service through 2035 is shown in Figure 2-3. VTA's Phase I Project is included in the Transportation 2035 Plan and is currently under construction. Figure 1-2 in Chapter 1 shows the BART system map for service through 2035 and includes the Phase I Project.

2035 Forecast Year Fleet Requirements

A total VTA bus fleet of 451 vehicles is estimated to meet 2035 service levels, which represents a slight increase over the 2015 fleet to account for additional bus service shuttling passengers between the Berryessa/North San Jose Station and downtown stations. Although the light rail network will expand by 2035, it will be served with no increases to the existing light rail fleet of 100 vehicles.

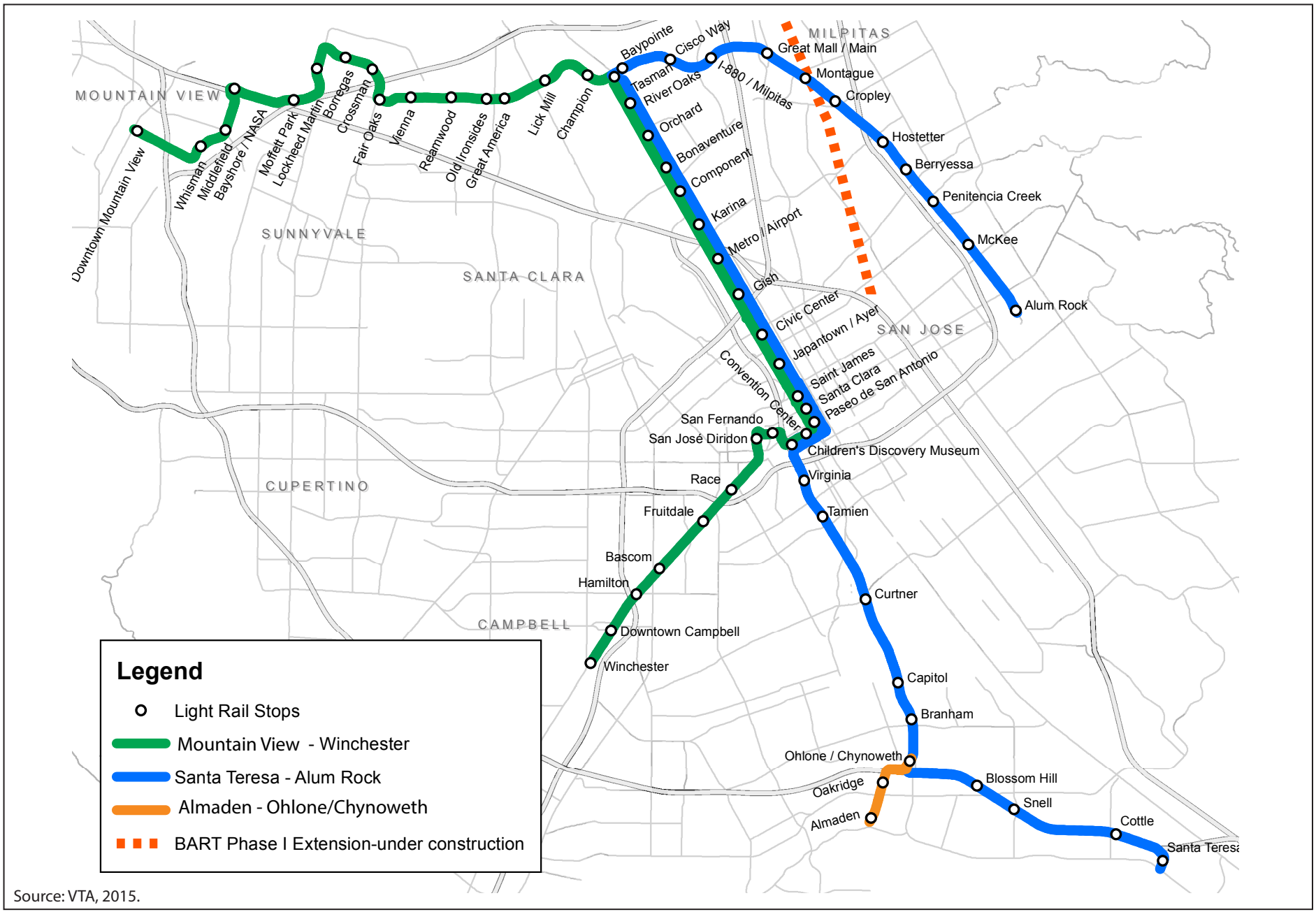
The current BART fleet is 669 cars. BART has ordered a new fleet of 775 cars to replace the existing fleet and accommodate the Warm Springs and VTA's Phase I Project. BART plans to purchase an additional 306 cars as part of their Core Capacity Project. Table 2-2 summarizes VTA and BART fleet sizes.

Table 2-2: 2035 No Build Alternative Fleet Size

Service	2015 Existing Service	2035 No Build Alternative
VTA Buses	440	451
VTA Light Rail Transit Vehicles	99	99
BART Cars (entire BART system)[a]	669	1,081
[a] The No Build Alternative includes the Phase I Project, which is currently under construction. Source: Connetics Transportation Group and VTA 2015.		

2035 Forecast Year Facility Requirements

The buses operated by VTA and identified under the No Build Alternative would be stored and maintained at the following existing bus operating and maintenance facilities: the Cerone Bus Operating Division and Overhaul and Repair Facility in North San Jose, the Don Pedro Chaboya Bus Operating Division in South San Jose, and the North Bus Operating Division in Mountain View. These facilities have sufficient land to enable any potential future need for expansion as necessary to accommodate additional buses above the 2035 fleet levels. Because the LRT fleet size is not anticipated to change by 2035, LRT vehicles would be stored and maintained at the existing Guadalupe Light Rail Maintenance facility near downtown San Jose.



Source: VTA, 2015.

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Figure 2-3
LRT Service Map
VTA's BART Silicon Valley–Phase II Extension Project

2.2.1.2 Roadway System

Existing Roadway System

The corridor contains two major north-south regional freeways, Interstate (I-) 880 and I-680, which parallel one another from southern Alameda County into northern Santa Clara County. The freeways are part of a more extensive regional roadway system that converges in Santa Clara County around the San Jose Central Business District. Other freeways and expressways that traverse the corridor are U.S. 101, State Route (SR) 87, and San Tomas Expressway.

Major arterials, such as Mabury Road/Taylor Street, McKee Road/Julian Street, San Antonio Street, Autumn Street, San Fernando Street, San Carlos Street, Brokaw Road, Lafayette Street, Benton Street, and Alum Rock Avenue/Santa Clara Street/The Alameda/El Camino Real (SR 82), traverse the corridor from east to west. Major north-south streets within the corridor include North 28th Street, Bird Avenue/Montgomery Street, Stockton Avenue, Coleman Avenue, and De La Cruz Boulevard.

Planned and Programmed Roadway Improvements Through 2035

Roadway improvements planned and programmed for the corridor through 2025 or 2035 include projects in Santa Clara County. These roadway improvements consist of widenings and new interchanges on existing routes. No new freeways or other major roadways are planned.

The following list identifies road and highway improvements that are ~~assumed~~ anticipated to be completed by 2025[1] in the corridor under the No Build Alternative.

- Convert all existing freeway high-occupancy vehicle (HOV) lanes to express lanes.
- I-880: Add HOV lanes and convert to express lanes between SR 237 and U.S. 101.
- Coleman Avenue: Widen from four lanes to six lanes between I-880 and Taylor Street.
- 10th and 11th Streets, Almaden Avenue and Vine Street, and 2nd and 3rd Streets: Convert one-way couplets to two-way streets.
- Central Expressway: Widen from four lanes to six lanes between Lawrence and San Tomas Expressways.
- Central Expressway: Convert westbound HOV lanes to mixed-flow lanes between De La Cruz Boulevard and San Tomas Expressway.
- San Tomas Expressway: Widen to eight lanes between Williams Road and El Camino Real.
- San Carlos Street: Replace and widen bridge at Caltrain/Vasona LRT.
- U.S. 101 and Mabury Road/Taylor Street: Construct interchange.

[1] This list was generated from VTA staff, Cities of San Jose and Santa Clara staff, the County's 2040 Expressway Plan, VTP 2040, and Plan Bay Area.

- Julian Street: Realign between SR 87 and North 1st Street to extend the downtown urban grid system.
- St. James Street: Convert from a one-way to two-way street from Notre Dame/SR 87 to Market Street (part of the Julian Realignment project).
- Autumn Street: Complete the realignment and extension between St. John Street and Coleman Avenue.
- Autumn Street: Convert from a one-way (northbound) street to a two-way street between Santa Clara Street and Park Avenue. Autumn Street will become a four-lane street.
- Montgomery Street: Convert from a one-way (southbound) street to a two-way street between Santa Clara Street and San Fernando Street. Montgomery Street will remain a two-lane street.
- Montgomery Street: Create cul-de-sac at southerly end, just north of Park Avenue.
- King Road and McKee Road: Add a second eastbound left-turn lane.
- Eastbound SR 87 and Julian Street: Convert the existing northbound shared right-through lane to separate through and right-turn lanes; convert the existing westbound shared right-through lane to a dedicated right-turn lane.
- Montgomery Street and Santa Clara Street: Add a left-turn and a right-turn lane on the northbound approach; eliminate one of the existing westbound left-turn lanes.
- Autumn Street and Santa Clara Street: Add a southbound through lane and convert the existing southbound right-turn lane to shared right-through lane; add an eastbound right-turn lane; and add two westbound left-turn lanes and a separate westbound right-turn lane.
- Montgomery Street and San Fernando Street: Add an all-movement lane on the northbound approach and convert all intersection approaches to single all-movement lanes.
- Autumn Street and San Fernando Street: Convert the existing northbound shared left-through lane to a dedicated left-turn lane; add one left-turn, one through, and one shared right-through lane on the southbound approach; and convert the existing westbound through lane to a shared left-through lane.
- Montgomery Street and Park Avenue: This intersection will become Autumn Street and Park Avenue. Reconfigure intersection with one left, one through, and one shared right-through lane on the northbound approach; one left, one through, and one shared right-through lane on the southbound approach; one left and one shared right-through lane on the eastbound approach; and two left-turn and one shared right-through lane on the westbound approach.

- Bird Avenue and San Carlos Street: Add a second left-turn lane and convert the shared right-through lane to exclusive right-turn lane (reducing the number of through lanes by one) on the northbound approach; and eliminate one southbound through lane.
- Autumn Street and Julian Street: Reconfigure the northbound and southbound approaches to include one left-turn, one through, and one shared right-through lane.
- Lafayette Street and El Camino Real: Add second left-turn lanes on both the southbound and eastbound approaches.
- Coleman Avenue and Brokaw Road: Widen Coleman Avenue to accommodate a third southbound through lane.
- San Tomas Expressway and El Camino Real: Add second left-turn lanes on both the eastbound and westbound approaches.

The following list identifies road highway improvements that are ~~assumed~~ anticipated to be completed by 2035[2] in the corridor under the No Build Alternative.

- I-280: Convert one mixed-flow lane to express lanes between U.S. 101 and Leland Avenue.
- I-680: Convert one mixed-flow lane to express lanes between Montague Expressway and U.S. 101.
- I-280: Downtown San Jose access improvements between 3rd and 7th Streets; reconstruct existing ramps at 7th and 4th Streets; eliminate existing off-ramp connection at 5th Street.
- I-280/Senter Road interchange: Extend Senter Road and construct new on-/off-ramps, and modify existing on-/off-ramps into a collector/distributor ramp system.
- U.S. 101 Southbound/Trimble Road/De La Cruz Boulevard/Central Expressway interchange: Modify existing loop cloverleaf ramp from Southbound U.S. 101 to Trimble Road into a partial cloverleaf ramp. Modify the Southbound U.S. 101 on-ramp from De La Cruz Boulevard/Central Expressway to one mixed-flow and one HOV lane with ramp meter. Widen the De La Cruz Boulevard bridge from four to six lanes.

[2] This list was generated from VTA staff, Cities of San Jose and Santa Clara staff, the 2008 Santa Clara County Expressway Plan, VTP 2040, and Plan Bay Area.

2.2.2 NEPA BART Extension Alternative

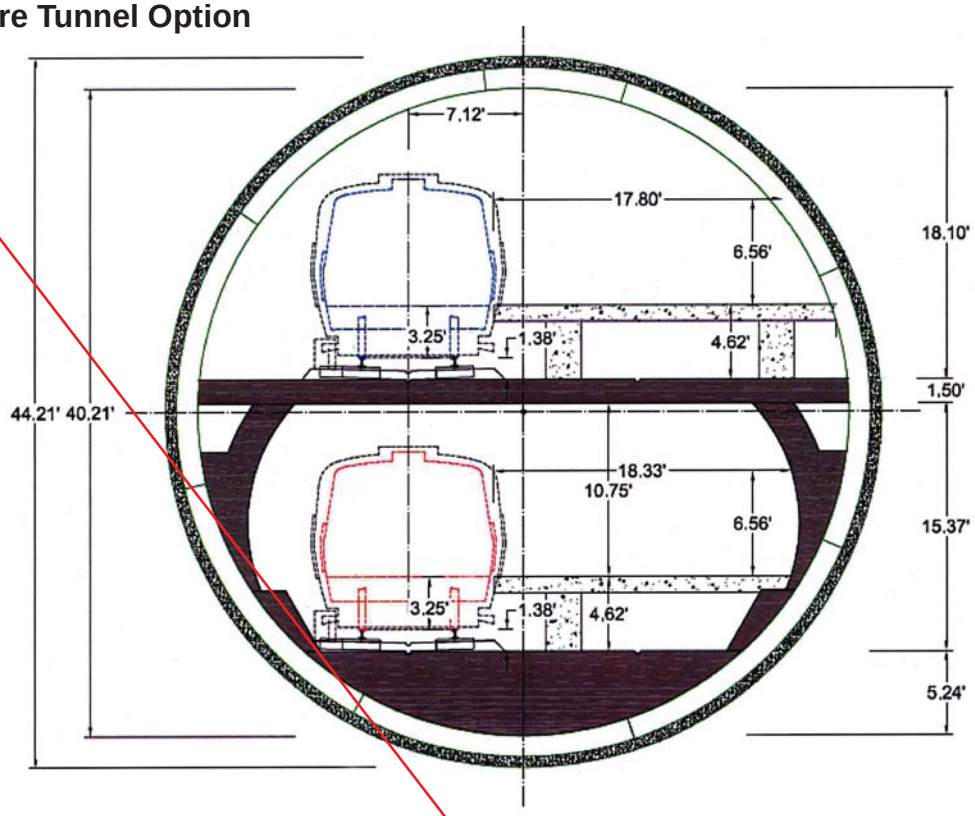
The BART Extension Alternative consists of the approximately 6-mile extension of the BART system from the Berryessa/North San Jose ~~BART~~ Station ~~in San Jose~~ through downtown San Jose, terminating in Santa Clara near the Santa Clara Caltrain Station. There are two tunneling methodologies proposed to construct the BART Extension, the Twin-Bore and Single-Bore Options. Both options have a length of approximately 4.5 miles with the differences shown on Figure 2-2. The Twin-Bore Option tunnel diameter is approximately 20 feet, and the Single-Bore Option tunnel diameter is approximately ~~44~~45 feet as depicted in Figure 2-4. The ~~larger~~ Single-Bore Option tunnel diameter typically requires the tunnel to be at a greater depth to reduce vertical settlement displacement. ~~Therefore, stations~~ Additionally, for the Single-Bore Option, station platforms are ~~deeper~~ located within the bored tunnel while entrances and ~~escalators, elevators,~~ vertical circulation elements are located adjacent and ~~stairways cover greater distances.~~ connected to the tunnel. The tunnel(s) would be lined with precast concrete segmental linings, which are installed behind the tunnel boring machine as it moves forward. These linings serve as permanent waterproof support for the tunnel(s). Chapter 5, Section 5.3.1 *Tunnel, Trackwork, and Ventilation Structures* provides additional descriptions of the tunnel boring options.

The differences between the Twin-Bore and Single-Bore Options are described below. Where no differences are described, the project description applies to both tunnel boring options.

In order to provide maximum flexibility, both aboveground and belowground ~~options will be~~ systems facilities have been evaluated in the environmental analysis. In order to optimize future joint development and ridership around the stations, the traction power substations in the three underground stations are located underground. VTA will work with BART and key joint development stakeholders to determine the final location~~.~~ for systems facilities. Where the facilities are placed underground, they will be within the Single-Bore Option tunnel or within the Twin-Bore Option station box.

Two BART lines are planned to serve the BART Extension Alternative: Santa Clara–Richmond, and Santa Clara–Daly City. The service level description that follows represents the combined service of these two lines in one direction. BART would operate every weekday from 4 a.m. to 1 a.m., with 6- to 12-minute average headways from 4 a.m. to 6 a.m., 6-minute peak to 7.5-minute average headways from 6 a.m. to 7 p.m., and 15- to 20-minute average headways after 7 p.m. Saturday BART service would be from 6 a.m. to 1 a.m., with 7.5- to 10-minute average headways from about 9 a.m. to 6:30 p.m., and 15- to 20-minute average headways before 9 a.m. and after 6:30 p.m. Sunday BART service would be from 8 a.m. to 1 a.m., with 15- to 20-minute headways all day. However, BART service levels are subject to refinement based on BART's updates to their systemwide operating plan. Approximately 48 new BART vehicles would be needed to accommodate these service levels and the 2035 Forecast Year ridership demand.

Single-Bore Tunnel Option



TYPICAL SECTION IN STATION

Twin-Bore Tunnel Option

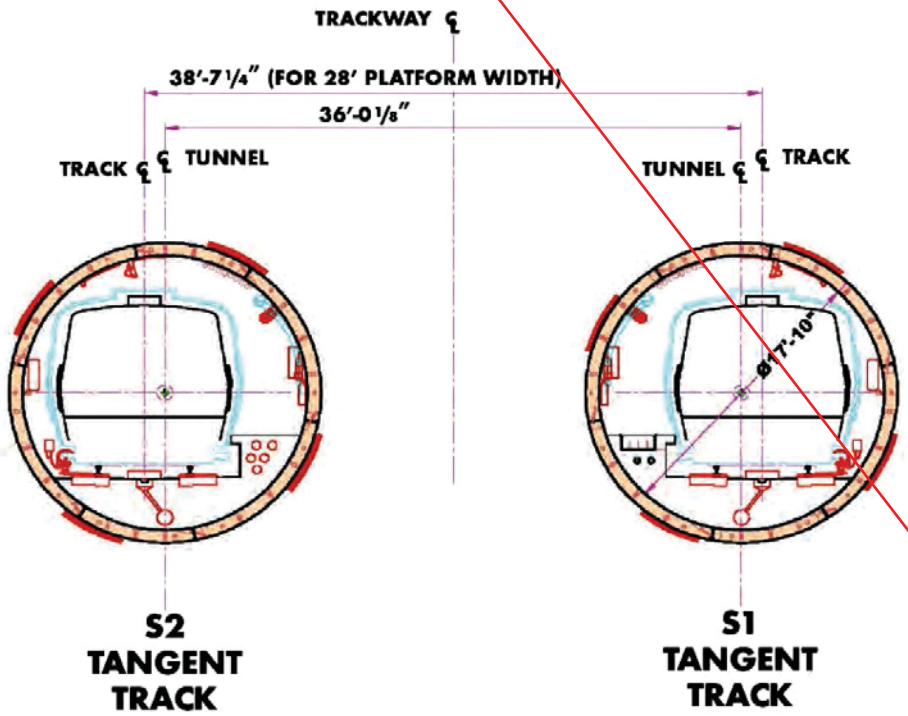


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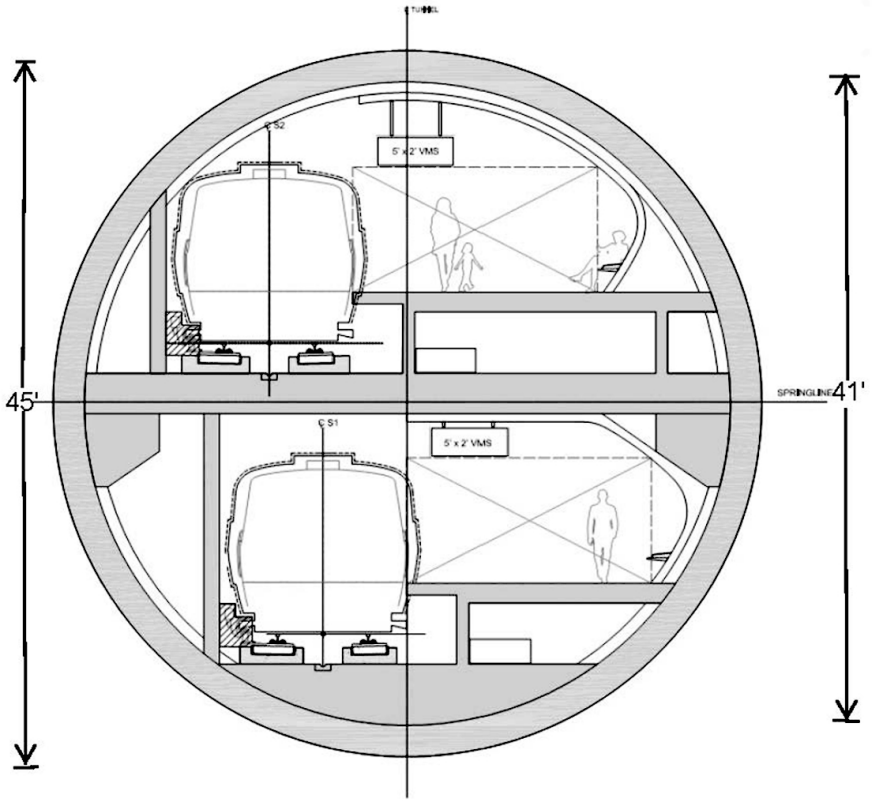
Figure 2-4
Tunnel Options
VTA's BART Silicon Valley–Phase II Extension Project

Single-Bore Tunnel Option



TYPICAL SECTION IN STATION

Twin-Bore Tunnel Option

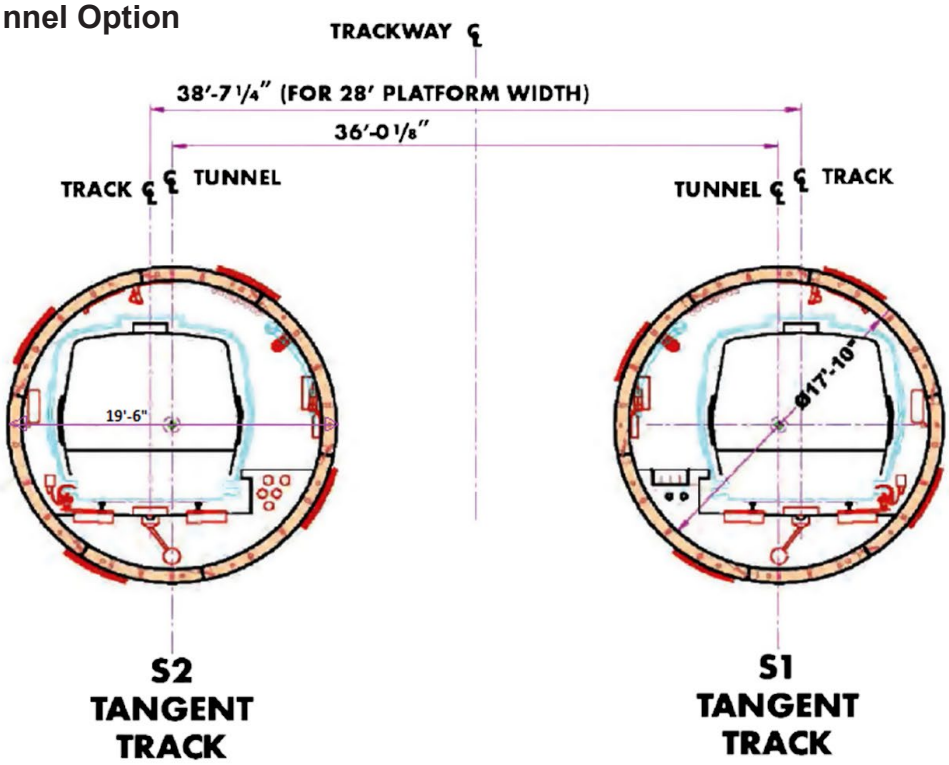


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Figure 2-4
Tunnel Options (Revised)
VTA's BART Silicon Valley–Phase II Extension Project

A summary of proposed parking is provide in Table 2-A and described in detail in Section 2.2.2.1 below.

Table 2-A: Proposed Parking to be Provided as Part of the BART Extension Alternative

BART Station	Proposed Parking Spaces
Alum Rock/28th Street	1,200
Downtown San Jose (East and West Options)	No park-and-ride facilities
Diridon Station (South and North Options)	No park-and-ride facilities
Santa Clara	500

2.2.2.A Changes Since the Release of the Draft SEIS/SEIR

Table 2-B describes the modifications and design refinements made to the BART Extension Alternative since the Draft SEIS/SEIR was released to the public in December 2016. As a part of the BART Silicon Valley, Phase II Singe Bore Tunnel Technical Studies (Single Bore Technical Studies; HNTB 2017), refinements were made to the single-bore tunnel construction methodology and location on station entrances. Two entrances would be located on the same side of the tunnel and at each end of the station for the Single-Bore Option, whereas the Twin-Bore Option has several station entrance options on both sides of the tunnel. As a result, the Final SEIS/SEIR includes separate site plans for each station location and tunneling methodology option. The project changes for the Single-Bore Option tunneling methodology include increasing the size of the construction staging area for the east tunnel portal, refining the station configuration and concepts for the three underground stations (Alum Rock/28th Street, Downtown San Jose, and Diridon), and changing the plan and profile of the alignment east and west of the Diridon Station North Option. The changes for the Twin-Bore Option tunneling methodology include refining the Diridon Station North Option site plan and alignment near the station, in addition to relocating the TPSS from west of Autumn Street to the west side of the railroad tracks/Caltrain, which increased the size of the construction staging area west of the railroad tracks.

In addition, there were a few minor clarifications in the description of the station features in Section 2.2.2.1, *Alignment and Station Features by City*, that have been added in this Final SEIS/SEIR. Streetscape improvements along Santa Clara Street from Market and 4th Streets to San Jose City Hall and San Jose State University were planned for the Downtown San Jose Station – West Option, but the text was unintentionally absent from the project description in the Draft SEIS/SEIR. The text has now been added in underlined font. For the Diridon South Option with the Twin-Bore Option, an elevator may be located at the east end of the station. Figure 2-8 has been revised accordingly. Improvements to Brokaw Road and the intersection of Brokaw Road and Coleman Avenue near the Santa Clara Station are not part of the project, but the statement was included in the Draft SEIS/SEIR. The statement has now been removed and shown in strikeout text. The clarifications described above would not result in adverse effects or significant environmental impacts.

This Final SEIS/SEIR analyzes the project and its refinements detailed in Table 2-B.

Table 2-B: Changes Since Release of the Draft SEIS/SEIR

Project Change	Type of Change		Reason
	Modification	Deletion	
Single-Bore Construction Methodology			
East Tunnel Portal Construction Staging Area (CSA)			
Increased size of the CSA for the East Tunnel Portal.	X		Construction of the East Tunnel Portal would require preconstruction and cut and cover construction activities within the right-of-way of North Marburg Way between Las Plumas Avenue and Lower Silver Creek.
Alum Rock/28th Street Station			
Eliminated station entrance option west of 28th Street		X	Two entrances on the same side of the station instead of three entry points are now provided at this underground station, while still meeting applicable access, safety, and egress requirements.
Created an underground concourse between the two remaining station entrances east of 28th Street	X		Underground concourse connecting two entry points is now provided to aid in passenger queuing, egress, and vertical circulation.
Shifted Tunnel Ventilation Shaft (TVS)/Fresh Air Intake (FAI) & Emergency Egress (EE) at southwestern end of the station platform to the west side.	X		Shifted so TVS/FAI and EE facilities are consolidated on the same side of the station platform to facilitate access for maintenance. All other facilities are located in the same location.
Downtown San Jose Station East Option (Note: CSA shows both Single-Bore and Twin-Bore footprints together.)			
Eliminated four station entrance options: all entrances north of Santa Clara Street and one south of Santa Clara Street and west of 3rd Street.		X	These locations were for sidewalk entrances and are not feasible for the Single-Bore Option because the station entrance would need to be larger than the area available and would require additional right-of-way. Elimination of these station options would avoid additional right-of-way acquisition.
Created an underground concourse under the station entrance at City Hall) and added TVS/FAI and EE.	X		Underground concourse now provided to aid in passenger queuing, egress, and vertical circulation.
Enlarged station entrance south of Santa Clara Street and between 6th and 7th Streets (see plans). Removed EAS.	X		Enlarged station entrance provided to aid in passenger queuing, egress, and vertical circulation and eliminated the need for equipment access shaft.

Project Change	Type of Change		Reason
	Modification	Deletion	
Moved Traction Power Substation (TPSS) from between 6th and 7th Streets south of Santa Clara Street to north of Santa Clara Street at 3rd Street.	X		The space previously provided for TPSS is no longer viable due to size requirements for the Single-Bore Option station entrance. Therefore, the facility was moved to another location.
Downtown San Jose Station West Option (Note: CSA shows both Single-Bore and Twin-Bore footprints together.)			
Eliminated six station entrances options: all entrances south of Santa Clara Street and two north of Santa Clara Street and east of 2nd Street.		X	These six sidewalk entrances are not feasible for the Single-Bore Option because the station entrance would need to be larger than the area available and would require additional right-of-way. Elimination of these station options would avoid additional right-of-way acquisition.
Enlarged station entrance between Market and 1st Street (see plans). New station entry point on this block coming from Market Street.	X		Enlarged station entrance provided to aid passenger queuing and egress, and improve rider vertical circulation within the station.
Added a new station entrance between 1st and 2nd Streets (see dimensions on plans).	X		A new station entrance not located on a sidewalk was required because station entrances need to be larger for the Single-Bore Option to meet applicable access, safety, and egress requirements, and a minimum of two entrances are required. Possible locations are limited to avoid the properties to the east, which are Historical Resources under CEQA and the property to the west is a six-story commercial building. Properties to the south of Santa Clara Street are also historic resources.
Diridon Station South Option (Note: CSA shows both Single-Bore and Twin-Bore footprints together.)			
Created an underground concourse between the two station entrances. The aboveground entrance west of Cahill Street and in front of Caltrain Historic Depot remains the same size/dimensions as the Twin-Bore Option Because the entrance portal must be adjacent to the tunnel, the portal "shifted north" as compared to the former concept and is a few hundred feet farther north	X		Underground concourse connecting two entry points is now provided to aid in passenger queuing, egress, and vertical circulation. Entrance is now adjacent to the tunnel and from the south, and the elevator is moved to the west side to facilitate passenger egress and vertical circulation.

Project Change	Type of Change		Reason
	Modification	Deletion	
and away from the historic depot. Also, the station entrance portal "rotated" 90 degrees counterclockwise, and the elevator shifted to the west side of the portal as compared to the former concept.			
Diridon Station North Option (Note: CSA shows both Single-Bore and Twin-Bore footprints together.)			
Shifted alignment slightly to the north between Diridon Station and where the tunnel alignment lines up directly under Stockton Avenue at Harding Avenue. Station platform is now directly under Santa Clara Street instead of south of Santa Clara Street. Station platform shifted approximately 200 feet farther to the east, and shifted the eastern entrance from the west side of Montgomery to the east side of Montgomery, relocated TPSS and Auxiliary Power Substation from east of Montgomery to the west side of Caltrain/the railroad tracks, and moved the EE from the west side of the tracks to the east side of the tracks. These changes did not change the CSA	X		As part of the Single Bore Technical Studies, the horizontal alignment of the single-bore tunnel was reviewed and now provides a larger radius curve from Diridon Station to Stockton Avenue to enable higher speeds and reduce maintenance. The TPSS and Auxiliary Power Substation were moved to enable development of the site. The EE was moved to be adjacent to the new station location.
Created an underground concourse between the two station entry points. The aboveground station entrance portal west of Cahill Street remains the same size/dimensions as the Twin-Bore Option.	X		Underground concourse connecting two entry points is now provided to aid in passenger queuing, egress, and vertical circulation.

Project Change	Type of Change		Reason
	Modification	Deletion	
Alignment Changes			
Depth of the tunnel is now shallower at some locations west of Diridon Station.	X		As part of the Single Bore Technical Studies, the profile of the single-bore tunnel was reviewed and the required amount of soil cover above the tunnel was determined to be less, reducing costs.
Twin-Bore Construction Methodology			
Diridon Station North Option (Note: CSA shows both Single-Bore and Twin-Bore footprints together.)			
Shifted alignment between S. Almaden Boulevard and Autumn Street northward to be directly under Santa Clara Street from farther to the south. Alignment shifts south of Santa Clara Street west of Almaden Boulevard. This shifted the station box approximately 200 feet farther to the west, and shifted the eastern entrance from west of Autumn to west of Montgomery Street and shifted the western entrance slightly to the east and rotated 90 degrees counterclockwise. Also relocated the TPSS from west of Autumn Street to the west side of Caltrain/the railroad tracks, and shifted the TVS/FAI from west of Autumn Street to east of Montgomery Street. All of these changes shifted the CSA to the west to include part of White Street and to the north to include the sidewalk of Santa Clara Street.	X		Shifted alignment, station, and facilities to avoid future development between Guadalupe River and Los Gatos Creek.

2.2.2.1 Alignment and Station Features by City

City of San Jose

Connection to Phase I Berryessa Extension

The BART Extension would begin where the Phase I tail tracks end. The at-grade Phase I tail tracks would be partially removed to allow for construction of the bored tunnels, East Tunnel Portal, and supporting facilities. The new tracks would be connected to the Phase I tracks to allow for future BART operation along the entire BART Silicon Valley corridor from southern Fremont to Santa Clara.

The alignment would transition from a retained-fill configuration east of U.S. 101 and south of Mabury Road near the end of the Phase I alignment into a retained-cut configuration and enter the East Tunnel Portal ~~just north of~~ near Las Plumas Avenue (approximately STA 570+00 in Appendix B, *Project Plans and Profiles* for the Twin-Bore Option and approximately STA 573+00 for the Single-Bore Option). The references to STA 570+00 and other station numbers throughout the document refer to Volume III, *Appendices*, Appendix B, *Plans and Profiles*, which identify the specific station numbers at the bottom of the page for reference.

South of the portal, the alignment would pass beneath North Marburg Way, then approximately 25 feet below the creek bed of Lower Silver Creek (STA 581+00) for the Twin-Bore Option, or approximately 30 feet for the Single-Bore Option, just to the east of U.S. 101 (STA 581+00), then curve under U.S. 101 south of the McKee Road overpass, and enter Alum Rock/28th Street Station.

Alum Rock/28th Street Station

Alum Rock/28th Street Station would be located between U.S. 101 and North 28th Street (starting at approximately STA 600+00) and between McKee Road and Santa Clara Street. The approximately 11-acre station campus would include ~~an underground~~ station ~~and aboveground~~ facilities, such as a parking structure, systems facilities, and roadway improvements to North 28th Street as shown on Figures 2-5 and 2-A. The station would be underground with street-level entrance portals with elevators, escalators, and stairs covered by canopy structures. The station would have a minimum of two entrances. ~~The number, location,~~ Under the Single-Bore Option, an underground concourse level would span between the two entrances adjacent to the tunnel. The location and configuration of the station entrances would be finalized during final design based on BART Facilities Standards and ridership projections. Signage for all stations would comply with Metropolitan Transportation Commission's Regional Transit Wayfinding Guidelines and Standards.

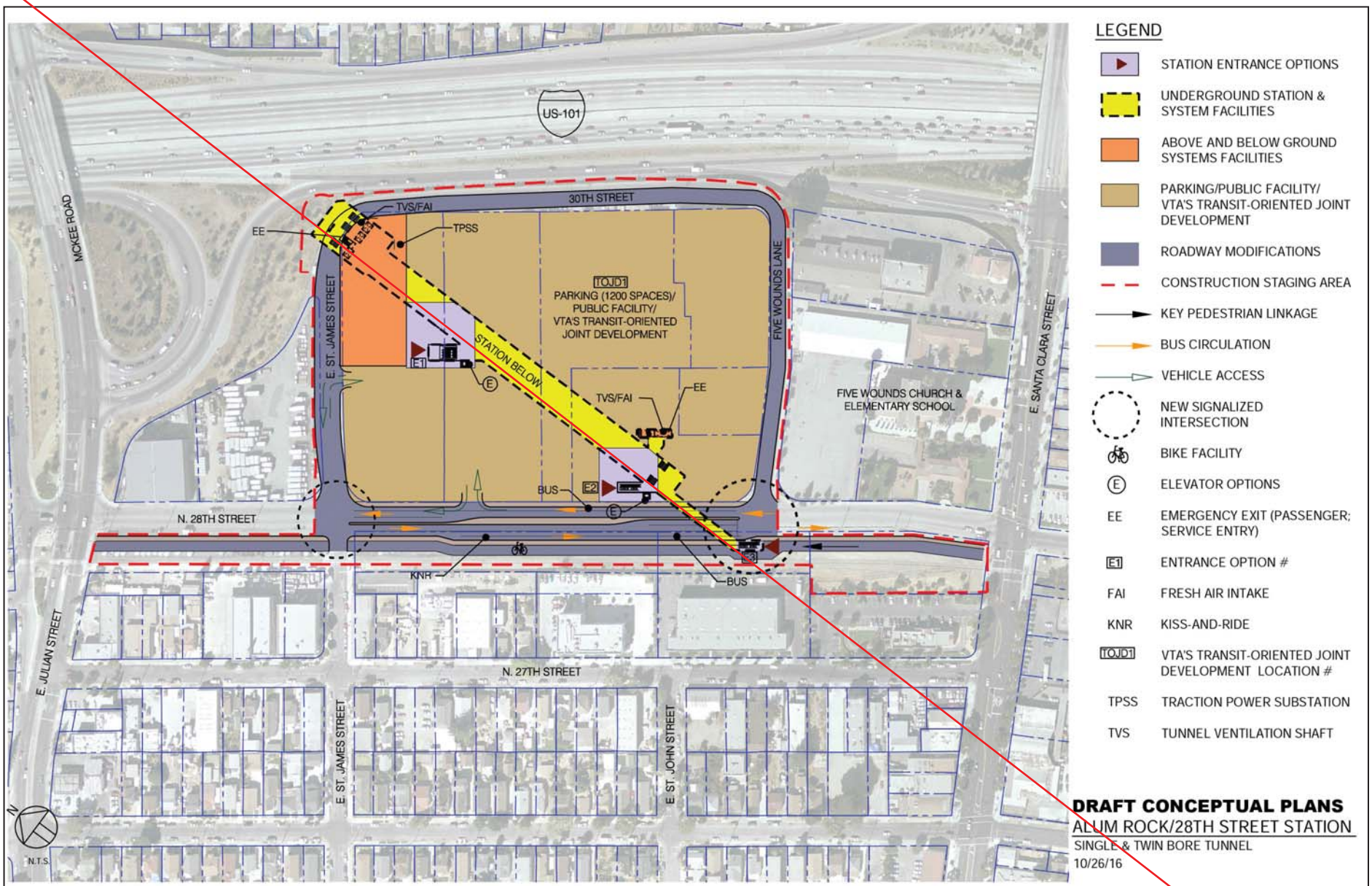
A parking structure of up to seven levels would accommodate BART park-and-ride (PNR) demand with 1,200 parking spaces. Areas for automobiles, shuttles, and buses to drop off passengers would be provided on North 28th Street and/or within the station campus.

Access to Alum Rock/28th Street Station would be primarily from McKee Road and North 28th Street at the north end of the station site, and from Santa Clara and North 28th Streets at the south end of the site. New or modified traffic signals would be provided at the intersections of North 28th Street and McKee Road, and North 28th and Santa Clara Streets. New traffic signals would also be provided in the station area on North 28th Street at St. James Street and at Five Wounds Lane for access to the parking structure and passenger loading areas. A pedestrian connection along the south side of the station campus at North 28th Street from Santa Clara Street would be designed as a pedestrian/bicycle/transit gateway into the station campus with amenities such as street trees, wide sidewalks, bicycle facilities, and pedestrian-scaled lighting. This gateway would link the station with buses and Bus Rapid Transit (BRT) operating on Santa Clara Street and Alum Rock Avenue. Accommodations for the Five Wounds Trail would be provided along North 28th Street as part of station access improvements.

The station would include systems facilities such as electrical, ventilation, and communication equipment as shown on Figures 2-5 and 2-A and described in Section 2.2.2.2. Systems facilities include a Traction Power Substation (TPSS), Train Control Communications Room (TCCR), an auxiliary power substation, and an emergency generator. Systems facility sites within public view would be surrounded by an approximately 9-foot-high concrete block (CMU) wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, these systems facilities may also be located aboveground. If aboveground, access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates.

The station would include emergency exhaust ventilation facilities and ~~at least three~~ ventilation shafts as shown on Figures 2-5 and 2-A. Fresh air intake/exhaust hatches at grade would be near the emergency ventilation facilities.

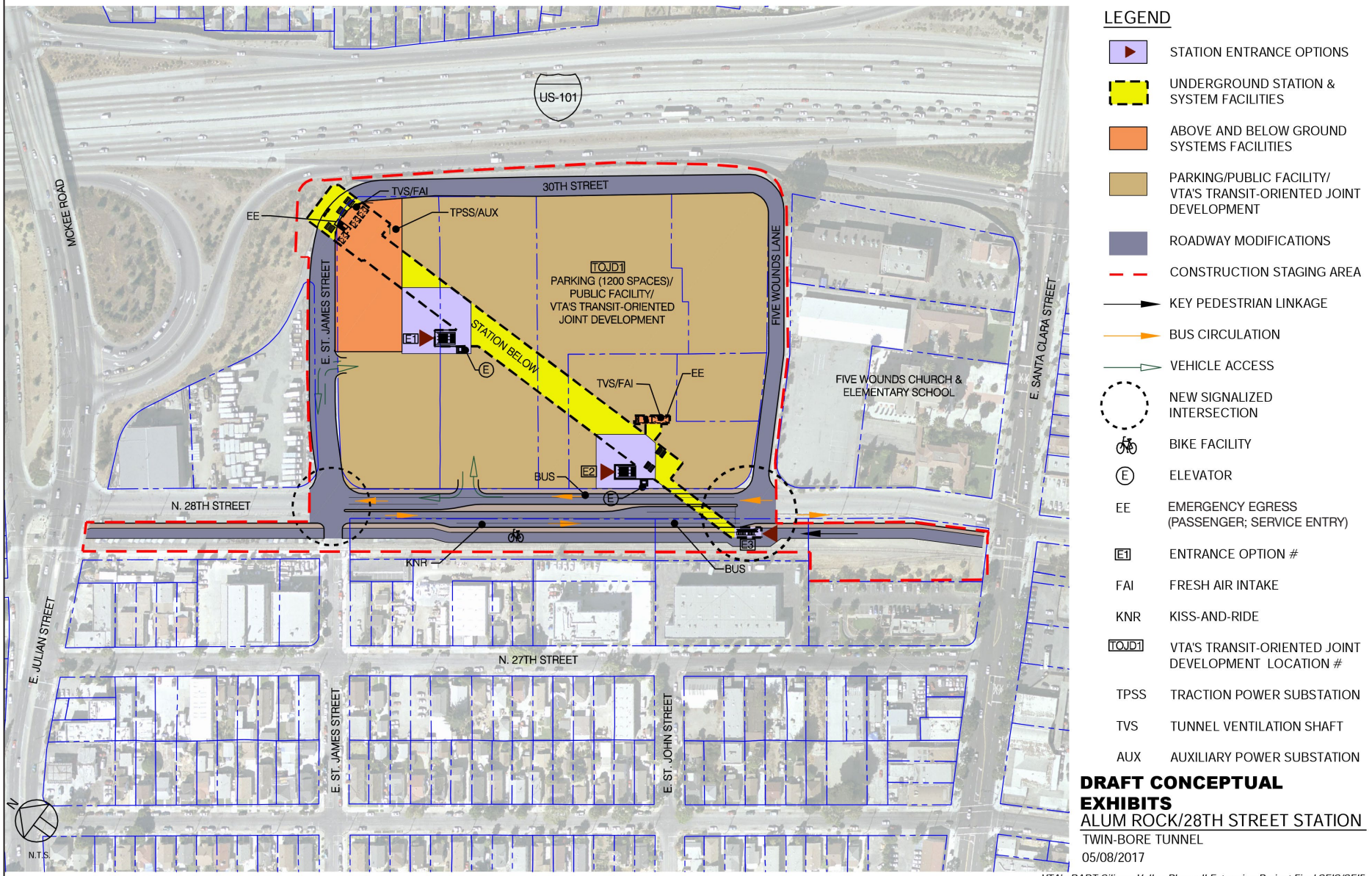
From Alum Rock/28th Street Station, the alignment would curve under North 28th Street, North 27th Street, and North 26th Street before aligning under Santa Clara Street (STA 620+00). The alignment would continue under the Santa Clara Street right-of-way (ROW) until the alignment approaches Coyote Creek (STA 644+00).



Source: VTA, 2016.

Graphics ... 00332.13 (10-31-2016)

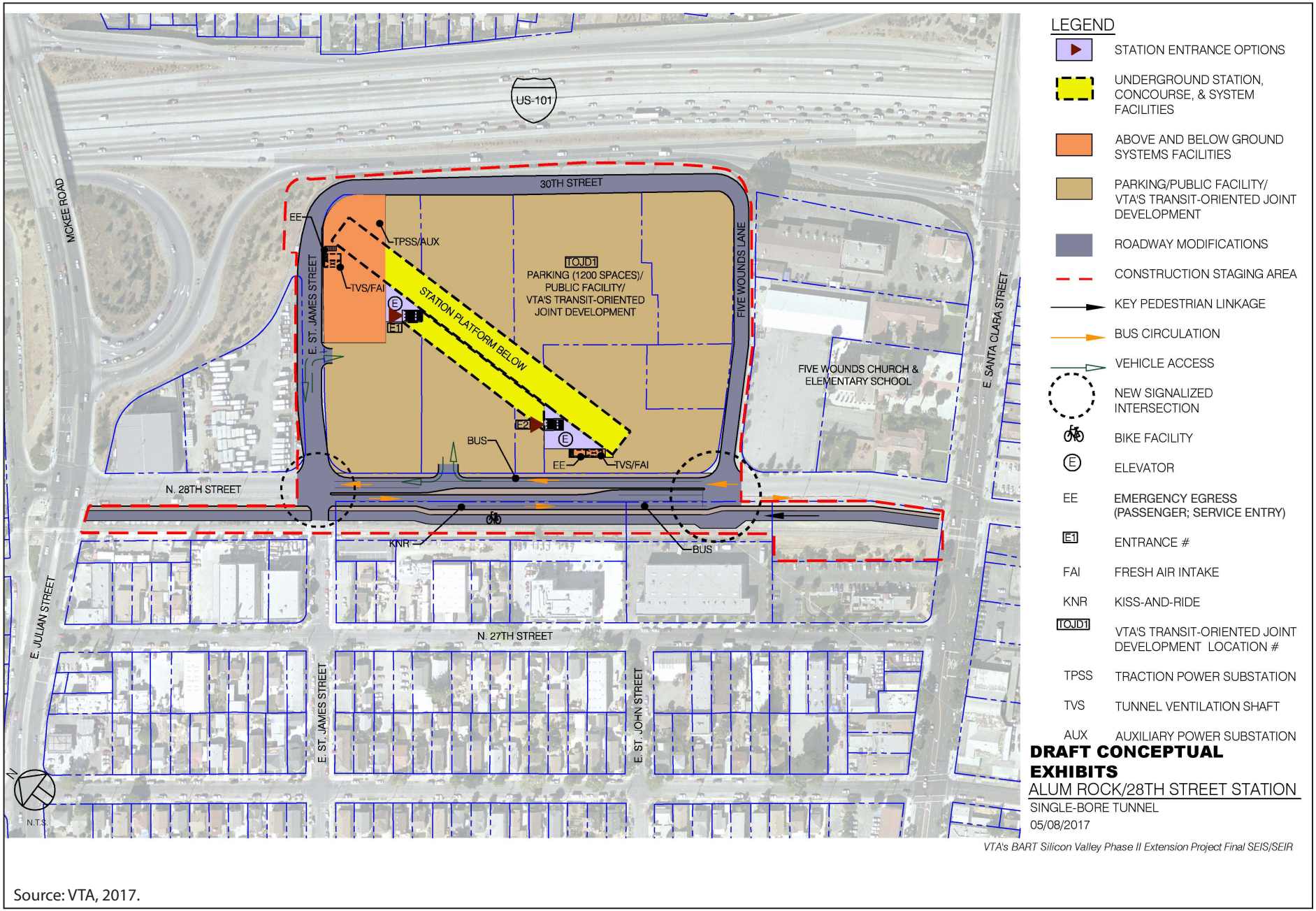
Figure 2-5
Alum Rock/28th Street Station Plan (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-5
Alum Rock/28th Street Station Plan (Twin-Bore) (Revised)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-A
Alum Rock/28th Street Station Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

Tunnel Alignment near Coyote Creek

For the Twin-Bore Option, the alignment would transition north of Santa Clara Street beginning just west of 22nd Street and pass approximately 20 feet beneath the creekbed of Coyote Creek to the north of Santa Clara Street and avoid the Coyote Creek/Santa Clara Street bridge foundations. The alignment would transition back into the Santa Clara Street ROW near 13th Street, west of Coyote Creek. However, for the Single-Bore Option, the alignment would continue directly under Santa Clara Street and pass approximately 55 feet beneath the creekbed of Coyote Creek and approximately 20 feet below the existing bridge foundations.

13th Street Ventilation Structure

A systems facility site would be located at the northwest corner of Santa Clara and 13th Streets. This site would include a tunnel ventilation structure, which would be an aboveground structure with an associated ventilation shaft and is described in Section 2.2.2.2.

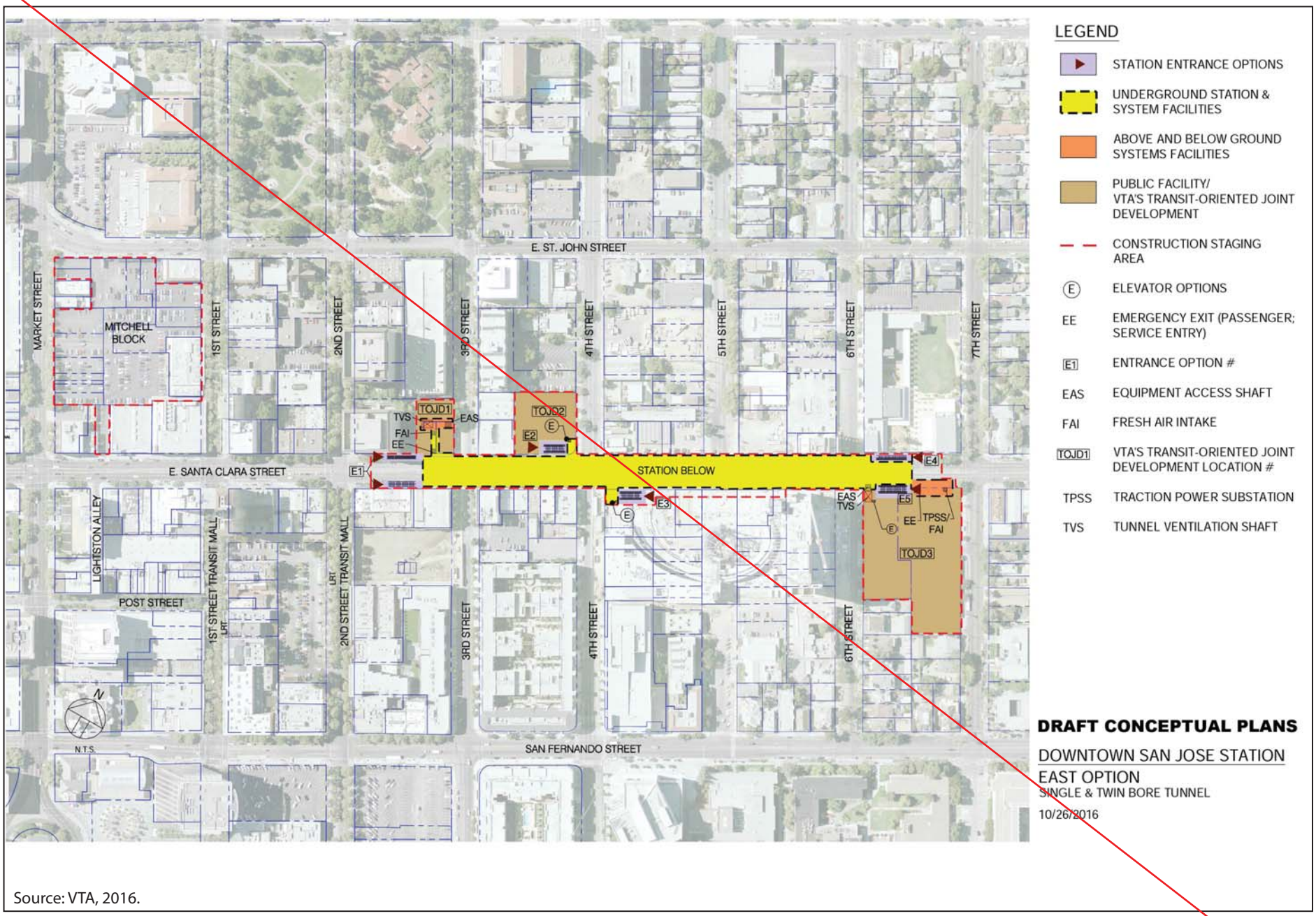
Downtown San Jose Station

There are two station location options for the Downtown San Jose Station: the Downtown San Jose Station East Option and the Downtown San Jose Station West Option, as described in detail below. The alignment for this area would be the same irrespective of the station option.

Downtown San Jose Station East Option

The alignment would continue beneath Santa Clara Street to the Downtown San Jose Station East Option. Under the Twin-Bore Option, crossover tracks would be located east of the Downtown San Jose Station between 7th and 5th Streets (within the cut-and-cover box). Under the Single-Bore Option, the crossover tracks would be located east of the station ~~between 9th~~within the limits of 8th and ~~5th~~13th Streets. The station would not have dedicated PNR ~~park-and-ride~~ facilities.

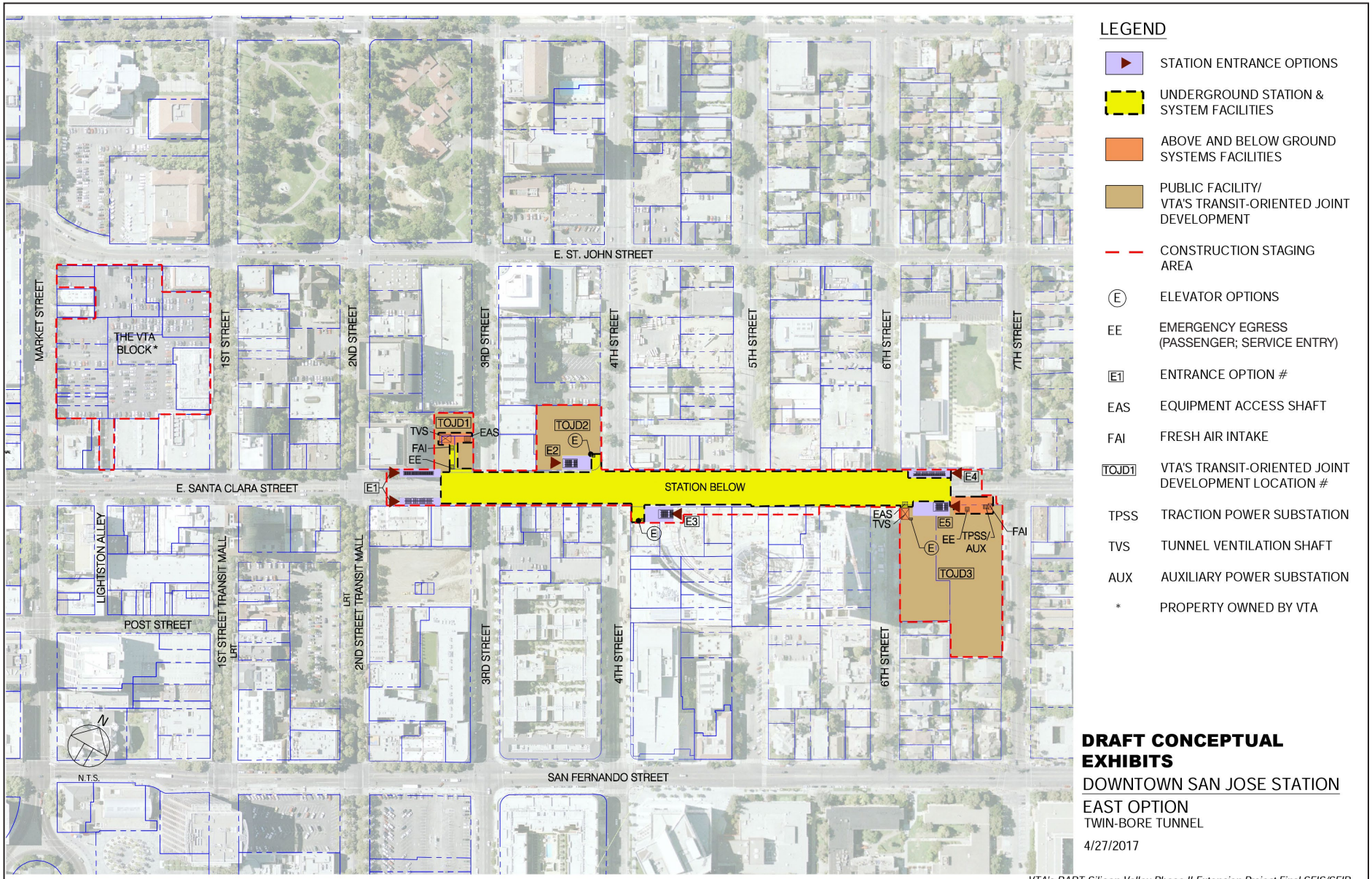
~~The~~ For the Twin-Bore Option, the Downtown San Jose Station East Option would be located between 5th and 2nd Streets as shown on Figure 2-6. For the Single-Bore Option, the station platforms would be located between 7th and 4th Streets as shown on Figure 2-B. The station would consist of boarding platform levels and some systems facilities within the tunnel beneath Santa Clara Street, as well as entrances at street level.



Graphics ... 00332.13 (10-31-2016)

Source: VTA, 2016.

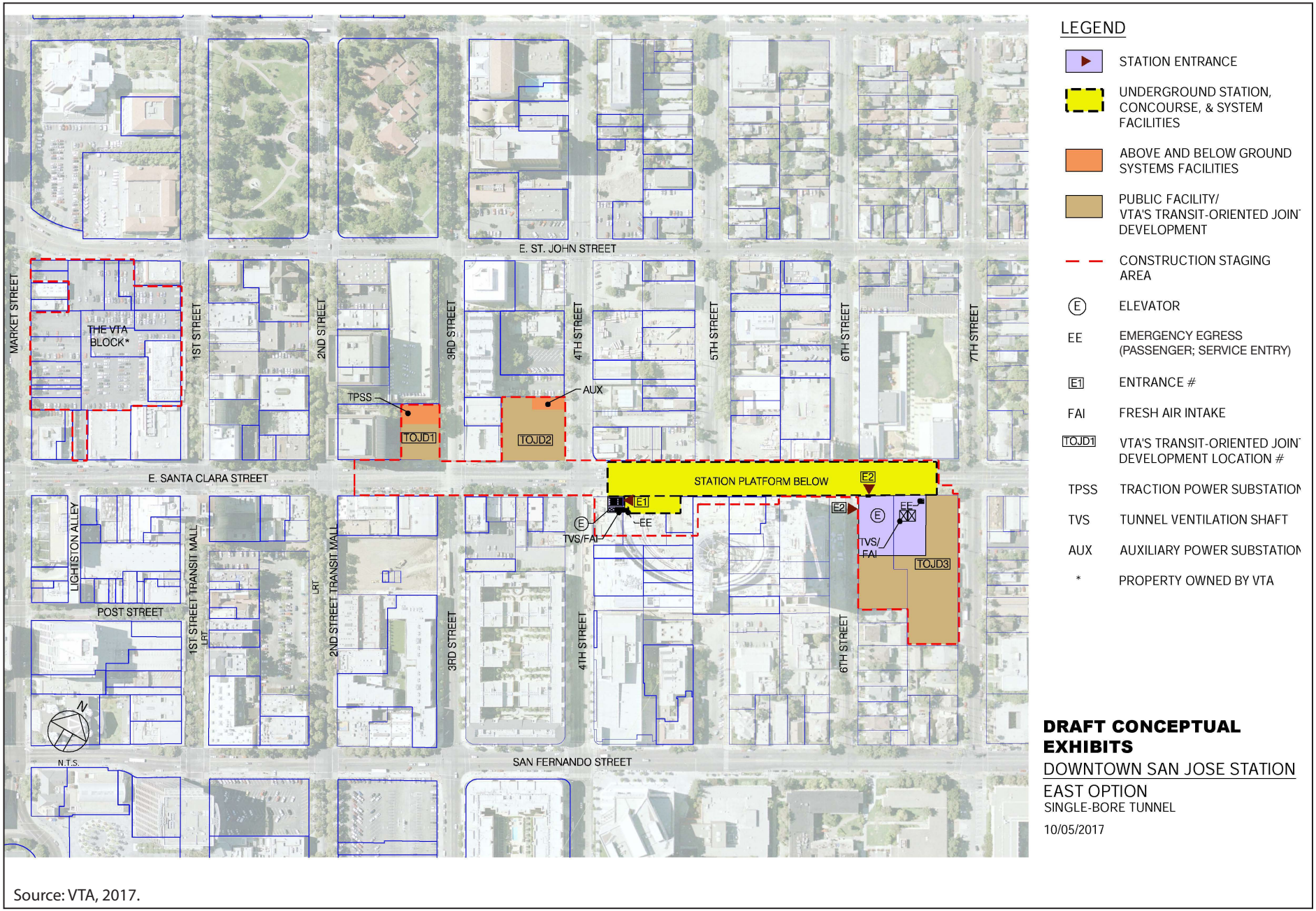
Figure 2-6
Downtown San Jose Station East Option Station (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-6
Downtown San Jose Station East Option Plan (Twin-Bore) (Revised)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-B
Downtown San Jose Station East Option Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

Elevators, escalators, and stairs that provide pedestrian access to the ~~mezzanine~~ concourse would be at station portal entrances as shown on Figures 2-6 and 2-B. Escalators and stairs would be covered by canopy structures. ~~Several~~ The station would have a minimum of two entrances. For the Twin-Bore Option, several station portal entrance location options in sidewalks along Santa Clara Street between 2nd and 7th Streets are being evaluated. ~~The station would have a minimum~~ For the Single-Bore Option, one entrance would be located at the southeast corner of ~~two entrances.~~ Santa Clara and 4th Streets and would include an underground concourse; a second entrance would be located at the southeast corner of 6th and Santa Clara Streets. Stairs and ~~up/down~~ escalators would be provided at each of the entrances. Elevators would be provided ~~at~~ near the end of each station ~~near each end~~. The ~~number,~~ location~~,~~ and configuration of station entrances for both options would be finalized during final design and based on BART Facilities Standards and ridership projections.

Systems facilities would be located aboveground and underground as shown on Figures 2-6 and 2-B and would include a TPSS, an auxiliary power substation, ventilation facilities, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, these systems facilities may also be located aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches as shown on Figures 2-6 and 2-B.

Streetscape improvements would be provided along Santa Clara Street between 7th and 1st Streets to create a pedestrian corridor connecting San Jose City Hall and San Jose State University with the Downtown Commercial District. Streetscape improvements would be guided by San Jose's Master Streetscape Plan.

Downtown San Jose Station West Option

The alignment would continue beneath Santa Clara Street to the Downtown San Jose Station West Option. Crossover tracks for the Twin-Bore Option would be located east of the Downtown San Jose Station between 2nd and 4th Streets (within the cut-and-cover box~~.~~). Under the Single-Bore Option, the crossover tracks would be located east of the station ~~between 7th~~ within the limits of 8th and ~~2nd~~ 13th Streets. The station would not have dedicated PNR ~~park-and-ride~~ facilities.

The Downtown San Jose Station West Option would be located between 2nd and Market Streets for the Twin-Bore Option and between Market and 3rd Streets for the Single-Bore Option as shown on Figures 2-7 and 2-C. The station would consist of boarding platform levels and some systems facilities within the tunnel beneath Santa Clara Street, and entrances at street level as shown on Figures 2-7~~. Elevators~~ and 2-C. Vertical circulation elements including elevators, escalators, and stairs ~~that provide pedestrian access to the mezzanine level~~ would be at station portal entrances~~.~~ providing pedestrian access to the boarding platforms. Escalators and stairs would have canopy structures. The station would have a minimum of two entrances. ~~Several~~ For the Twin-Bore Option, several station entrance location options within sidewalks along Santa Clara Street and cross streets between Market and 3rd Streets are being evaluated. For the Single-Bore Option, one entrance would be

located north of Santa Clara Street between 2nd and 1st Streets, and a second entrance would be located north of Santa Clara Street between 1st and Market Streets on the VTA-owned property, the VTA Block. ~~The station would have a minimum of two entrances.~~ Stairs and ~~up/down~~ escalators would be provided at each of the entrances. Elevators would be provided near each end of the station. The ~~number,~~ location of the station entrances for the Twin-Bore Option, and the configuration of the station entrances for both options, would be finalized during final design and would be based on BART Facilities Standards and ridership projections.

Systems facilities would be located aboveground and underground as shown on Figures 2-7 and 2-C and would include a TPSS, an auxiliary power substation, ventilation facilities, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, these systems facilities may also be located aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches as shown on Figures 2-7 and 2-C.

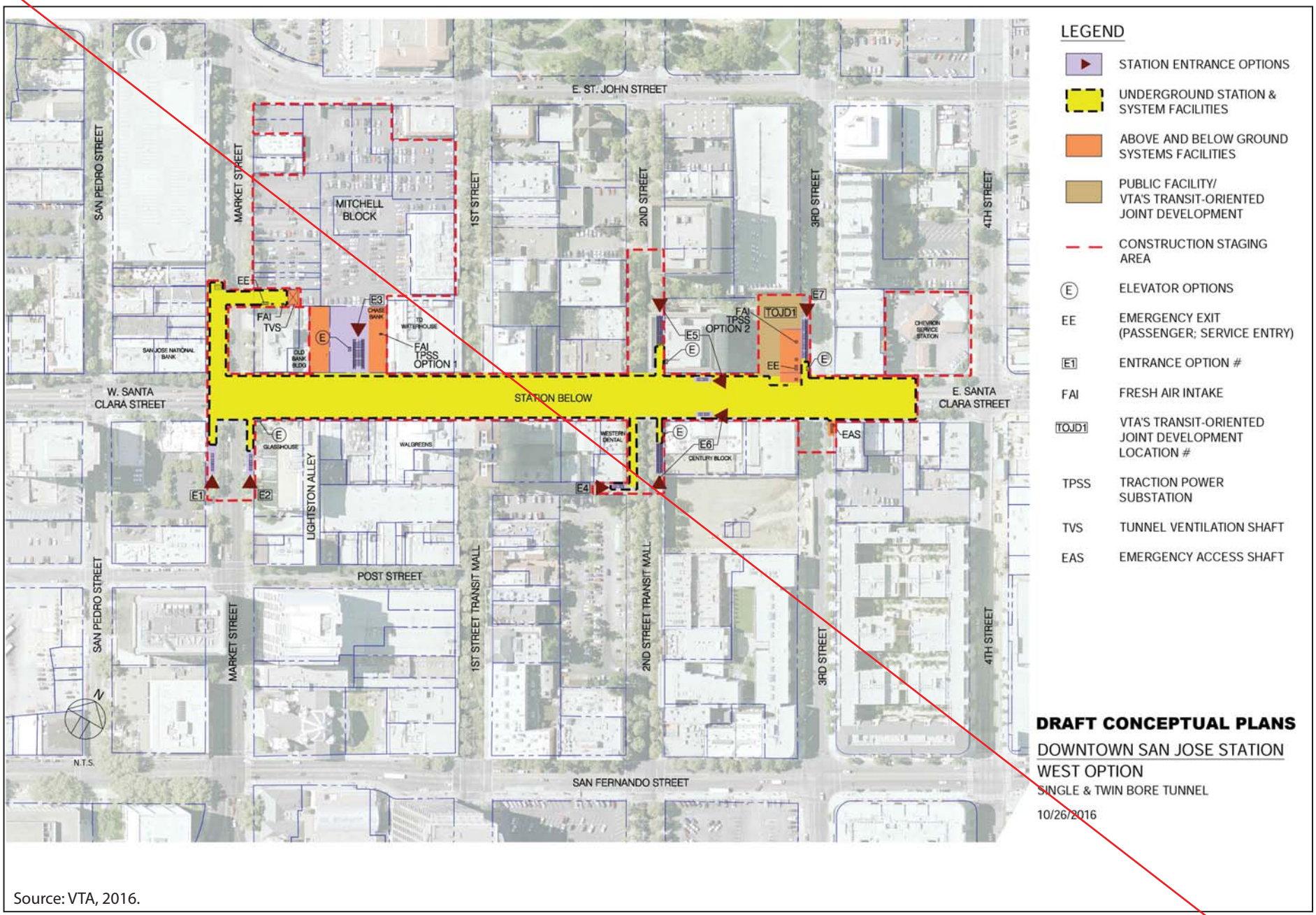
Streetscape improvements would be provided along Santa Clara Street from Market and 4th Streets to San Jose City Hall and San Jose State University in order to create a pedestrian corridor connecting San Jose City Hall and San Jose State University with the Downtown Commercial District. Streetscape improvements would be guided by San Jose's Master Streetscape Plan, and would include elements such as special paving and lighting, landscaping with trees and planters, and public art.

Tunnel Alignment into Diridon Station

There are two station location options at Diridon Station: the Diridon Station South Option and the Diridon Station North Option, as described in detail below. The alignment into Diridon Station varies between the Diridon Station North and South Options and between the Twin-Bore and Single-Bore Options for the tunnel as described below and as shown in Appendices B and C.

Tunnel Alignment into Diridon Station South Option

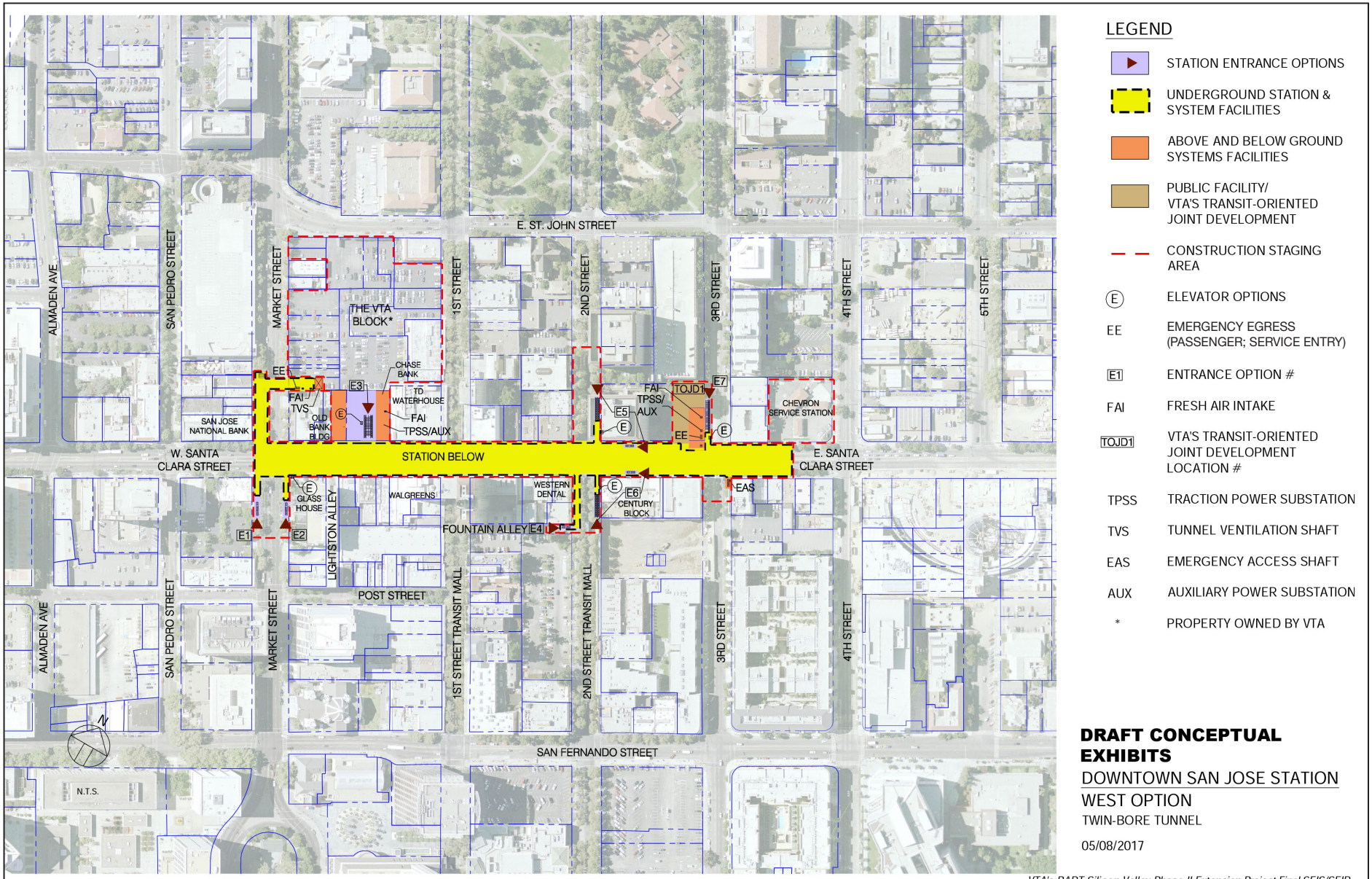
The alignment would continue from the Downtown San Jose Station beneath Santa Clara Street and shift south beginning just west of South ~~Alamaden~~ Almaden Boulevard to pass between the SR 87 bridge foundations. For the Twin-Bore Option, the alignment would pass ~~40~~45 feet below the riverbed of the Guadalupe River ~~and~~, pass beneath a retaining wall west of the river, and over ~~20~~ 25 feet below the creekbed of Los Gatos Creek. For the Single-Bore Option, the alignment would pass approximately 50 feet below the riverbed of the Guadalupe River, pass under the retaining wall, and approximately 35 feet below the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment for both options would enter the Diridon Station between Los Gatos Creek and Autumn Street.



Graphics ... 00332.13 (10-31-2016)

Source: VTA, 2016.

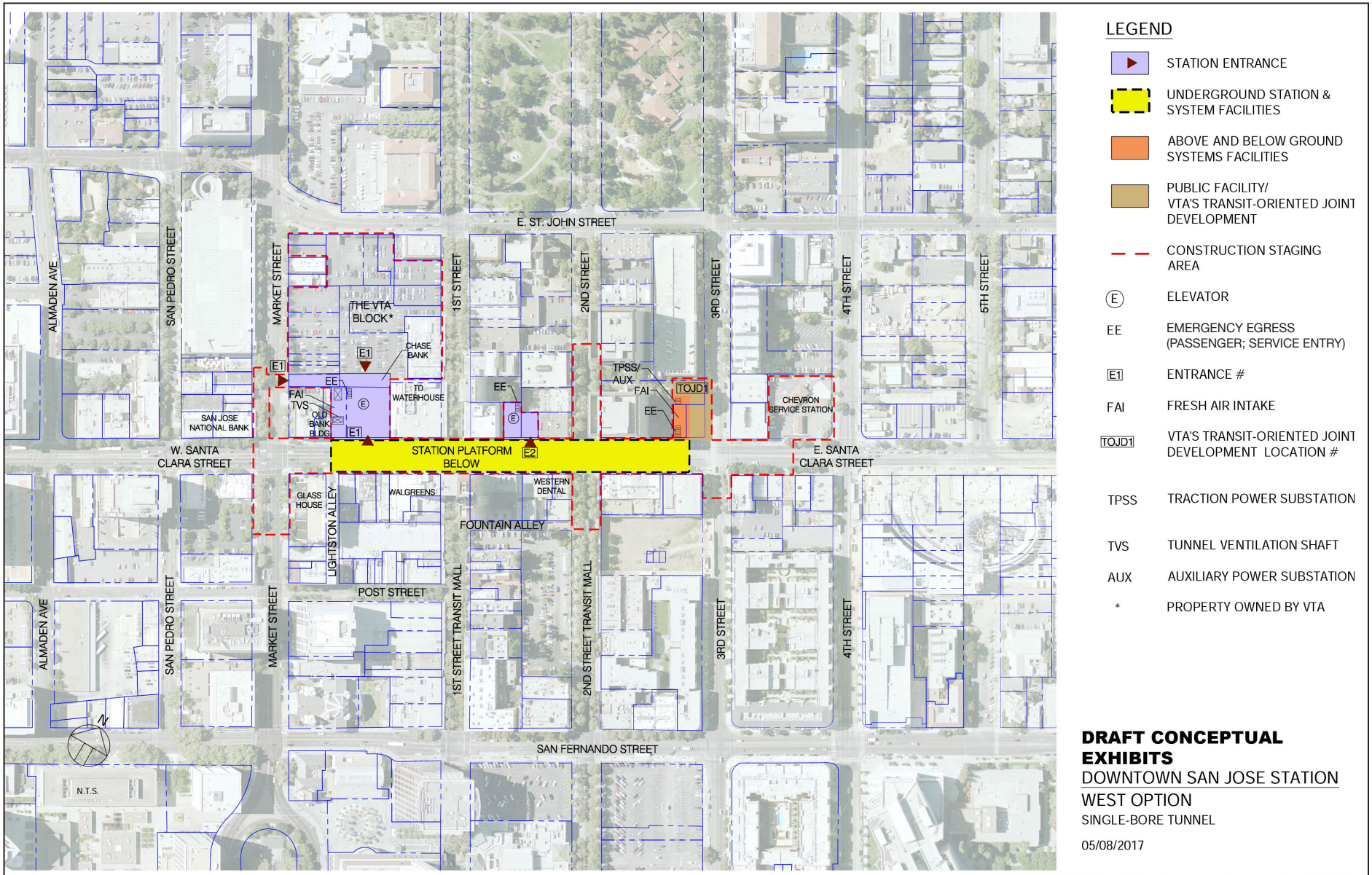
Figure 2-7
Downtown San Jose Station West Option Plan (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 0033213 (1-23-2018)

Figure 2-7
Downtown San Jose Station West Option Plan (Twin-Bore) (Revised)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 0033213 (1-23-2018)

Figure 2-C
Downtown San Jose Station West Option Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

Tunnel Alignment into Diridon Station North Option

Under the Twin-Bore Option, the alignment would continue beneath Santa Clara Street ~~and shift south beginning just west of South Almaden Boulevard to pass between the SR 87 bridge foundations. The alignment would then pass~~, then continue approximately ~~45~~ 50 feet below the riverbed of the Guadalupe River and ~~a retaining wall, then veer back north to a location just south of and adjacent to Santa Clara Street. The alignment passes 25~~30 feet below the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment would enter Diridon Station ~~under~~ between Autumn ~~Street~~ and Montgomery Streets and directly south of Santa Clara Street. The Diridon Station North Option is closer to Santa Clara Street in comparison to the South Option.

Under the Single-Bore Option, the alignment would continue and remain beneath Santa Clara Street, and continue ~~50~~45 feet below the riverbed of the Guadalupe River and ~~50~~40 feet below the creekbed of Los Gatos Creek. ~~After passing under Los Gatos Creek,~~ The boarding platforms, within the ~~alignment~~ single-bore tunnel, would ~~shift north and enter Diridon Station~~ be located between ~~Autumn and~~ Montgomery and White Streets~~, directly south of Santa Clara Street~~. The Diridon Station North Option is closer to Santa Clara Street in comparison to the South Option.

Diridon Station

There are two station location options for the Diridon Station: the Diridon Station South Option and the Diridon Station North Option, as described in detail below. The alignment varies by station location.

Diridon Station South Option

The Diridon Station South Option would be located between Los Gatos Creek to the east, the San Jose Diridon Caltrain Station to the west, Santa Clara Street to the north, and West San Fernando Street to the south as shown on Figures 2-8 and 2-D. The station would consist of a boarding platform level, a ~~mezzanine~~ concourse level, and entrances at street-level portals. Under the Single-Bore Option, an underground concourse level would span between the two entrances adjacent to the tunnel. Entrances would have elevators, escalators, and stairs covered by canopy structures.

The station would have a minimum of two entrances. Stairs and ~~up/down~~ escalators would be provided at each of the entrances. Two elevators would be provided at each station, generally one near each end. The ~~number,~~ location~~,~~ and configuration of station entrances would be finalized during final design and based on BART Facilities Standards and ridership projections.

~~An~~ The existing VTA bus transit center would be reconfigured for better access and circulation to accommodate projected bus and shuttle transfers to and from the BART station. The reconfiguration would be compatible/consistent with the Diridon Transportation

Facilities Master Plan's design of the area. Kiss-and-ride (KNR) facilities would be located along Cahill Street. No PNR ~~park-and-ride~~ parking would be provided.

Access to the station would be from Santa Clara Street from the north and from West San Fernando Street from the south. Street-level station entrance portals would provide pedestrian linkages to the Diridon Caltrain Station and SAP Center.

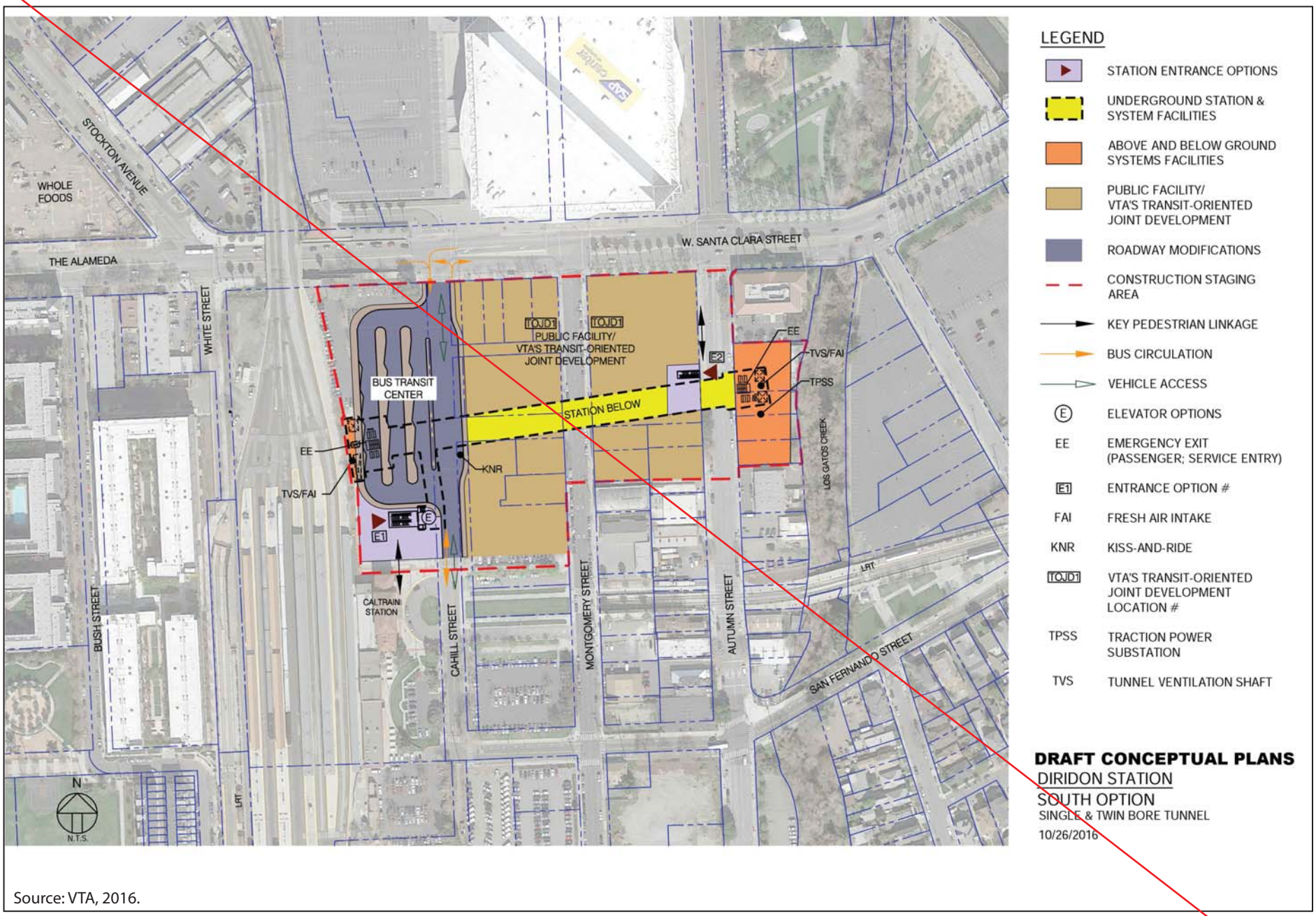
Systems facilities would be located aboveground and underground as shown on Figures 2-8 and 2-D and would include a TPSS, an auxiliary power substation, ventilation facilities, associated ventilation shafts, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, these systems facilities may also be located aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches as shown on Figures 2-8 and 2-D. System facility sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates.

West of the station, the alignment for both the Twin-Bore and Single-Bore Options would continue beneath the Diridon Caltrain Station train tracks and White Street. The alignment would then turn towards the north, crossing under The Alameda at Cleaves Avenue and under West Julian Street at Morrison Avenue before aligning under Stockton Avenue (STA 780+00).

Diridon Station North Option

~~Under the Twin-Bore Option, the Diridon Station North Option would be located between Autumn Street to the east, the Caltrain tracks to the west, Santa Clara Street to the north, and West San Fernando Street to the south as shown on Figure 2-9.~~

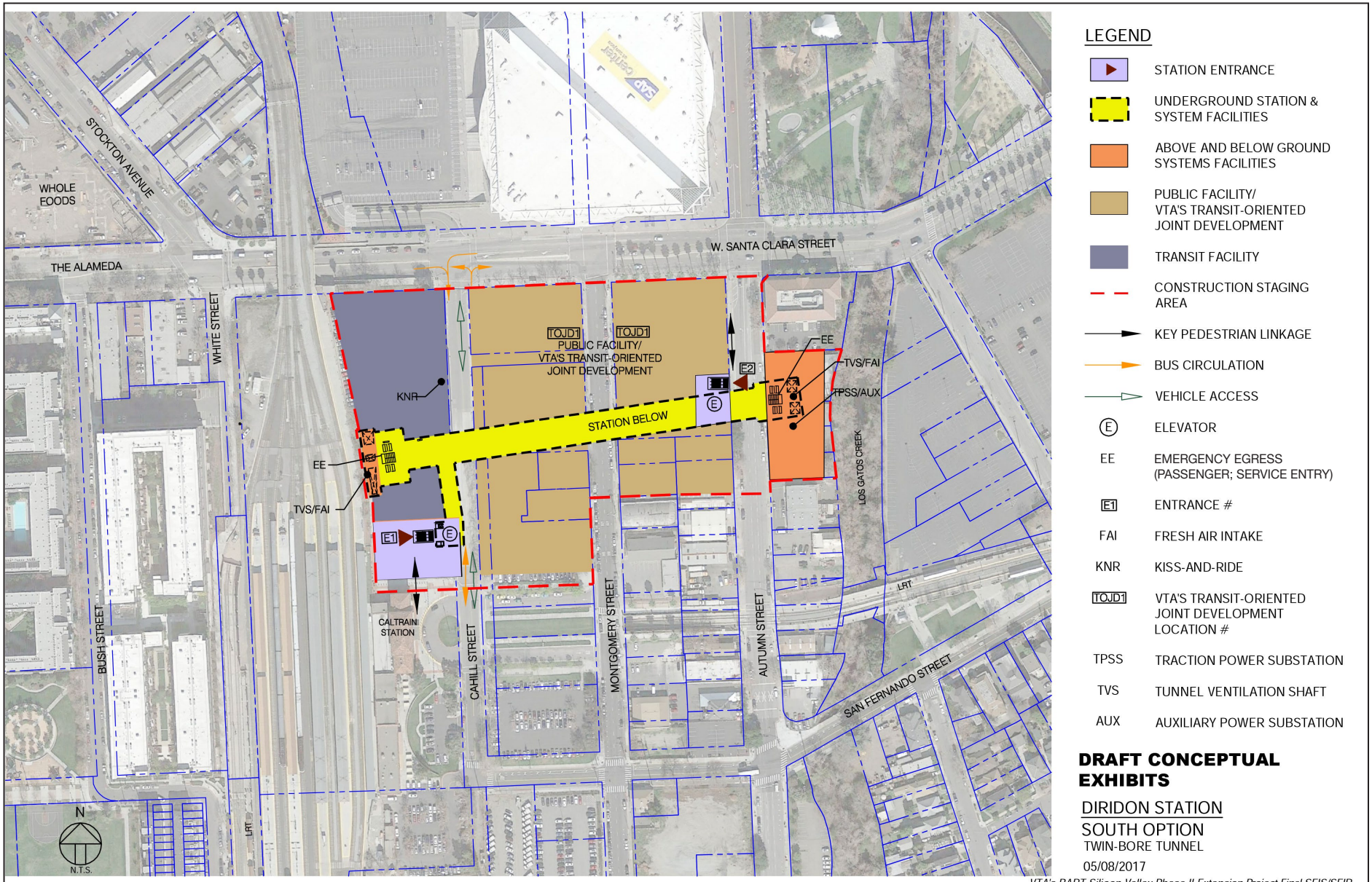
~~Under the Single-Bore Option~~ For both the Twin-Bore and Single-Bore Options, the Diridon Station North Option would be located between Autumn Street to the east, White Street to the west, Santa Clara Street to the north, and West San Fernando Street to the south as shown on Figures 2-9 and 2-10. Under the Twin-Bore Option, the underground station platforms would be located adjacent to, and just south of, Santa Clara Street. Under the Single-Bore Option, the underground station platforms would be located directly under Santa Clara Street.



Source: VTA, 2016.

Graphics ... 00332.13 (10-31-2016)

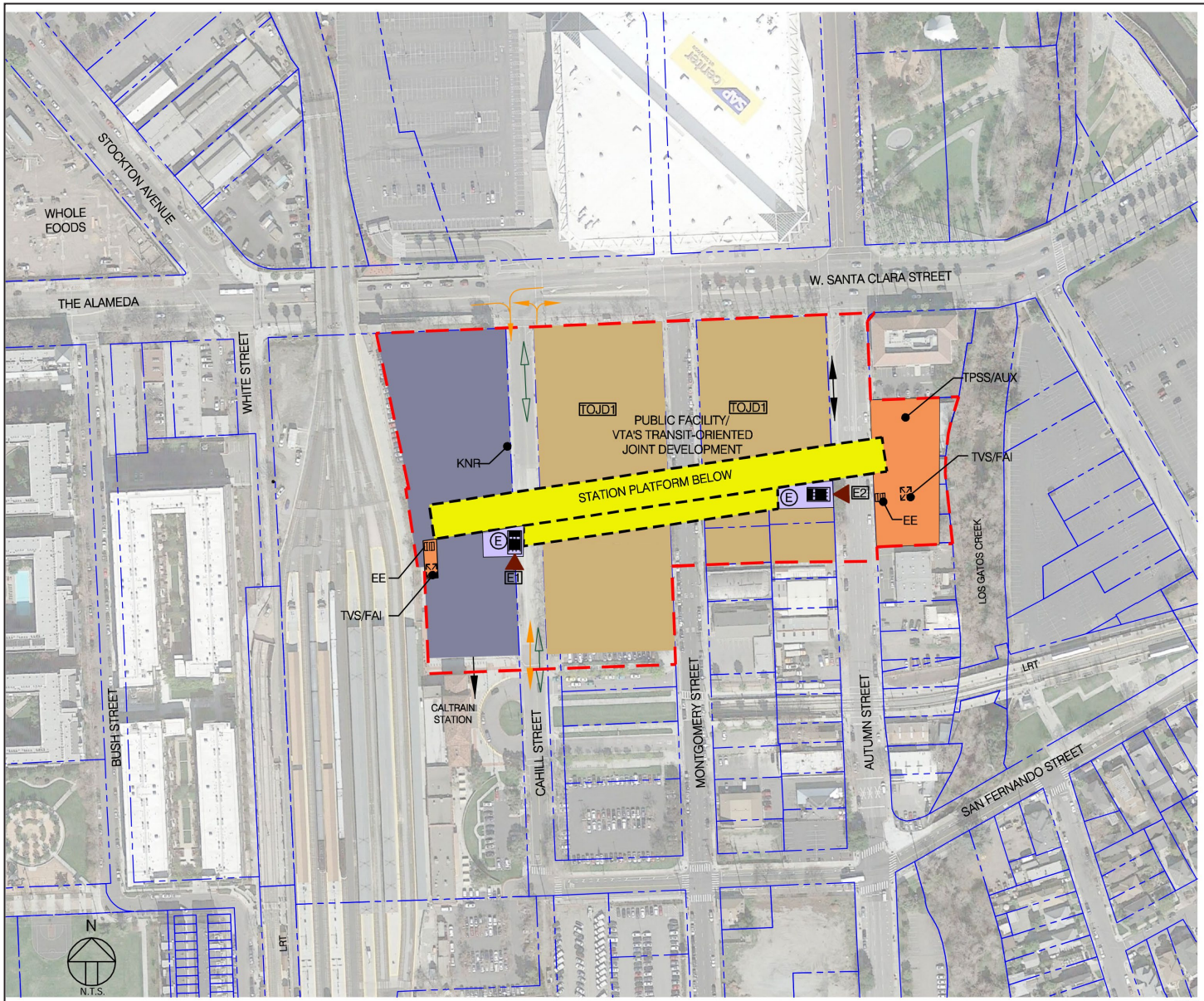
Figure 2-8
Diridon Station South Option Plan (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-8
Diridon Station South Option Plan (Twin-Bore) (Revised) VTA's BART Silicon Valley–Phase II Extension Project



LEGEND

- STATION ENTRANCE
- UNDERGROUND STATION, CONCOURSE, & SYSTEM FACILITIES
- ABOVE AND BELOW GROUND SYSTEMS FACILITIES
- PUBLIC FACILITY/ VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT
- TRANSIT FACILITY
- CONSTRUCTION STAGING AREA
- KEY PEDESTRIAN LINKAGE
- BUS CIRCULATION
- VEHICLE ACCESS
- Ⓔ ELEVATOR
- EE EMERGENCY EGRESS (PASSENGER; SERVICE ENTRY)
- E1 ENTRANCE #
- FAI FRESH AIR INTAKE
- KNR KISS-AND-RIDE
- TOJD1 VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT LOCATION #
- TPSS TRACTION POWER SUBSTATION
- TVS TUNNEL VENTILATION SHAFT
- AUX AUXILIARY POWER SUBSTATION

DRAFT CONCEPTUAL EXHIBITS

DIRIDON STATION

SOUTH OPTION

SINGLE-BORE TUNNEL

05/08/2017

VTA's BART Silicon Valley Phase II Extension Project Final SEIS/SEIR

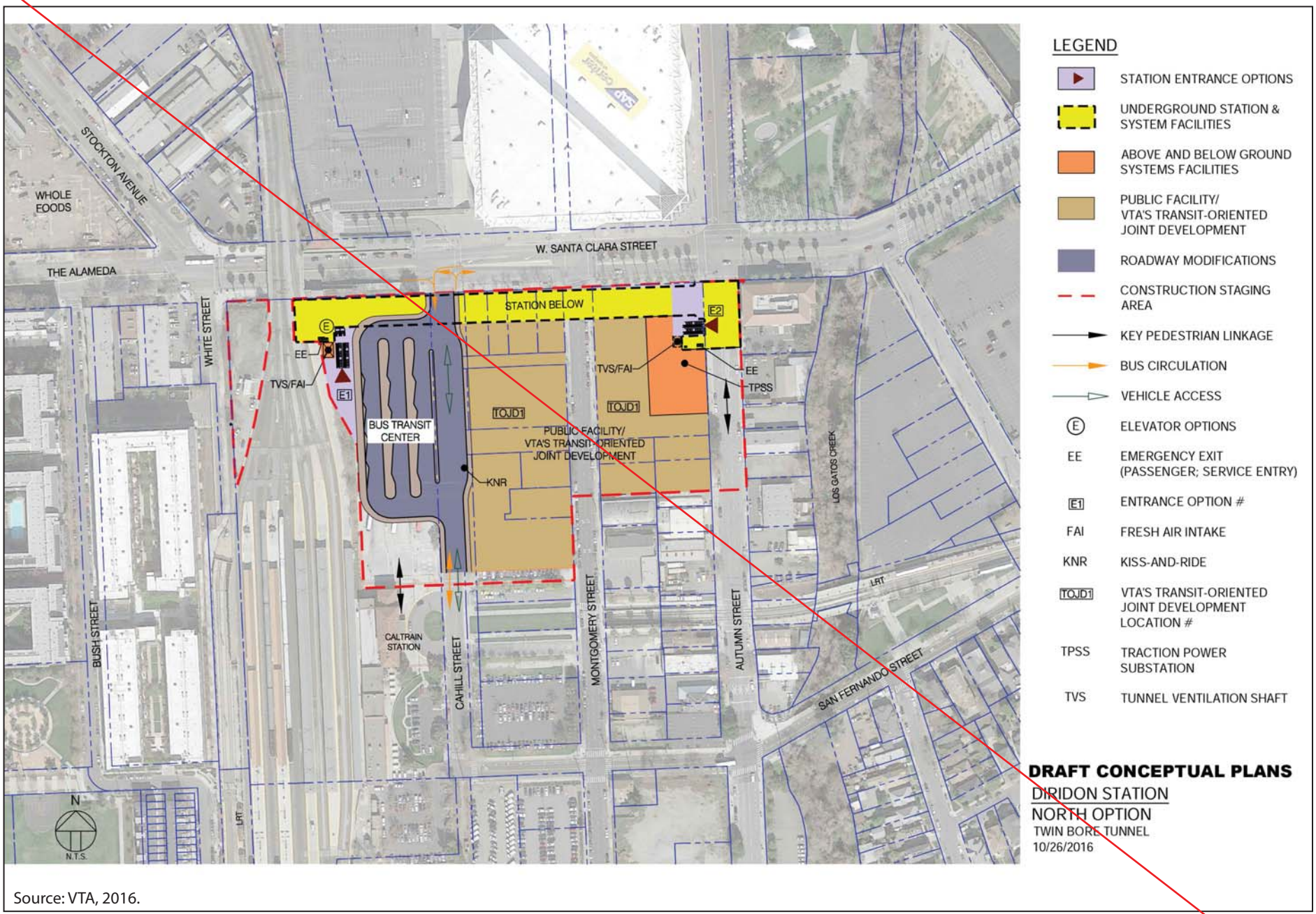
Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-D

Diridon Station South Option Plan (Single-Bore)

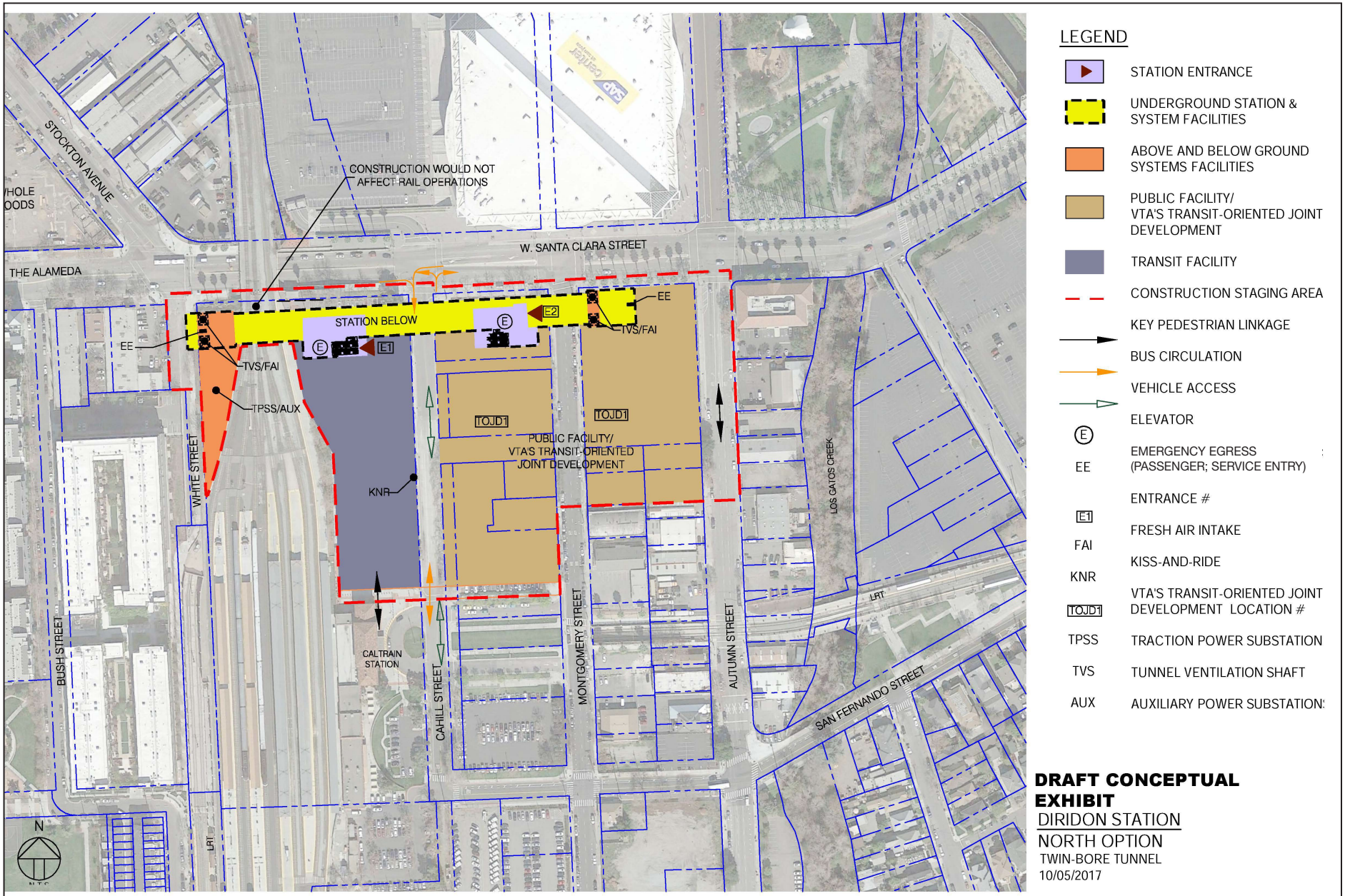
VTA's BART Silicon Valley–Phase II Extension Project



Graphics ... 00332.13 (10-31-2016)

Source: VTA, 2016.

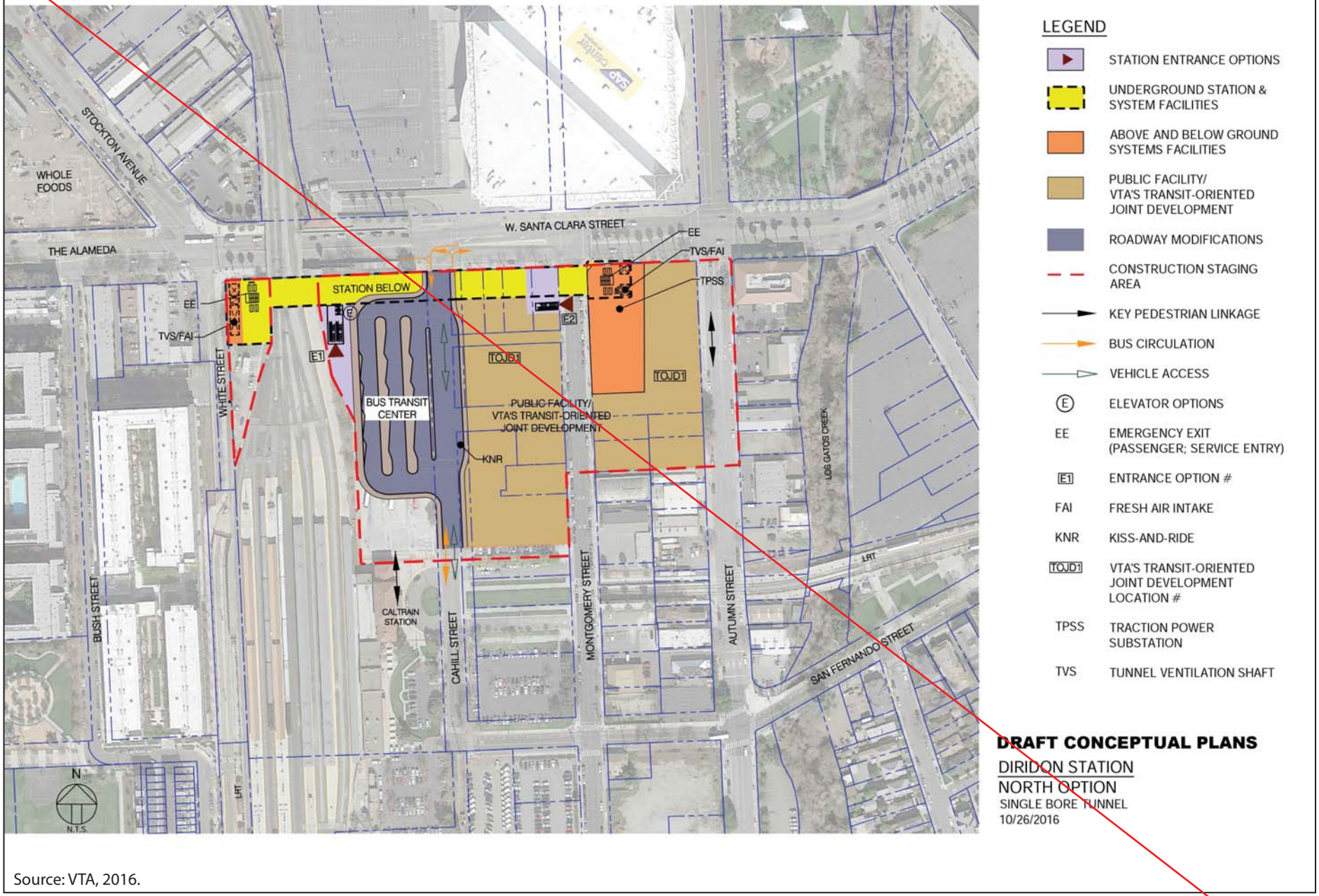
Figure 2-9
Diridon Station North Option Plan (Twin-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

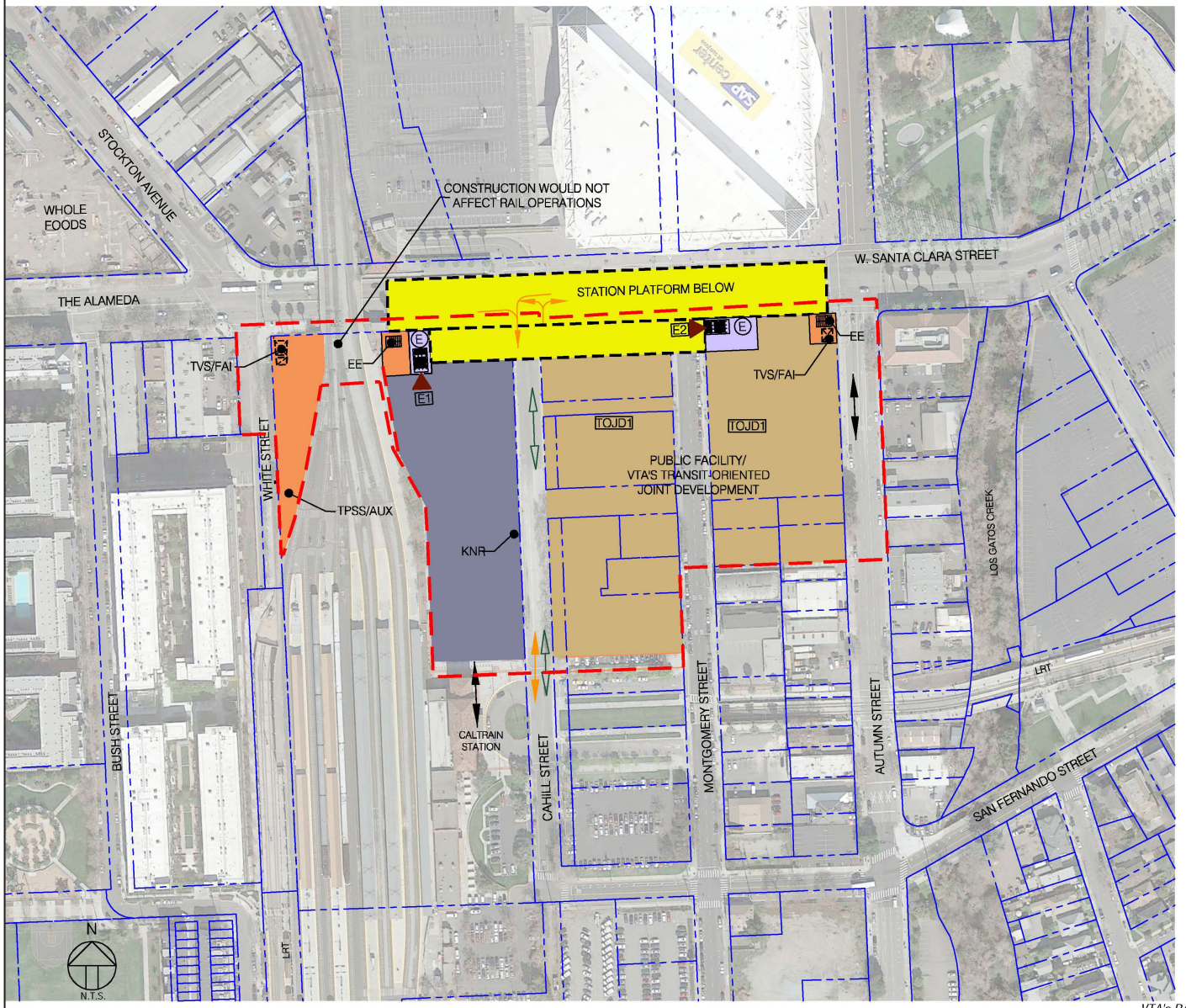
Figure 2-9
Diridon Station North Option Plan (Twin-Bore) (Revised)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2016.

Graphics ... 00332.13 (10-31-2016)

Figure 2-10
Diridon Station North Option Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



LEGEND

- STATION ENTRANCE
- UNDERGROUND STATION, CONCOURSE, & SYSTEM FACILITIES
- ABOVE AND BELOW GROUND SYSTEMS FACILITIES
- PUBLIC FACILITY/ VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT
- TRANSIT FACILITY
- CONSTRUCTION STAGING AREA
- KEY PEDESTRIAN LINKAGE
- BUS CIRCULATION
- VEHICLE ACCESS
- Ⓔ ELEVATOR
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- E1 ENTRANCE #
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- TOJD1 VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT LOCATION #
- TPSS TRACTION POWER SUBSTATION
- TVS TUNNEL VENTILATION SHAFT
- AUX AUXILIARY POWER SUBSTATION

DRAFT CONCEPTUAL EXHIBITS

DIRIDON STATION

NORTH OPTION

SINGLE-BORE TUNNEL

10/05/2017

VTA's BART Silicon Valley Phase II Extension Project Final SEIS/SEIR

Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-10

Diridon Station North Option Plan (Single-Bore) (Revised)

VTA's BART Silicon Valley–Phase II Extension Project

~~The station would be located underground and adjacent to, and just south of, Santa Clara Street.~~ The station would consist of a boarding platform level, a ~~mezzanine~~ concourse level, and entrances at street-level portals. ~~Access to the station would be from Santa Clara Street.~~ Street-level station entrance portals would provide pedestrian linkages to the Diridon Caltrain Station and SAP Center. Entrances would have elevators, escalators, and stairs covered by canopy structures. The station would have a minimum of two entrances. Under the Single-Bore Option, an underground concourse level would span the two entrances adjacent to the tunnel. Stairs and ~~up/down~~ escalators would be provided at each of the entrances~~. Elevators~~, and elevators would be provided at each station near each end ~~as shown on Figure 2-9~~. The ~~number,~~ location, and configuration of station entrances would be finalized during final design based on BART Facilities Standards and ridership projections.

~~An~~ The existing VTA bus transit center would be reconfigured for better access and circulation to accommodate projected bus and shuttle transfers to and from the BART station. The reconfiguration would be compatible/consistent with the Diridon Transportation Facilities Master Plan's design of the area. Kiss-and-ride facilities would be located along Cahill Street. No PNR ~~park-and-ride~~ parking would be provided.

Systems facilities would be located aboveground and underground as shown on Figure 2-9 for the Twin-Bore Option and Figure 2-10 for the Single-Bore Option and would include a TPSS, an auxiliary power substation, ventilation facilities, associated ventilation shafts, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, these systems facilities may also be located aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches as shown on Figure 2-9. System facility sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Access to the aboveground systems facilities, and parking areas for service vehicles would be restricted by access gates.

Under the Twin-Bore Option, west of the station, the alignment would continue ~~beneath the Diridon Caltrain Station train tracks and~~ under White ~~Street.~~ and Bush Streets south of The Alameda. The alignment would then turn towards the north, crossing under The Alameda at ~~Wilson Avenue~~ Sunol Street and under West Julian Street at ~~Cleaves~~ Morrison Avenue ~~Street~~ before aligning under Stockton Avenue (STA 775+00).

Under the Single-Bore Option, west of the station, the alignment would continue under ~~White and Bush Streets south of~~ Santa Clara Street/The Alameda. The alignment would then turn towards the north at Wilson Avenue, crossing under ~~The Alameda at Sunol Street~~ Rhodes Court and under West Julian Street ~~at Morrison Avenue~~ before aligning under Stockton Avenue (STA ~~780+~~775 + 00).

Tunnel Alignment along Stockton Avenue

Around Pershing Avenue, all of the options—the Twin-Bore and Single-Bore Options and the Diridon Station South and North Options—converge back onto the same alignment under Stockton Avenue, The alignment is the same for all four options mentioned above after Pershing Avenue; however, the station numbering is different between the Diridon Station South and North Options because the alignment for the Diridon Station North Option is slightly "shorter" than the South Option as shown on Appendices B and C. On the east side of Stockton Avenue between Schiele Avenue and West Taylor Street, there are four ~~three~~ alternate locations for a systems facility site that would house a tunnel ventilation structure, auxiliary power substation, and a gap breaker station ~~(Twin Bore: STA 780+00 to STA 793+00, Single Bore: 785+00 to 798+00)~~ as described in Section 2.2.2.2. Sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates.

The alignment would continue north and cross under the Caltrain tracks ~~(STA 807+00) and~~ then under Hedding Street (STA 807+00 and 813+00~~).~~ for Diridon Station South Option and STA 802+00 and 808+00 for the Diridon Station North Option). The alignment would continue on the east side of the Caltrain tracks and cross under ~~Interstate (I-)~~ -880 before ascending and exiting the West Tunnel Portal near Newhall Street (~~Single Bore:~~ between STA ~~835+00, Twin Bore: 833+00).~~ 829+00 and STA 838+00 depending on the option).

A high-voltage substation, TPSS, and TCCR would be located at a systems facility site above the West Tunnel Portal and near Pacific Gas & Electric Company's (PG&E's) FMC Substation as described in Section 2.2.2.2. A 115-kiloVolt (kV) line from PG&E's existing FMC substation would serve the high-voltage substation. There are two alternate routes for this 115-kV line connection. The first alternate route would begin at the high-voltage substation, run north to Newhall Street, then run east on upgraded poles along Newhall Street, then south on an existing line along Stockton Avenue. A second alternate route would also run north to Newhall Street and then run east on upgraded poles along Newhall Street, but a new line would be constructed to traverse the PG&E substation site. The 115-kV line would require approximately 80- to 115-foot-high galvanized tapered tubular steel ~~towers~~ poles or wood poles spaced approximately every 150 to 300 feet.

Crossover tracks would be located in the retained-cut trench just outside the West Tunnel Portal (~~Single Bore:~~ between approximately STA ~~833~~830+00~~, Twin Bore: STA 831+00 (Diridon North Option)~~ and ~~STA 836~~840+00 ~~(Diridon South Option~~ depending on the option). The alignment would then transition to ~~be~~an at-grade ~~(Twin Bore:~~ configuration (between STA ~~844~~839+00 and ~~Single Bore:~~ STA ~~848~~851+00 depending on the option) as it enters the Newhall Maintenance Facility and the Santa Clara Station to the north.

City of Santa Clara

The BART Extension Alternative in Santa Clara would consist of the Newhall Maintenance Facility and the Santa Clara Station. The San Jose/Santa Clara boundary is located approximately midway through the Newhall Maintenance Facility.

Newhall Maintenance Facility

The Newhall Maintenance Facility is approximately 40 acres and would begin north of the West Tunnel Portal at Newhall Street in San Jose and extend to De La Cruz Boulevard near the Santa Clara Station in Santa Clara as shown in Figure 2-11. A single tail track would extend north from the Santa Clara Station and cross under the De La Cruz Boulevard overpass and terminate on the north side of the overpass. A systems facility is located north of Brokaw Road that includes a radio tower, traction power substation, and auxiliary power substation.

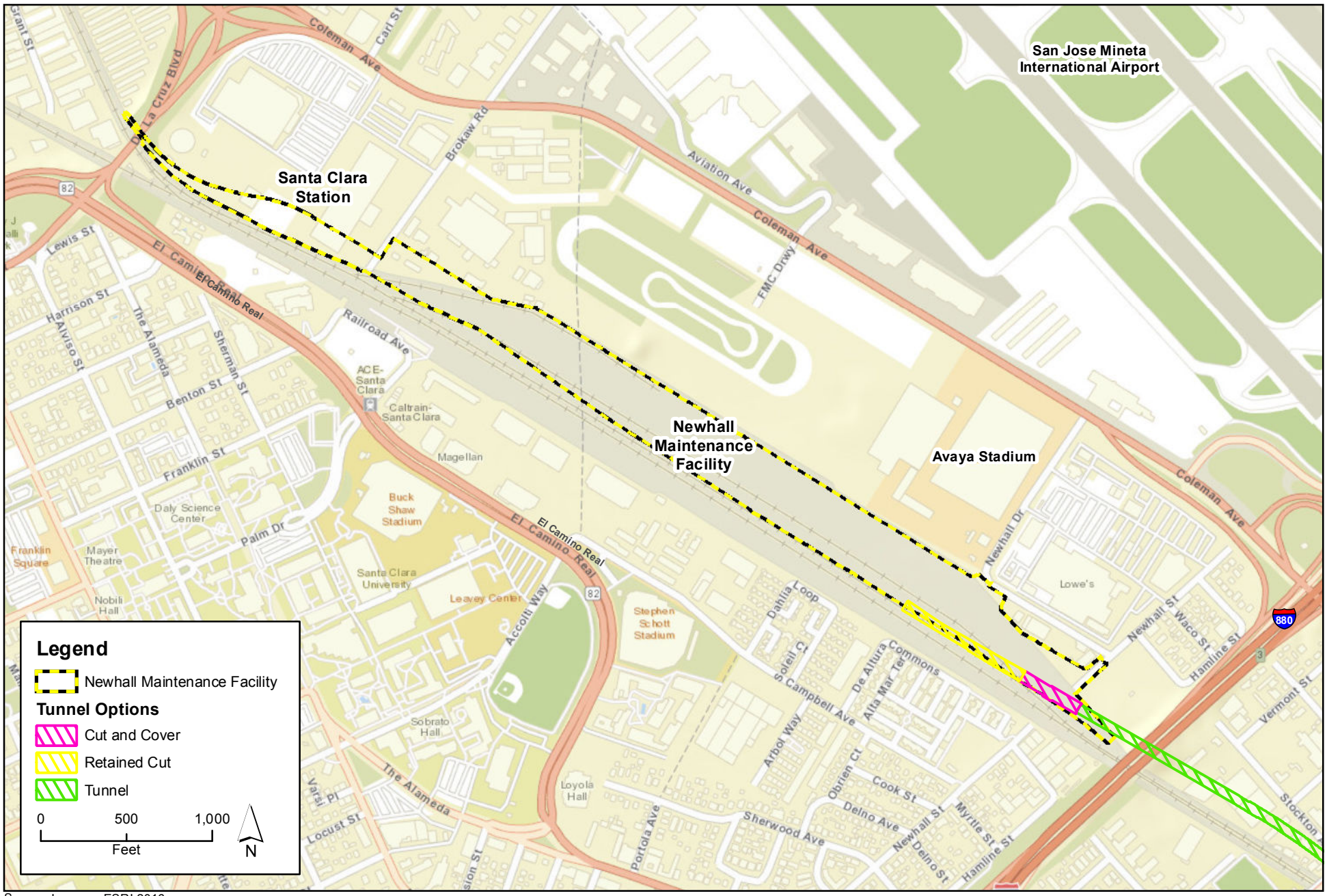
The maintenance facility would be constructed on the former Union Pacific Railroad (UPRR) Newhall Yard that was purchased by VTA in 2004 and has been cleared of all structures. The main entrance to the facility would be from Newhall Drive. Other secured entrances would be provided at various locations for employees and emergency personnel. The site would include service roads to all buildings and approximately 225 onsite parking spaces for employees, authorized visitors, and delivery and service vehicles. The layout of the facility is provided in Appendix B.

The maintenance facility would serve two purposes: (1) general maintenance, running repairs, and storage of up to 200 BART revenue vehicles and (2) general maintenance of non-revenue vehicles. The facility would also include maintenance and engineering offices and a yard control tower. To provide for these functions, several buildings and numerous transfer and storage tracks would be constructed.

The following systems facilities would be located in the maintenance facility: a TPSS (11,000 square feet and 12 feet high), an auxiliary power substation (3,000 square feet and 12 feet high), two gap breaker stations (one 3,800 square feet and 12 feet high, and the other 3,200 square feet and 12 feet high), and a TCCR (3,300 square feet and 35 feet high).

System facility sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. The systems site would require two access points with gates and internal parking areas for service vehicles. An approximately 150-foot-high radio tower and an associated equipment shelter would be located within the systems site north of Brokaw Road.

Provisions would be made in the maintenance facility area for storage of maintenance equipment and supplies. Two detention basins, one in each city, would be constructed to retain and provide controlled release of stormwater into the respective city's storm drain systems.



Source: Imagery, ESRI 2016

Figure 2-11
Newhall Maintenance Facility
VTA's BART Silicon Valley – Phase II Extension Project

Specific features of the Newhall Maintenance Facility are described below.

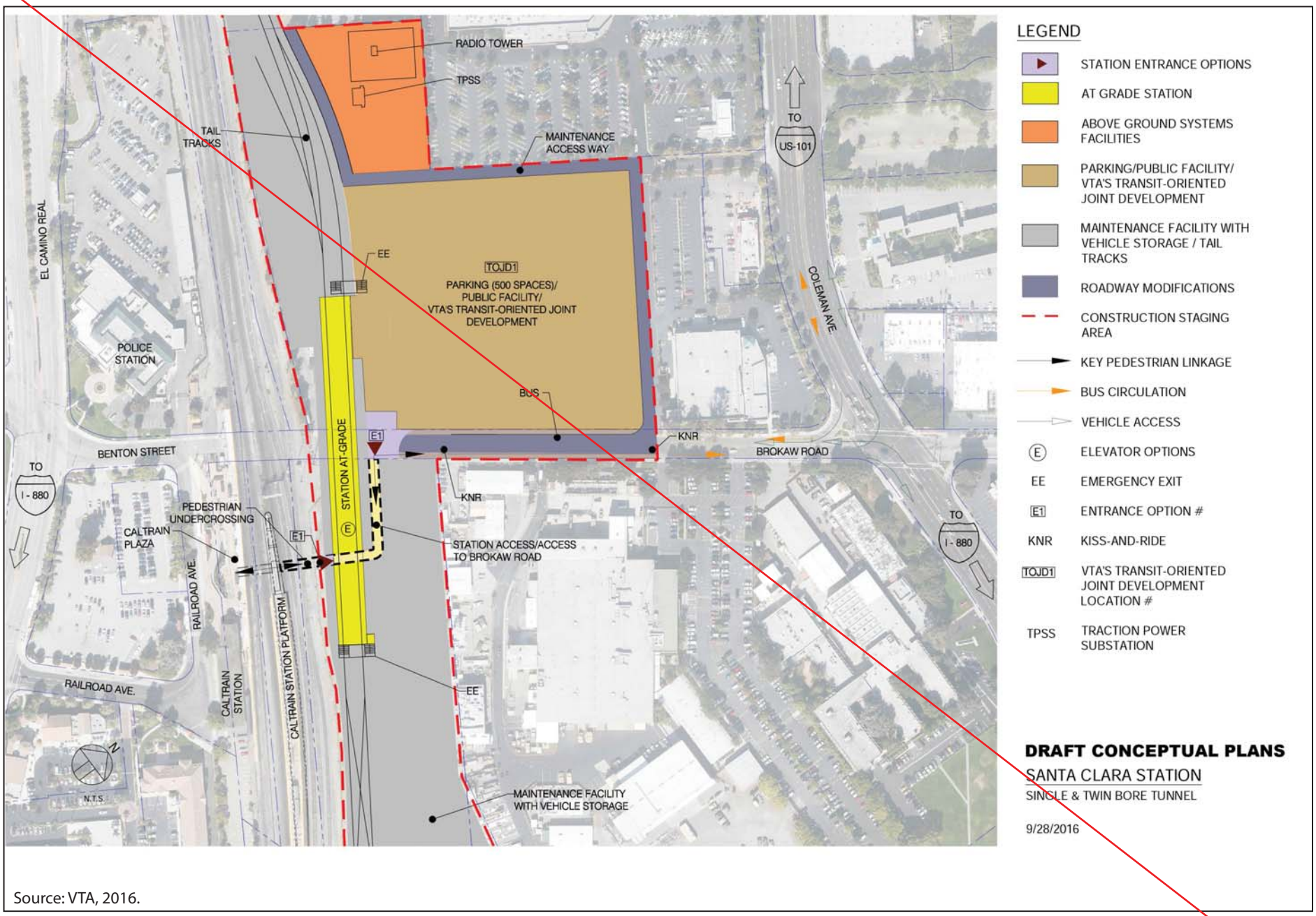
- **Train Car Washer.** The train car washer would be an open-ended building with an automated vehicle washing machine. As each train returns to the yard for storage, it would be driven through the car washer, where the exterior would be cleaned.
- **Yard Control Tower.** The yard control tower would be approximately three stories in height. The tower would be situated to have a view of train operations in the maintenance yard area. Employees staffing the tower would control the majority of train movements within the yard area, while shop area movements would be made under local control.
- **Inspection Pit.** The inspection pit would be enclosed in a shed and open at each end to allow trains to travel over a depressed pit so that the underside of trains could be inspected.
- **Blowdown Facility.** The blowdown facility would be used primarily for cleaning the underside of trains in a combined wet and dry process in preparation for scheduled inspections. The cleaning operation would be performed within a service pit.
- **Wheel Truing Facility.** The wheel truing facility would be located next to the revenue vehicle maintenance shop. The primary function of this facility would be to enclose the wheel truing pit and equipment to facilitate the maintenance and repair of BART vehicle wheel sets.
- **Revenue Vehicle Maintenance Shop.** The revenue vehicle maintenance shop would be approximately 70,000 square feet. Tracks would lead to and through the building. Vehicle car lifts, bridge cranes, and jib cranes would be located within the first floor of the shop. The second floor would be primarily for administration offices. The major functions carried out in the shop would include car inspections and repairs, parts storage, heavy component repairs, electro-mechanical repairs, and electronic repairs.
- **Vehicle Turntable.** The approximately 85-foot-diameter vehicle turntable would be located on a spur track close to the storage tracks. The vehicle turntable would be used for turning cars that must be oriented in the correct direction before they are added to a consist (a group of rail vehicles that make up a train).
- **Non-revenue Vehicle Maintenance Shop and Maintenance and Engineering Offices.** The non-revenue vehicle maintenance facility would be for maintenance of non-revenue service vehicles, such as rubber-tired vehicles, and cars for the maintenance of track and equipment. The facility would contain maintenance bays for rubber-tired vehicles, a service bay with a depressed pit for train maintenance, and a storage area for replacement parts. It would also contain an overhead crane, vehicle hoists, and diagnostic repair equipment.
- **Material Storage Area.** The material storage area would be utilized to store maintenance equipment and stockpile supplies.

- **Train Control House.** The train control house would be a one-story building located within the maintenance facility.
- **Gap Breaker Station.** The maintenance facility gap breaker station would be located adjacent to the train control house.
- **Radio Tower.** An approximately 150-foot-high radio tower and associated equipment shelter would be located near the traction power substation.
- **High-Voltage Substation.** A High-Voltage Substation and Switching Station would be located in the north east corner of the maintenance facility.

Santa Clara Station

The closest streets to the Santa Clara Station would be De La Cruz Boulevard to the northwest, Coleman Avenue to the northeast, and Brokaw Road to the east. The station would be at grade, centered at the west end of Brokaw Road, and would contain an at-grade boarding platform with a concourse one level below (Figure 2-12). Access to the boarding platform would be provided via elevators, escalators, and stairs covered by canopy structures. A pedestrian underpass would connect from the concourse level of the BART station to the Santa Clara Caltrain plaza. In addition, a pedestrian underpass would connect from the station concourse level to a new BART plaza near Brokaw Road. Kiss-and-ride, bus, and shuttle loading areas would be provided on Brokaw Road. ~~Brokaw Road would be widened, and the intersection of Coleman Avenue and Brokaw Road would be reconfigured.~~

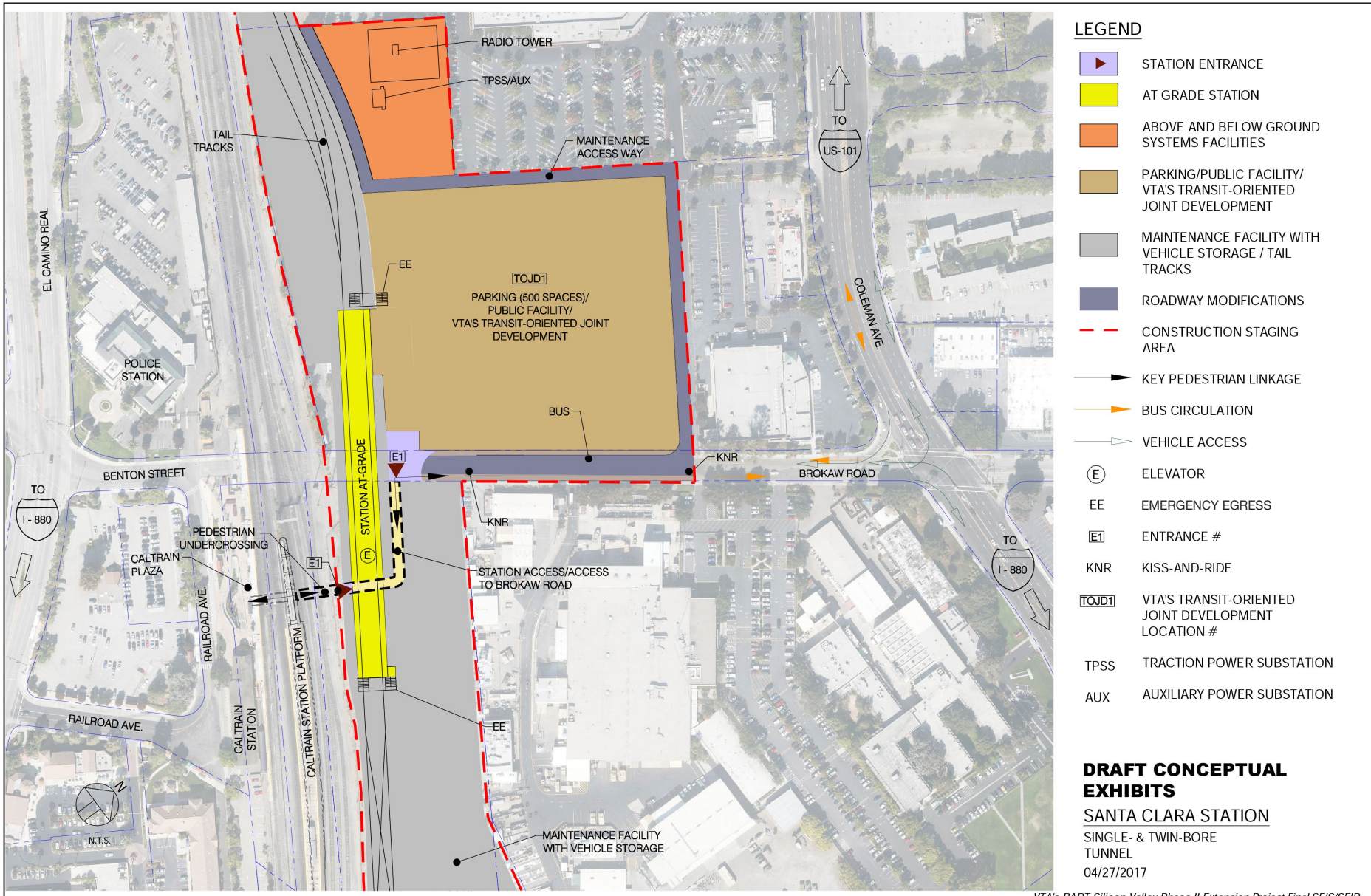
A parking structure of up to five levels would be located north of Brokaw Road and east of the Caltrain tracks within the approximately 10-acre station campus area and would accommodate 500 BART PNR ~~park-and-ride~~ parking spaces in addition to public facilities on the site. Vehicular access to the parking structure would be provided from Brokaw Road. Pedestrian access from the parking structure to the Santa Clara BART Station would be provided by a pedestrian tunnel from Brokaw Road to the below-grade BART concourse level.



Graphics ... 00332.13 (10-31-2016)

Source: VTA, 2016.

Figure 2-12
Santa Clara Station (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

Graphics ... 00332.13 (1-23-2018)

Figure 2-12
Santa Clara Station (Twin-Bore and Single-Bore) (Revised)
VTA's BART Silicon Valley–Phase II Extension Project

2.2.2.2 Description of NEPA BART Extension Alternative Auxiliary Features

This section describes various features of the NEPA BART Extension Alternative to assist the reader's understanding of the electrical, communication, cross passages, ventilation, and pump facilities required to operate the transit system. Definitions for the terms used in this chapter and throughout this SEIS/SEIR are included in Chapter 12, *Definitions, Abbreviations, and Acronyms*.

Electrical Facilities

Several types of electrical facilities are required to provide power to BART trains, stations, and associated facilities. High-voltage substations transform 115-kV AC power distributed from PG&E to 34.5kV AC power that is then distributed to the dual 34.5kV sub-transmission cable system (two sets of cables on the guideway that deliver this intermediate voltage to various locations throughout the system such as the traction power substations). Traction power substations convert the 34.5kV power to 1,000-volt (V) DC power that is then distributed to the BART third rail (also called the contact rail). Switching and sectionalizing stations control power on the 34.5-kV sub-transmission system. The switching stations are co-located with the high-voltage substations, and the sectionalizing stations are between these locations and co-located with traction power substations.

High-Voltage Substations and Switching Stations

High-voltage substations transform 115-kV AC power distributed from PG&E to 34.5-kV AC power that is then distributed to the dual 34.5-kV sub-transmission cable system. High-voltage substations include outdoor type equipment consisting of power utility interface equipment, such as a disconnect switch; metering potential and current transformers; a revenue metering facility; a 115-kV, outdoor-type power circuit breaker; a power transformer; a 34.5-kV indoor-type power circuit breaker; and electrical auxiliary equipment, protection relays, meters, telemetering devices, and supervisory control and data acquisition system (SCADA).

Switching stations consist of 34.5-kV metal-clad, walk-in-type switchgear circuit breakers, protection relays and meters, and SCADA, all of which are used for switching, distribution, and protection of the dual 34.5kV sub-transmission cable system.

High-voltage substations would require installation of high-voltage (115-kV) power feed lines connecting to nearby existing PG&E towers and lines or to PG&E substations. Permanent overhead or underground easements would be required for the 115-kV lines. Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities such as traction power substations and train control buildings. However, approximate dimensional requirements are 75 by 190 feet and 20 feet in height for high-voltage substations and 30 by 60 feet and 20 feet in height for switching stations. Some sites would require construction of an access road.

Traction Power Substations and Sectionalizing Stations

Traction power substations provide the power required to run BART trains on the mainlines, storage tracks, and maintenance facility tracks. These substations transform 34.5-kV AC to 1,000-V DC for distribution through BART's electrified third rail (also called the contact rail). Traction power substations include both outdoor and indoor equipment. The equipment consists of 34.5-kV AC metal clad walk-in type switchgear, transformer-rectifier assemblies, 1,000-V DC switchgear circuit breakers, control equipment, electrical auxiliary equipment, protection relays, meters and telemetering devices, SCADA, and connecting AC and DC power and control cables.

Sectionalizing stations consist of metal-clad, walk-in-type 34.5-kV switchgear circuit breakers, protection relays and meters, and SCADA, all of which are used to tie-in existing BART 34.5-kV cable distribution circuits or new 34.5-kV cable distribution circuits to obtain a flexible and reliable power supply system during contingency operations.

Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities, such as train control buildings. Some sites would require an access easement or construction of an access road. Minimum approximate dimensional requirements for traction power substations are 60 by 200 feet and 15 feet in height. Approximate dimensional requirements of sectionalizing stations are 30 by 20 feet, and the equipment would be combined with the traction power substation's 34.5-kV AC switchgear assembly.

Auxiliary Power Substations

Auxiliary power substations provide the power required to run the stations and Newhall Maintenance Facility. Electric power to the substations would be supplied by nearby overhead and underground medium voltage 480-V, 12.47-kV, and 21-kV distribution lines. Short (typically less than 1,000 feet) sections of overhead and underground power lines would be constructed from existing distribution facilities to the new facilities. Transformers and switching equipment would be located within ancillary areas at stations. In addition, each station and the Newhall Maintenance Facility would have a standby diesel-electric generator located aboveground. Additional standby diesel-electric generators would be located at pump stations and possibly at train control buildings.

Gap Breaker Stations

Gap breaker stations isolate appropriate electrified third rail sections for maintenance and repair purposes or de-energize third rail sections during an emergency. Gap breaker stations include indoor equipment in pre-fabricated enclosures or custom-built buildings. The equipment consists of 1,000-V DC switchgear circuit breakers and associated ancillary equipment such as relays and meters. DC power cables run in ductbanks from the gap breaker circuit breakers to BART's electrified third rail. Approximate dimensional requirements for gap breaker stations are 30 by 40 feet and 15 feet high.

Train Control and Communication Equipment

Train control equipment would be installed to provide automatic train control functions (e.g., accelerating, maintaining speed, braking, switching tracks, maintaining separation between different trains on the same track) and to integrate operations with the existing BART system. Some of the equipment required to monitor and control trains would be mounted along the trackways and on the trains. This equipment would include radios and antennae. Much of the wayside equipment would be contained in stand-alone train control buildings along the alignment or in train control rooms within the station areas. Train control buildings would be custom-built structures that range from 50 by 60 feet to 35 by 90 feet and 15 feet high.

Communications equipment for transmission of voice, video, and data would be installed as a means to: (1) provide information to passengers; (2) facilitate communication between passengers, BART staff, and BART Central; (3) provide transmission of closed circuit television camera data to a BART security center; and (4) enable subsystems to be monitored and remotely controlled where necessary.

~~Cross Passages~~

Emergency Egress

Under the Twin-Bore Option, emergency egress, known as cross passages, are underground connections located between the two tunnel bores and fitted with fire-rated doors. Cross passages would be spaced approximately 450 to 750 feet apart and are not required within the underground station boxes. Cross passages permit crossing from one tunnel bore to the other tunnel bore for purposes of emergency evacuation. For example, in the event of a fire, cross passages would provide the means to evacuate passengers from the tunnel with the fire incident to the other tunnel. Passengers could access rescue trains within the tunnel not affected by the emergency via the cross passages.

Under the Single-Bore Option, both ~~train~~ tracks guideways would be located within one large diameter tunnel~~, not within two separate tunnels as~~ either in a stacked, side-by-side, or transitional configuration (i.e., transitioning between the stacked configuration and the side-by-side configuration). Emergency egress provided would depend on the track configuration at that particular location. In the side-by-side configuration, a fire-rated door between the two guideways would be used, similar to the cross passage doors for the Twin-Bore Option. ~~Cross passages are required between two side-by-side tunnels, but the larger tunnel diameter~~ For the stacked configuration, an enclosed stairwell with fire-rated doors would be used to get patrons from one guideway to another (top to bottom or bottom to top). For the transitional areas where the track is transitioning from a side-by-side configuration to a stacked configuration, a combination of ~~the Single-Bore Option includes~~ fire-rated door and emergency ~~evacuation areas between each set of tracks within the single tunnel~~ egress enclosure/corridor would be utilized. For more information, see Chapter 5, Section 5.3.1, *Tunnel, Trackwork, and Ventilation Structures*.

Tunnel and Underground Station Ventilation Facilities

Tunnel and underground station ventilation facilities consist of emergency ventilation, fresh air intake, and exhaust facilities.

Emergency Ventilation Facilities

Emergency ventilation facilities would be located along the tunnel alignment between the underground stations (called mid-tunnel ventilation structures) and within the underground stations. The facilities include fans, dampers, ventilation shafts, and associated facilities and operate primarily to remove smoke in cases of emergency in either the tunnels or the stations. In addition, the facilities limit air velocities as trains pass through the tunnel and push the air forward and ventilate the tunnel when diesel propelled vehicles are being used during tunnel maintenance. Periodic testing of the facilities is required to ensure their proper operation.

There would be two mid-tunnel ventilation structures: one located at the northwest corner of Santa Clara and 13th Streets and another located east of Stockton Avenue south of Taylor Street. There are four optional locations for the Stockton Avenue ventilation structures. The final decision of a location would be based on the environmental impacts, property negotiations, and acquisition costs. The mid-tunnel ventilation structures would include an aboveground structure, or building, that houses the equipment required to ventilate the tunnel. The area required to accommodate each facility would be approximately 110 by 200 feet (including a small paved area used for maintenance activities or parking for maintenance personnel and an area for electrical transformers) with most of the equipment housed in a structure approximately 90 by 140 feet and 25 feet in height. A ventilation shaft would connect the structure to the tunnel below. The shaft opening would be located on the roof of the structure, with the smoke and air exhaust discharging vertically out of, or fresh air being drawn into, a protective grate.

There would be several underground ventilation facilities at the Alum Rock/28th Street, Downtown San Jose, and Diridon Stations, with all of the equipment located in the ancillary areas at both ends of the station boxes. The surface feature would be one or more ventilation shafts at each end of the station. Each shaft would be approximately 15 by 20 feet and 10 to 15 feet in height above ground level. An opening would be located at the top of each ventilation shaft with the smoke and air exhaust discharging vertically out of a protective grate.

Fresh Air Intake and Exhaust Facilities

Fresh air intake and exhaust facilities would be located within the underground stations. Dedicated fresh air intake and exhaust facilities supply fresh air exchange to the non-public ancillary areas. Similar to the tunnel and underground emergency ventilation facilities, these facilities would include shafts leading to the surface. Each shaft would be approximately 10 by 10 feet and approximately 18 feet in height above ground level. As trains pass through the tunnel and push air forward, fresh air exchanges into the station public area through the station entrances.

Pump Stations

All the equipment for pump stations along the tunnel alignment or in underground stations would be located underground. Access to these facilities for maintenance purposes would be from the nearest underground station or another facility. Access to pump stations located elsewhere along the alignment would be from within the retained cuts or from an at-grade location.

Pump stations would be located in the East and West Tunnel Portals, in the tunnel south of Lower Silver Creek, in the tunnel at Santa Clara and 13th Streets, in the tunnel west of SR 87, and in the tunnel between Schiele and Villa Avenues (location would vary depending on location of the ventilation structure near Stockton Avenue).

2.2.2.3 Sustainability Strategies

To the maximum extent practicable and in consultation with BART as required, the design and operation of the BART Extension Alternative would incorporate VTA's Sustainability Program green strategies through features that reduce energy, water, and solid resource consumption and improve indoor environmental quality. Some features that VTA will consider are listed below.

- **Daylighting and lighting controls.** Daylight combined with controls for artificial lighting can reduce electric power consumption. Photosensor-driven lighting control and dimming control is a well-established technology that could be applied to station platforms and interiors, and also on train cars. Controls should also offer low-power settings for after-hours periods at stations.
- **Escalators.** Because many passengers arrive at BART stations during peak hours, running escalators at full speed during non-peak hours uses energy needlessly. To reduce energy consumption, variable speed escalators that can stop and re-start or that operate at a low-speed mode (which may result in fewer maintenance problems than the start/stop escalators) could be installed.
- **Renewable power.** Photovoltaic solar panels are typically used to generate on-site power for transportation facilities. The top of roofs provide an opportunity for installing solar panels.
- **Water.** There are numerous well-established ways to save water, reduce stormwater flooding, and improve water quality in landscape design that are directly applicable to station areas and potentially to BART trackways. These methods include planting native, drought-resistant plants; using low-flow fixtures; increasing pervious surface with porous paving and unit pavers; capturing surface flow with bioswales and raingardens; and using soil-water separators and other filters. At the Newhall Maintenance Facility, the train car washing process could use recycled grey water and save up to 90 percent of the water used. If access to the San Jose and Santa Clara recycled water networks is available, then

recycled water could be used ~~for station landscaping~~ where possible for both indoor and outdoor uses.

- **Replacement and New Landscaping**. Replacement and new landscaping on VTA ROW will comply with VTA's Sustainable Landscaping Policy, which emphasizes native and drought tolerant plantings.
- **Plant-based lubricants and coolants.** Soy-based oil is being considered in the design for use with large transformers and potentially other system machinery.
- **Materials and resources.** Green strategies in this category include the management of construction and demolition waste through recycling and reuse to keep waste out of landfills to the maximum extent practicable; the use of recycled and regionally or locally available materials; and the reuse of soils onsite or elsewhere in the vicinity. Excavated soils could also be made available for use at other sites.
- **Indoor environmental quality.** Given that there would be indoor space involved, measures are being considered to address indoor environmental quality. These include the use of paints, coatings, carpet, and other materials containing reduced volatile organic compounds and green cleaning products.

2.3 CEQA Alternatives

2.3.1 CEQA No Build Alternative

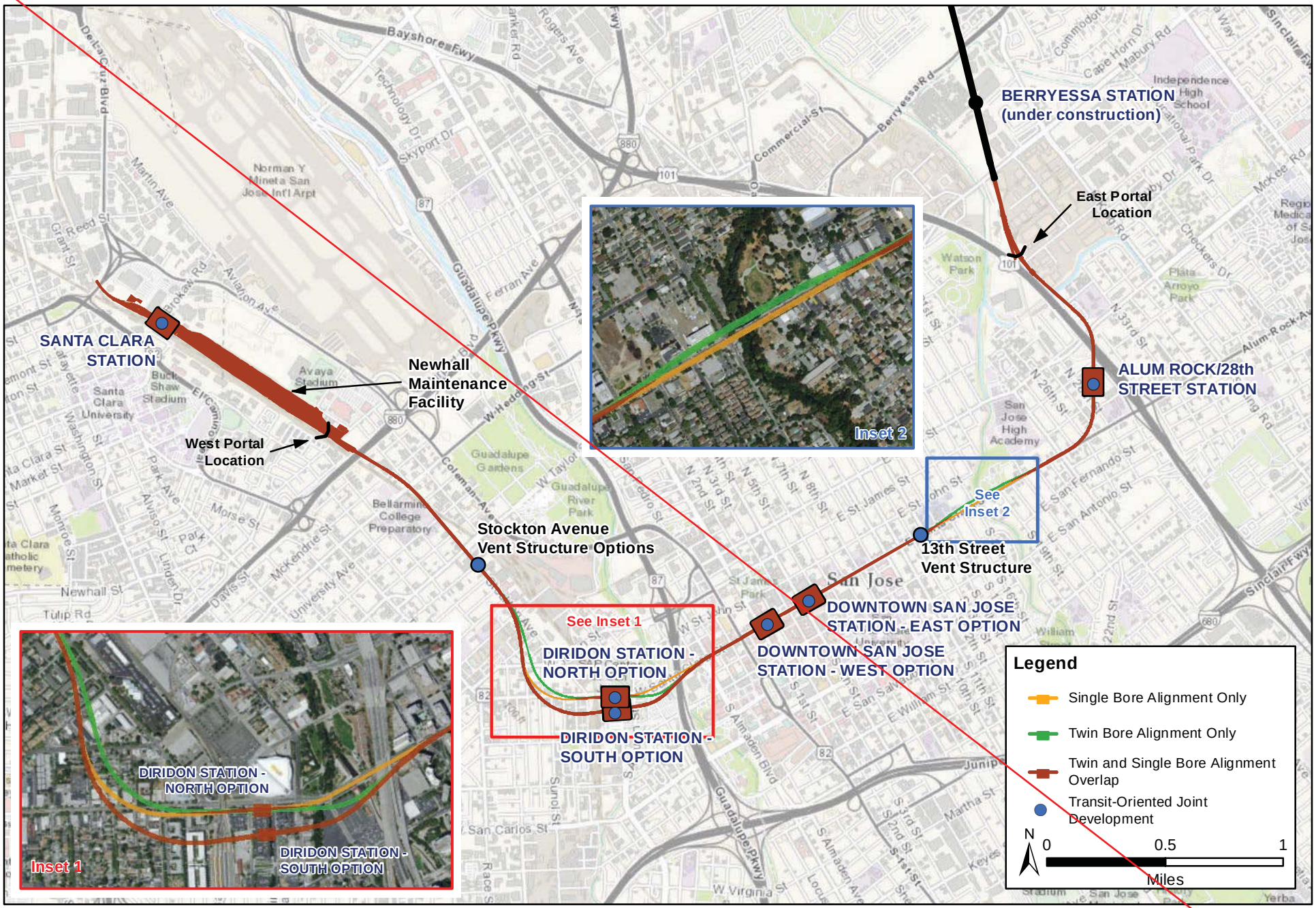
The No Build Alternative consists of the existing transit and roadway networks and planned and programmed improvements in the corridor that are described in Section 2.2.1, *NEPA No Build Alternative*. Future land uses would be consistent with the General Plans and area plans for the Cities of San Jose and Santa Clara.

2.3.2 CEQA BART Extension Alternative

The CEQA BART Extension Alternative consists of the approximately 6-mile extension of the BART system from the Berryessa/North San Jose ~~BART~~ Station ~~in San Jose~~ through downtown San Jose terminating in Santa Clara near the Santa Clara Caltrain Station as described in Section 2.2.2, *NEPA BART Extension Alternative*.

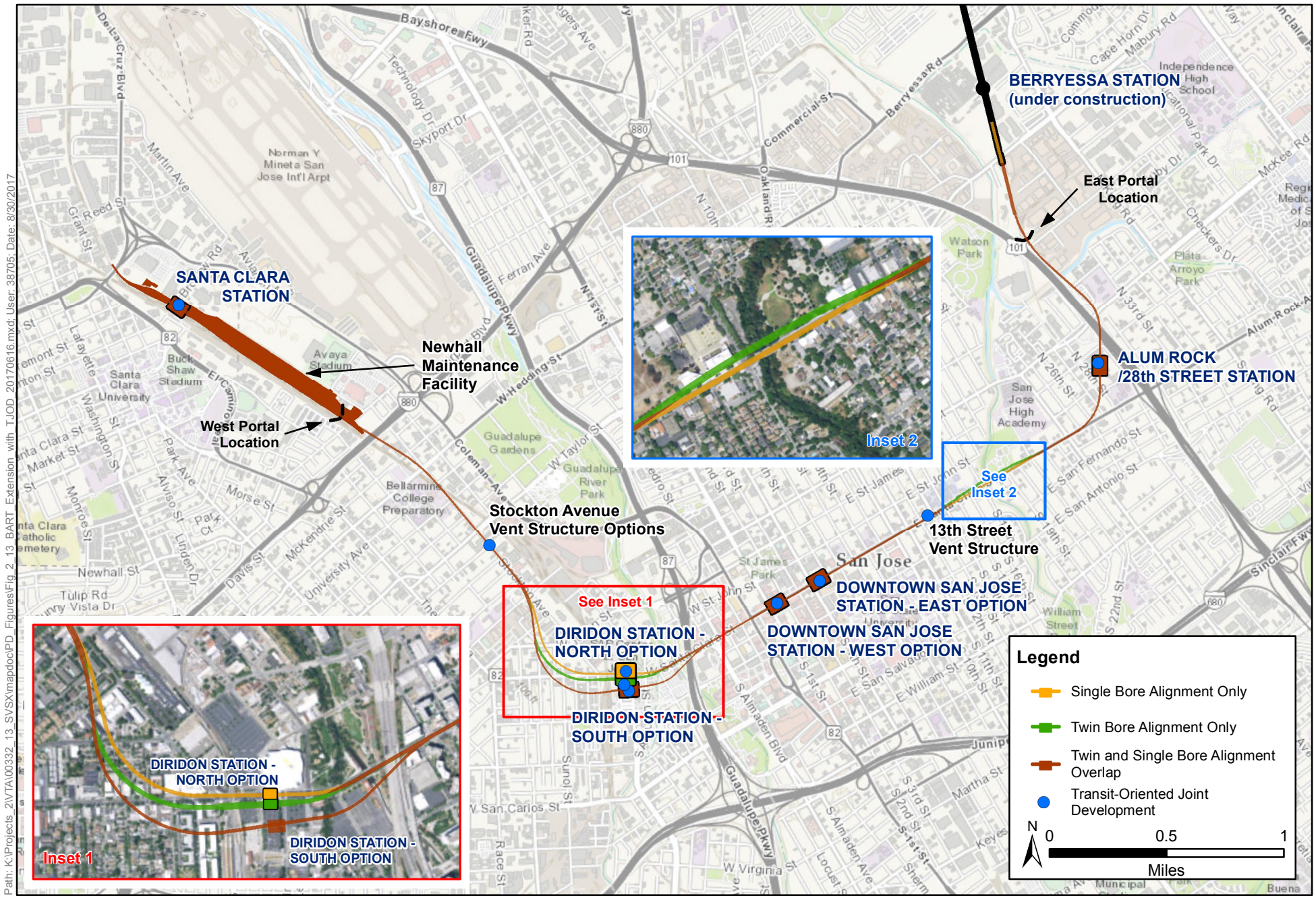
2.3.3 CEQA BART Extension with TOJD Alternative

The CEQA BART Extension with TOJD Alternative consists of the approximately 6-mile extension of the BART system from the Berryessa/North San Jose ~~BART~~ Station ~~in San Jose~~ through downtown San Jose terminating in Santa Clara near the Santa Clara Caltrain Station, as described in Section 2.2.2, *NEPA BART Extension Alternative.* In addition, this alternative has TOJD at each of the four BART stations and TOJD at the two ventilation structures as described below. The alignments, stations, and TOJD locations are depicted on Figure 2-13.



Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Figure 2-13
BART Extension (with Station options) and Transit-Oriented Joint Development Alternative
VTA's BART Silicon Valley–Phase II Extension Project



Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Figure 2-13

BART Extension (with Station Options) and Transit-Oriented Joint Development (Revised)

VTA's BART Silicon Valley – Phase II Extension Project

The TOJD would involve VTA working with a private developer to develop mixed-use developments consistent with California Public Utilities Code Section 100130-100133. The code defines TOJD as a commercial, residential, or mixed-use development that is undertaken in connection with existing, planned, or proposed transit facilities and is located ¼ mile or less from the external boundaries of that facility. The TOJD may be constructed at the same time as the BART Extension Alternative or later in time, dependent on the availability of funding and subject to market forces. However, the design of the stations and structures would not preclude TOJD. A private developer has not been identified at this time. Should the TOJD Alternative be carried forward, the design of the TOJD would be coordinated with the design of the BART Extension stations and structures.

In October, 2016, VTA was awarded a $1.52 million Fiscal Year 2016 Pilot Program for Transit-Oriented Development (TOD) Planning grant for the Phase II Project. The Pilot Program supports comprehensive planning efforts of local communities. Under the Pilot Program requirements, agencies and local communities who receive funds through this planning program must examine ways to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access, identify infrastructure needs, and enable mixed-use development near transit stations. The Pilot Program for TOD Planning funds will be used to support a study on concepts and future opportunities for transit-oriented development along the alignment. ~~After t~~The VTA Board of Directors ~~defines the scope of work and~~ approved~~s~~ the scope of work and the selection of a consultant in December 2017, and the study will take approximately a year to complete.

No federal dollars would be used to design or construct the TOJD. Because the TOJD is a separate action by VTA from the NEPA BART Extension Alternative, VTA's TOJD, which is intended to be consistent with city general plans and approved area plans, ~~would be~~is considered in the cumulative background conditions for NEPA purposes. However, the potential impacts of TOJD are ~~fully~~ analyzed under the CEQA BART Extension with TOJD Alternative.

2.3.3.1 Proposed Development

VTA is proposing to construct TOJD (office, retail, and residential land uses) at the four BART stations (Alum Rock/28th Street, Downtown San Jose, Diridon, and Santa Clara), which offers the benefit of encouraging transit ridership. VTA is also proposing to construct TOJD at two mid-tunnel ventilation structure locations (the northwest corner of Santa Clara and 13th Streets and east of Stockton Avenue south of Taylor Street). VTA's primary objective for the proposed TOJD is to encourage transit ridership and support land use development patterns that make the most efficient and feasible use of existing infrastructure and public services while promoting a sense of community as envisioned by the San Jose and Santa Clara General Plans and relevant adopted specific plans. Estimates for VTA's TOJD at the station sites and at the mid-tunnel ventilation structure locations are provided below and are based on current San Jose and Santa Clara general plans, approved area plans, the existing groundwater table constraints, and market conditions.

Table 2-3 summarizes the land uses at each proposed TOJD location, which are explained in further detail below. The number of parking spaces is based on meeting the Cities of San Jose and Santa Clara parking requirements for residential and commercial land uses. Parking for BART riders is not included in the table nor is shared parking with BART riders.

Table 2-3: Summary of Proposed TOJD (Revised)

Location	Residential (dwelling units)	Retail (square feet)	Office (square feet)	Parking (spaces)	Acres
Alum Rock/28th Street Station	275	20,000	500,000	2,150[a]	11
Santa Clara and 13th Streets Ventilation Structure	N/A	13,000	N/A	N/A	1.18
Downtown San Jose Station – East Option (at 3 sites)	N/A	160,000	303,000	1,398	3.84
Downtown San Jose Station – West Option	N/A	10,000	35,000	128	0.35
Diridon Station South Option	N/A	72,000	640,000	400	8
Diridon Station North Option	N/A	72,000	640,000	400	8
Stockton Avenue Ventilation Structure	N/A	15,000	N/A	N/A	1.18–1.7
Santa Clara Station	220	30,000	500,000	2,200[b]	10

[a] Total Parking (BART Extension Alternative + BART Extension with TOJD) at Alum Rock/28th Street Station will be 3,350 spaces.
[b] Total Parking (BART Extension Alternative + BART Extension with + TOJD) at Santa Clara Station will be 2,700 spaces.

City of San Jose

Alum Rock/28th Street Station

TOJD would be located within the station campus and would consist of a maximum of 500,000 square feet of office space with approximately 1,650 parking spaces, 20,000 square feet of retail with 100 parking spaces, and up to 275 dwelling units with approximately 400 parking spaces. The TOJD would range from 4 to 9 stories within the station area identified on the *Alum Rock/28th Street Station Conceptual Site Plan* in Appendix C. If the CEQA BART Extension with TOJD is selected, then design of the BART parking would be coordinated with the TOJD plans.

Santa Clara and 13th Streets Ventilation Structure

TOJD would be co-located with the ventilation structure at the northwest corner of Santa Clara and 13th Streets. The development would consist of a maximum of 13,000 square feet of ground-level retail along the street frontage facing Santa Clara Street.

Downtown San Jose Station East Option

Three TOJD sites would be located near the station as shown in *the Downtown San Jose Station East Option Conceptual Site Plan* in Appendix C. The first site is 2.79 acres located

south of Santa Clara Street between 6th and 7th Streets. A station entrance, elevator, and system facilities, including a TPSS, tunnel ventilation shaft, fresh air intake, and exhaust would also be located at this site. Because of the high groundwater table, underground parking would be limited to three levels. The TOJD would consist of one level of retail (approximately 120,000 square feet) and two levels of office (approximately 220,000 square feet). Three levels of underground parking would accommodate approximately 1,030 spaces (480 spaces for retail uses and 550 spaces for office uses).

The second site is 0.7 acres and located north of Santa Clara Street, west of 4th Street. A station entrance and elevator would also be located at this site. Because of the high groundwater table, underground parking would be limited to three levels. The TOJD would consist of one level of retail (approximately 30,000 square feet) and one and one-half levels of office (approximately 48,000 square feet). Three levels of underground parking would accommodate approximately 240 spaces (120 spaces for retail uses and 120 spaces for office uses).

The third site is 0.35 acres located north of Santa Clara Street, west of 3rd Street. System facilities, including a TPSS, tunnel ventilation shaft, fresh air intake, exhaust, emergency ~~exit~~ egress, and an equipment access shaft would also be located at this site. Because of the high groundwater table, underground parking would be limited to three levels. The TOJD would consist of one level of retail (approximately 10,000 square feet) and two and one-half levels of office (approximately 35,000 square feet). Three levels of underground parking would accommodate approximately 128 spaces (40 spaces for retail uses and 88 spaces for office uses).

Downtown San Jose Station West Option

The TOJD site for the West Option is 0.35 acre and located north of Santa Clara Street, west of 3rd Street, as shown in on the *Downtown San Jose Station West Option Conceptual Site Plan* in Appendix C. System facilities, including a TPSS, elevator, tunnel ventilation shaft, fresh air intake, exhaust, emergency ~~exit~~ egress, and an equipment access shaft would also be located at this site. Because of the high groundwater table, underground parking would be limited to three levels. The TOJD would consist of one level of retail (approximately 10,000 square feet) and two and one-half levels of office (approximately 35,000 square feet). Three levels of underground parking would accommodate approximately 128 spaces (40 spaces for retail uses and 88 spaces for office uses).

Diridon Station

Under both station location options, TOJD would be located adjacent to Diridon Station and would consist of a maximum of 640,000 square feet of office space with approximately 400 parking spaces, and 72,000 square feet of retail. The location of the TOJD is shown in the *Diridon Station Conceptual Site Plan* in Appendix C. The TOJD would be approximately 8 levels high and would have 3 levels of underground parking.

Stockton Avenue Ventilation Structure

TOJD would be located on the east side of Stockton Avenue, south of Taylor Street, with the ventilation structure at the rear of the site. The development would consist of a maximum of 15,000 square feet of ground level retail along the street frontage facing Stockton Avenue.

City of Santa Clara

Santa Clara Station

TOJD would be located within the station campus as shown on the *Santa Clara Station Conceptual Site Plan* in Appendix C. The TOJD would consist of a maximum of 500,000 square feet of office space with approximately 1,650 parking spaces, 30,000 square feet of retail with approximately 150 parking spaces, and up to 220 dwelling units with approximately 400 parking spaces. The TOJD would range from 4 to 11 stories and have one level of underground parking. If the CEQA BART Extension with TOJD Alternative is selected, the design of the 400 spaces of parking to accommodate BART PNR demand around the station campus would be coordinated with the TOJD.

2.3.3.2 Sustainability Strategies

The sustainability strategies described for the BART Extension Alternative would be similarly applied to the BART Extension with TOJD Alternative.

2.4 Alternatives Considered and Withdrawn

2.4.1 Initial Planning and Alternatives Screening

In 2001, VTA initiated a Major Investment Study/Alternative Analysis that evaluated 11 alternative alignments, including busway, commuter rail, light rail, and BART. Upon evaluating the performance of the alternatives and considering public comment, which favored the BART mode over light rail or other new modal options, the VTA Board of Directors on November 9, 2001, unanimously selected Alternative 11: BART on the former UPRR Alignment as the locally preferred alternative/preferred investment strategy. Alternative 11 was the environmentally superior alternative and best achieved the goals and objectives for the corridor. When compared with the other alternatives, BART on the former UPRR Alignment offered the fastest travel times to passenger destinations, the greatest congestion relief, improved air quality, best regional connectivity, lowest traffic and safety impacts due the fully grade-separated guideway, and consistency with local land use plans and policies. The VTA Board of Directors also approved a Comprehensive Agreement with the Bay Area Rapid Transit District that identified the terms and conditions for implementing and operating the locally preferred alternative/preferred investment strategy. On November 12, 2001, the BART Board of Directors adopted the terms and conditions of the Comprehensive Agreement.

2.4.2 Consideration of Alignment Variations and Options

Since 2001, the following additional variations to Alternative 11 from the Major Investment Study/Alternative Analysis have been considered but withdrawn (see Figure 2-E).

For purposes of this discussion, alignment variations are called *alternatives* and other variations to the recommended project are called *options*. All of these alternatives and options were considered and withdrawn with consideration of the following factors: substantial construction costs, operational costs, inefficient passenger access and intermodal connectivity, design and engineering concerns, inefficient maintenance yard operations, financial risk, or lower ridership, and/or they did not avoid or substantially lessen adverse environmental impacts when compared to the recommended project.

1. Las Plumas Yard and Shops Facility Option

This maintenance facility option would have located a maintenance facility east of U.S. 101 near Las Plumas Avenue as described in the Final EIS and 4 (f) Evaluation, March 2010. The Las Plumas Yard and Shops Facility was designed to support the Phase I Berryessa Extension. This option was eliminated from consideration in 2010 when BART and VTA agreed on an expansion program for BART's Hayward Maintenance Facility to support the Phase I Extension. The Las Plumas Yard and Shops Facility would not efficiently support the Phase II Extension. For example, after completing revenue service at the Santa Clara Station, BART vehicles would need to backtrack approximately 6 miles to the Las Plumas area for maintenance. In addition, once maintenance was completed, BART vehicles would need to travel back to the Santa Clara Station for storage until beginning revenue service. The additional daily 12 miles of travel for every BART vehicle serving the line is operationally inefficient. The additional mileage on the vehicles would add wear and tear and require long-term rail and wheel maintenance, resulting in an increase in the operations and maintenance costs for the project as compared to the recommended project. This option would have required the acquisition of many private properties and the displacement and relocation of many businesses.

Therefore, this option was eliminated because of operational inefficiencies, additional long-term operating costs, acquisition of many private properties and the displacement and relocation of many more businesses, and because it would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project in this Final SEIS/SEIR.

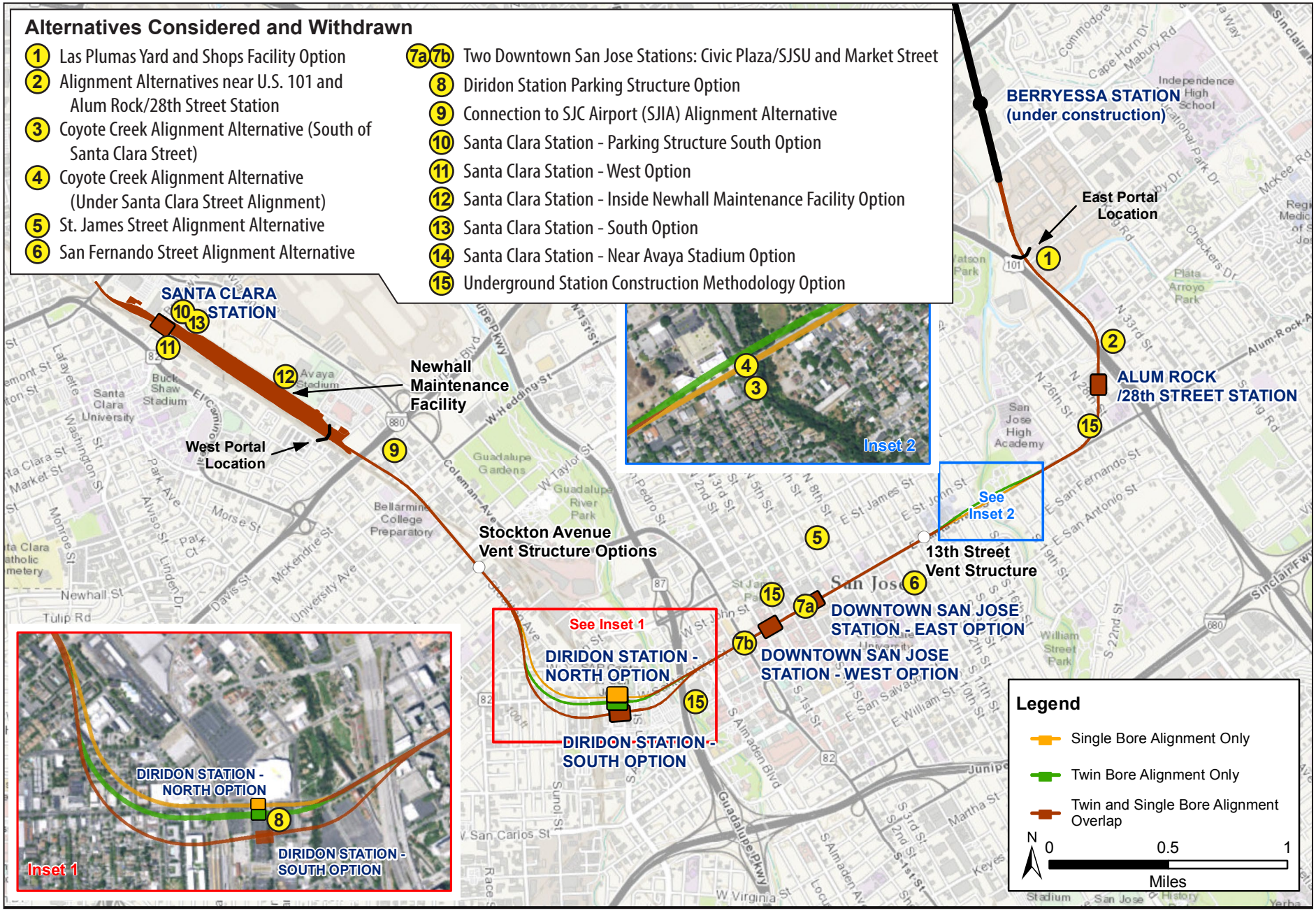


Figure 2-E
Alternatives Considered and Withdrawn
VTA's BART Silicon Valley–Phase II Extension Project

2. Alignment Alternatives near U.S. 101 and Alum Rock/28th Street Station

The following is a history of the consideration of various alternative alignments near the U.S. 101/McKee Road Interchange evaluated in previous environmental documents prepared for the project. This is followed by a detailed summary and analysis of each alternative considered and withdrawn.

- ***2004 Silicon Valley Rapid Transit Corridor (SVRTC) Draft EIS/EIR and Final EIR***

  The project description in the March 2004 SVRTC Draft EIS/EIR included two alignment alternatives at U.S. 101, as shown on pages 3.4-23 through 3.4-26:

  - U.S. 101/Diagonal Option – this alignment alternative is similar to the recommended project description in Section 2.A of this Final SEIS/SEIR. This alignment alternative crossed under a vacant property, which is now the Marburg Way residential neighborhood. However, the alignment in the 2004 SVRTC Draft EIS/EIR was shifted slightly to the west of the current alignment but still under what is now the Marburg Way residential neighborhood.
  - Railroad/28th Street Option– this alignment alternative was similar to the *BART Extension in a Bridge Over U.S. 101 Alignment Alternative* as described in Section 2.A of this Final SEIS/SEIR. This alignment included a bridge over U.S. 101 and west of, not under, what is now the Marburg Way residential neighborhood.

  On May 26, 2004, the Santa Clara Policy Advisory Board recommended the U.S. 101/Diagonal Option as part of the Recommended Project Description to the VTA Board of Directors. This alignment was selected because it passed beneath fewer residences than the Railroad/28th Street Option and therefore avoided noise and vibration impacts on those residences, would result in fewer ROW acquisitions, would cause less traffic disruption during construction, and was the more operationally efficient alignment since it did not require a reverse curve which was necessary for the Railroad/28th Street Option.

  The November 2004 SVRTC Final EIR carried forward the U.S. 101/Diagonal Option as part of the Recommended Project Description. On December 9, 2004, the VTA Board of Directors certified the 2004 SVRTC Final EIR and approved the Recommended Project as described on pages 2-10 through 2-12 of Volume II of the 2004 SVRTC Final EIR, including the U.S. 101/Diagonal Option. The U.S. 101/Diagonal Option remains as part of the current recommended project description (see Section 2.A below).

- ***2007 Silicon Valley Rapid Transit Corridor Draft Supplemental EIR and Final EIR***

  The 2007 Draft SEIR was the first environmental document circulated for the SVRTC after the Marburg Way residential neighborhood was constructed in 2006. The alignment near U.S. 101 crossed under what is now the Marburg Way residential neighborhood north of McKee Road.

  Chapter 1, page 12, of the 2007 Draft SEIR describes Design Change 32, U.S. 101 Alignment. Figure 1.3-3 on page 14 of Chapter 1 and Figure 3.2-3 on page 15 of Chapter 3 identify the location of Design Change 32. The BART alignment was slightly modified compared to the alignment in the 2004 Draft EIS/EIR to avoid abandoned bridge foundations located south of the McKee Road overpass, as shown in Figure B-42 of Appendix B of the 2007 Draft Supplemental EIR and described in Chapter 3, page 19. This allowed BART speed to increase from 50 to 70 mph around the curve and improve travel times. In addition, the Alum Rock Station (now called the Alum Rock/28th Street Station) footprint shifted to the east, and the alignment moved north of McKee Road farther to the east, directly under the Marburg Way residential neighborhood. Chapter 4, page 183, states that no additional groundborne noise or vibration impacts were identified with the design change compared to the analysis in 2004 environmental document. Appendix B, Figure B-41, shows the changes in the design of the alignment between the 2004 and the 2007 environmental documents.

  The May 2007 Silicon Valley Rapid Transit Corridor Final SEIR includes the Recommended Project Description with Design Change 32, the alignment shift to the east at U.S. 101, as shown on page 2-3, page 2-11 and Appendix C, Figure C-24. On June 7, 2007, VTA Board of Directors certified the SVRTC Final SEIR and approved the Recommended Project with Design Change 32. The 2007 alignment is the same as the current alignment in this 2017 Final SEIS/SEIR.

- ***2009 and 2010 SVRTC Draft and Final EIS and Section 4(f) Evaluation***

  The March 2009 SVRTC Draft EIS, Volume I, pages 2-52 and 2-53 and Volume II, Appendix C, Figure C-07 identify the alignment at U.S. 101 in the SVRTP Alternative. This alignment is the same alignment shown in the 2007 SEIR and the same alignment as the 2016 alignment in the recommended project description and in this 2018 Final SEIS/SEIR, which crossed under the Marburg Way residential neighborhood.

  In the March 2010 SVRTC Final EIS and Section 4(f) Evaluation, Volume II, Page 1-2, the Recommended Project Description describes the Berryessa Extension Project (BEP) Alternative, which is the 10-mile Berryessa Extension in an at-grade or retained cut configuration that terminates at U.S. 101 north of McKee Road. The 2010 Final EIS includes a description of the SVRTP Alternative, which is the full 16-

mile extension and includes a tunnel under U.S. 101. Volume I, pages 2-60 and 2-64, and Volume II, Appendix C, Figure C-06, identify a tunnel at U.S. 101 under the Marburg Way residential neighborhood and similar to the current alignment.

On June 24, 2010, the FTA issued a Record of Decision approving the recommended project, which was the 10-mile BEP Alternative, not the 16-mile SVRTP Alternative. The remaining 6 miles not built as part of Phase I are now the subject of the current 2018 Final SEIS/SEIR.

- ***2016 BART Silicon Valley – Phase II Extension Project Draft SEIS/SEIR***

  The 2016 Draft SEIS/SEIR for VTA's BART Silicon Valley – Phase II Extension Project was released in December 2016. The project description proposed an alignment near U.S. 101, the same as the alignment in the 2007 SVRTC Supplemental EIR, the 2009 Draft EIS, and 2010 Final EIS. The 2016 Draft SEIS/SEIR also included two alignment alternatives in Section 2.4, *Alternatives Considered and Withdrawn:* the BART in a Bridge Over U.S. 101 Alignment Alternative (similar to the Railroad/28th Street Option mentioned above in the 2004 environmental documents) and the Alum Rock Station at 23rd Street Alignment Alternative (a new alternative evaluated in 2015 prior to the release of the Draft SEIS/SEIR).

  During the public comment period for the Draft SEIS/SEIR in the spring of 2017, members of the neighborhood located east of U.S. 101 and north of McKee Road (the Marburg Way residential neighborhood) expressed concerns over the proposed alignment described in the project description and requested relocating the alignment to avoid crossing directly under their neighborhood. In response to these requests, VTA re-analyzed two alignment alternatives that were evaluated previously:

  - BART Extension in a Bridge Over U.S. 101 Alignment Alternative (see Figure 2-F) (formerly the Railroad/28th Street Option in the 2004 environmental documents, and which was listed in Section 2.4, *Alternatives Considered and Withdrawn*, in the 2016 Draft SEIS/SEIR as the "BART in a Bridge Over U.S. 101 Alignment")
  - Alum Rock Station at 23rd Street Alignment Alternative (see Figure 2-G) (evaluated in 2015, and which was called "Alum Rock Station at 23rd Street Alternative" in Section 2.4, *Alternatives Considered and Withdrawn*, in the 2016 Draft SEIS/SEIR.)

  VTA also analyzed three new alignment alternatives near U.S. 101 in response to public comment on the Draft SEIS/SEIR:

  - BART Extension Adjacent to U.S. 101 Alignment (see Figure 2-H)
  - BART Extension Under Anne Darling School Alignment (see Figure 2-I)

- BART Extension Under U.S. 101 Alignment (see Figure 2-J)

Analysis of Alignment Alternatives Considered and Withdrawn

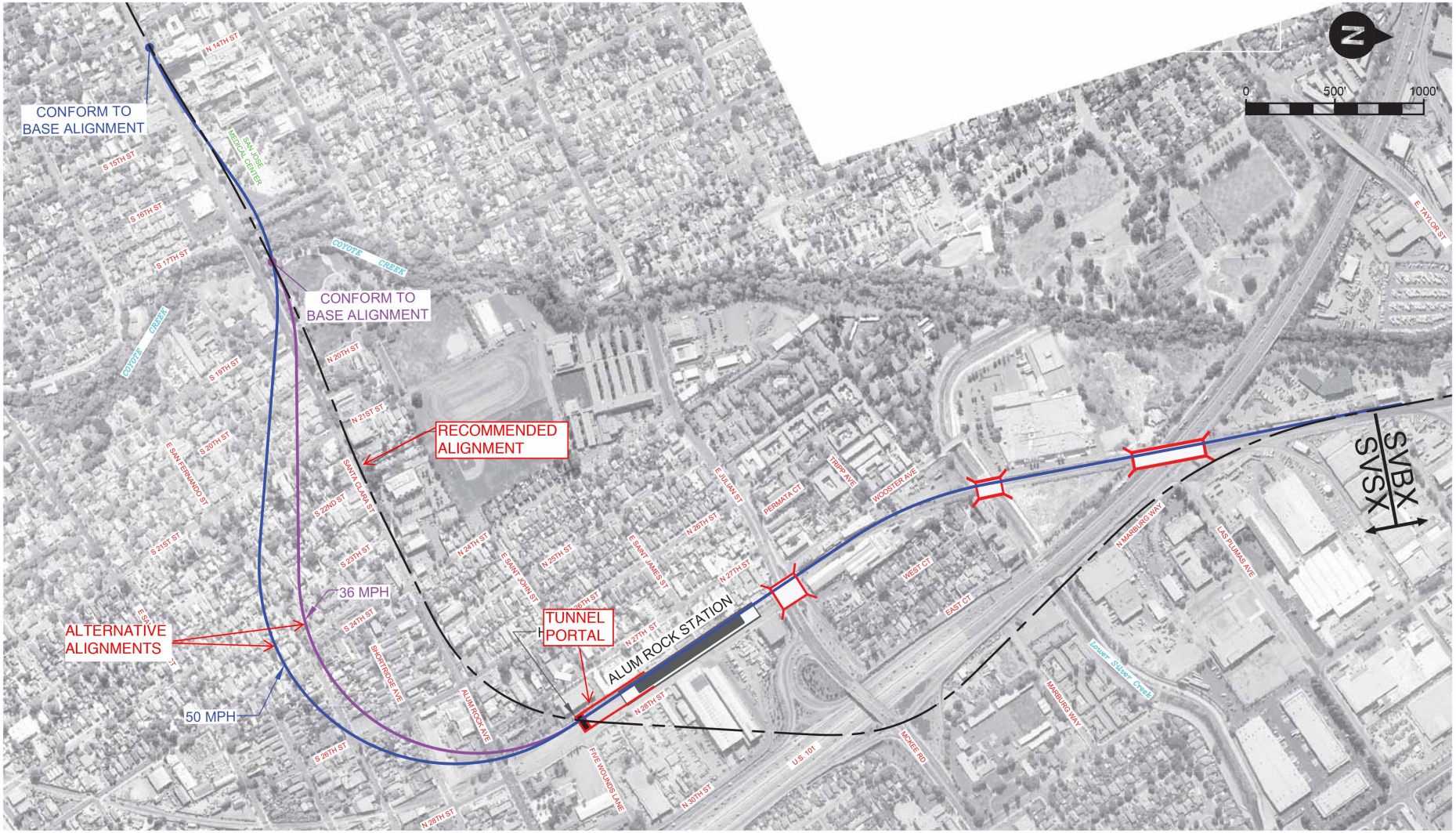
Each of these five alignment alternatives are discussed below in terms of description of the alternative, station configuration, constructability, operational impacts, ROW/real estate requirements, and environmental impacts. These U.S. 101 alignment alternatives were not carried forward for additional study with consideration of the following factors: design, engineering, and constructability feasibility issues;; operational inefficiencies; additional ROW/real estate requirements; increases in construction and/or maintenance costs; and increases in or lack of reducing adverse effects or significant environmental impacts compared to the recommended project in this Final SEIS/SEIR.

A. BART Extension in a Bridge Over U.S. 101 Alignment Alternative (see Figure 2-F)

This alignment alternative was evaluated in the 2004 Draft EIS/EIR as the "Railroad/28th Street Option" as mentioned in the timeline above. This alignment alternative was eliminated from consideration in December 2004 when the VTA Board of Directors selected the U.S. 101/Diagonal Option instead of the Railroad/28th Street Option. It was also listed in Section 2.4, *Alternatives Considered and Withdrawn*, in the 2016 Draft SEIS/SEIR as the "BART in a Bridge Over U.S. 101 Alignment."

Description of Alternative – This alignment alternative would extend from Berryessa/North San Jose Station to Santa Clara Street along the existing at-grade railroad bridge alignment over U.S. 101. The Alum Rock/28th Street Station would be located west of, and parallel to, 28th Street in a retained-cut configuration (trench) within VTA ROW. Because of the station location and the BFS turning radius criteria, the alignment would be pushed out far south of Santa Clara Street (in a tunnel) down to San Fernando Street before turning back to the north to realign with Santa Clara Street west of 19th Street.

Station Configuration – Alum Rock/28th Street Station would be located in a retained-cut (trench) configuration constructed within VTA-owned property west of 28th Street, between East Julian and Santa Clara Streets as shown on Figure 2-F.



Source: VTA, 2017.

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Figure 2-F
BART Extension in a Bridge Over U.S. 101 Alignment Alternative
Conceptual Design
VTA's BART Silicon Valley–Phase II Extension Project

Evaluation – This alignment alternative has been eliminated from consideration for the following reasons:

a. **Constructability –** This alignment would require the reconstruction, or removal and replacement, of the existing railroad bridge over U.S. 101 and construction of a new railroad bridge over Lower Silver Creek. Because of the short distance between a new bridge over Lower Silver Creek and the need to cross under East Julian Street, the intersection of East Julian Street and 28th Street would need to be raised several feet and the entire intersection would need to be reconfigured in order for the BART alignment to pass under the intersection and meet all applicable safety requirements.

b. **Operational Impacts** – The alignment south of Alum Rock/28th Street Station would require the design of a large-radius curve in order to meet the BFS minimum design speed of 50 miles per hour (mph). The resulting curve would be in an "S" shape that would require additional long-term rail and wheel maintenance, resulting in an increase in the operations and maintenance costs for the project as compared to the recommended project. (Note, Figure 2-F also shows a smaller radius 36 mph curve that does not meet the minimum design speed per BFS. Also, the smaller radius curve has greater travel times than the recommended project.)

c. **ROW/Real Estate Requirements** – Additional ROW would be required, as compared to the recommended project, adjacent to the existing ROW starting from Lower Silver Creek south to East Julian Street for construction, operation, and maintenance of the BART tracks. The ROW needed just south of Lower Silver Creek is constrained by Hacienda Park to the east and Rocketship Discovery Prep to the west. Acquisition of ROW to the east from Hacienda Park is preferred operationally. A greater number of tunneling easements under residential properties than the recommended project alignment would be required as a result of tunneling under more than 40 residences located south of Santa Clara Street.

d. **Environmental Impacts**

   i. Construction Traffic – The intersection of East Julian Street and 28th Street would have to be elevated and reconstructed to implement this alternative, which would take at least a year to construct. This would result in temporary construction traffic and access impacts on residential properties on West and East Court. During construction, this alternative would eliminate access and isolate these neighborhoods unless additional property were acquired and a bypass road constructed that would connect to Wooster Street. Construction of the station would require lane closures of 28th Street during various phases of construction.

   ii. Noise/Vibration – BART operations along this alignment alternative between Lower Silver Creek and East Julian Street would be aboveground, instead of in a tunnel as the preferred alignment alternative, and would therefore have the potential to result in noise and vibration impacts on residents and a park east of

the alignment and the Rocketship Discovery Prep school west of the alignment. This alignment would also result in groundborne noise impacts on over 40 residences south of Santa Clara Street that would not be impacted with the recommended alternative alignment. The likely need for additional groundborne noise mitigation to minimize and avoid adverse effects and would result in additional project costs.

iii. Section 4(f) – As mentioned above, additional ROW is needed south of Lower Silver Creek within an existing City of San Jose Park. However, Section 4(f) of the Department of Transportation Act of 1966 places restrictions on when a project involving a federal action (including funding) can acquire land from a public park. Therefore, acquisition to the east may not be possible pending a Section 4(f) evaluation.

Therefore, this alignment alternative would result in a non-standard design; require the acquisition of additional ROW; result in new significant impacts on traffic and access during construction resulting from the reconstruction of an at-grade intersection; have the potential to cause additional noise, groundborne noise, and vibration impacts on residences; and potential restrictions on ROW acquisition of Section 4(f) recreational resources, all of which would substantially increase project costs and schedule delays. This alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts as compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative was eliminated from consideration.

B. Alum Rock Station at 23rd Street Alignment Alternative (see Figure 2-G)

Description of Alternative – This alignment and station alternative was not evaluated in earlier environmental documents and would have the same alignment as the BART Extension in a Bridge Over U.S. 101 Alignment Alternative (described above) from the bridge over U.S. 101 to south of McKee Road. However, the alignment would turn to the west farther to the north at East St. James Street as compared to the alternative described above, which would continue south along 28th Street and turn west after passing Santa Clara Street. The alignment would extend south from Berryessa/North San Jose Station to East St. James Street along the existing at-grade railroad bridge alignment over U.S. 101 and Lower Silver Creek. The alignment would descend into a tunnel at the East Tunnel Portal starting at East St. James Street. The tunnel alignment would then turn west from 28th Street, starting north of East St. John Street, to align parallel to and north of Santa Clara Street at 24th Street. The station, called the 23rd Street Station, would be situated north of Santa Clara Street between 24th and 20th Streets. The alignment would then realign directly under Santa Clara Street west of 13th Street. Figure 2-G also shows a no station alignment that was withdrawn from consideration. It was determined that a station in this area is needed to serve East San Jose ridership demand. This alignment alternative was evaluated and eliminated in 2015 prior to the release of the Draft SEIS/SEIR in December 2016.

Station Configuration – The underground 23rd Street Station would be located just north of and parallel to Santa Clara Street as shown on Figure 2-G. Unlike the recommended Alum Rock/28th Street Station, this alternative was evaluated and eliminated at a very early phase of conceptual design prior to conducting parking studies.

Evaluation – This alignment alternative has been eliminated from consideration for the following reasons:

a. **Constructability** – This alignment would require reconstruction, or removal and replacement, of the existing at-grade railroad bridge over U.S. 101 and construction of a new bridge over Lower Silver Creek. Because of the short distance between a new bridge Lower Silver Creek and the need to cross under East Julian Street, the intersection of East Julian Street and 28th Street would need to be raised several feet and the entire intersection would need to be reconfigured in order for the BART alignment to pass under the intersection and meet all applicable safety requirements. This alignment would also introduce a non-typical, curved portal south of 28th and East Saint James Streets.

b. **ROW/Real Estate Requirements –** As described for the BART Extension in a Bridge Over U.S. 101 Alignment Alternative above, additional at-grade ROW would be required, compared to the recommended project, from Lower Silver Creek south to East Julian Street for construction, operation, and maintenance of the BART tracks. The ROW needed just south of Lower Silver Creek is constrained by Hacienda Park to the east and Rocketship Discovery Prep to the west. Acquisition of ROW to the east from Hacienda Park is preferred operationally. However, Section 4(f) of the Department of Transportation Act of 1966 places restrictions on when a project involving a federal action (including funding) can acquire land from a public park. Therefore, acquisition to the east may not be possible pending a Section 4(f) evaluation. The portal for this alignment would require additional ROW/real estate acquisitions south of McKee Road and west of 28th Street as compared to the recommended project. Easements would be required for tunneling under properties between 12th Street and 28th Street that would not be required for the recommended project alignment. This alternative would require the acquisition of many small retail businesses and a community center for the 23rd Street Station, and additional construction staging areas would be needed to build the 23rd Street Station.

Source: VTA, 2017.

Graphics ... 00332.13 (12-20-2017)

Figure 2-G
Alum Rock Station at 23rd Street Alignment Alternative
VTA's BART Silicon Valley–Phase II Extension Project

c. **Environmental Impacts**

i. Construction Traffic – The intersection of East Julian Street and 28th Street would be elevated and reconstructed to implement this alternative, which would take at least a year to construct. This would result in temporary construction traffic and access impacts on residential properties to the east on West and East Court. During construction, this alternative would eliminate access and isolate these neighborhoods.

ii. Environmental Justice – The businesses and community center that would be displaced by this alternative are within an environmental justice community and are owned by or serve environmental justice populations and/or communities. Therefore, this alternative is likely to result in disproportionately high and adverse effects to environmental justice communities.

iii. Noise/Vibration – BART operations along this alignment alternative between Lower Silver Creek and East Julian Street would be aboveground, instead of in a tunnel as identified for the recommended project alignment, and would therefore have the potential to result in noise and vibration impacts on residents and a park east of the alignment and the Rocketship Discovery Prep school west of the alignment. This alignment would also have the potential to result in groundborne noise impacts on properties west of 28th Street and north of Santa Clara Street that would not occur with the recommended alternative and the alignment, and the need for additional mitigation to minimize and avoid adverse effects that would result in additional project costs.

iv. Section 4(f) – As mentioned above, additional ROW is needed south of Lower Silver Creek within an existing City of San Jose park. However, Section 4(f) of the Department of Transportation Act of 1966 places restrictions on when a project involving a federal action (including funding) can acquire land from a public park. Therefore, acquisition to the east may not be possible pending a Section 4(f) determination.

Therefore, this alignment alternative would result in the acquisition of additional ROW; result in new significant impacts on traffic and access during construction resulting from the reconstruction of an at-grade intersection; have the potential to result in disproportionately high and adverse effects on environmental justice populations; have the potential to cause additional noise, groundborne noise, and vibration impacts and additional mitigation measures; and have potential restrictions on ROW acquisition due to Section 4(f) evaluation, all of which would substantially increase project costs and schedule delays. Thus, this alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative was eliminated from consideration.

C. BART Extension Under and Adjacent to U.S 101 Alignment Alternative (see Figure 2-H)

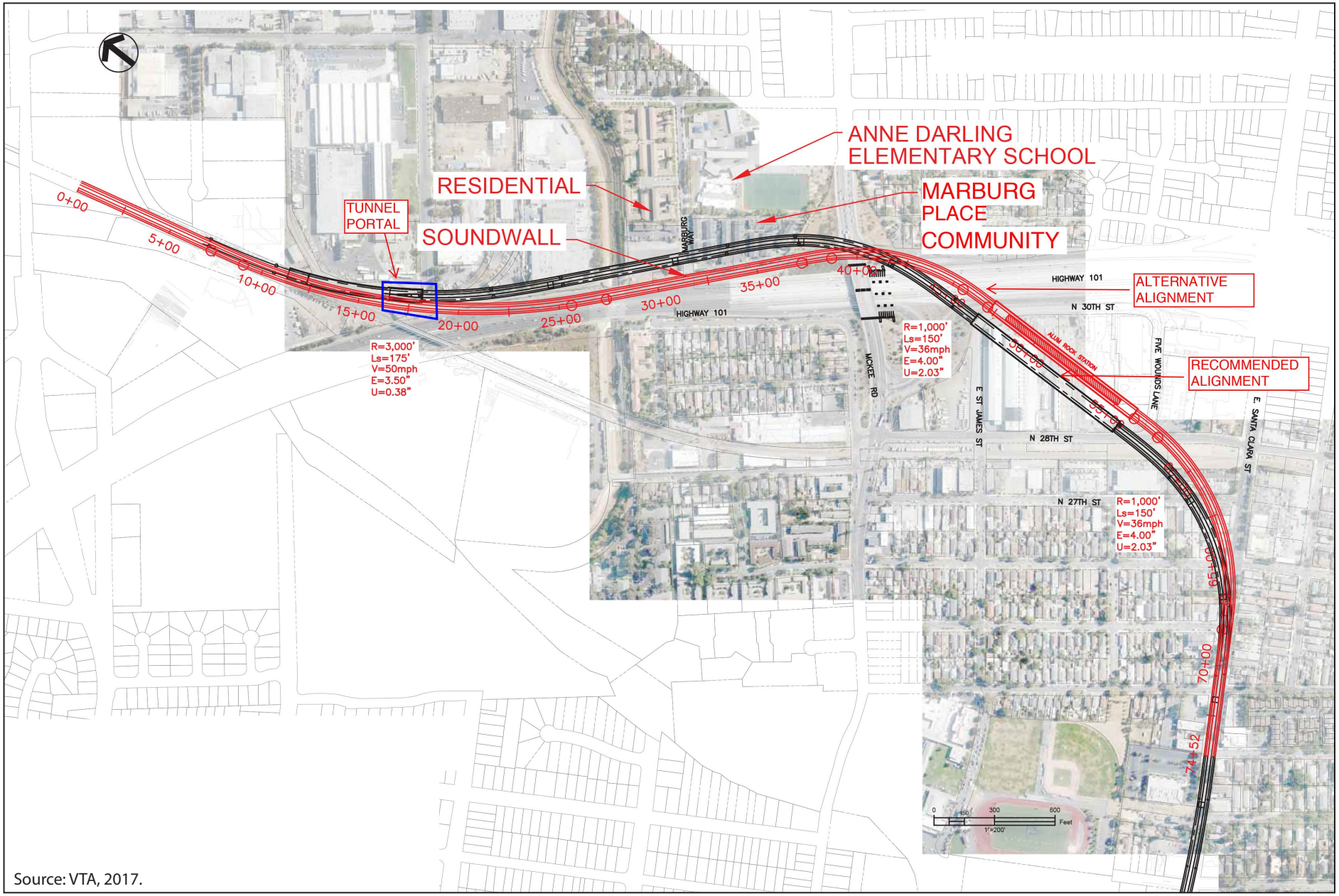
Description of Alternative – This alignment alternative would extend south from Berryessa/North San Jose Station in an at-grade configuration and enter into the East Tunnel Portal at Las Plumas Avenue near the portal of the recommended project alignment, then head southeast, west of the recommended project alignment to avoid the Marburg Way neighborhood. The alignment would continue in an underground tunnel parallel to U.S. 101 (west of Marburg Way) and curve to the southwest just east of the McKee Road/U.S.101 interchange before swinging diagonally under U.S. 101 south of the interchange. The alignment would continue southward between 28th and 30th Streets where Alum Rock/28th Street Station would be underground. The alignment would then curve westward past 28th Street before realigning with Santa Clara Street after 26th Street. This alignment alternative was evaluated in 2017 in response to comments received during the Draft SEIS/SEIR public circulation period.

Station Configuration – The underground station would be located between 30th and 28th Streets and between East St. James Street and Five Wounds Lane west of U.S. 101 with a portion of the station under the southbound on-ramp to U.S. 101. The station would be shifted slightly east of the station location of the recommended project as shown on Figure 2-H.

Evaluation – This alignment alternative has been eliminated from consideration for the following reasons:

a. **Constructability** – This alternative tunnel alignment would run under a sound wall that is parallel and adjacent to U.S. 101 and under an on-ramp at McKee Road, which would require additional settlement monitoring to ensure that construction resulted in no adverse impacts on the sound wall foundation, thereby increasing project costs. The vertical alignment of the station may need to be deeper to avoid the U.S. 101 sound walls and the southbound on-ramp resulting in an increase in the annual operation and maintenance costs by approximately 3%. With a deeper station, construction costs of this station configuration would be approximately 10% greater than the station configuration of the recommended project. If the station is not redesigned at a lower depth to avoid impacts, construction of the station would require construction within the on-ramp to southbound U.S. 101, which would have to be restored after construction of the station. All of these design modifications listed above would result in increased project costs.

b. **Operational Impacts –** This alignment alternative does not achieve the BFS minimum design speed of 50 mph in or out of the station due to the track geometry resulting in reduced speeds and an increase in travel times when compared to the recommended project.



Source: VTA, 2017.

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Figure 2-H
BART Extension Under and Adjacent to U.S. 101 Alignment Alternative Conceptual Design
VTA's BART Silicon Valley–Phase II Extension Project

c. **ROW/Real Estate Requirements –** A portion of the station box would be within Caltrans ROW requiring an encroachment permit from Caltrans. The extensive and ongoing coordination with Caltrans during construction has the potential to increase project costs and cause delays.

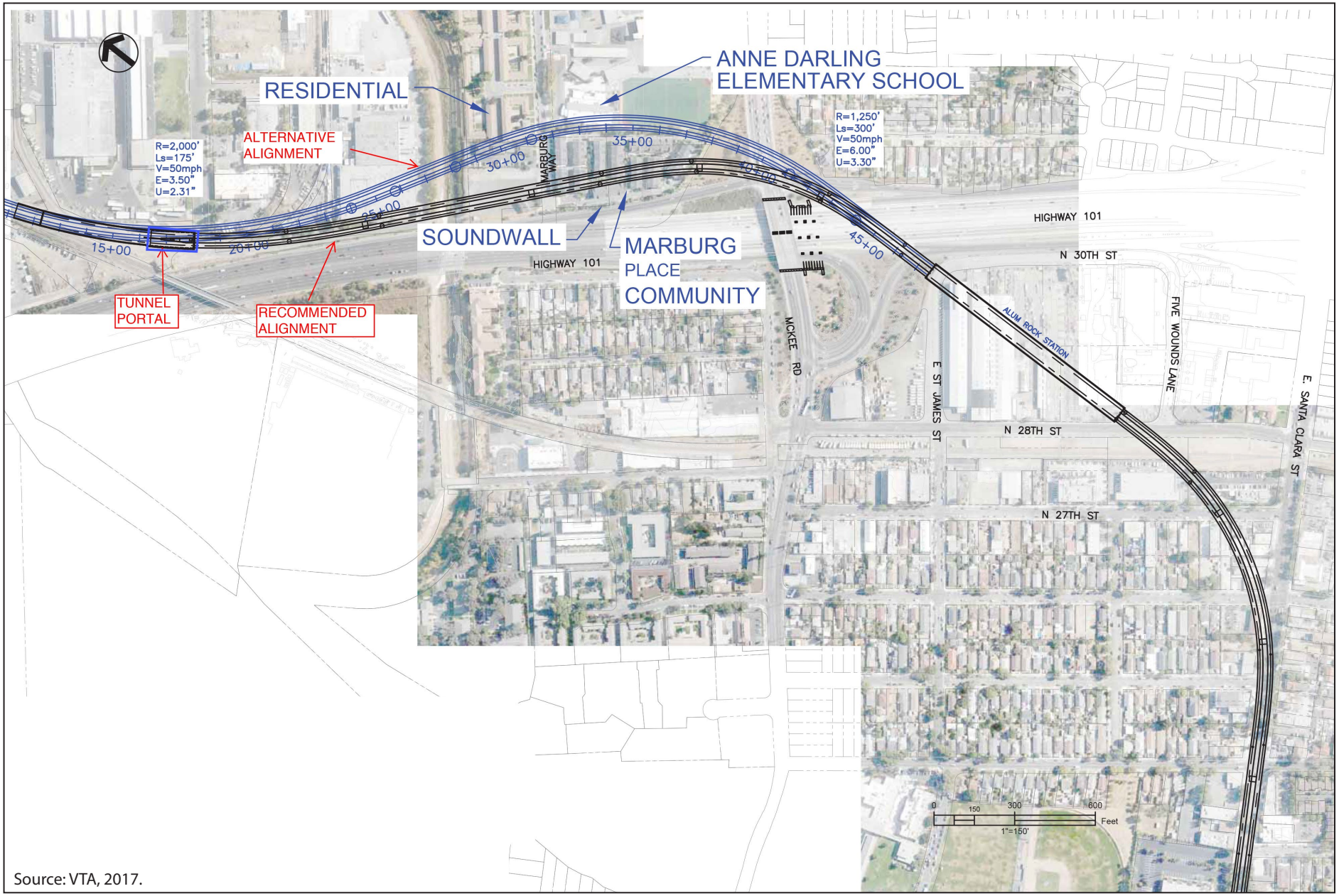
d. **Environmental Impacts –** Construction Traffic: The station would be partially within Caltrans ROW (U.S. 101) requiring closure of the southbound on-ramp during construction for approximately 18 months which would not occur with the implementation of the recommended project alignment. This is potentially an adverse and significant impact.

Therefore, this alignment alternative would have less efficient operational design speeds due to track geometry; require substantial coordination with Caltrans during construction; and would result in new significant impacts to traffic and access during construction resulting from the closure of the U.S. 101 southbound on-ramp, all of which would increase project costs with potential schedule delays. Thus, this alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative has been eliminated from consideration.

D. BART Extension Under U.S. 101 and Anne Darling School Alignment Alternative (see Figure 2-I)

Description of Alternative – This alignment would extend south from Berryessa/North San Jose Station and enter into the East Tunnel Portal at Las Plumas Avenue near the portal of the recommended project alignment, then turn farther to the east than the recommended project alignment to avoid the Marburg Place neighborhood. The alignment would cross under properties between Lower Silver Creek and McKee Road, including residential properties north of Marburg Way and Anne Darling Elementary School south of Marburg Way. The alignment would then curve to the south under Anne Darling School to cross under McKee Road and cross diagonally under U.S. 101. The alignment would cross diagonally between 28th and 30th Streets where Alum Rock/28th Street Station would be underground. The alignment would then curve to the southwest past 28th Street before realigning with Santa Clara Street around 26th Street. This alignment alternative was evaluated in 2017 in response to comments received during the Draft SEIS/SEIR public circulation period.

Station Configuration – The station location would be similar to the recommended project as shown on Figure 2-I.



Source: VTA, 2017.

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Figure 2-I
BART Extension Under U.S. 101 and Anne Darling School Alignment Alternative Conceptual Design
VTA's BART Silicon Valley–Phase II Extension Project

Evaluation – This alignment alternative has been eliminated from consideration for the following reasons:

a. **Constructability** – This alternative tunnel alignment would run under a sound wall that is parallel and adjacent to U.S. 101 and under an on-ramp at McKee Road, which would require additional settlement monitoring to ensure that construction resulted in no adverse impacts on the sound wall foundation, increasing project costs.

b. **Operational Impacts** – This alignment introduces a greater reverse curve radius east of U.S. 101 when compared to the recommended project, which would require additional long-term operational rail and wheel maintenance resulting in increased operations and maintenance costs.

c. **ROW/Real Estate Requirements –** Tunneling easements would be required from residences north of Marburg Way and from Anne Darling Elementary School instead of from the Marburg Place residential neighborhood, as identified for the recommended project.

d. **Environmental Impacts –** This alignment would have the potential to result in groundborne noise impacts on residences in an apartment complex north of Marburg Way. The top of the tunnel is at a shallower depth under these residences when compared to the recommended project alignment. The shallower depth of the tunnel would likely result in groundborne noise impacts that would require additional mitigation to minimize and avoid adverse effects. In addition, both the Marburg Place residences and the residences in the apartment complex north of Marburg Way are Environmental Justice communities; neither of which would be disproportionately high and adversely affected by either alternative. This alignment does not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended alternative and alignment and would result in noise impacts which would require mitigation.

Therefore, this alignment alternative would require additional settlement monitoring; increase operational rail and wheel maintenance; and have the potential for groundborne noise impacts requiring mitigation for residences north of Marburg Place, which would increase project costs. Thus, this alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative has been eliminated from consideration.

E. BART Extension Under U.S. 101 Alignment North of McKee Road Alternative (see Figure 2-J)

Description of Alternatives – This alignment would extend south from Berryessa/North San Jose Station, enter into the East Tunnel Portal at Las Plumas Avenue similar to the portal of the recommended project alignment, then head south after crossing under Lower Silver Creek and farther to the west than the recommended project alignment. The alignment would cross under U.S. 101 near the Marburg Place residential neighborhood

to avoid crossing under the residences. The alignment would head slightly east and continue under U.S. 101, west of the McKee Road and U.S. 101 Interchange. The underground Alum Rock/28th Street Station would be located between McKee Road and Five Wounds Lane.

The alignment would then curve past 28th Street before realigning with Santa Clara Street. This alignment alternative was evaluated in 2017 in response to comments received during the Draft SEIS/SEIR public circulation period.

Station Configuration – The underground Alum Rock/28th Street Station would be located between McKee Road and Five Wounds Lane as shown on Figure 2-J.

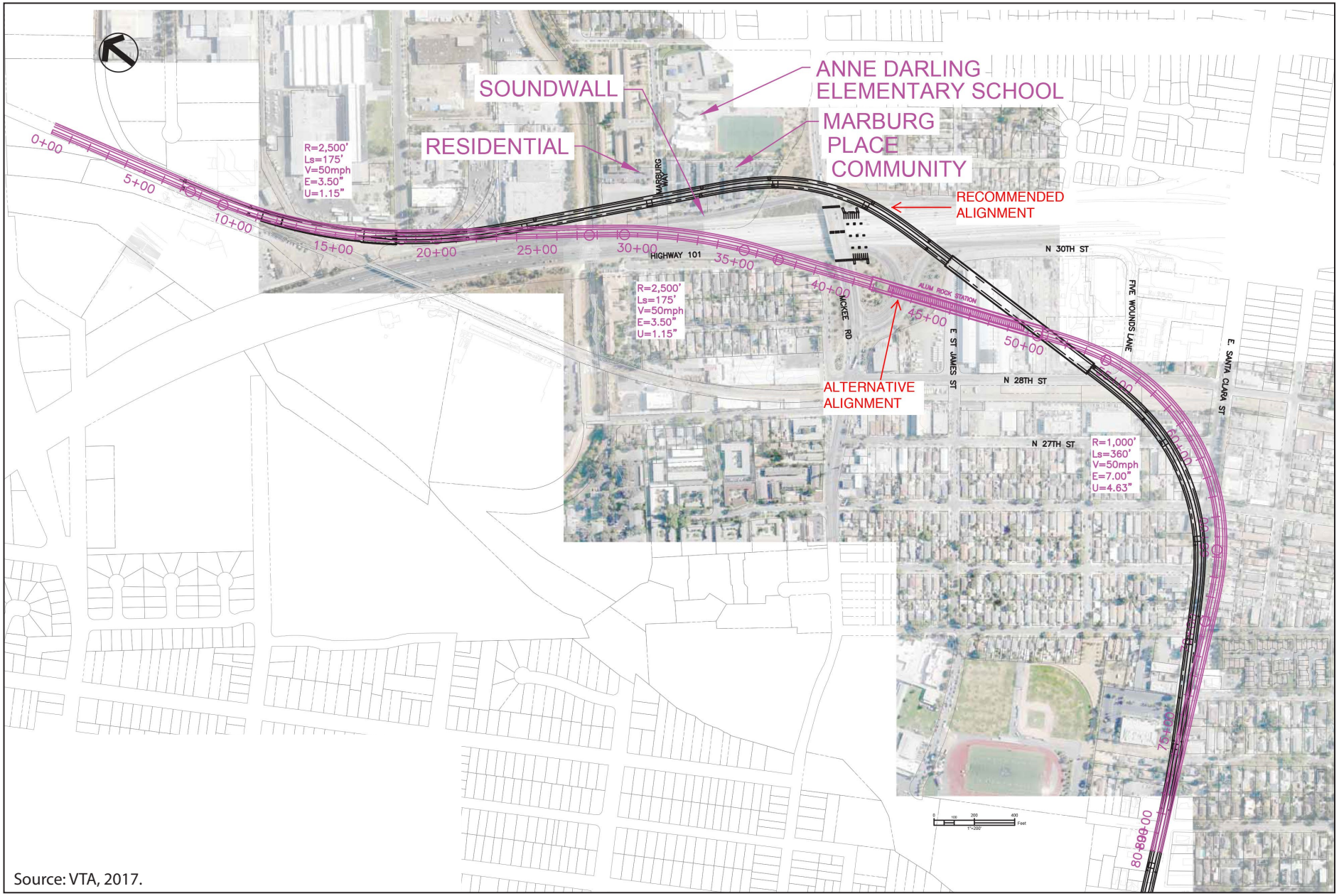
Evaluation – This alignment alternative has been eliminated from consideration for the following reasons:

a. **Constructability** – This alignment shifts the location of Alum Rock/28th Street Station to the north and into Caltrans ROW at the U.S. 101 on- and off- ramps south of McKee Road. Under the Twin-Bore Option, the on- and off- ramps would be reconstructed after completion of the station construction. This alignment would involve a substantial amount of additional coordination with and approval from Caltrans, increasing construction costs and potentially delaying the schedule.

b. **Operational Impacts** – Because the northern end of this station location is directly under the U.S. 101 on- and off- ramps south of McKee Road, the northern station entrance and system facilities would need to be located away from these ramps and farther to the south. The northernmost station entrance would need to be shifted towards the middle of the station leading to two entrances being closely spaced, which is not efficient for passenger circulation, access, and egress. Due to the northern end of the station (edge of platform) being located under the on- and off-ramps, required station facilities such as an emergency egress, tunnel ventilation shaft, and fresh air intake would need be relocated and the underground station configuration would not meeting the California Building Code (CBC) for emergency exiting.

c. **ROW/Real Estate Requirements –** Tunneling easements would be required under properties located between 28th Street and Santa Clara Street. A portion of the station box would be within Caltrans ROW requiring an encroachment permit from Caltrans and extensive coordination Caltrans during construction which would increase project costs and delays.

d. **Environmental Impacts** – Construction Traffic: The cut-and-cover construction of the station for the Twin-Bore Option would significantly impact traffic circulation in the general vicinity of the station area for approximately 18 months. These impacts would include closures of the U.S. 101 on- and off- ramps, detours of traffic from McKee Road/Julian Street to Santa Clara Street/Alum Rock Avenue.



Source: VTA, 2017.

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Figure 2-J
BART Extension Under U.S. 101 North of McKee Road Alignment Alternative Conceptual Design
VTA's BART Silicon Valley–Phase II Extension Project

Therefore, this alignment alternative would require substantial coordination with Caltrans during construction, and would result in new significant impacts to traffic and access during construction resulting from the closure of the U.S. 101 southbound on- and off-ramps, which would increase project costs and schedule delays. Thus, this alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative has been eliminated from consideration.

3. Coyote Creek Alignment Alternative (Twin-Bore Tunneling Methodology Only)

South of Santa Clara Street Alignment. This alternative was eliminated from consideration prior to circulation of the 2016 Draft SEIS/SEIR. This alignment would travel under Santa Clara Street in a subway configuration from 25th Street to 21st Street, then turn to the south of Santa Clara Street at 21st Street as it passes under Coyote Creek to avoid intersecting the bridge abutments that extend approximately 60 feet below ground. The alignment would then turn north and align under Santa Clara Street at 13th Street. This alignment alternative would require more tunneling easements under residences and would therefore result in greater potential for groundborne noise impacts when compared to other Coyote Creek alignment alternatives and the recommended project alignment. In addition, VTA conducted extensive outreach with the neighborhood in 2008. The neighborhood collectively voiced their strong preference for the north of Santa Clara Street alignment alternative as included in the project description. This alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative was eliminated from consideration.

4. Coyote Creek Alignment Alternative (Twin-Bore Tunneling Methodology Only)

Under Santa Clara Street Alignment. This alternative was eliminated from consideration prior to circulation of the 2016 Draft SEIS/SEIR. This alignment would travel directly under Santa Clara Street in a subway configuration starting at 25th Street, continuing to the west directly under Santa Clara Street as it passes under Coyote Creek near 17th Street. The Coyote Creek bridge abutments are approximately 60 feet below ground at this location. The top of the tunnel for the Twin-Bore Option would need to be approximately 80 feet below ground to pass safely below the bridge abutment as compared to the approximately 50foot depth of the recommended project alignment, which swings north to avoid the bridge abutments. Constructing this alternative alignment below the bridge foundations and approximately 30 feet deeper than the recommended project alignment, which avoids going under the bridge, would result in increased construction and maintenance costs, and less efficient operating conditions as the guideway must quickly descend to pass beneath the bridge abutments and quickly ascend after passing the abutments. Thus, the alternative would result in additional costs

and less efficient operating conditions, and would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project of this Final SEIS/SEIR. Therefore, this alternative was eliminated.

5. St. James Street Alignment Alternative

This alternative was eliminated from consideration prior to circulation of the 2016 Draft SEIS/SEIR. The alignment would travel from Berryessa/North San Jose Station in east San Jose over U.S. 101 on a bridge, west of 28th Street within VTA ROW, then turn west near McKee Road to align under St. James Street in a subway configuration to St. James Park. The alignment would then cross through St. James Park diagonally from the northeast corner to the southwest corner, cross under Santa Clara Street, and head west under SR-87 south of Santa Clara Street and into Diridon Station. This alignment alternative was designed to eliminate cut-and-cover construction impacts on Santa Clara Street for the construction of the Downtown San Jose Station by locating the station entirely within VTA's property bounded by Santa Clara, Market, East St. John, and 1st Streets.

Under this alternative, to construct the Downtown San Jose Station, a portion of the station box and crossover would be constructed within St. James Park. As a result, this alignment alternative would have adversely affected St. James Park, which is listed on the National Register of Historic Places and is therefore a Section 4(f) resource under Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966, which places restrictions on when a project involving a federal action (including funding) can acquire land from a public park. According to this act, the USDOT cannot approve a project that would use a Section 4(f) property unless there is no feasible and prudent alternative to that use, and the action includes all possible planning to minimize harm to the property resulting from such a use. There were several alternatives that have been evaluated that would not use this Section 4(f) resource, such as the recommended project in this Final SEIS/SEIR. Also, this alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts as compared to the recommended project. Therefore, this alternative was eliminated from consideration.

6. San Fernando Street Alignment Alternative

This alternative was eliminated prior to circulation of the 2004 Draft EIS/EIR. This alignment alternative would begin at the Berryessa/North San Jose Station, cross over U.S. 101 on a bridge, and travel through downtown San Jose under San Fernando Street in a subway configuration to Diridon Station.

San Fernando Street has a substantially narrower ROW than Santa Clara Street east of 10th Street. A greater number of easements would be required from adjacent residential properties compared to the Santa Clara Street alignment of the recommended project in this Final SEIS/SEIR. The alignment would require easements under businesses and residences and at-grade ROW acquisitions from Hacienda Creek Park and/or Rocketship

Discovery Prep, a private elementary school, south of Lower Silver Creek. The additional easements and ROW would add to project costs. This alignment alternative would result in greater potential for groundborne noise and vibration impacts because the alignment would be at grade south of U.S. 101 and not in a tunnel configuration as identified for the recommended project in this Final SEIS/SEIR. This alignment alternative would also result in construction traffic impacts, particularly impacts due to limited/restricted access to residential neighborhoods north of McKee Road and resulting traffic impacts during construction to residences, commercial properties, and the school. This alternative would require the acquisition of a substantially greater number of easements; result in additional cost to the project; and result in a greater potential for groundborne noise impacts, vibration impacts, and construction impacts compared to the recommended project in this Final SEIS/SEIR. The alignment alternative would not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project in this Final SEIS/SEIR. Therefore, this alternative was eliminated from consideration.

7. Two Downtown San Jose Stations: Civic Plaza/SJSU and Market Street

The 2004 Draft EIS/EIR and Final EIR included two stations, the Civic Plaza/SJSU and Market Street Stations, in downtown San Jose. The Civic Plaza/SJSU Station was a proposed underground station between 4th and 7th Streets; station entrances would be located between 4th and 8th Streets. The Market Street Station was a proposed underground station along Santa Clara Street between 1st Street and Almaden Avenue; station entrances would be located between 2nd and San Pedro Streets. In Design Change #38 of the 2007 Draft SEIR, these stations were consolidated into a single station called the Downtown San Jose Station. A single consolidated downtown station had similar ridership when compared to the two stations discussed in the 2004 EIS/EIR. The consolidation of the two downtown underground stations substantially reduced potential environmental impacts that would have resulted from lengthy cut-and-cover construction within Santa Clara Street for the construction of two stations. A single downtown station would also substantially reduce project costs as compared to two downtown stations. Therefore, having two downtown San Jose stations was eliminated from further consideration.

8. Diridon Station Parking Structure Option

The issue of providing parking or not providing parking at the Diridon Station has been addressed in several previous environmental documents. The VTA Board of Directors certified the 2004 Final EIR and approved the project with a parking structure with 1,500-2,200 parking spaces in the vicinity of Diridon Station. The Recommended Project identified in the 2007 Final SEIR included both a No Parking Option and a Parking Structure Option (1,320 parking spaces). At that time, VTA's Board of Directors did not select an option when approving the project. The 2010 Final EIS described a 1,300 space

parking structure at Diridon Station for the 16-mile extension alternative (SVRTP Alternative); however, this alternative was not carried forward for implementation. The alternative that was carried for implementation was the 10-mile extension alternative (BEP Alternative) that terminated at Berryessa Station in east San Jose and did not extend to the Diridon Station. Therefore, plans for the Diridon Station and parking structure were not carried forward at that time.

As described in Chapter 3, *NEPA and CEQA Transportation Operation Analysis*, VTA's Travel Demand Modeling conducted for this Final SEIS/SEIR quantified 2035 BART ridership at the four stations, including Diridon Station, with and without BART--transit-specific parking. This ridership modeling showed that providing a parking structure with 500 parking spaces at Diridon Station would increase daily ridership at Diridon Station by 1,359 riders (14 percent) as compared to the daily ridership without a parking structure at Diridon Station. However, the overall system-wide ridership among the four stations remained relatively the same (the total system--wide ridership increased by only 19 passengers with the inclusion of parking spaces at Diridon Station). The modeling indicates that without parking at Diridon Station, auto-based BART trips would shift~~ed to Diridon Station to the~~ to Alum Rock/28th Street and Santa Clara Stations, which provide parking. Based on the parking garage construction costs for Phase I, the cost per parking space for the Berryessa and Milpitas Stations parking garages was in excess of $35,000 per space, not including property acquisition. Therefore, the 500-space parking garage construction cost at Diridon would be in excess of $17,500,000, not including property acquisition, for an overall ridership increase of 19 passengers within the 4-station BART Extension. Therefore, based on the ridership modeling for the BART Extension, the nominal increase in overall ridership (19 passengers or 0.0004 percent) that would be gained from construction of a BART transit-specific parking structure did not outweigh the cost of construction.

In addition, since 2010, BART has implemented new policies to discourage drive-alone trips to BART stations. On June 9, 2016, the BART Board of Director's adopted a BART Station Access Policy that included a Station Access Design Hierarchy. In descending order, BART's priorities for passenger access to its stations are walk, bicycle, transit and shuttle, drop-off and pick-up, and, lastly, auto parking. The decision to not provide PNR facilities for the BART Extension at Diridon Station is also consistent with BART's Station Access Policy adopted June 9, 2016, regarding "urban" BART stations. In reviewing the BART's Station Access Typology Definitions,[3] Diridon Station would be classified as an "Urban" station when considering these categories. Specifically, BART's definition of an Urban Station has the characteristics listed in the following table that are consistent with the characteristics of the Diridon Station.

[3] See BART's web site at http://www.bart.gov/about/planning/access.

Table 2-C: BART's Access Policy Characteristics of an Urban Station and Diridon Station Characteristics

Characteristics of an Urban Station	BART Extension Alternative – Diridon Station
Combined walk, bike, and transit access of greater than 75%.	Non-auto access is 91% and greater than 75% threshold needed to be considered an "Urban" station (per Table 3-16 in SEIS/SEIR).
Drive alone rates of 5% or less.	Drive alone percentage is 1% and meets the 5% or less threshold needed to be considered an "urban" station (per Table 3-16, *2035 Forecast Year Mode of Access by BART Extension Station*, in Chapter 3 of the SEIS/SEIR).
No BART-managed parking.	No BART-managed parking is provided.
Almost all auto access is from drop-off activity.	Only auto access is 9% kiss-and-ride (per Table 3-16 in the SEIS/SEIR).
Highway access is not convenient.	State Route (SR-) 87 and Interstate (I-) 280 are nearby, but they are heavily congested during the AM and PM peak commute periods.
Station can be found in a downtown or neighborhood business district.	Station is located in Downtown San Jose.
Station may be underground or otherwise has a limited spatial footprint.	Station is underground.
Station is well-served by many types of transit service that stop on adjacent streets.	Existing transit service includes commuter rail, intercity passenger rail, light rail, express bus, and local/limited bus transit operators. These include Caltrain, ACE, and Amtrak heavy rail service. This station also has access to VTA's light rail system. Bus service includes California Shuttle Bus, Amtrak Bus, Monterey-Salinas Transit, Santa Cruz Metro, SMART, and VTA's Alum Rock Bus Rapid Transit service and many local VTA bus lines.
Source: BART's Station Access Policy, adopted June 9, 2016.	

As shown in Table 3-16, *2035 Forecast Year Mode of Access by BART Extension Station*, access to Diridon Station would be almost entirely (91 percent) by non-auto modes, such as walk/bicycle, heavy and light rail transit, and bus. The remaining 9 percent would be by auto KNR, which does not require parking. Table 3-16 shows the Diridon Station Auto Park-and-Ride column as "not applicable," because Diridon Station, as currently proposed, would not include BART specific auto PNR facilities.

Additionally, the decision to not provide PNR facilities for the BART Extension at Diridon Station is also consistent with the Envision San Jose 2040 General Plan, Commercial Downtown Land Use Plan Policies, and Transportation Policies (adopted November 2011).

The Commercial Downtown Land Use Policies state that "all development within this designation should enhance the 'complete community' in downtown, support pedestrian and bicycle circulation, and increase transit ridership. The Downtown Urban Design Policies speak to the urban, pedestrian-oriented nature of this area. As such, uses that serve the automobile should be carefully controlled in accordance with the Downtown Land Use Policies."

Land use policy LU-3.5 would apply to the Diridon Station area and is as follows; "Balance the need for parking to support a thriving Downtown with the need to minimize the impacts of parking upon a vibrant pedestrian and transit oriented urban environment. Provide for the needs of bicyclists and pedestrians, including adequate bicycle parking areas and design measures to promote bicyclist and pedestrian safety."

San Jose's Transportation Goals, Policies, and Actions aim to establish circulation policies that increase bicycle, pedestrian, and transit travel, while reducing motor vehicle trips, to increase the City's share of travel by alternative transportation modes. Goal TR-1.3, Balanced Transportation System, policy is to "increase substantially the proportion of commute travel using modes other than the single-occupant vehicle. The 2040 commute mode split target for San Jose residents and workers are presented in [Table TR-1]." Table TR-1: Commute Mode Split Targets for 2040 displays the goal for Drive alone as no more than 40% and Transit is at least 20%. The Diridon Station is intended to be in alignment with the City's mode shift goal.

Therefore, although previous environmental documents have evaluated parking structure options at Diridon Station, for the reasons described above, the Diridon Station Parking Garage Option has been eliminated from consideration in this SEIS/SEIR.

9. Connection to Mineta San Jose International Airport (SJIA) Alignment Alternative

A connection would be constructed to Mineta San Jose International Airport (SJIA) via a spur from the alignment just south of I-880. The alignment would pass under I-880 in a tunnel configuration, then turn east to travel under the SJIA runways and terminate under the terminals. This alternative was eliminated from consideration prior to the 2004 Final EIR because of Federal Aviation Administration security concerns regarding public transit operations in a tunnel under active runways. Also, the additional tunneling to the airport and the station at the airport would substantially increase costs. This alignment would not avoid or substantially lessen adverse effects or significant environmental impacts as compared to the recommended project in this Final SEIS/SEIR. Therefore, this alternative was eliminated from consideration.

10–14. Santa Clara Station Location Options

The following is a history of the consideration of various Santa Clara Station options evaluated in prior environmental documents prepared for the project. This is followed by a detailed summary and analysis of each alternative considered and withdrawn. The

development of alternatives for Santa Clara Station location, design, and layout considered several design constraints described below.

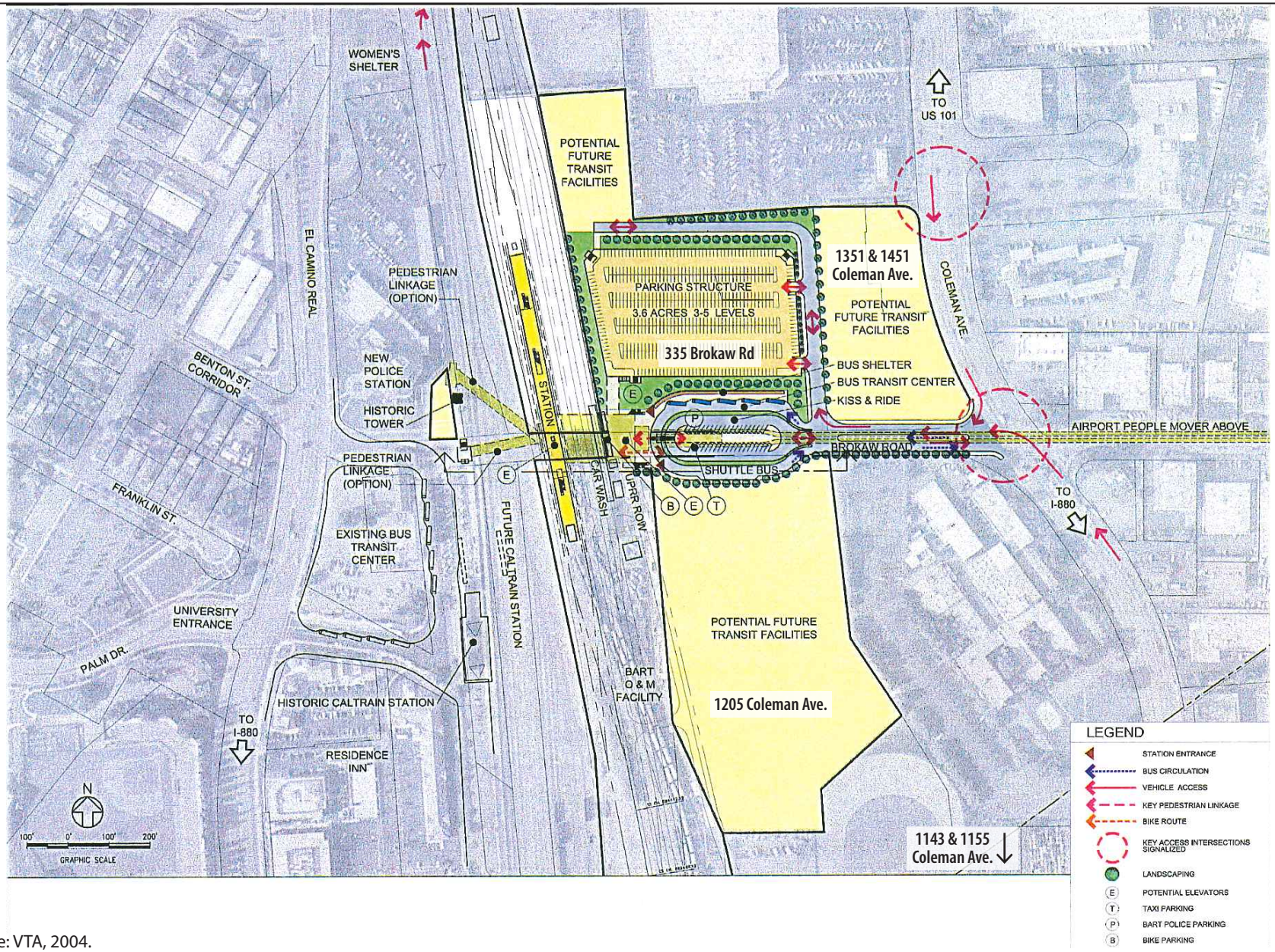
- ***2004 Silicon Valley Rapid Transit Corridor (SVRTC) Draft EIS/EIR and Final EIR***

  The 2004 Draft EIS/EIR considered two options at Santa Clara Station: the Parking Structure North Option (Figure 2-K1) and the Parking Structure South Option (Figure 2-K2). Both had the same footprint north of Brokaw Road (335 Brokaw Road, 1451 and 1351 Coleman Avenue) and south of Brokaw Road (1205 Coleman Avenue).Therefore, both options would have resulted in the acquisition of the same properties. The difference between the two options was that the parking structure would have been located north of Brokaw Road for the Parking Structure North Option (on a site occupied at the time by a Federal Express shipping business at 335 Brokaw Road) or south of Brokaw Road for the Parking Structure South Option (at 1205 Coleman Avenue) on a site occupied at the time by a defense contractor, United Defense, who manufactured military vehicles such as the Bradley Tank and tested them on a large test track within the site at 1205 Coleman Avenue in Santa Clara and at 1143 and 1155 Coleman Avenue in San Jose.

  At the May 26, 2004, SVRTC BART Extension Policy Advisory Board (PAB) Meeting, the PAB concurred with VTA staff's recommendations on the alignment and station option refinements to be included in the Final EIR (SVRTC BART Extension to Milpitas, San Jose, and Santa Clara Policy Advisory Board Meeting, May 26, 2004, and October 27, 2004). The PAB recommended approval of Design Option #13, Santa Clara Station Parking Option – North Parking Structure, which selected the parking structure. Staff recommended selecting the North Option, and the PAB concurred, because the site configuration included better traffic circulation with the separation of buses and KNR vehicles from the parking garage, avoided potential hazardous materials concerns on the south side (1205 Coleman Avenue), and took into consideration concerns regarding relocation of the United Defense and Federal Express businesses.

  In the 2004 Final EIR, the Recommended Project did not include the Parking Structure South Option and included the recommendation of the selection of the Parking Structure North Option (with a parking structure on the Federal Express site) consistent with the SVRTC BART PAB recommendations (Figure 2-K1).

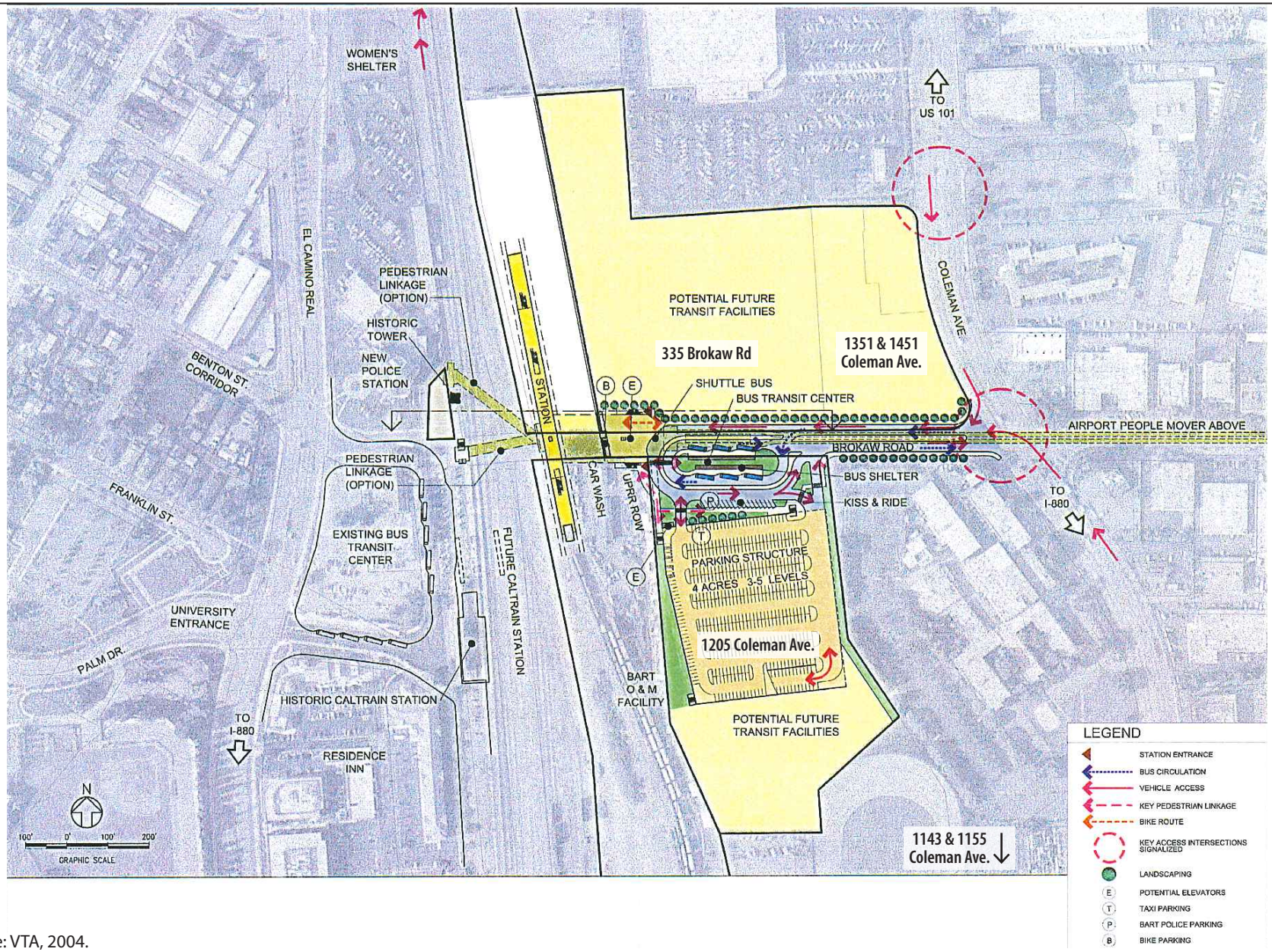
  At their December 2004 Board meeting, the VTA Board of Directors directed staff to carry both options forward for additional study in response to public comments received and concerns regarding the potential relocation of Federal Express. Therefore, the VTA Board of Directors did not make a decision on an option at Santa Clara Station.



Source: VTA, 2004.

Graphics ... 00332.13 (1-24-2018)

Figure 2-K1
Santa Clara Station – Parking Structure North Option
From: 2004 Draft EIS/EIR and 2004 Final EIR
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2004.

Graphics ... 00332.13 (1-24-2018)

Figure 2-K2
Santa Clara Station – Parking Structure South Option
From: 2004 Draft EIS/EIR and 2004 Final EIR
VTA's BART Silicon Valley–Phase II Extension Project

In 2005, the City of San Jose purchased the United Defense site south of Brokaw Road in the City of San Jose (1143 and 1155 Coleman Avenue), demolished all structures, and initiated environmental remediation on the site.

Also in 2005, BAE Systems acquired United Defense and continued the production of military vehicles on its property on the south side of Brokaw Road at 1205 Coleman Avenue in the City of Santa Clara.

- ***2007 Silicon Valley Rapid Transit Corridor Draft Supplemental EIR and Final EIR***

  In the 2007 Draft SEIR, the project description was revised and the station footprint was reduced to show the Santa Clara Station located on a site north of Brokaw Road between the railroad corridor and Coleman Avenue (335 Brokaw Road, 1451 and 1351 Coleman Avenue). The site was occupied by a Federal Express shipping business near the existing railroad corridor and several smaller commercial and retail businesses located on the corner of Brokaw Road and Coleman Avenue (Figure 2-L). The 2004 Parking Structure South Option had been eliminated from consideration because the North Option was more operationally efficient for traffic and pedestrian circulation and the South Option had a high likelihood of hazardous materials contamination due to the use by BAE Systems. In the 2007 Final SEIR, the footprint of the Santa Clara Station platform and campus did not change from the footprint as shown in the 2007 Draft SEIR.

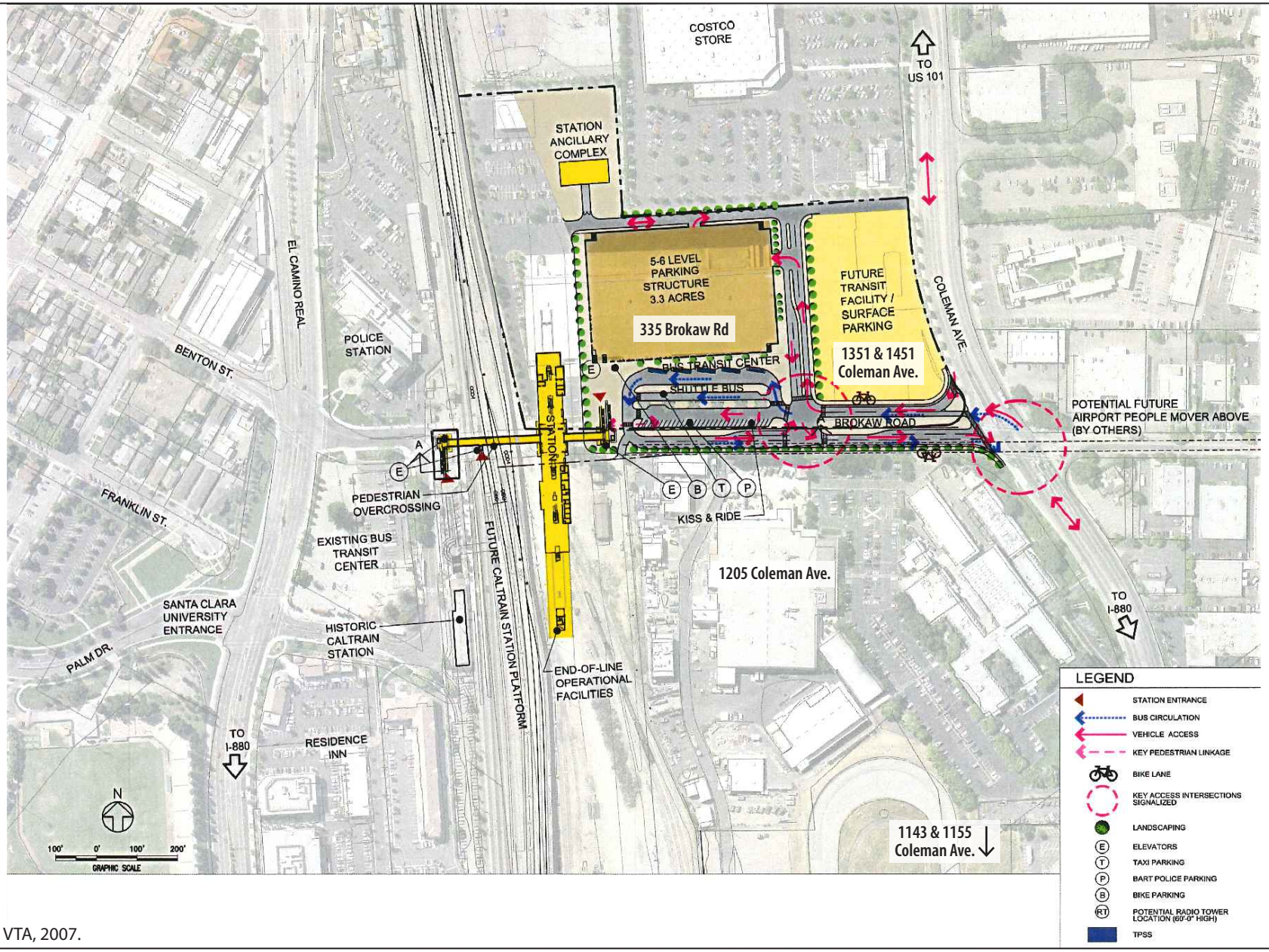
  At their June 2007 Board hearing, the VTA Board of Directors approved the project with the Santa Clara Station campus located entirely north of Brokaw Road (Figure 2-L).

- ***2009 and 2010 SVRTC Draft and Final EIS and Section 4(f) Evaluation***

  In the 2009 Draft EIS, the project description and site plans showed the Santa Clara Station campus located north of Brokaw Road (Figure 2-M) with a reconfigured site layout but the same footprint as the 2007 site plan in Figure 2-L.

  In the 2010 Final EIS, the footprint of the Santa Clara Station platform and campus did not change from the footprint as shown in the 2009 Draft EIS (335 Brokaw Road, 1451 and 1351 Coleman Avenue) (Figure 2-M).

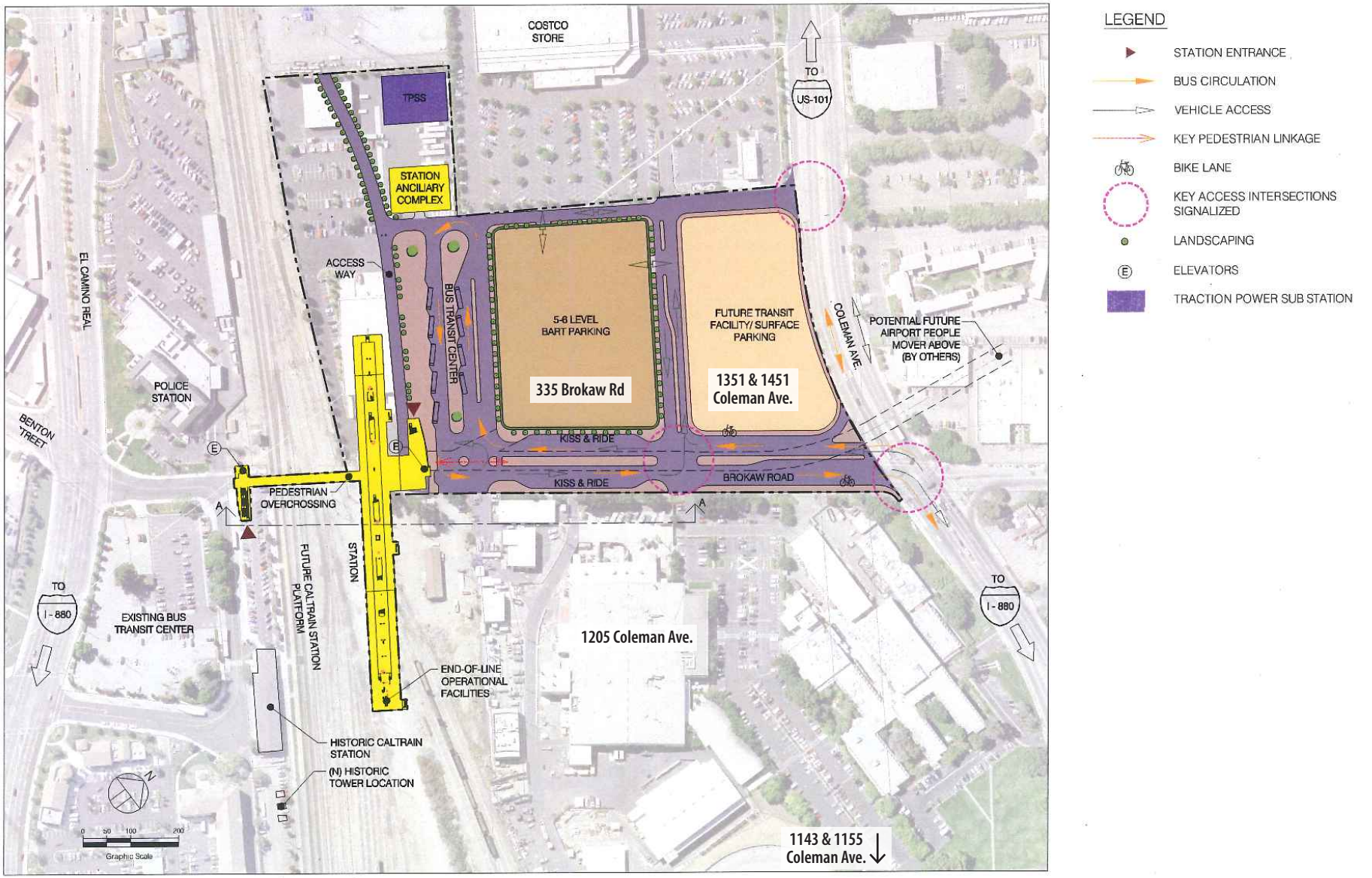
  In June 2010, FTA issued a Record of Decision approving only the first 10 miles of the 16-mile BART extension, now called the BART Silicon Valley Berryessa Extension; the last four stations in the remaining 6 miles, including the Santa Clara Station, were not included.



Source: VTA, 2007.

Graphics ... 00332.13 (1-24-2018)

Figure 2-L
Santa Clara Station – Without Parking Structure Option at Diridon Station
From: 2007 Draft and Final SEIR
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2009 & 2010.

Graphics ... 00332.13 (1-24-2018)

Figure 2-M
Santa Clara Station Conceptual Site Plan – SVRTP Alternative Only
From: 2009 Draft EIS and 2010 Final EIS (but not in the alternative selected for project approval)
VTA's BART Silicon Valley–Phase II Extension Project

- ***2011 BART Silicon Valley - Phase I Berryessa Extension Project Draft 2nd Supplemental EIR and Final EIR***

  In 2011, VTA prepared a 2nd Supplemental EIR, which was approved by VTA's Board of Directors; the project was divided into phases with the first 10 miles evaluated as Phase I and named the BART Silicon Valley Berryessa Extension Project; the last four stations in the remaining 6 miles, including Santa Clara Station, were not included.

  In 2012, VTA began construction on the BART Silicon Valley Berryessa Extension, which is scheduled to open in 2018.

  In 2014, Federal Express vacated the property at 335 Brokaw Road.

- ***2016 BART Silicon Valley– Phase II Extension Project Draft SEIS/SEIR***

  In January 2015, VTA released the Notice of Intent/Notice of Preparation (NOI/NOP) for an SEIS/SEIR for the remaining 6 miles, called VTA's BART Silicon Valley Phase II Extension Project, which included Santa Clara Station. In the scoping materials released to the public in early 2015, the site plan for Santa Clara Station (Figure 2-N) showed the platform and station campus north of Brokaw Road with two options for the parking garage: the East and West Options. The East Option (formerly the "Parking Structure North Option" in the 2004 EIR and the only design in the 2007 SEIR) was proposed in a location north of Brokaw Road (335 Brokaw Road) on an unoccupied site formerly occupied by Federal Express. The new West Option was proposed in a location west of the railroad tracks and east of El Camino Real on a site containing a parking lot owned by VTA and Caltrain/JPB (474 Benton Street).

  In early January 2015, BAE Systems closed down military vehicle production on its site at 1205 Coleman Avenue in Santa Clara south of Brokaw Road, and the buildings were demolished between 2015 and 2016. In late 2015, the City of San Jose sold its property (1143 and 1155 Coleman Avenue) to Hunter Storm, who began discussions with the City of Santa Clara and the City of San Jose for the future development of this combined site into high-density mixed-use transit-oriented development, called the Coleman Highline in the City of San Jose and Gateway Crossings in the City of Santa Clara. (CBS SF Bay Area 2013.)

  In 2015, Apple began leasing 335 Brokaw Road north of Brokaw Road, formerly occupied by the Federal Express business. However, due to company privacy concerns, it was not publicly known that Apple had moved in and had begun making upgrades to the building. The information relating to Apple's tenancy was not made known to VTA nor made publicly available until 2016 shortly before the release of the BART Phase II Extension Project Draft SEIS/SEIR.

  In December 2016, VTA released the Draft SEIS/SEIR for the Phase II Extension Project. The site plan for the Santa Clara Station campus was shown located north of Brokaw Road and east of the railroad corridor on a site (335 Brokaw Road) recently

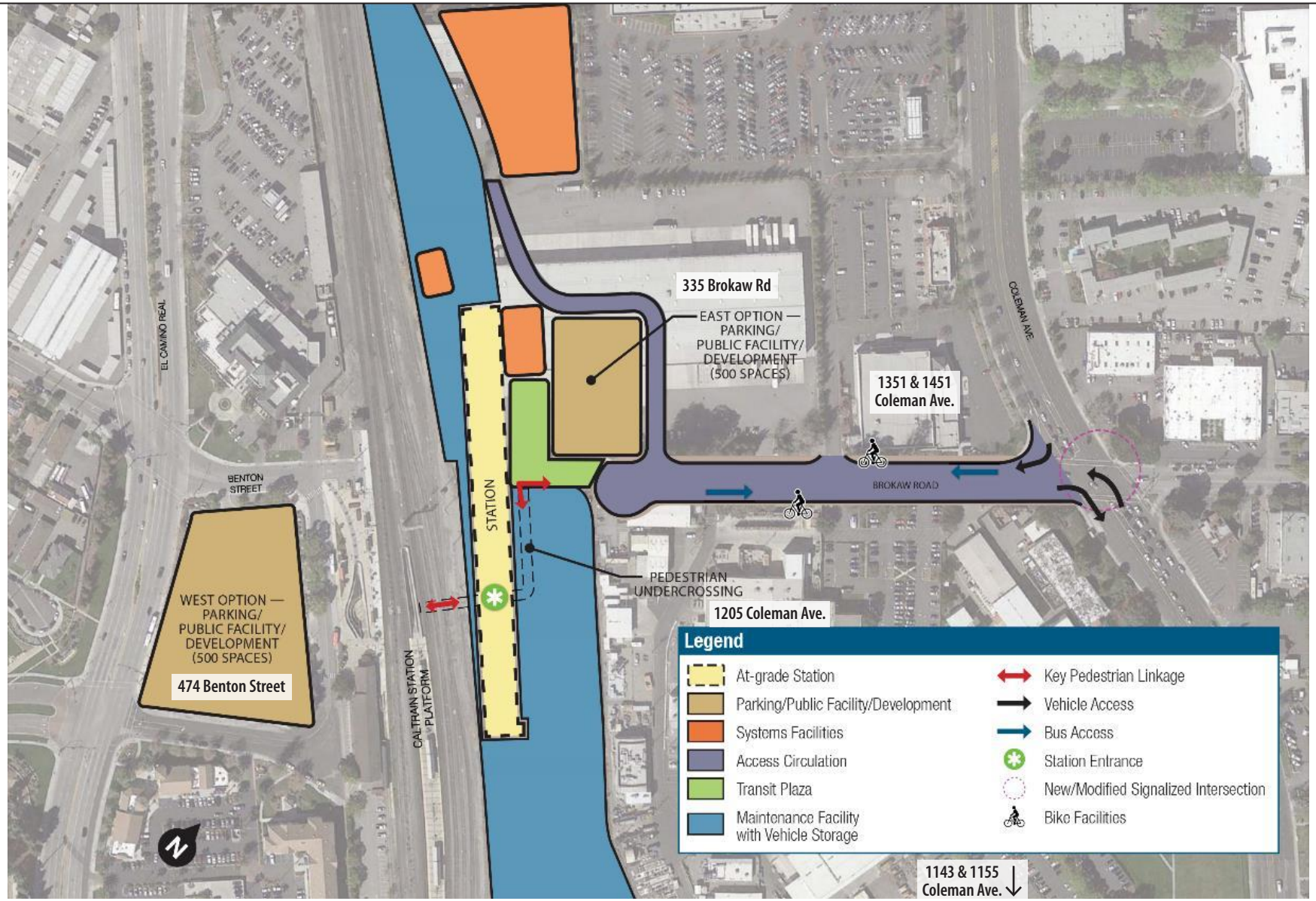
occupied by an Apple R&D business (similar to the East Option as shown in the site plans released during the scoping period) (Figure 2-O). The option for a parking structure on the west side of the railroad corridor (the West Option) had been eliminated from consideration for the reasons described below.

The property north of Brokaw Road currently occupied by Apple was identified in the 2004 Draft EIS/EIR, 2004 Final EIR, 2007 Draft SEIR, 2007 Final SEIR, 2010 EIS, and 2017 Draft SEIS/SEIR as needed for the Santa Clara Station.

Analysis of Santa Clara Station Alternatives Considered and Withdrawn

The development of alternatives for Santa Clara Station location, design, and layout considered several design constraints described below.

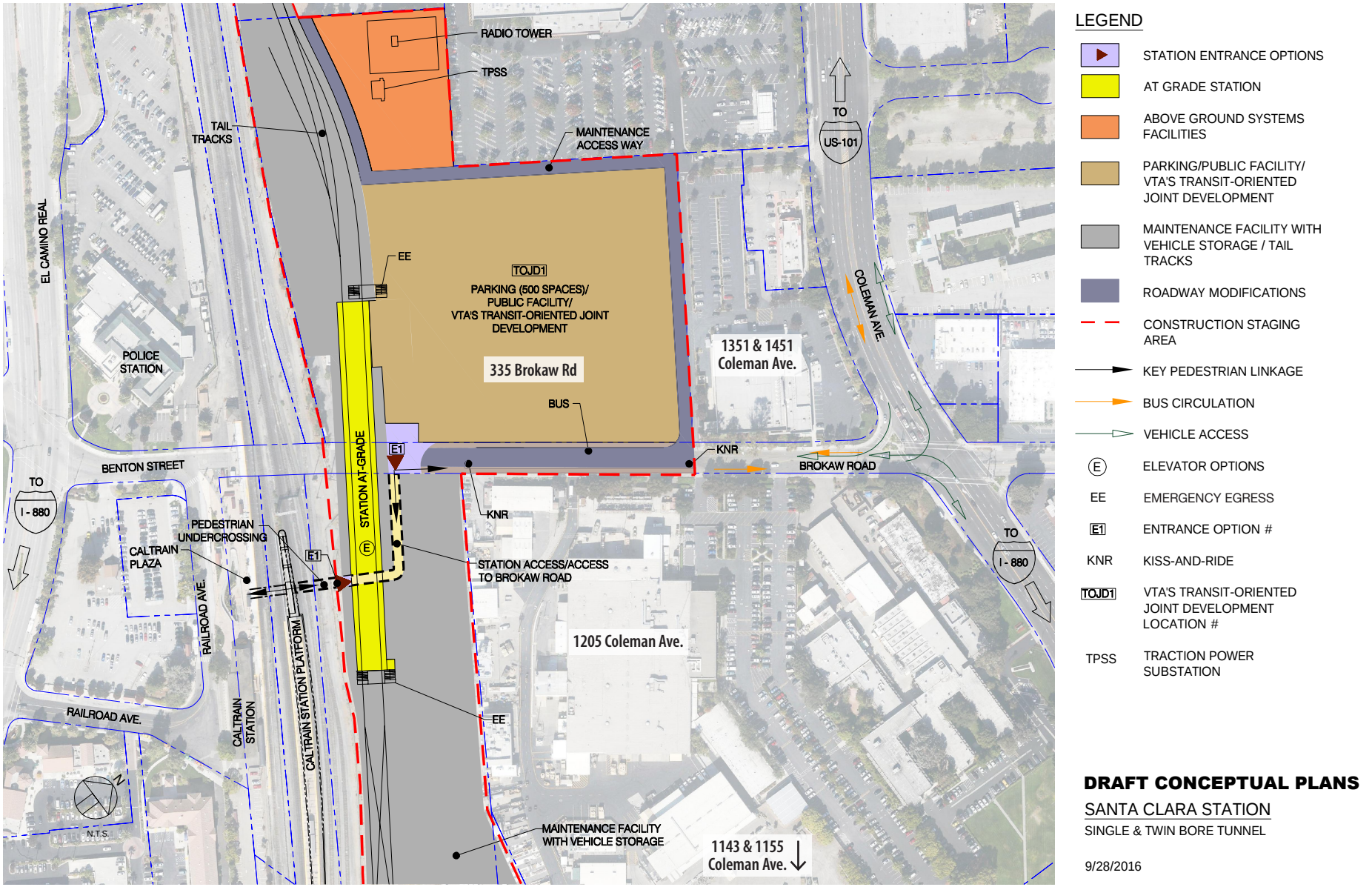
- The station facilities, such as the PNR and KNR lots, bus transfer center, and pedestrian and bicycle access must provide direct and efficient transfers between the new BART station, the station platform, and all existing transit modes to the west at the existing Santa Clara Caltrain Station to minimize travel times and maintain efficiency and viability of the transit network. Therefore, all of these uses should be located within short distances from each other to minimize transfers and travel times.
- The station platform must be located along the proposed BART guideway, and to minimize travel times, it must be located close to the Santa Clara Caltrain Station.
- The area around the existing Santa Clara Caltrain Station is highly urbanized. An existing railroad corridor dominates the area running northwest to southwest through the area, and the existing Santa Clara Caltrain Station and transit center are located to the west of this railroad corridor. Potential locations for the proposed Santa Clara BART Station are limited to either the west or east side of the tracks. The west side of the tracks is highly sensitive for both archaeological and historic architectural resources, as described under the *2016 West Option* below. The east side of the tracks has been built out with primarily industrial, commercial, and retail land uses for the last 15 years and more, with the exception of the recent demolition of former industrial uses south of Brokaw Road as described in the sections that follow.
- The site for the maintenance facility was selected (see *Las Plumas Yard and Shops Facility Option*, above) because it provided sufficient area needed for a critical maintenance facility at the end of the line of the 16-mile BART extension into Santa Clara County. The site is compatible with and adjacent to the proposed BART corridor within an existing industrial area and surrounded primarily by industrial and commercial uses and separated from sensitive land uses by existing railroad tracks, railroad operations, and sound walls. As described under the *2017 Location of Santa Clara Station inside Newhall Maintenance Facility Option* below, the Santa Clara Station does not need to be near the maintenance facility; however, the location of the maintenance facility at the Newhall Yard is a limiting constraint on the location of the Santa Clara Station platform and station facilities.



Source: VTA, 2015.

Graphics ... 00332.13 (1-24-2018)

Figure 2-N
Santa Clara Station Conceptual Site Plan – 2015
From: 2015 Scoping Report for the 2016 Draft SEIS/SEIR for Phase II Project
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2016.

Figure 2-O
Santa Clara Station Conceptual Site Plan – 2016
From: 2016 Draft SEIS/SEIR for Phase II Project
VTA's BART Silicon Valley–Phase II Extension Project

After considering the design constraints listed above, the potential sites for the station facilities include the following:

- Potential Site 1 (335 Brokaw Road): east of the tracks and north of Brokaw Road on a site formerly occupied by a Federal Express shipping business and currently occupied by an Apple R&D business, which is the location of the recommended project.
- Potential Site 2 (1205 Coleman Avenue): east of the tracks and south of Brokaw Road on a site formerly occupied by BAE Systems, which is currently vacant and owned by Hunter Storm.
- Potential Site 3 (474 Benton Street): to the west of the railroad corridor on an existing parking lot (see *West Option* below).
- Potential Site 4 (480 Brokaw Road): within the proposed Newhall Maintenance Facility located between the existing railroad tracks and the western terminus of Brokaw Road.
- Potential Site 5 (1143 and 1155 Coleman Avenue): east of the tracks and farther south of the BAE Systems/Hunter Storm site.
- Potential Site 6: the station facilities are eliminated from the project.

The analysis that follows lists all options that were considered and eliminated from consideration for the location of the Santa Clara Station. The list of options is organized chronologically in the order that each was evaluated.

A. 2004 Santa Clara Station – Parking Structure South Option. This option, identified above as Potential Site 2 at 1205 Coleman Avenue, was evaluated in the 2004 Draft EIS/EIR. This option included a three- to five-level parking structure and other future transit facilities on property south of Brokaw Road on a site occupied at the time by a defense contractor, United Defense. This option also included potential future transit facilities north of Brokaw Road (335 Brokaw Road, 1451 and 1351 Coleman Avenue) on a site occupied at the time by a Federal Express shipping business and several other commercial and retail businesses on the corner of Coleman Avenue and Brokaw Road. This option also included an elevated alignment of the Airport People Mover within the center median of Brokaw Road leading to the airport.

At the time, there were existing businesses on both sides of the street (Federal Express to the north and United Defense to the south); thus, neither site was empty or vacant at that time. Therefore, the layout that was most operationally efficient was preferred, which was the North Option. It was also noted that development of the United Defense site to the south of Brokaw Road had a much higher potential for encountering and having to treat hazardous waste during construction of the facilities because of the historic use of that property by the military. In addition, the United Defense contractor manufactured and tested military vehicles in a very large site that

would have been costly to relocate. At the 2004 Board meeting, Federal Express representatives stated their concerns regarding relocation of their facility and the cost involved.

This option was withdrawn for consideration when the VTA Board of Directors approved the project, which selected the North Option, in June 2007. The Parking Structure South Option was eliminated from consideration because the site configuration of the North Option included better traffic circulation with the separation of buses and KNR vehicles from the parking garage, and avoided potential hazardous materials concerns on the south side of Brokaw Road (1205 Coleman Avenue), and the alternative would not avoid or substantially lessen adverse impacts.

B. 2015 West Option. This option, identified above as Potential Site 3 at 474 Benton Street, was evaluated in 2015 and 2016. Under this option, the 500-space parking garage at the Santa Clara BART Station would be located at 474 Benton Street, west of the existing Santa Clara Caltrain Station and east of El Camino Real. This option would be located very close to a known archaeological site (Mission Santa Clara, CA-SCL-30H), which is eligible for the National Register of Historic Places (NRHP) under Criteria A, C, and D. Therefore, the construction would have a very high potential to encounter and adversely affect archaeological resources associated with Mission Santa Clara. Also, this option had the potential to result in an adverse visual effect and significant visual impact on the historic Santa Clara Caltrain Depot, which is listed on the NRHP.

Both CA-SCL-30H and the Santa Clara Caltrain Depot are on or eligible for the NHRP and are considered Section 4(f) resources per Section 4(f) of the U.S. Department of Transportation Act. According to this act, the USDOT cannot approve a project that would use a Section 4(f) property unless there is no feasible and prudent alternative to that use and the action includes all possible planning to minimize harm to the property resulting from such a use. There were several alternatives that have been evaluated that would not use this Section 4(f) resource, such as the recommended project in this SEIS/SEIR.

Therefore, because cultural resources impacts would have been greater than the station location in the recommended project and this option would likely result in substantially greater adverse effects and significant impacts, and because the USDOT would be restricted from selecting this alternative with viable alternatives that would not use Section 4(f) properties, this option was eliminated from further consideration.

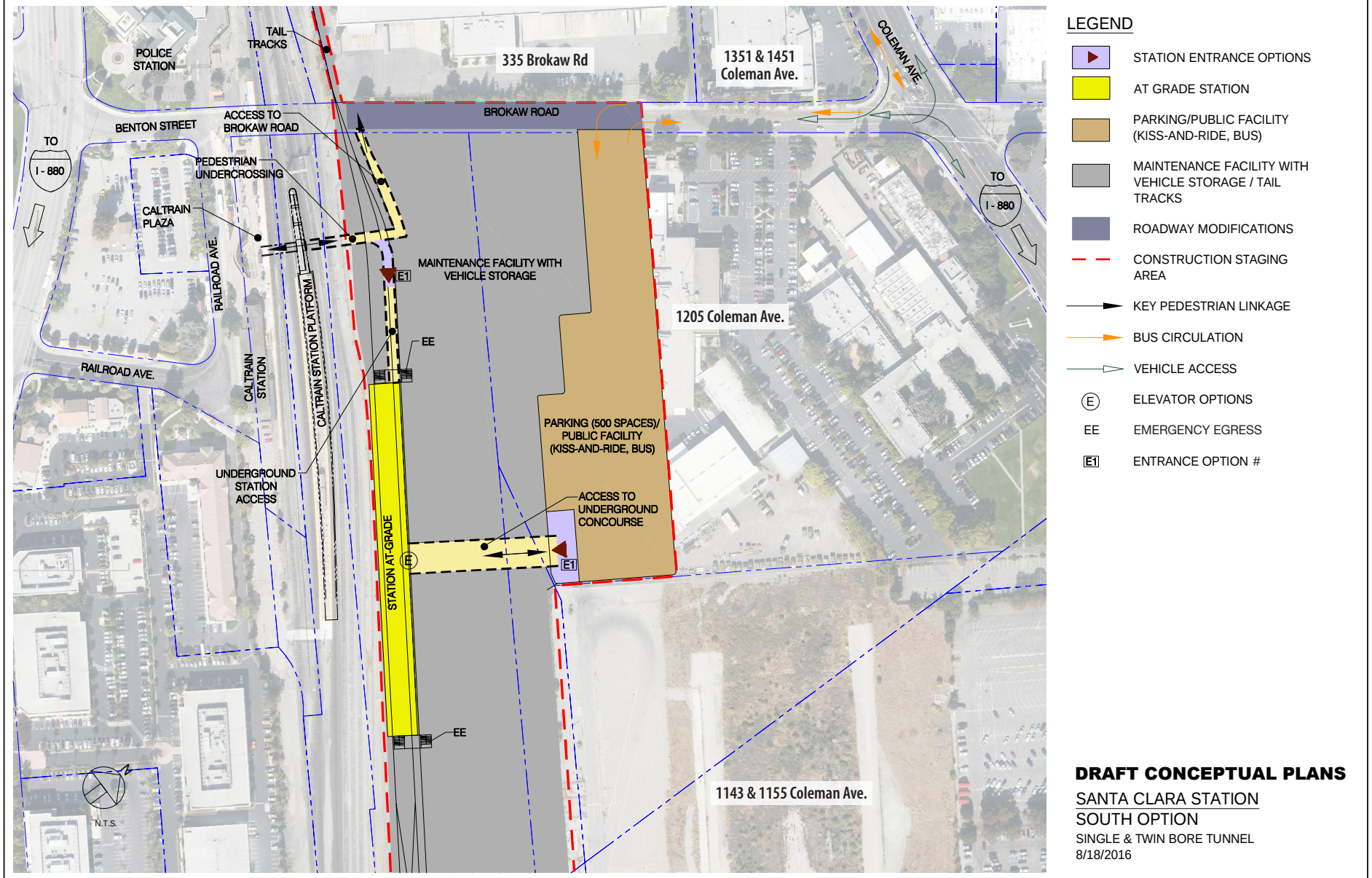
C. 2016 Location of Santa Clara Station inside Newhall Maintenance Facility Option. This option, identified above as Potential Site 4 at 480 Brokaw Road, was evaluated prior to release of the 2016 SEIS/SEIR. This option included the relocation of the Santa Clara Station platform, parking garage, KNR facility, bus transfer facility, systems facilities—including a Traction Power Substation, and the pedestrian plaza into the proposed Newhall Maintenance Facility, located north of I-880 to avoid

impacting an Apple Research and Development facility at 335 Brokaw Road. An explanation of the siting of the maintenance facility is provided as background information below.

The 40-acre Newhall Maintenance Facility would be located within a former Union Pacific Railroad (UPRR) property called the Newhall Yard that is owned by VTA. This area was selected as the site for the maintenance facility because it provided sufficient area needed for a critical maintenance facility at the end of the line of the 16-mile BART extension into Santa Clara County. The site is compatible with and adjacent to the proposed BART corridor within an existing industrial area and surrounded primarily by industrial and commercial uses and separated from sensitive land uses by existing railroad tracks, railroad operations, and sound walls. The site was vacant when VTA purchased it; therefore, no displacements or relocations were necessary. One other location for a maintenance facility was evaluated (see *Las Plumas Yard and Shops Facility Option*, above); however, it would have resulted in the displacement and relocation of several businesses. The Newhall site was selected as the preferred location for the maintenance facility site because it was the more operationally efficient option and did not require the acquisition of many private properties and the displacement and relocation of many businesses as compared to the preferred alternative. Santa Clara Station does not need to be near the maintenance facility; however, the location of the maintenance facility at the Newhall Yard is a limiting constraint on the location of the Santa Clara Station platform and station facilities.

As mentioned above, this option was evaluated to avoid acquisition of 335 Brokaw Road and the displacement of the Apple Research and Development facility. To avoid impacting this site, the station platform, 500-space parking garage, KNR facility, bus transfer facility, systems facilities—including the Traction Power Substation, and pedestrian plaza would need to be relocated into the Newhall Maintenance Facility. However, as shown in the Newhall Maintenance Facility plans and profiles in Volume III, Appendix B, *Project Plans and Profiles*, the required elements of the maintenance facility are tightly compressed into the 40-acre site. The Newhall Maintenance Facility is insufficient in size to contain all elements necessary for the Newhall Maintenance Facility *in addition to* the relocated elements of the station. It is not feasible to reconfigure the site to accommodate all the required elements. Therefore, this option was eliminated from consideration.

D. 2016 South Option. This option (see Figure 2-P) is identified above as Potential Site 2 at 1205 Coleman Avenue. Although this site was evaluated and eliminated (as described under the *2004 Parking Structure North Option* above), it was re-evaluated in 2016 prior to the release of the Draft SEIS/SEIR. It was evaluated as an option to avoid the acquisition of private property and displacement of the existing Apple Research and Development business, located at 335 Brokaw Road.



Source: VTA, 2016.

Graphics ... 00332.13 (1-24-2018)

Figure 2-P
Santa Clara Station South Option (Twin-Bore and Single-Bore)
From: 2016 Draft SEIS/SEIR for Phase II Project
VTA's BART Silicon Valley–Phase II Extension Project

Unlike the 2004 Parking Structure South Option and the 2007 station site plan, both of which would have displaced businesses on the north side of Brokaw Road, this 2016 South Option would locate all project elements, such as the station platform and 500-space parking garage, the Newhall Maintenance Facility, and systems facilities, south of Brokaw Road to avoid impacts on 335 Brokaw Road. These elements would be relocated mainly within a site formerly occupied by BAE Systems but currently vacant and owned by Hunter Storm at 1205 Coleman Avenue with the exception of a single tail track that would extend north of Brokaw Road and some system facilities located south of De La Cruz Boulevard. The results of the evaluation of this option are described below:

- Shifting the station platform south by several hundred feet to avoid 335 Brokaw Road would locate the station platform several hundred feet away from the existing Caltrain platform, which would reduce connectivity and hinder the objectives of the project to have a direct and efficient connection between transit modes.
- The parking garage/PNR and KNR facilities would be separated from the station platform by 300 to 500 feet because the maintenance facility would be located between them. The main, and only, access between the PNR and KNR facilities and the station, without interfering with maintenance facility operations, would be through a 300- to 500-foot-long entrance (pedestrian/bicycle undercrossing) beneath the maintenance facility. This would not only pose safety and security concerns due to limited visibility within the undercrossing, but would also increase passenger travel time and pose walkability concerns by extending the distance traveled between intermodal connections.
- The long underground entrance passageway used for station platform access may require mechanical ventilation resulting in a potential increase in operation and maintenance costs. This option would also require greater areas of excavation for the main entrance (pedestrian/bike undercrossing); increases in structural support requirements for the facilities above the entrance undercrossing; additional ventilation and fire safety requirements within the entrance undercrossing; and additional safety and security requirements, which would increase project costs.
- The number of parking spaces within the Newhall Maintenance Facility available to staff working in the facility would be reduced by approximately 25 percent when compared with the recommended project facility layout.
- The City of Santa Clara has also stated its preference for the recommended station and facilities location and does not support an alternative that would impact the Hunter Storm development project on the south of Brokaw Road as they have identified that property for high-density mixed-use and residential land uses to maximize the use of existing and planned transit (as stated by Mayor Gillmor at City Council Study Session, July 19, 2016). The City's position on this property

is consistent with the vision of the Santa Clara Station Focus Area of the City of Santa Clara 2010–2035 General Plan.

- Hunter Storm is currently working with the Cities of San Jose and Santa Clara to acquire entitlements to construct a mixed-use residential and commercial development on this site called the Coleman Highline in the City of San Jose and Gateway Crossings in the City of Santa Clara. This South Option would eliminate the possibility of the high-density, mixed-use project proposed within the Hunter Storm property south of Brokaw Road.

Therefore, for the reasons listed above, and because the South Option does not avoid or substantially lessen adverse effects or significant environmental impacts compared to the recommended project, this option was eliminated from further consideration.

E. 2017 Near Avaya Stadium Option. This option, identified above as Potential Site 5 at 1143 and 1155 Coleman Avenue, was evaluated in 2017 in response to a public comment on the 2016 Draft SEIS/SEIR. This option would locate the Santa Clara BART Station far to the southeast of Brokaw Road and closer to Avaya Stadium. This option would avoid acquisition of the Apple property at 335 Brokaw Road and provide a connection to a major activity center (Avaya). However, this option would place BART riders at least 0.5 mile from the existing Santa Clara Caltrain Station and VTA's Transit Center on El Camino Real. These facilities provide access to several commuter rail lines such as Caltrain, ACE, Capitol Corridor, and local and express bus lines. Potential station locations farther south of Brokaw Road and east of the existing railroad corridor would not perform as well in meeting the purpose and need of the BART extension as compared to the North Option identified as part of the recommended project in this Final SEIS/SEIR. This includes not performing as well in the areas of enhancing regional connectivity by expanding and interconnecting BART rapid transit service with Amtrak, ACE, Caltrain, and VTA bus services in Santa Clara County and improving intermodal transit hubs where rail, bus, auto, bicycle, and pedestrian links meet because of the greater walking distances required for connections. A station closer to Avaya Stadium would be surrounded by compatible commercial and railroad land uses similar to the recommended project. Therefore, mitigation measures for air quality, noise, and other impacts are expected to be similar to the recommended project. While this option would not require a mitigation measure for traffic impacts at the intersection of Coleman Avenue and Brokaw Road as does the recommended project, this option would likely require traffic mitigation at the primary access to Coleman Avenue, which is congested during peak hours. This option would not avoid or substantially lessen adverse effects or significant environmental impacts because the impacts would be similar to the North Option or the recommended project. Therefore, this option was eliminated from consideration.

F. 2017 No Parking at Santa Clara Station Option. This option, identified above as Potential Site 6, evaluated a station without PNR (parking garage) parking spaces.

This option was explored in response to a public comment on the 2016 Draft SEIS/SEIR and in an effort to minimize the station footprint and to minimize the ROW acquisition required for the station and impacts on 335 Brokaw Road. Under this option, only the station platform, KNR, bus transfers, and bicycle and pedestrian facilities would be provided; there would be no PNR parking spaces.

As an end-of-the-line station, it is important to have a parking option. The ridership modeling indicated a demand for 500 parking spaces at this location. Parking at Santa Clara Station also provides an opportunity to park at this station and ride BART to other destinations, including Diridon Station, which is one BART stop away. Therefore, parking at Santa Clara Station reduces the parking demand at these other destinations.

In addition, even with the removal of a parking garage, the location of the Santa Clara Station platform would still be in conflict with the Apple building located at 335 Brokaw Road, and would require acquisition and partial removal of the building. This would not avoid impacts on the Apple business. If the station platform were to be shifted to the south to avoid impacting the business at 335 Brokaw Road, the design would be similar to the 2016 South Option described above. As described above, shifting the station platform south of 335 Brokaw Road to avoid impacts on the business would result in a less efficient operations at the Newhall Maintenance Facility. Therefore, because this option would not avoid or substantially lessen adverse effects or significant environmental impacts as compared to the North Option identified as part of the recommended project in this Final SEIS/SEIS and would result in a less efficient layout of the yard, this option was eliminated from further consideration.

15. Underground Station Construction Methodology Options Considered and Withdrawn

Mined-Station Construction

Mined-station construction methodology is the construction of underground facilities with reduced or minimal disturbance to the surface over the underground facility. This construction technique was evaluated as an alternative to the cut-and-cover construction methodology proposed for construction of the three underground stations for the Twin-Bore Option. Unlike the cut-and-cover construction method, which would excavate the stations from the surface down to the base of the excavation, the mined-station method would excavate the stations from within the bored tunnel or from other off-street, underground locations to attempt to avoid the disruption of traffic operations and restriction of access to businesses on the surface above the construction site. As detailed below, due to unstable soils within downtown San Jose, mining of the underground stations would require extensive ground treatment to stabilize soil prior to mining of the station in sections.

The feasibility of constructing mined stations as part of the BART Extension to San Jose was first assessed by URS in 2003 (*Evaluation of the Feasibility of Mined Underground Stations Report*), with a team consisting of experts in the disciplines of geotechnical and tunnel engineering and underground construction. A total of 27 case studies were identified that involved mined underground stations in metropolitan areas, 23 of which were successful due to favorable subsurface conditions for mining (i.e., rock, stiff-hard clays, or dense granular soils above the water table). The remaining 4 case studies identified undesirable subsurface conditions (i.e., soft ground with high groundwater table), much like Downtown San Jose, which resulted in large ground deformations, damage to underground utilities, and disruption to local businesses. Mining would be considerably riskier than cut-and-cover construction and prolong the project schedule by 6 to 9 months. Mining would also involve a certain level of surface disruption and undesirable impacts on the public. URS concluded that mined station construction would not provide significant benefits in contrast to a cut-and-cover construction method.

In 2012, VTA reassessed the feasibility of a mined station and whether the conclusions drawn by URS in 2003 were still relevant based on technological and material advances in the tunneling industry (HMM/Bechtel, *Feasibility Studies for Post-SVBX Scenarios* 2012). The review reiterated that the potential disadvantages of mining include, but are not limited to, contamination issues due to grout slurry leakage, muck disposal, varied effectiveness for fine-grained and coarse-grained soil types, required surface road closures, and the potential of near-surface ground swelling due to the soil treatments required to make mining possible. Because of the lack of soil stability and high groundwater table in the Downtown area, ground improvement would be required. This could be accomplished by either jet grouting or deep soil mix methods. Jet grouting solidifies the soil by injecting cement slurry under high pressure. The deep soil mix method introduces cementitious binders to create greater strength and reduce permeability. Both of these methods would require heavy equipment operating along Santa Clara Street with road closures.

The *Feasibility Studies for Post-SVBX Scenarios* (HMM/Bechtel 2012) states that the jet-grouting mined station option is estimated to cost approximately $140 million more than the cut-and-cover construction option. The HMM/Bechtel analysis recommended that a greater contingency multiplier be applied to the estimate for mined stations (30 percent versus 15 percent for cut-and-cover construction) due to the greater design and construction risks and uncertainties. Therefore, although mining has been considered as an option, the uncertainties and associated potential damage to nearby utilities, disruption to local businesses, and impacts on the schedule make mining not reasonable to implement. In addition, this construction method would not meet the goal of avoiding traffic disruption along Santa Clara Street due to the required street closures and operation of equipment along the street. The feasibility study recommends cut-and-cover construction of the Downtown San Jose Station, as this method is better-suited for

construction of this station within the geotechnical conditions and high groundwater table in the Downtown San Jose area.

In 2015, HMM completed the *Downtown San Jose Station – Mined Station with Mitchell Block Entrance Study* to provide further discussion regarding the feasibility and cost/schedule effectiveness of a Downtown San Jose BART Station and crossover, which would be implemented by underground mining techniques originating from the VTA Block property. The study concluded that while mining the station is technically feasible based upon increasing precedence and current industry technologies, extensive ground improvement would be necessary and would still require temporary lane closures in the vicinity to enable complete coverage of the footprint. Additionally, the intake, exhaust, and emergency egress structures would be required in the Santa Clara Street area; and there is an expectation that the Sequential Excavation Method (SEM) concept is still costlier and would take more time in comparison to cut-and-cover. As indicated by URS (2003), and confirmed by HMM/Bechtel (2012), the SEM station concept would involve significant construction risk.

- ~~**Santa Clara Station South Option.** The Santa Clara Station and 500-space parking garage would be located south of Brokaw Road requiring reconfiguration of the Newhall Maintenance Facility. Access to the station platform and concourse from intermodal connections would require 300- to 500-foot passenger tunnel/undercrossings and result in an inefficient maintenance facility layout.~~
- ~~**San Fernando Street Alignment.** An alignment would run between Berryessa and Santa Clara BART Stations via UPRR ROW, then under San Fernando Street (subway alignment) to Diridon Station.~~
- ~~**BART in a Bridge Over U.S. 101 Alignment.** An alignment would go from Berryessa Station to Santa Clara Street via the existing railroad bridge over U.S. 101, with Alum Rock Station west of 28th Street in a trench within VTA ROW. The alignment would pass perpendicularly under and south of Santa Clara Street (subway alignment) before realigning with Santa Clara Street west of 19th Street.~~
- ~~**Coyote Creek – South of Santa Clara Street Alignment.** An alignment would travel under Santa Clara Street (subway alignment) from 25th Street to 21st Street, then swing to the south of Santa Clara Street at 21st Street as it passes under Coyote Creek to avoid intersecting the bridge abutments. It would then realign under Santa Clara Street at 13th Street.~~
- ~~**Coyote Creek – Under Santa Clara Street Alignment.** An alignment would run directly under Santa Clara Street (subway alignment) starting at 25th Street, continuing directly under Santa Clara Street as it passes under Coyote Creek with the alignment below the Santa Clara Street bridge abutments.~~
- ~~**Alum Rock Station at 23rd Street.** An alignment would run from Berryessa Station over U.S. 101 on a bridge within VTA ROW, under Julian Street (subway alignment) parallel~~

~~to 28th Street, and swing west starting north of East St. John Street to align parallel to and north of Santa Clara Street at 24th Street. Alum Rock Station would be north of Santa Clara Street between 24th and 20th Streets. Past the station, the alignment would realign directly under Santa Clara Street west of 13th Street.~~

- ~~**Connection to Mineta San Jose International Airport.** A connection would be constructed to Mineta San Jose International Airport (SJIA) via a spur from the alignment just south of I-880. The alignment would be in a tunnel under I-880, then swing east and travel under the SJIA runways and terminate under the terminals.~~
- ~~**St. James Street Alignment.** An alignment would travel from Berryessa Station over U.S. 101 on a bridge, along VTA ROW west of 28th Street, before swinging west near McKee Road and aligning under St. James Street (subway alignment). The alignment would then swing diagonally south through St. James Park and under Santa Clara Street, then west under SR 87 south of Santa Clara Street and into Diridon Station.~~

~~All of these variations to the selected alternative were considered and withdrawn because of substantial construction costs, operational costs, inefficient passenger access and intermodal connectivity, design and engineering concerns, inefficient maintenance yard operations, financial risk, lower ridership, or environmental impacts.~~

~~Also refer to Section 1.4, *BART Extension Project History*, which summarizes the previous environmental studies that have been completed.~~

2.A Recommended Project Description/Locally Preferred Alternatives

This section provides VTA staff recommended options, NEPA recommended project, CEQA recommended project, and timeline for future option decisions (remaining issues to be resolved). Appendix B of this Final SEIS/SEIR includes updated station plans for the Phase II NEPA and CEQA recommended projects.

While this section has been added since the Draft SEIS/SEIR, it is not shown in underline and ~~strikeout~~ for improved readability. This section is a required section for the Final SEIS/SEIR.

2.A.1 VTA Staff Recommended Options

VTA staff has evaluated the Downtown San Jose and Diridon Station options, Alum Rock/28th Street and Downtown San Jose Station (if a Twin-Bore construction methodology is selected) entrance options, the Stockton Avenue ventilation structure location options, and the tunneling methodology options. As shown in Table 2-D, VTA staff has made recommendations regarding the preferred options for Downtown San Jose and Diridon Stations. Therefore, the recommended NEPA and CEQA Alternatives will include the Downtown San Jose Station West Option and Diridon Station North Option. At this time,

VTA staff has not made recommendations regarding the preferred options for the Alum Rock/28th Street and Downtown San Jose Station (if a Twin-Bore construction methodology is selected) entrance options, Stockton ventilation structure location, and tunnel construction methodology (i.e. Twin-Bore versus Single-Bore). The selection of Downtown San Jose and Diridon Stations and tunneling methodology options is planned for VTA's Board of Directors' meeting in early 2018.

All comments received, and responses to those comments, are available in this Final SEIS/SEIR, which has been released several weeks prior to the VTA Board of Directors' meeting when they are scheduled to make a decision on the station location and tunneling methodology options. Therefore, the VTA Board will have the opportunity to review all comments and responses prior to selecting options, certifying the environmental document, and approving the project. Responses to comments are located in Volume II, Chapter 2, *Responses to Comments*. In addition, the VTA Board of Directors, when approving the project, would also consider cost, risk, schedule, operator concerns, and stakeholder input.

The decisions on the Alum Rock/28th Street Station and Downtown San Jose Station West Option (if a Twin-Bore construction methodology is selected) entrances and Stockton Avenue ventilation structure location will be made during the engineering phase. The SEIS/SEIR analyzes all options in equal detail.

Table 2-D: NEPA and CEQA BART Alternative Options and VTA Staff Recommendations

Design Feature	Options Analyzed	VTA Staff Recommended Option
Downtown San Jose Station	East Option West Option	West Option
Diridon Station	North Option South Option	North Option
Station Entrances	Alum Rock/28th Street Downtown San Jose West (if a Twin-Bore construction methodology is selected)	No Recommended Options
Stockton Avenue Ventilation Structure Location	At Schiele Avenue Option At Villa Avenue Option North of Villa Avenue Option South of Taylor Option	No Recommended Option
Tunneling Methodology	Single-Bore Option Twin-Bore Option	No Recommended Option

2.A.1.1 Downtown San Jose Station

VTA staff recommends that the Downtown San Jose Station West Option be selected as the preferred option. The Downtown San Jose Station West Option would provide long-term revitalization of the downtown core and maximize high-density developable square footage and transit-oriented development. This option would also provide excellent transit connectivity and avoid conflict with the existing San Jose City Hall underground parking garage. The most difficult challenges for the West Option would be the significant temporary impacts on VTA's light rail and bus operations during construction if the Twin-Bore Option is selected. VTA would implement a Construction Transportation Management Plan and an extensive outreach program to minimize disruption to service and inconvenience to customers. Additionally, the long-term benefits of greater connectivity would far outweigh the short-term construction impacts. Under the Twin-Bore Option, the costs for utility relocations, subsurface easements, infrastructure impacts, and traffic mitigation for the West Option would be higher than the East Option, but when compared to the cost associated with the need to acquire a large parcel for a primary station entrance and construction staging area for East Option, the overall costs for the West Option are not significantly different than the East Option.

2.A.1.2 Diridon Station

VTA staff recommends that the Diridon Station North Option be selected as the preferred option. The Diridon Station North Option would maximize development potential and flexibility by consolidating transit infrastructure closest to Santa Clara Street, leaving the remaining parcel areas for development and avoiding conflict with the planned development projects. This option would also provide opportunities to reduce impacts on parking during construction. The North Option, located partially under the Caltrain tracks, would require complex construction techniques in order to maintain Caltrain service during construction if the twin-bore methodology is selected. Even with this complexity and an additional cost of roughly $50 million compared with the Diridon Station South Option, having a long-term integrated intermodal facility with compatible development is essential.

2.A.2 NEPA Recommended Project – BART Extension Alternative

VTA staff recommends that the BART Extension Alternative be selected as the preferred NEPA alternative.

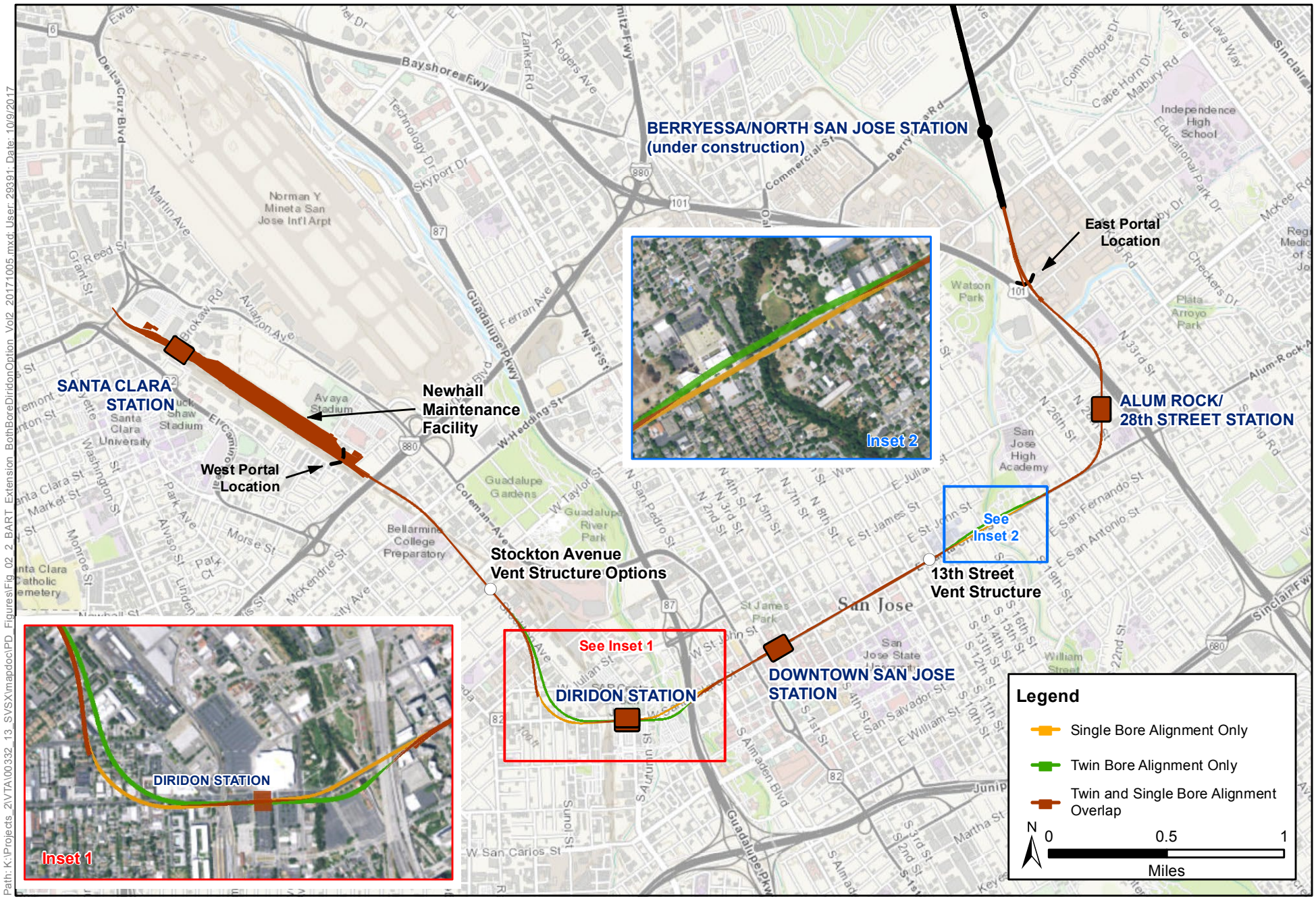
The BART Extension Alternative would consist of the approximately 6-mile extension of the BART system from the Berryessa/North San Jose Station through downtown San Jose, terminating in Santa Clara near the Santa Clara Caltrain Station, as shown in Figure 2-Q. There are two tunneling methodologies proposed to construct the BART Extension: the Twin-Bore Option and Single-Bore Option. Both have a length of approximately 4.5 miles. The Single-Bore Option tunnel diameter typically requires the tunnel to be at a greater depth

to reduce vertical settlement displacement. Additionally, for the Single-Bore Option, station platforms are located within the bored tunnel while entrances and vertical circulation elements are located adjacent and connected to the tunnel. The tunnel(s) would be lined with precast concrete segmental linings, which are installed behind the tunnel boring machine as it moves forward.

In order to optimize future joint development and ridership around the stations, the traction power substations in the three underground stations would be located underground. VTA will work with BART and key joint development stakeholders to determine the final location for systems facilities. Where the facilities are placed underground, they would be within the Single-Bore Option tunnel/station or within the Twin-Bore Option station box.

Two BART lines are planned to serve the BART Extension Alternative: Santa Clara–Richmond, and Santa Clara–Daly City. The service level description that follows represents the combined service of these two lines in one direction. BART would operate every weekday from 4 a.m. to 1 a.m., with 6- to 12-minute average headways from 4 a.m. to 6 a.m., 6-minute peak to 7.5-minute average headways from 6 a.m. to 7 p.m., and 15- to 20-minute average headways after 7 p.m. Saturday BART service would be from 6 a.m. to 1 a.m., with 7.5- to 10-minute average headways from about 9 a.m. to 6:30 p.m., and 15- to 20-minute average headways before 9 a.m. and after 6:30 p.m. Sunday BART service would be from 8 a.m. to 1 a.m., with 15- to 20-minute headways all day. However, BART service levels are subject to refinement based on BART's updates to their systemwide operating plan. Approximately 48 new BART vehicles would be needed to accommodate these service levels and the 2035 Forecast Year ridership demand.

A summary of parking by station location is provided in Table 2-E and described in detail in the individual City discussions below.



Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Path: K:\Projects_2\VTA\00332_13_SVSX\mapdoc\PD_Figures\Fig_02_2_BART_Extension_BothBoreDiridonOption_Vol2_20171005.mxd User: 29391; Date: 10/9/2017

Figure 2-Q
BART Extension Alternative
VTA's BART Silicon Valley – Phase II Extension Project

Table 2-E: Parking to be Provided as Part of the BART Extension Alternative

BART Station	Parking Spaces
Alum Rock/28th Street	1,200
Downtown San Jose	No park-and-ride facilities
Diridon	No park-and-ride facilities
Santa Clara	500

Subsequent to the publication of the Draft SEIS/SEIR, additional design changes were identified that are noteworthy but do not result in additional environmental impacts. These are addressed in Section 2.2.A, *Changes as a Result of Tunnel Methodology Since the Release of the Draft SEIS/SEIR*.

For a description of NEPA BART Extension Alternative Auxiliary Features, See Chapter 2, Section 2.2.2.2, *Description of NEPA BART Extension Alternative Auxiliary Features,* for a full discussion of these features.

For a discussion of NEPA BART Extension Alternative Sustainability Strategies, See Section 2.2.2.3, *Sustainability Strategies*, for a full discussion of these strategies.

2.A.2.1 Alignment and Station Features by City

City of San Jose

Connection to Phase I Berryessa Extension

The BART Extension would begin in the City of San Jose where the Phase I tail tracks end. The at-grade Phase I tail tracks would be partially removed to allow for construction of the bored tunnels, East Tunnel Portal, and supporting facilities. The new tracks would be connected to the Phase I tracks to allow for future BART operation along the entire BART Silicon Valley corridor from southern Fremont to Santa Clara.

The alignment would transition from a retained-fill configuration east of U.S. 101 and south of Mabury Road near the end of the Phase I alignment into a retained-cut configuration and enter the East Tunnel Portal near Las Plumas Avenue (approximately STA 570+00 for the Twin-Bore Option and approximately STA 573+00 for the Single-Bore Option).

South of the portal, the alignment would pass beneath North Marburg Way, then approximately 25 feet below the creek bed of Lower Silver Creek (STA 581+00) for the Twin-Bore Option, or approximately 30 feet for the Single-Bore Option, just to the east of U.S. 101 (STA 581+00), then curve under U.S. 101 south of the McKee Road overpass, and enter Alum Rock/28th Street Station.

Alum Rock/28th Street Station

Alum Rock/28th Street Station would be located between U.S. 101 and North 28th Street (starting at approximately STA 600+00) and between McKee Road and Santa Clara Street.

The approximately 11-acre station campus would include facilities such as a parking structure, systems facilities, and roadway improvements to North 28th Street, as shown on Figures 2-3 and 2-4. The station would be underground with street-level entrance portals with elevators, escalators, and stairs covered by canopy structures. The station would have a minimum of two entrances. Under the Single-Bore Option, an underground concourse level would span between the two entrances adjacent to the tunnel. The location and configuration of the station entrances would be finalized during final design based on applicable BART Facilities Standards and ridership projections. Signage for all stations would comply with Metropolitan Transportation Commission's Regional Transit Wayfinding Guidelines and Standards.

A parking structure of up to seven levels would accommodate BART PNR demand with 1,200 parking spaces. Areas for automobiles, shuttles, and buses to drop off passengers would be provided on North 28th Street and/or within the station campus.

Access to Alum Rock/28th Street Station would be primarily from McKee Road and North 28th Street at the north end of the station site, and from Santa Clara and North 28th Streets at the south end of the site. New or modified traffic signals would be provided at the intersections of North 28th Street and McKee Road, and North 28th and Santa Clara Streets. New traffic signals would also be provided in the station area on North 28th Street at St. James Street and at Five Wounds Lane for access to the parking structure and passenger loading areas. A pedestrian connection along the south side of the station campus at North 28th Street from Santa Clara Street would be designed as a pedestrian/bicycle/transit gateway into the station campus with amenities such as street trees, wide sidewalks, bicycle facilities, and pedestrian-scaled lighting. This gateway would link the station with buses and Bus Rapid Transit (BRT) operating on Santa Clara Street and Alum Rock Avenue. Accommodations for the future Five Wounds Trail would be provided along North 28th Street as part of station access improvements.

The station would include systems facilities such as electrical, ventilation, and communication equipment, as shown on Figures 2-3 and 2-4. Systems facilities include a Traction Power Substation (TPSS), Train Control Communications Room (TCCR), an auxiliary power substation, and an emergency generator. Systems facility sites within public view would be surrounded by an approximately 9-foot-high concrete masonry unit (CMU) wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, some systems facilities may also be located aboveground. If aboveground, access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates. The station would include emergency exhaust ventilation facilities and ventilation shafts as shown on Figures 2-R and 2-S. Fresh air intake/exhaust hatches at grade would be near the emergency ventilation facilities.

From Alum Rock/28th Street Station, the alignment would curve under North 28th Street, North 27th Street, and North 26th Street before aligning under Santa Clara Street

(STA 620+00). The alignment would continue under the Santa Clara Street right-of-way (ROW) until the alignment approaches Coyote Creek (STA 644+00).

Tunnel Alignment near Coyote Creek

For the Twin-Bore Option, the alignment would transition north of Santa Clara Street beginning just west of 22nd Street and pass approximately 20 feet beneath the creekbed of Coyote Creek to the north of Santa Clara Street and avoid the Coyote Creek/Santa Clara Street bridge foundations. The alignment would transition back into the Santa Clara Street ROW near 13th Street, west of Coyote Creek. However, for the Single-Bore Option, the alignment would continue directly under Santa Clara Street and pass approximately 55 feet beneath the creekbed of Coyote Creek and approximately 20 feet below the existing bridge foundations.

13th Street Ventilation Structure

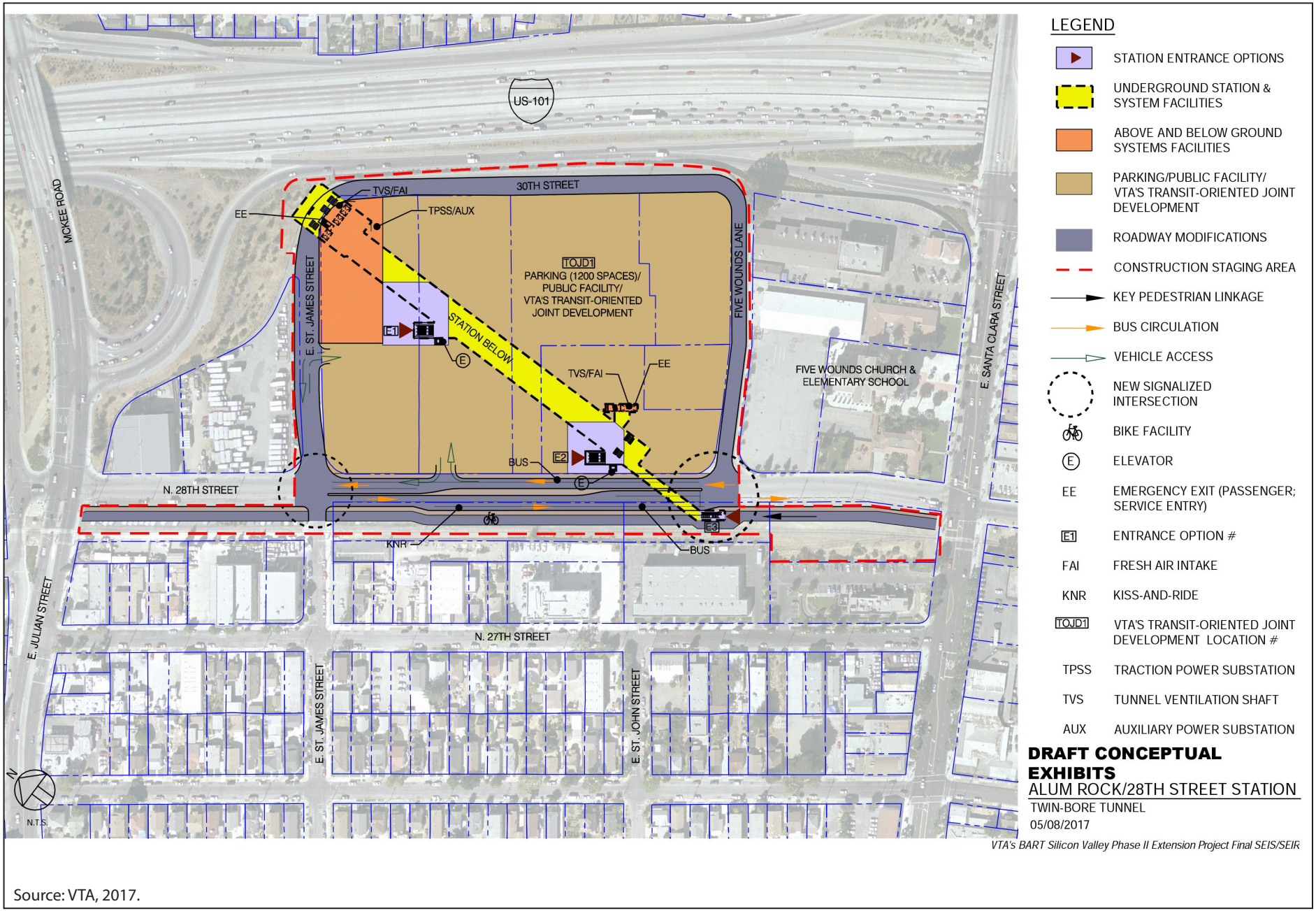
A systems facility site would be located at the northwest corner of Santa Clara and 13th Streets. This site would include a tunnel ventilation structure, which would be an aboveground structure with an associated ventilation shaft.

Downtown San Jose Station

The alignment would continue beneath Santa Clara Street to the Downtown San Jose Station. Crossover tracks for the Twin-Bore Option would be located east of Downtown San Jose Station between 2nd and 4th Streets (within the cut-and-cover box). Under the Single-Bore Option, the crossover tracks would be located east of the station within the limits of 8th and 13th Streets. The station would not have dedicated PNR facilities.

The Downtown San Jose Station would be located between 2nd and Market Streets for the Twin-Bore Option and between Market and 3rd Streets for the Single-Bore Option, as shown on Figures 2-T and 2-U. The station would consist of boarding platform levels and some systems facilities within the tunnel beneath Santa Clara Street, and entrances at street level, as shown on Figures 2-T and 2-U. Vertical circulation elements, including elevators, escalators, and stairs, would be at station portal entrances, providing pedestrian access to the boarding platforms. Escalators and stairs would have canopy structures. The station would have a minimum of two entrances. For the Twin-Bore Option, several station entrance location options within sidewalks along Santa Clara Street and cross streets between Market and 3rd Streets are being evaluated. For the Single-Bore Option, one entrance would be located north of Santa Clara Street between 2nd and 1st Streets, and a second entrance would be located north of Santa Clara Street between 1st and Market Streets on the VTA-owned property, the VTA Block. Stairs and escalators would be provided at each of the entrances.

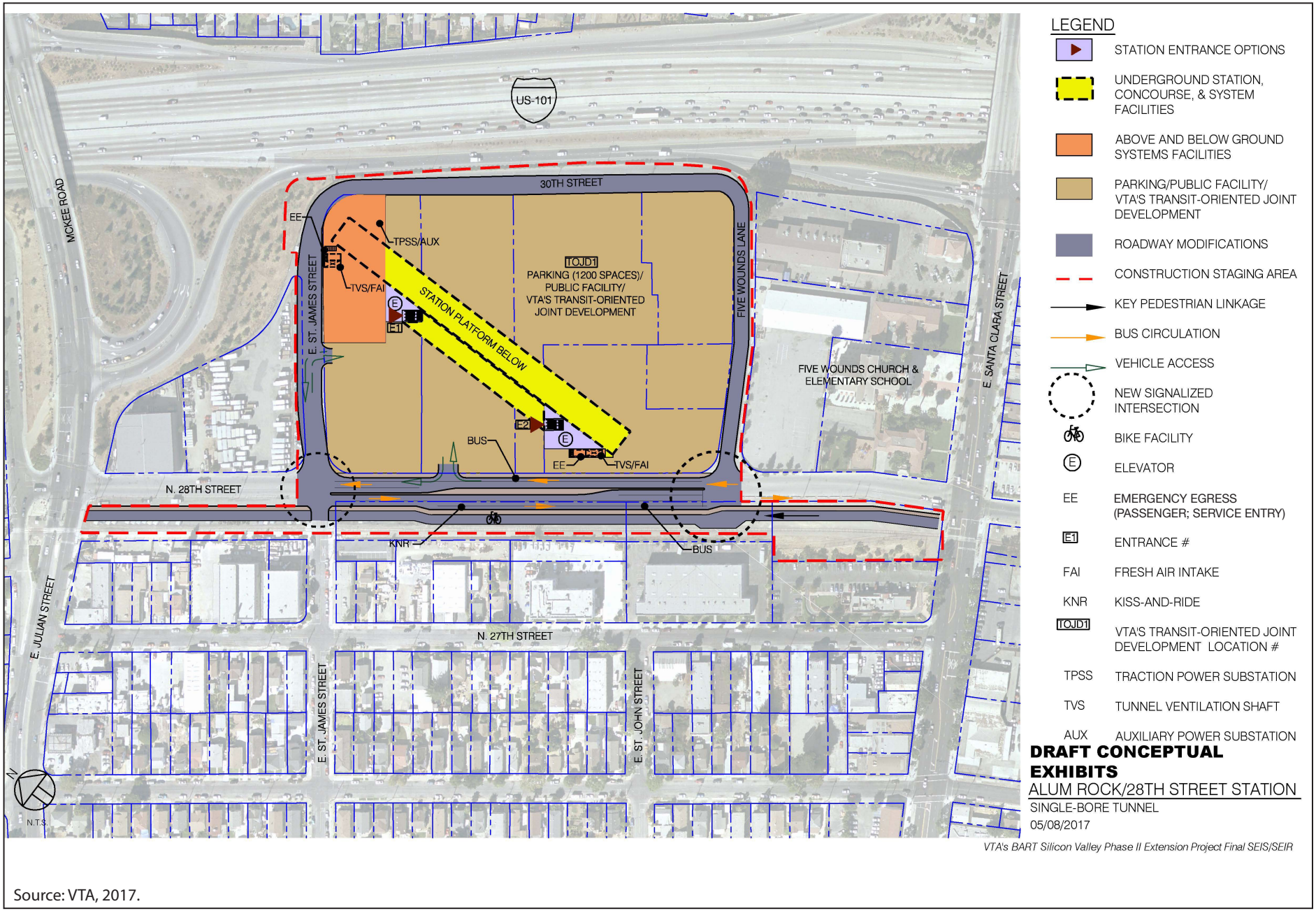
Elevators would be provided near each end of the station. The location of the station entrance for the Twin-Bore Option, and the configuration of the station entrances for both options, would be finalized during final design and would be based on applicable BART Facilities Standards and ridership projections.



ICF Graphics ... 00332.13 (12-20-2017)

Source: VTA, 2017.

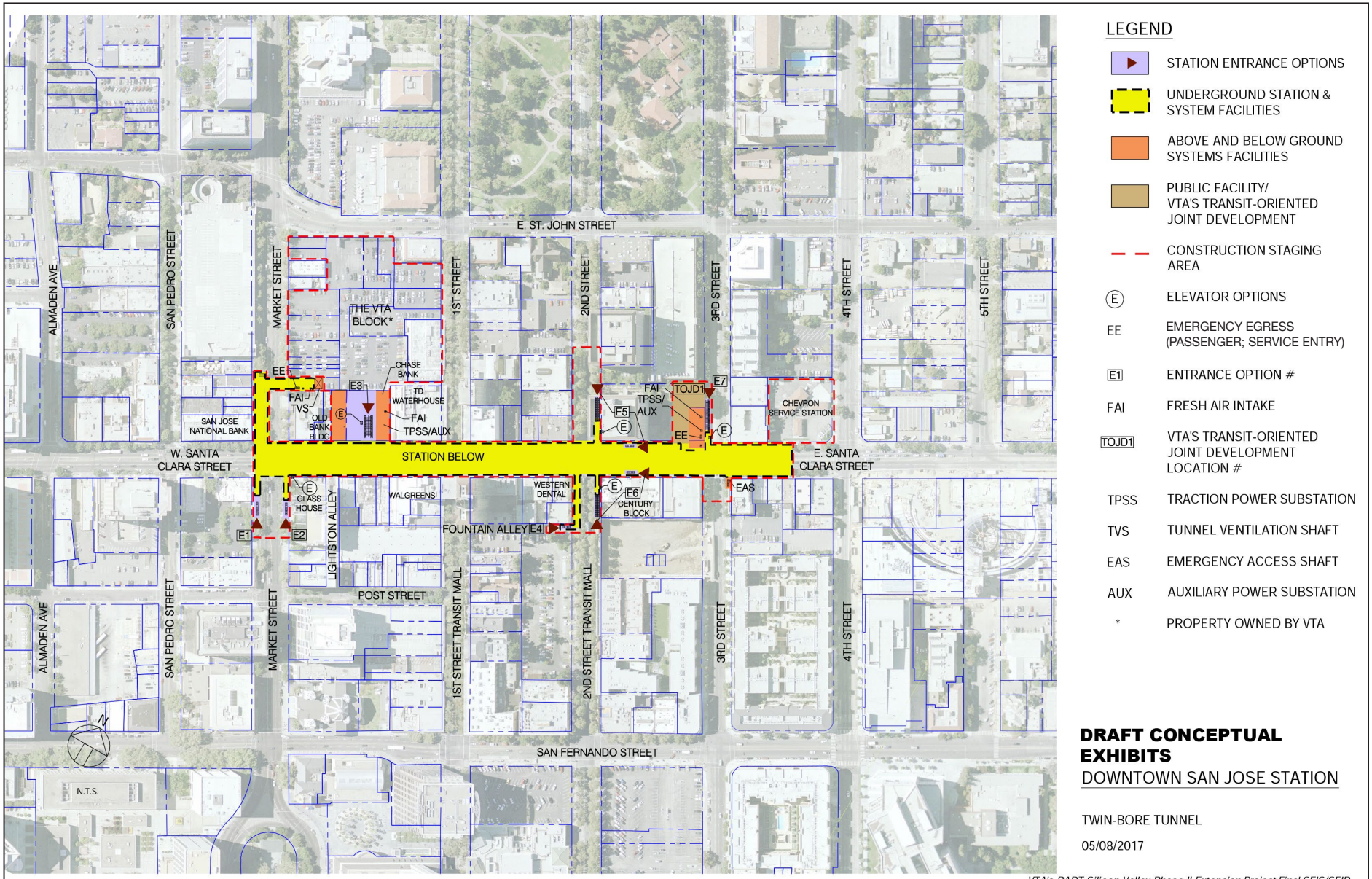
Figure 2-R
Alum Rock/28th Street Station Plan (Twin-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Graphics ... 00332.13 (1-23-2018)

Source: VTA, 2017.

Figure 2-S
Alum Rock/28th Street Station Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

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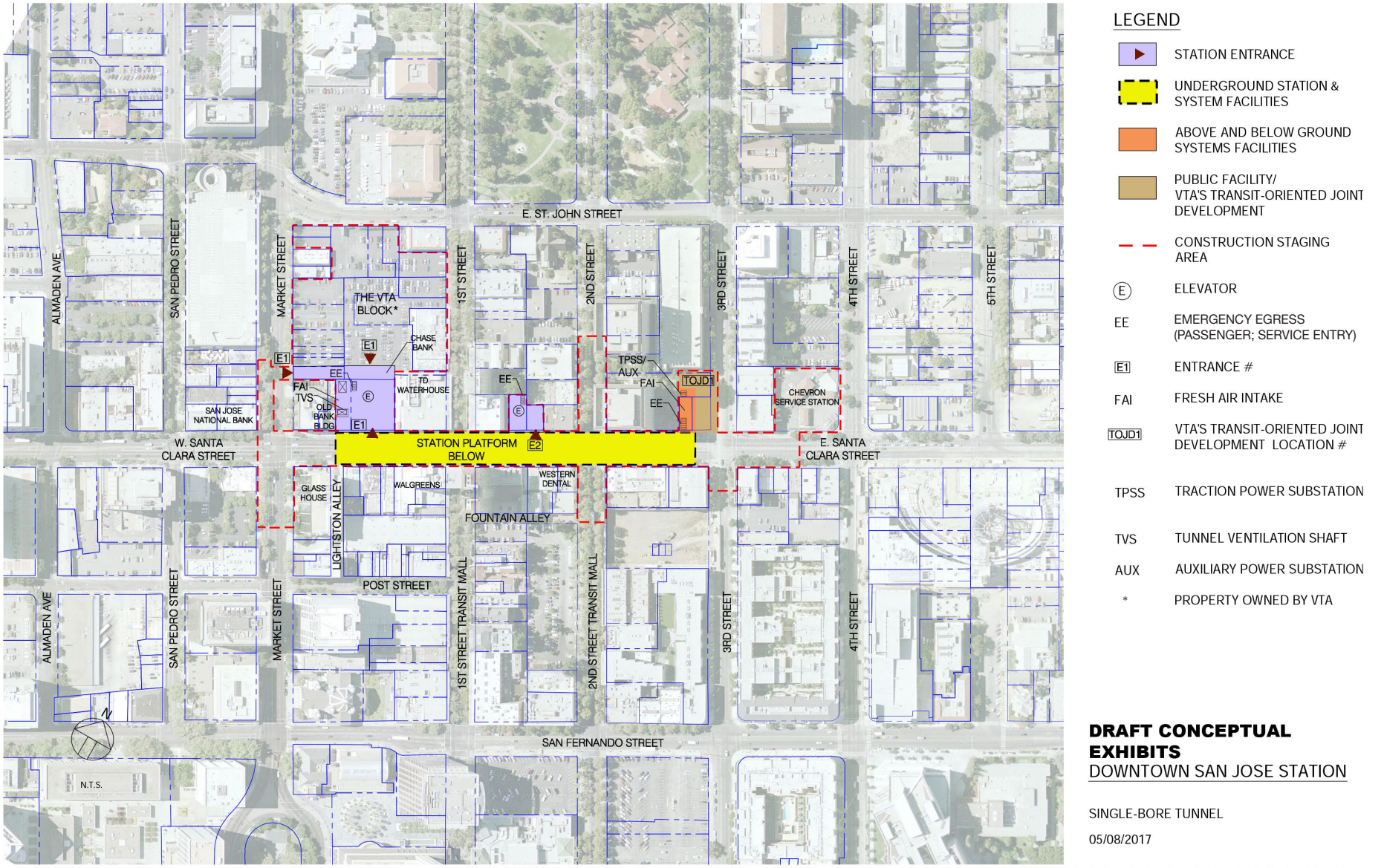
Figure 2-T
Downtown San Jose Station Plan (Twin-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



Source: VTA, 2017.

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Figure 2-U
Downtown San Jose Station Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

Systems facilities would be located aboveground and underground, as shown on Figures 2-T and 2-U and would include a TPSS, an auxiliary power substation, ventilation facilities, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, some may be aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches, as shown on Figures 2-T and 2-U.

Streetscape improvements would be provided along Santa Clara Street from Market and 4th Streets to San Jose City Hall and San Jose State University in order to create a pedestrian corridor connecting San Jose City Hall and San Jose State University with the Downtown Commercial District. Streetscape improvements would be guided by San Jose's Master Streetscape Plan.

Tunnel Alignment into Diridon Station

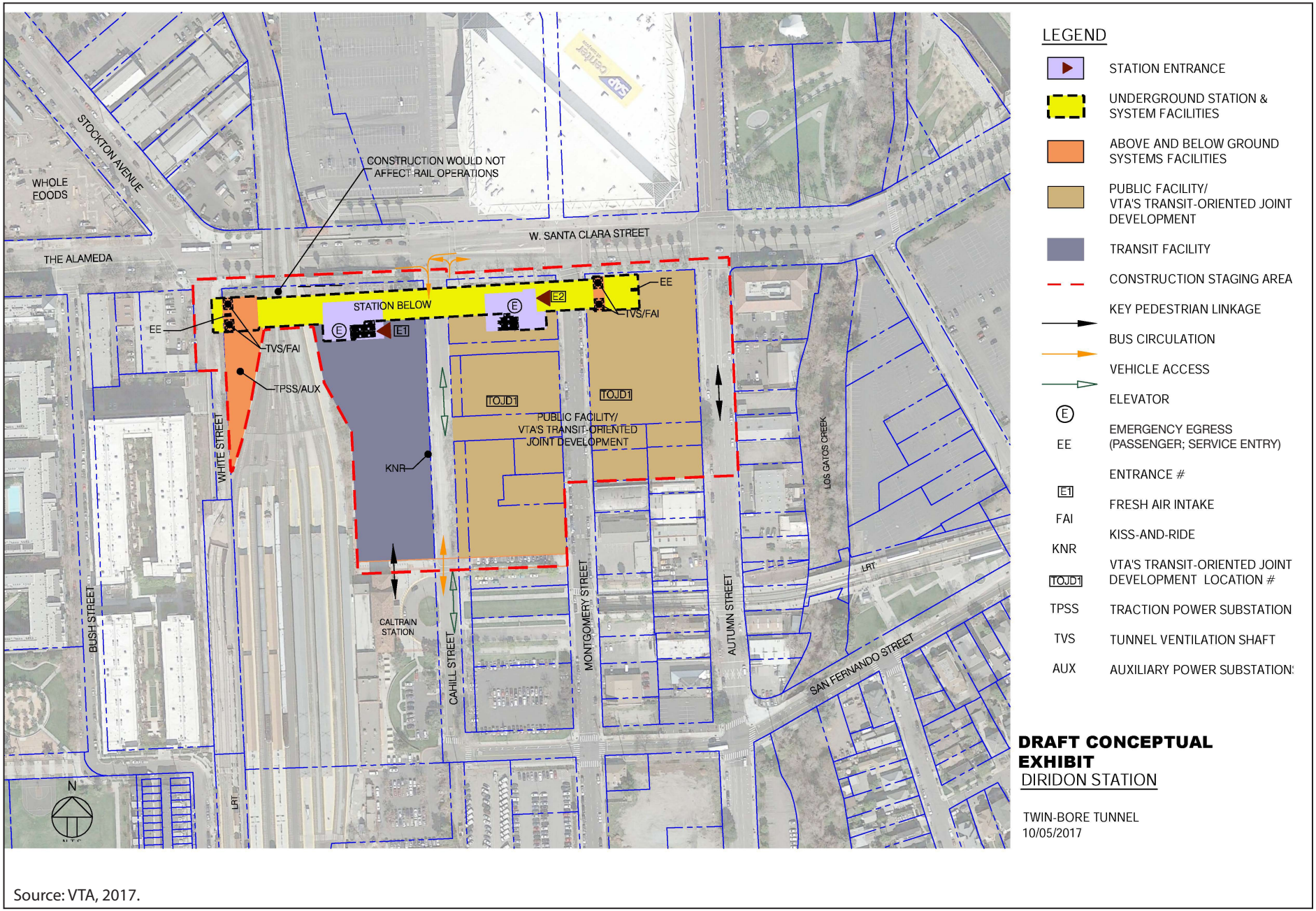
Under the Twin-Bore Option, the alignment would continue beneath Santa Clara Street, then continue approximately 50 feet below the riverbed of the Guadalupe River and 30 feet below the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment would enter Diridon Station between Autumn and Montgomery Streets and directly south of Santa Clara Street.

Under the Single-Bore Option, the alignment would continue and remain beneath Santa Clara Street, and continue 45 feet below the riverbed of the Guadalupe River and 40 feet below the creekbed of Los Gatos Creek. The boarding platforms, within the Single-Bore tunnel, would be located between Montgomery and White Streets.

Diridon Station

For both the Twin-Bore and Single-Bore Options, the Diridon Station would be located between Autumn Street to the east, White Street to the west, Santa Clara Street to the north, and West San Fernando Street to the south, as shown on Figures 2-V and 2-W. Under the Twin-Bore Option, the underground station platforms would be located adjacent to, and just south of, Santa Clara Street. Under the Single-Bore Option, the underground station platforms would be located directly under Santa Clara Street.

The station would consist of a boarding platform level, a concourse level, and entrances at street-level portals. Street-level station entrance portals would provide pedestrian linkages to the Diridon Caltrain Station and SAP Center. Entrances would have elevators, escalators, and stairs covered by canopy structures. The station would have a minimum of two entrances. Under the Single-Bore Option, an underground concourse level would span the two entrances adjacent to the tunnel. Stairs and escalators would be provided at each of the entrances, and elevators would be provided at each station near each end. The location and configuration of station entrances would be finalized during final design based on applicable BART Facilities Standards and ridership projections.



Source: VTA, 2017.

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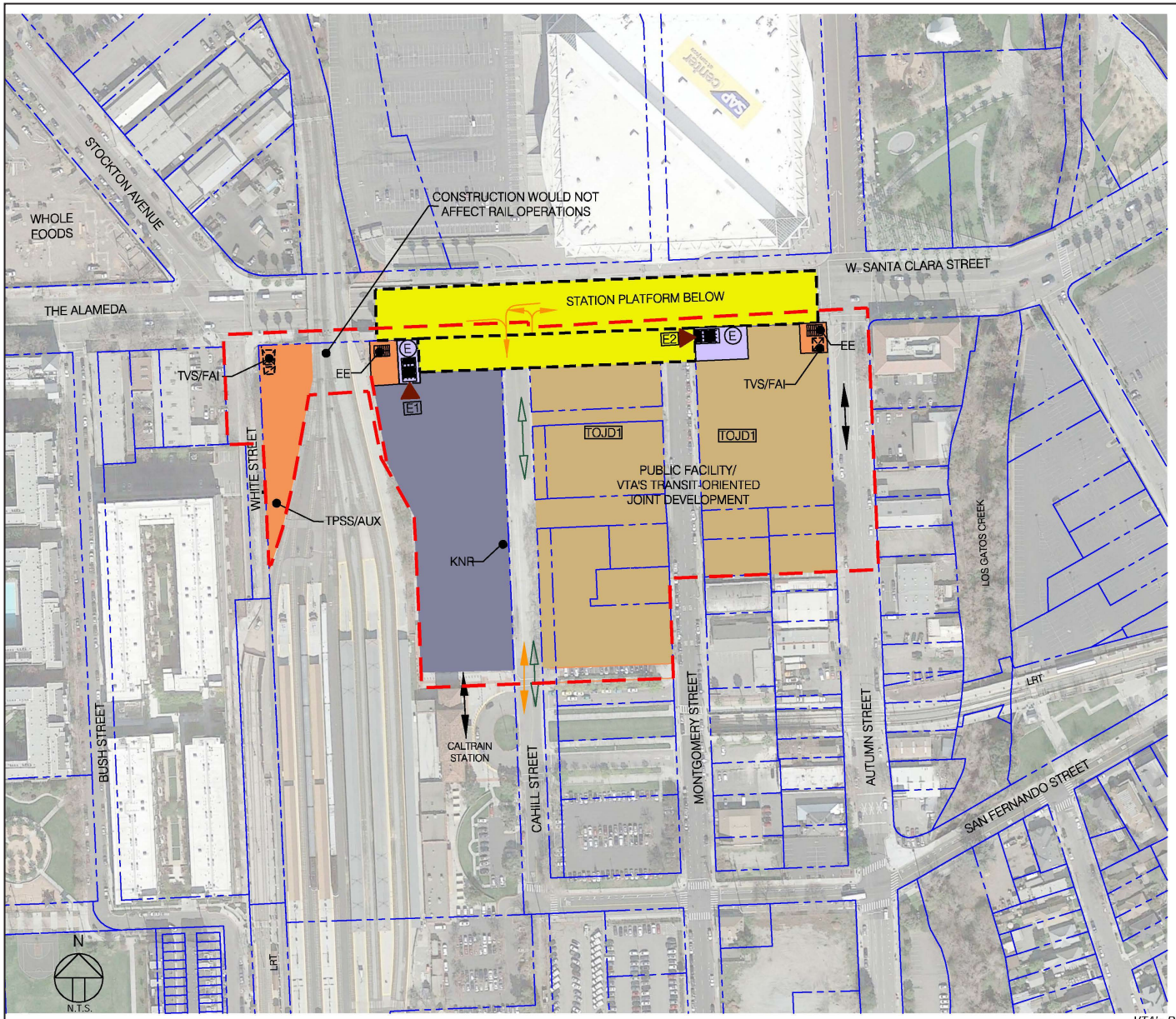
Figure 2-V
Diridon Station Plan (Twin-Bore)
VTA's BART Silicon Valley–Phase II Extension Project



LEGEND

- STATION ENTRANCE
- UNDERGROUND STATION, CONCOURSE, & SYSTEM FACILITIES
- ABOVE AND BELOW GROUND SYSTEMS FACILITIES
- PUBLIC FACILITY/ VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT
- TRANSIT FACILITY
- CONSTRUCTION STAGING AREA
- KEY PEDESTRIAN LINKAGE
- BUS CIRCULATION
- VEHICLE ACCESS
- (E) ELEVATOR
- EE EMERGENCY EGRESS (PASSENGER; SERVICE ENTRY)
- E1 ENTRANCE #
- FAI FRESH AIR INTAKE
- KNR KISS-AND-RIDE
- TOJD1 VTA'S TRANSIT-ORIENTED JOINT DEVELOPMENT LOCATION #
- TPSS TRACTION POWER SUBSTATION
- TVS TUNNEL VENTILATION SHAFT
- AUX AUXILIARY POWER SUBSTATION

DRAFT CONCEPTUAL EXHIBITS

DIRIDON STATION

SINGLE-BORE TUNNEL
10/05/2017

VTA's BART Silicon Valley Phase II Extension Project Final SEIS/SEIR

Graphics ... 00332.13 (1-23-2018)

Source: VTA, 2017.

Figure 2-W
Diridon Station Plan (Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

The existing VTA bus transit center would be reconfigured for better access and circulation to accommodate projected bus and shuttle transfers to and from the BART station. The reconfiguration would be compatible/consistent with the Diridon Transportation Facilities Master Plan's design of the area. Kiss-and-ride facilities would be located along Cahill Street. No PNR parking would be provided.

Systems facilities would be located aboveground and underground, as shown on Figure 2-V for the Twin-Bore Option and Figure 2-8 for the Single-Bore Option and would include a TPSS, an auxiliary power substation, ventilation facilities, associated ventilation shafts, and a TCCR. Under the Twin-Bore and Single-Bore Options, most of these system facilities would be located underground; however, some may be located aboveground. The station would also include emergency exhaust ventilation facilities with ventilation shafts and fresh air intake/exhaust hatches, as shown on Figure 2-V. System facility sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates.

Under the Twin-Bore Option, west of the station, the alignment would continue under White and Bush Streets south of The Alameda. The alignment would then turn towards the north, crossing under The Alameda at Sunol Street and under West Julian Street at Morrison Avenue before aligning under Stockton Avenue (STA 775+00).

Under the Single-Bore Option, west of the station, the alignment would continue under Santa Clara Street/The Alameda. The alignment would then turn towards the north at Wilson Avenue, crossing under Rhodes Court and under West Julian Street before aligning under Stockton Avenue (STA 775 + 00).

Tunnel Alignment along Stockton Avenue

Around Pershing Avenue, the Twin-Bore and Single-Bore Options converge back onto the same alignment under Stockton Avenue, On the east side of Stockton Avenue between Schiele Avenue and West Taylor Street, there are four alternate locations for a systems facility site that would house a tunnel ventilation structure, an auxiliary power substation, and a gap breaker station. Sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. Access to the aboveground systems facilities and parking areas for service vehicles would be restricted by access gates.

The alignment would continue north and cross under the Caltrain tracks then under Hedding Street (STA 802+00 and STA 808+00). The alignment would continue on the east side of the Caltrain tracks and cross under Interstate (I-) 880 before ascending and exiting the West Tunnel Portal near Newhall Street (between STA 829+00 and STA 838+00 depending on the option).

A high-voltage substation, TPSS, and TCCR would be located at a systems facility site above the West Tunnel Portal and near Pacific Gas & Electric Company's (PG&E's) FMC

Substation. A 115-kilovolt (kV) line from PG&E's existing FMC substation would serve the high-voltage substation. There are two alternate routes for this 115-kV line connection. The first would begin at the high-voltage substation, run north to Newhall Street, then east on upgraded poles along Newhall Street, then south on an existing line along Stockton Avenue. The second route would also run north to Newhall Street and then east on upgraded poles along Newhall Street, but a new line would be constructed to traverse the PG&E substation site. The 115-kV line would require approximately 80- to 115-foot-high galvanized tapered tubular steel poles or wood poles spaced approximately every 150 to 300 feet.

Crossover tracks would be located in the retained-cut trench just outside the West Tunnel Portal (between approximately STA 830+00 and STA 840+00 depending on the option). The alignment would then transition to an at-grade configuration (between STA 839+00 and STA 851+00 depending on the option) as it enters the Newhall Maintenance Facility and Santa Clara Station to the north.

City of Santa Clara

The BART Extension Alternative in Santa Clara would consist of the project Maintenance Facility and the Santa Clara Station. The San Jose/Santa Clara boundary is located approximately midway through the Newhall Maintenance Facility.

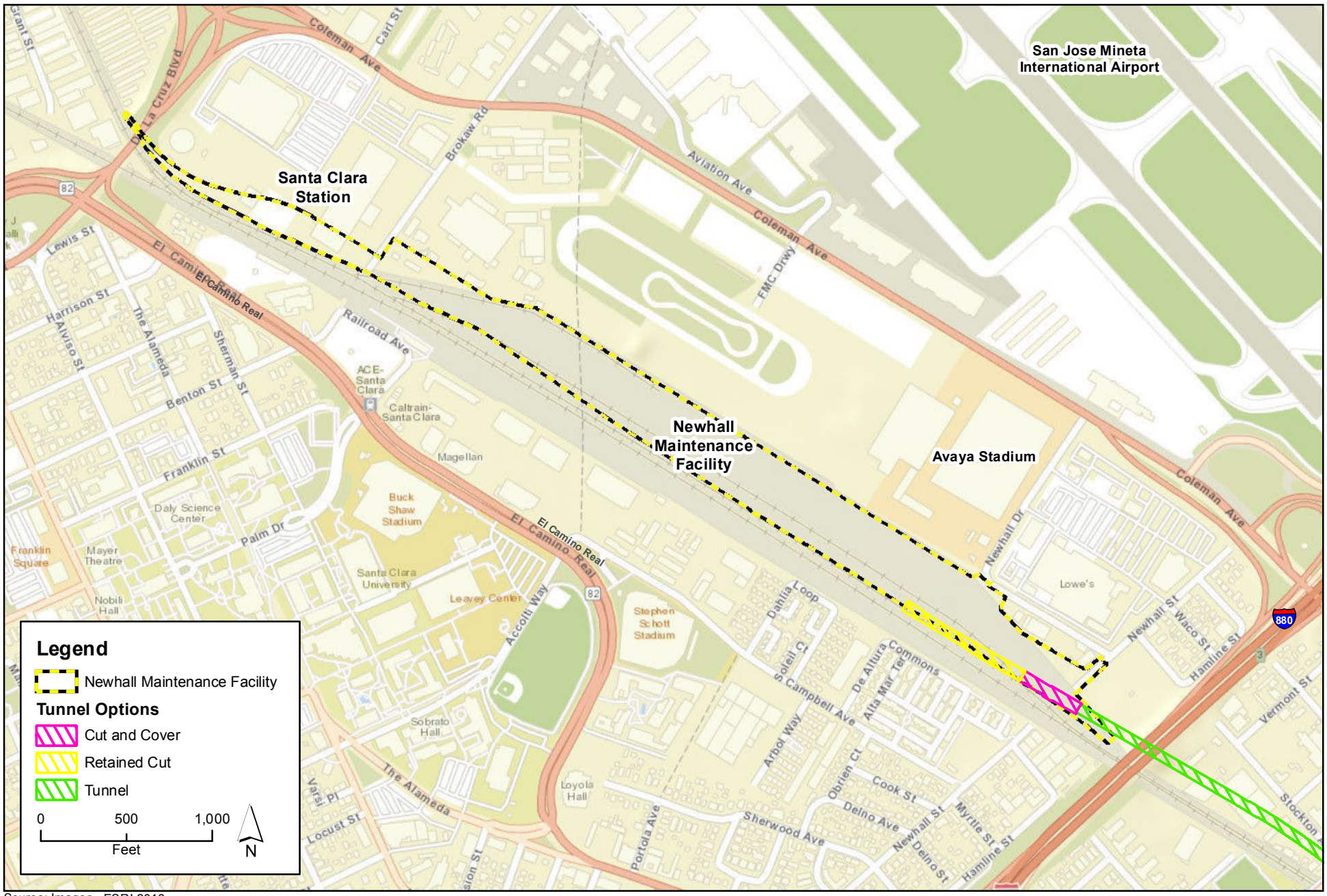
Newhall Maintenance Facility

The Newhall Maintenance Facility is approximately 40 acres and would begin north of the West Tunnel Portal at Newhall Street in San Jose and extend to De La Cruz Boulevard near the Santa Clara Station in Santa Clara, as shown in Figure 2-X.

A single tail track would extend north from the Santa Clara Station and cross under the De La Cruz Boulevard overpass and terminate on the north side of the overpass. A systems facility that includes a radio tower, traction power substation, and auxiliary power substation is located north of Brokaw Road.

The maintenance facility would be constructed on the former Union Pacific Railroad (UPRR) Newhall Yard that was purchased by VTA in 2004 and has been cleared of all structures. The main entrance to the facility would be from Newhall Drive. Other secured entrances would be provided at various locations for employees and emergency personnel. The site would include service roads to all buildings and approximately 225 onsite parking spaces for employees, authorized visitors, and delivery and service vehicles. The layout of the facility is provided in Appendix B.

The maintenance facility would serve two purposes: (1) general maintenance, running repairs, and storage of up to 200 BART revenue vehicles and (2) general maintenance of non-revenue vehicles. The facility would also include maintenance and engineering offices and a yard control tower. To provide for these functions, several buildings and numerous transfer and storage tracks would be constructed.



Source: Imagery, ESRI 2016

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Figure 2-X
Newhall Maintenance Facility
VTA's BART Silicon Valley – Phase II Extension Project

The following systems facilities would be located in the maintenance facility: a TPSS (11,000 square feet and 12 feet high), an auxiliary power substation (3,000 square feet and 12 feet high), two gap breaker stations (one 3,800 square feet and 12 feet high, and the other 3,200 square feet and 12 feet high), and a TCCR (3,300 square feet and 35 feet high).

System facility sites within public view would be surrounded by an approximately 9-foot-high CMU wall, and sites outside of public view would be surrounded by a 9-foot-high fence. The systems site would require two access points with gates and internal parking areas for service vehicles. An approximately 150-foot-high radio tower and an associated equipment shelter would be located within the systems site north of Brokaw Road.

Provisions would be made in the maintenance facility area for storage of maintenance equipment and supplies. Two detention basins, one in each city, would be constructed to retain and provide controlled release of stormwater into the respective city's storm drain systems.

Specific features of the Newhall Maintenance Facility are described below.

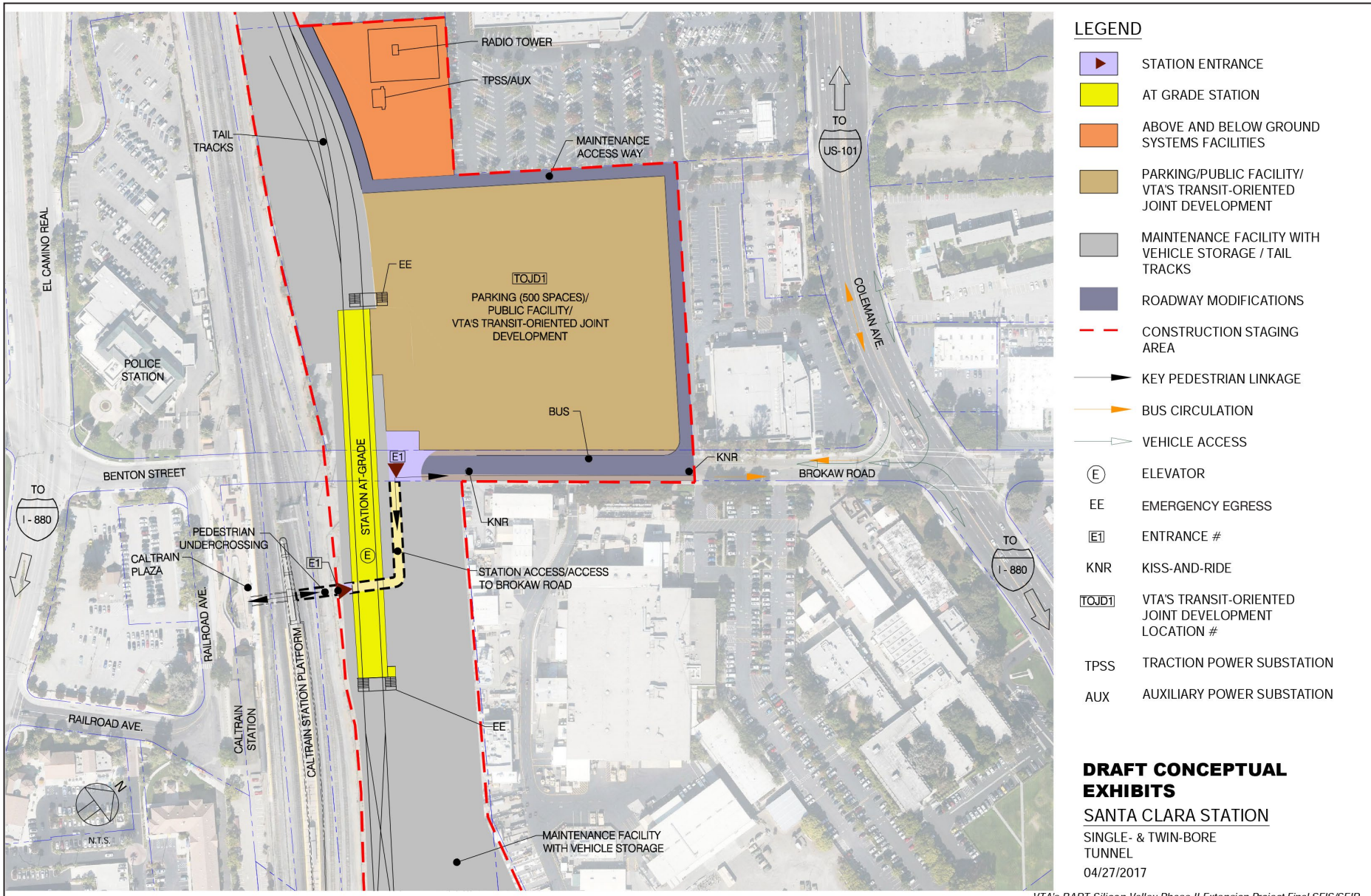
- **Train Car Washer.** The train car washer would be an open-ended building with an automated vehicle washing machine. As each train returns to the yard for storage, it would be driven through the car washer, where the exterior would be cleaned.
- **Yard Control Tower.** The yard control tower would be approximately three stories in height. The tower would be situated to have a view of train operations in the maintenance yard area. Employees staffing the tower would control the majority of train movements within the yard area, while shop area movements would be made under local control.
- **Inspection Pit.** The inspection pit would be enclosed in a shed and open at each end to allow trains to travel over a depressed pit so that the underside of trains could be inspected.
- **Blowdown Facility.** The blowdown facility would be used primarily for cleaning the underside of trains in a combined wet and dry process in preparation for scheduled inspections. The cleaning operation would be performed within a service pit.
- **Wheel Truing Facility.** The wheel truing facility would be located next to the revenue vehicle maintenance shop. The primary function of this facility would be to enclose the wheel truing pit and equipment to facilitate the maintenance and repair of BART vehicle wheel sets.
- **Revenue Vehicle Maintenance Shop.** The revenue vehicle maintenance shop would be approximately 70,000 square feet. Tracks would lead to and through the building. Vehicle car lifts, bridge cranes, and jib cranes would be located within the first floor of the shop. The second floor would be primarily for administration offices. The major functions carried out in the shop would include car inspections and repairs, parts storage, heavy component repairs, electro-mechanical repairs, and electronic repairs.

- **Vehicle Turntable.** The approximately 85-foot-diameter vehicle turntable would be located on a spur track close to the storage tracks. The vehicle turntable would be used for turning cars that must be oriented in the correct direction before they are added to a consist (a group of rail vehicles that make up a train).
- **Non-revenue Vehicle Maintenance Shop and Maintenance and Engineering Offices.** The non-revenue vehicle maintenance facility would be for maintenance of non-revenue service vehicles, such as rubber-tired vehicles, and cars for the maintenance of track and equipment. The facility would contain maintenance bays for rubber-tired vehicles, a service bay with a depressed pit for train maintenance, and a storage area for replacement parts. It would also contain an overhead crane, vehicle hoists, and diagnostic repair equipment.
- **Material Storage Area.** The material storage area would be utilized to store maintenance equipment and stockpile supplies.
- **Train Control House.** The train control house would be a one-story building located within the maintenance facility.
- **Gap Breaker Station.** The maintenance facility gap breaker station would be located adjacent to the train control house.
- **Radio Tower.** An approximately 150-foot-high radio tower and associated equipment shelter would be located near the traction power substation.
- **High-Voltage Substation.** A high-voltage substation and switching station would be located in the north east corner of the maintenance facility.

Santa Clara Station

The closest streets to the Santa Clara Station would be De La Cruz Boulevard to the northwest, Coleman Avenue to the northeast, and Brokaw Road to the east. The station would be at grade, centered at the west end of Brokaw Road, and would contain an at-grade boarding platform with a concourse one level below (Figure 2-Y). Access to the boarding platform would be provided via elevators, escalators, and stairs covered by canopy structures. A pedestrian underpass would connect from the concourse level of the BART station to the Santa Clara Caltrain station. The pedestrian underpass would continue from the station concourse level to a new BART plaza near Brokaw Road. Kiss-and-ride, bus, and shuttle loading areas would be provided on Brokaw Road.

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 campus area and would accommodate 500 BART PNR parking spaces in addition to public facilities on the site. Vehicular access to the parking structure would be provided from Brokaw Road. Pedestrian access from the parking structure to the Santa Clara BART Station would be provided from Brokaw Road to the below-grade BART concourse level.



Source: VTA, 2017.

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Figure 2-Y
Santa Clara Station Plan (Twin-Bore and Single-Bore)
VTA's BART Silicon Valley–Phase II Extension Project

2.A.3 CEQA Recommended Project – BART Extension with TOJD Alternative

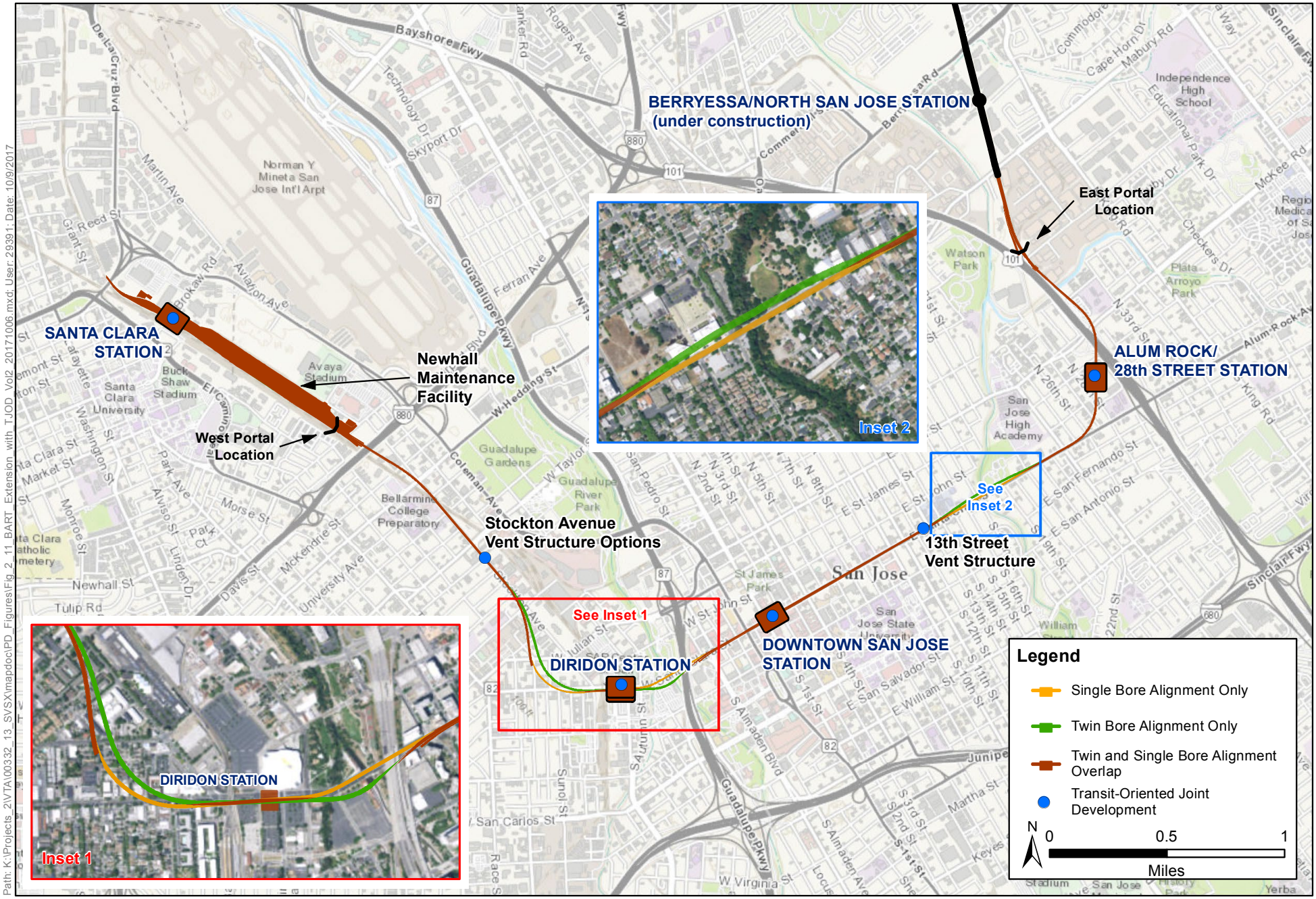
VTA staff recommends that the CEQA BART Extension with TOJD Alternative be selected as the preferred CEQA alternative.

This alternative would consist of the approximately 6-mile extension of the BART system from the Berryessa/North San Jose Station through downtown San Jose terminating in Santa Clara near the Santa Clara Caltrain Station, as described in Section 2.A.2, *NEPA Recommended Project – BART Extension Alternative.* In addition, this alternative has TOJD at each of the four BART stations and TOJD at the two ventilation structures as described below. The alignments, stations, and TOJD locations are depicted on Figure 2-Z.

The TOJD would involve VTA working with a private developer to develop mixed-use developments consistent with California Public Utilities Code Section 100130-100133. The code defines TOJD as a commercial, residential, or mixed-use development that is undertaken in connection with existing, planned, or proposed transit facilities and is located ¼ mile or less from the external boundaries of that facility. However, the design of the stations and structures would not preclude TOJD. A private developer has not been identified at this time.

The proposed TOJD is not included in the NEPA Build Alternative because the TOJD is proposed independent action by VTA and no federal action is involved. The proposed TOJD serves a separate purpose and need than the BART Extension Alternative as described below and has independent utility. It is included as an alternative under CEQA to support local and regional land use planning. The proposed TOJD may be constructed at the same time as the BART Extension Alternative or later in time, dependent on the availability of funding and subject to market forces. However, the design of the stations and structures would not preclude TOJD. No private developer has been identified at this time, and the proposed TOJD by VTA may be subject to refinement once a private developer is identified. Any proposed TOJD by VTA, should the Board decide to implement this alternative, would be separately funded and would not include federal funding. The proposed TOJD by VTA is intended to be consistent with the City of San Jose and City of Santa Clara general plans and approved area plans, as applicable.

For sustainability strategies described for the CEQA Recommended Project – BART Extension with TOJD Alternative, see Volume I, Section 2.2.2.2, *Sustainability Strategies*.



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Source: Station and Track, VTA 2014; Basemap, ESRI 2015

Figure 2-Z

BART Extension and Transit-Oriented Joint Development

VTA's BART Silicon Valley–Phase II Extension Project

2.A.3.1 Planned Development

VTA is planning to construct TOJD (office, retail, and residential land uses) at the four BART stations (Alum Rock/28th Street, Downtown San Jose, Diridon, and Santa Clara), which offers the benefit of encouraging transit ridership. VTA is also planning to construct TOJD at two mid-tunnel ventilation structure locations (the northwest corner of Santa Clara and 13th Streets and east of Stockton Avenue south of Taylor Street). VTA's primary objective for the TOJD is to encourage transit ridership and support land use development patterns that make the most efficient and feasible use of existing infrastructure and public services while promoting a sense of community as envisioned by the San Jose and Santa Clara General Plans and relevant adopted specific plans. VTA's TOJD planned densities at the station sites and at the mid-tunnel ventilation structure locations are provided below and are based on current San Jose and Santa Clara General Plans, approved area plans, the existing groundwater table constraints, and market conditions.

Table 2-F summarizes the land uses at each TOJD location, which are explained in further detail below. The number of parking spaces is based on meeting the Cities of San Jose and Santa Clara parking requirements for residential and commercial land uses. Parking for BART riders is not included in the table nor is shared parking with BART riders.

Table 2-F: VTA Staff Recommended CEQA Project and Parking

Location	Residential (dwelling units)	Retail (square feet)	Office (square feet)	Parking (spaces)	Acres
Alum Rock/28th Street Station	275	20,000	500,000	2,150[a]	11
Santa Clara and 13th Streets Ventilation Structure	N/A	13,000	N/A	N/A	1.18
Downtown San Jose Station	N/A	10,000	35,000	128	0.35
Diridon Station	N/A	72,000	640,000	400	8
Stockton Avenue Ventilation Structure	N/A	15,000	N/A	N/A	1.18–1.7
Santa Clara Station	220	30,000	500,000	2,200[b]	10

[a] Total Parking (BART Extension Alternative + BART Extension with TOJD) at Alum Rock/28th Street Station will be 3,350 spaces.
[b] Total Parking (BART Extension Alternative + BART Extension with + TOJD) at Santa Clara Station will be 2,700 spaces.

City of San Jose

Alum Rock/28th Street Station

TOJD would be located within the station campus and would consist of a maximum of 500,000 square feet of office space with approximately 1,650 parking spaces, 20,000 square feet of retail with 100 parking spaces, and up to 275 dwelling units with approximately 400 parking spaces. The TOJD would range from 4 to 9 stories within the station area identified on the *Alum Rock/28th Street Station Conceptual Site Plan* in Appendix C. Design of the BART parking would be coordinated with the TOJD plans.

Santa Clara and 13th Streets Ventilation Structure

TOJD would be co-located with the ventilation structure at the northwest corner of Santa Clara and 13th Streets. The development would consist of a maximum of 13,000 square feet of ground-level retail along the street frontage facing Santa Clara Street.

Downtown San Jose Station

The TOJD site for the Downtown Station is 0.35 acre and located north of Santa Clara Street, west of 3rd Street. System facilities—including a TPSS, elevator, tunnel ventilation shaft, fresh air intake, exhaust, emergency egress, and an equipment access shaft—would also be located at this site. Because of the high groundwater table, underground parking would be limited to three levels. The TOJD would consist of one level of retail (approximately 10,000 square feet) and two and one-half levels of office (approximately 35,000 square feet). Three levels of underground parking would accommodate approximately 128 spaces (40 spaces for retail uses and 88 spaces for office uses).

Diridon Station

TOJD would be located adjacent to Diridon Station and would consist of a maximum of 640,000 square feet of office space with approximately 400 parking spaces, and 72,000 square feet of retail. The location of the TOJD is shown on the *Diridon Station Conceptual Site Plan* in Appendix C. The TOJD would be approximately eight levels high and would have three levels of underground parking.

Stockton Avenue Ventilation Structure

TOJD would be located on the east side of Stockton Avenue, south of Taylor Street, with the ventilation structure at the rear of the site. The development would consist of a maximum of 15,000 square feet of ground level retail along the street frontage facing Stockton Avenue.

City of Santa Clara

Santa Clara Station

TOJD would be located within the station campus as shown on the *Santa Clara Station Conceptual Site Plan* in Appendix C. The TOJD would consist of a maximum of

500,000 square feet of office space with approximately 1,650 parking spaces, 30,000 square feet of retail with approximately 150 parking spaces, and up to 220 dwelling units with approximately 400 parking spaces. The TOJD would range from 4 to 11 stories and have one level of underground parking. The 400 spaces of parking to accommodate BART PNR demand would be coordinated with the TOJD around the station campus.

2.A.4 Timeline for Future Option Decisions

This section describes future refinements to the design options and construction methodology during engineering phase. All the environmental impacts of these options have been fully addressed and disclosed in this Final SEIS/SEIR. The following timeline addresses Section ES.6, Issues to be Resolved in the Executive Summary. Please also refer to Chapter 10 Agency and Community Participation for additional coordination that has occurred since the release of the Draft SEIS/SEIS for public review.

1. **Selection by the VTA Board of Directors of Tunnel Construction Methodology Option (Twin-Bore versus Single-Bore)**

   In November 2017, VTA and BART jointly engaged a peer review panel consisting of operators of heavy rail subway systems with deep stations in the United States to further review the Single-Bore Option with a focus on operations, maintenance, and safety. The peer review panel included current and retired managers from the Los Angeles Metropolitan Transportation Authority, Washington Metropolitan Area Transit Authority, Metropolitan Atlanta Rapid Transit Authority, New York City Transit, New York Metropolitan Transportation Authority, and San Francisco Municipal Transportation Agency. The 3-day peer review was conducted November 13–15, 2017, in downtown San Jose, CA.

   The key question asked of the peer review panel was: “What are the risks and/or challenges associated with the Single-Bore Option and, can it be operated and maintained safely as an extension of the BART system?”

   The peer review workshop included staff presentations by VTA and BART describing aspects of the Single-Bore and Twin-Bore Options. At the conclusion of the review, the panel provided their opinion that, with some adjustments or variations within the single-bore tunnel to the proposed Single-Bore Option design to address BART’s operational safety concerns, the BART system extension can be operated safely if constructed with the Single-Bore Option. These adjustment or variations primarily involved underground safety features within the tunnel and stations and minor aboveground safety features that would not result in a new adverse effects or significant impacts.

   However, due to timing constraints related to the current federal funding schedule combined with BART’s strong preference for operating what the agency is familiar with, the panel advised at the time of the review that the Twin-Bore Option was the preferred option.

This peer review was conducted to help inform VTA's decision-making process. As such, VTA has taken the recommendations of the peer review panel into consideration, and, as a result, has requested an extension of the New Starts Project Development Phase under the Federal Capital Investment Grant Program from FTA. This additional time will be used to work cooperatively with BART and other stakeholders in establishing agency agreements and completing additional work necessary to select the tunnel option that best meets the needs of VTA, BART, and project stakeholders, while completing the NEPA process and the requirements for the New Starts Project Development Phase.

The decision regarding selection of the preferred tunnel construction methodology will be made when the VTA Board of Directors certifies the Final SEIS/SEIR and approves the project in early 2018 prior to the Record of Decision.

2. **Refine Location for Stockton Avenue Ventilation Structure**

   The decision regarding location of the Stockton Avenue Ventilation Structure will be made during the engineering phase prior to right-of-way acquisition. This decision will be made by VTA after the Record of Decision. All of the environmental impacts associated with the location options have been fully disclosed in the Final SEIS/SEIR.

3. **Refine Underground Entrances Locations**

   The decision regarding location and design of underground entrances at the Alum Rock/28th Street and Downtown San Jose Stations (if the Twin-Bore Option of construction methodology is selected) will be made during the engineering phase prior to right-of-way acquisition and in coordination with the City of San Jose and in consideration of input from public workshops and public involvement. This decision will be made by VTA after the Record of Decision. All of the environmental impacts associated with the entrance location options have been fully disclosed in the Final SEIS/SEIR.

4. **Refine Tunnel-Boring Machine Option (Earth-Pressure-Balanced, Slurry, or Hybrid of the two)**

   After the Record of Decision, the decision regarding the type of tunnel-boring machine will be made by VTA with input from, and the recommendations of, the Contractor selected to perform the tunnel excavation work based on their experience and expertise. All of the environmental impacts associated with the tunnel-boring machine options have been fully disclosed in the Final SEIS/SEIR.

2.5 Required Permits and Approvals

This Draft SEIS/SEIR for the BART Silicon Valley Phase II Extension Project has been prepared in accordance with NEPA, the Council on Environmental Quality regulations implementing NEPA, and CEQA. There are two alternatives evaluated in this document in accordance with NEPA: the No Build Alternative and the BART Extension Alternative. The

BART Extension Alternative consists of a 6-mile BART Extension from the Berryessa/North San Jose Station through downtown San Jose to the Santa Clara Caltrain Station. There are three alternatives evaluated in this document in accordance with CEQA: the No Build Alternative, the BART Extension Alternative, and the BART Extension with TOJD Alternative. The CEQA No Build Alternative is the same as the NEPA No Build Alternative. The CEQA BART Extension Alternative is the same as the NEPA BART Extension Alternative. The CEQA BART Extension with TOJD Alternative consists of the 6-mile BART Extension as described above in addition to TOJD at the four BART stations and retail at the two ventilation structure sites. This document discloses the environmental impacts of all the alternatives listed above and provides mitigation, where feasible, to minimize significant impacts.

VTA is the local project sponsor and CEQA lead agency intending to partially fund and implement the CEQA BART Extension with TOJD Alternative. In November 2001, the VTA and BART District governing boards approved a Comprehensive Agreement regarding the institutional, project implementation, and financial issues related to the SVRTCP. FTA is the federal lead agency for preparation of the EIS, and VTA is the implementing agency. BART is a designated Cooperating Agency on the SEIS and a Responsible Agency on the SEIR. BART will operate and maintain the system consistent with the Comprehensive Agreement. VTA has full responsibility for all capital improvements, operating, and maintenance funding of the BART Extension. While not a component of the NEPA BART Extension Alternative, the TOJD component of the CEQA BART Extension with TOJD Alternative is reviewed as part of the NEPA cumulative impact analysis in Section 7.1, *Cumulative Impacts under NEPA and CEQA*. The TOJD review under CEQA is contained in Chapter 3, *NEPA and CEQA Transportation Operation Analysis*, Chapter 6, *CEQA Alternatives Analysis of Construction and Operation*, and Section 7.1, *Cumulative Impacts under NEPA and CEQA*.

Information provided in this document will enable the public to review, evaluate, and comment on all of the alternatives. This document will also be used by federal, state, regional, and local agencies to assess the environmental impacts of all alternatives on resources under their jurisdiction and to make discretionary decisions. FTA, the State of California, and the San Francisco Bay Area's metropolitan planning organization, MTC, will use this document in deciding whether and how to fund the BART Extension. These and other agencies will use the SEIS/SEIR as the basis for their decisions to issue permits and other approvals necessary to construct the selected alternative.

FTA will use the final version of this document when amending the 2010 Record of Decision (ROD) to formalize the final selection of the preferred NEPA alternative. The ROD is a written public record explaining why an agency has taken a particular course of action. The 2010 ROD determined that the requirements of NEPA were satisfied for Phase I. Pursuant to Public Law 112-141, 126 Stat. 405, Section 13 l 9(b), the FTA can issue a single Final Supplemental Environmental Impact Statement/Record of Decision document unless the FTA determines statutory criteria or practicability considerations preclude issuance of the combined document pursuant to Section 1319. However, ~~F~~for this project, ~~if~~ practicality

considerations preclude the issuance of a combined Final SEIS/ROD; therefore, FTA ~~would~~ will issue a Final Supplemental Environmental Impact Statement followed by an amendment to the Record of Decision~~, as needed~~. ~~When~~ After the amended ROD is issued, VTA would be able to proceed with the engineering phase ~~final design~~, right-of-way acquisition, and construction of the federally funded Phase II BART Extension ~~Phase II~~, subject to federal funding requirements.

A list of permits and approvals required for the BART Extension and TOJD is provided in Table 2-4. This includes working within the ROW of various jurisdictions.

Table 2-4: Required Permits and Approvals (Revised)

Agency	Permits and Approvals
BART Extension Alternative	
Federal Railroad Administration	Coordination regarding common corridor and crossing under Caltrain/UPRR ROW.
Federal Aviation Administration	FAR Part 77 construction height limitations for cranes operating in the Diridon Station area.
Federal Highway Administration	Approval of plans for crossings under U.S. 101 and I-880.
California Department of Transportation	Approval of plans for crossings under U.S. 101, SR 82, SR 87, and I-880. Encroachment permit for any work or traffic control within the state right-of-way.
State Office of Historic Preservation	Approval and execution of Programmatic Agreement and Treatment Plan describing procedures for protection and mitigation of impacts on historic and cultural resources pursuant to Section 106 of the National Historic Preservation Act and Code of Federal Regulations, Title 36, Part 800.
California Public Utilities Commission	Coordination regarding common corridor and responsibility for all safety and security certification of the system.
San Francisco Bay Area Rapid Transit District	Approval of project pursuant to VTA/BART Comprehensive Agreement.
Peninsula Corridor Joint Powers Board (Caltrain)	~~Temporary Encroachment permit for closing easternmost track for construction (Diridon Station Twin-Bore Option only).~~ Encroachment permit for crossing under railroad tracks at Diridon.
State Water Resources Control Board and San Francisco Bay Regional Water Quality Control Board	Approval of Section 402 General Construction Activity National Pollutant Discharge Elimination System Permit for construction phase impacts and project-specific construction compliance measures. Incorporation of Section 402 Phase II Small Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System General Permit project-specific control measures to reduce the discharge of stormwater pollutants to the Maximum Extent Practicable. Waste discharge requirements for discharges of stormwater associated with industrial activities, excluding construction activities (Industrial General Permit) for Newhall Maintenance Facilities.
Bay Area Air Quality Management District	Various permits for operating the Newhall Maintenance Facility.
Santa Clara Valley Water District	Issuance of encroachment permit if construction comes within specified limits of any Santa Clara County stream. Well permits for geotechnical and chemical investigations or groundwater monitoring. Permits for monitoring and dewatering well installations and destructions per District Ordinance 90-1.
City of San Jose	Encroachment permit for construction in the City ROW. Master Cooperative Agreement and Mutual Aid Agreements

Agency	Permits and Approvals
City of Santa Clara	Encroachment permit for construction in the City ROW. Master Cooperative Agreement and Mutual Aid Agreements
Additional Permits and Approvals for BART Extension with TOJD Alternative	
Federal Aviation Administration	FAR Part 77 construction height limitations for cranes and development.
City of San Jose	Responsible Agency in accordance with CEQA. Master Cooperative Agreement and Mutual Aid Agreements General Plan conformance, Historic Preservation Permits, Public Improvement Permits, and Subdivision Map as applicable Approval of rezoning. Site and Architectural Review Issuance of site development, grading, and building permits.
City of Santa Clara	Responsible Agency in accordance with CEQA. Master Cooperative Agreement and Mutual Aid Agreements Approval of rezoning. Site and Architectural Review. Issuance of grading, building, and occupancy permits.
State Water Resources Control Board and San Francisco Regional Water Quality Control Board	Approval of Section 402 General Construction Activity National Pollutant Discharge Elimination System Permit for construction phase impacts and project-specific construction compliance measures. Incorporation of Section 402 Phase II Small Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System General Permit project-specific control measures to reduce the discharge of stormwater pollutants to the Maximum Extent Practicable.

All of the TOJD that would be constructed under the BART Extension with TOJD Alternative at the four BART stations and two ventilation structures is consistent with the ~~land uses identified in the~~ intent of the approved General Plans of the Cities of San Jose and Santa Clara. The TOJD is also consistent with a number of other adopted land use plans including the Diridon Station Area Plan, the San Jose Downtown Strategy 2000 Plan, the Five Wounds and ~~/~~Roosevelt Park Urban Village~~s~~ Plans, and the Santa Clara Station Area Plan. CEQA review for all of these plans previously occurred at a program level with the Cities of San Jose and Santa Clara as CEQA Lead Agencies, as applicable.

In that context, the intent of this document is to provide VTA project-level CEQA clearance for all components of the BART Extension with TOJD Alternative. VTA recognizes that the TOJD is subject to the approvals of the Cities of San Jose and Santa Clara as they have jurisdiction over land use decisions within their respective boundaries. Because VTA has assumed the role of CEQA Lead Agency, the Cities of San Jose and Santa Clara would function as CEQA Responsible Agencies in conjunction with their necessary approvals and actions for the TOJD (e.g., rezonings, site development permits, demolition permits, grading permits, building permits, etc.). This document will be used by the Cities of San Jose and Santa Clara during this process, which may require subsequent environmental analysis to be determined by the Cities of San Jose and Santa Clara.

VTA is leading the Diridon Transportation Facilities Master Plan effort with the cooperation of current and future high speed rail, heavy rail, commuter rail, intercity passenger rail, light rail, express bus, and local/limited bus transit operators, as well as the City of San Jose.

2.B Project Costs

The BART Extension project costs include both capital costs and operating and maintenance costs. The current estimated capital cost of the BART Extension is $4.9 billion in year of expenditure (this includes an estimated additional $90 million for a Single-Bore versus Twin-Bore tunneling methodology option), excluding unallocated BART Extension contingencies and potential borrowing costs. Contingencies are set asides for unanticipated cost increase during final engineering and construction. However, the current estimated capital cost does include allocated contingencies to cover uncertainties associated with each of the major design and construction activities required to implement the BART Extension. Borrowing costs would be incurred if VTA decides to bond against multi-year revenues available to VTA for the BART Extension, but not received until after 2025. The overall net increase in operating and maintenance costs either directly or indirectly subsidized by VTA with the BART Extension is approximately $40.5 million in the 2035 Forecast Year in year of expenditure dollars.

There are a variety of federal, state and local funding sources for the BART Extension. Capital costs would be funded by the Federal Section 5309 New Starts Program, the State Transit and Intercity Rail Capital Program, the State Traffic Congestion Relief Program (Expanded), and VTA Local Sales Taxes (2000 Measure A and 2016 Measure B). The Comprehensive Agreement between VTA and BART identifies VTA as responsible for all operating and maintenance costs for the Phase I and Phase II BART Extension into Santa Clara County. On November 4, 2008, Santa Clara voters approved Measure B to add a 1/8-cent increment to the local sales tax, dedicated solely to the operation, maintenance, and infrastructure renewal costs of BART extensions into Santa Clara County. Effective March 2012, the tax continues to 2042. This tax is projected to generate sufficient revenue to fully cover the annual payments VTA would make to the BART District beginning in 2018 for the Phase I Extension and in 2025/2026 for the Phase II Extension.

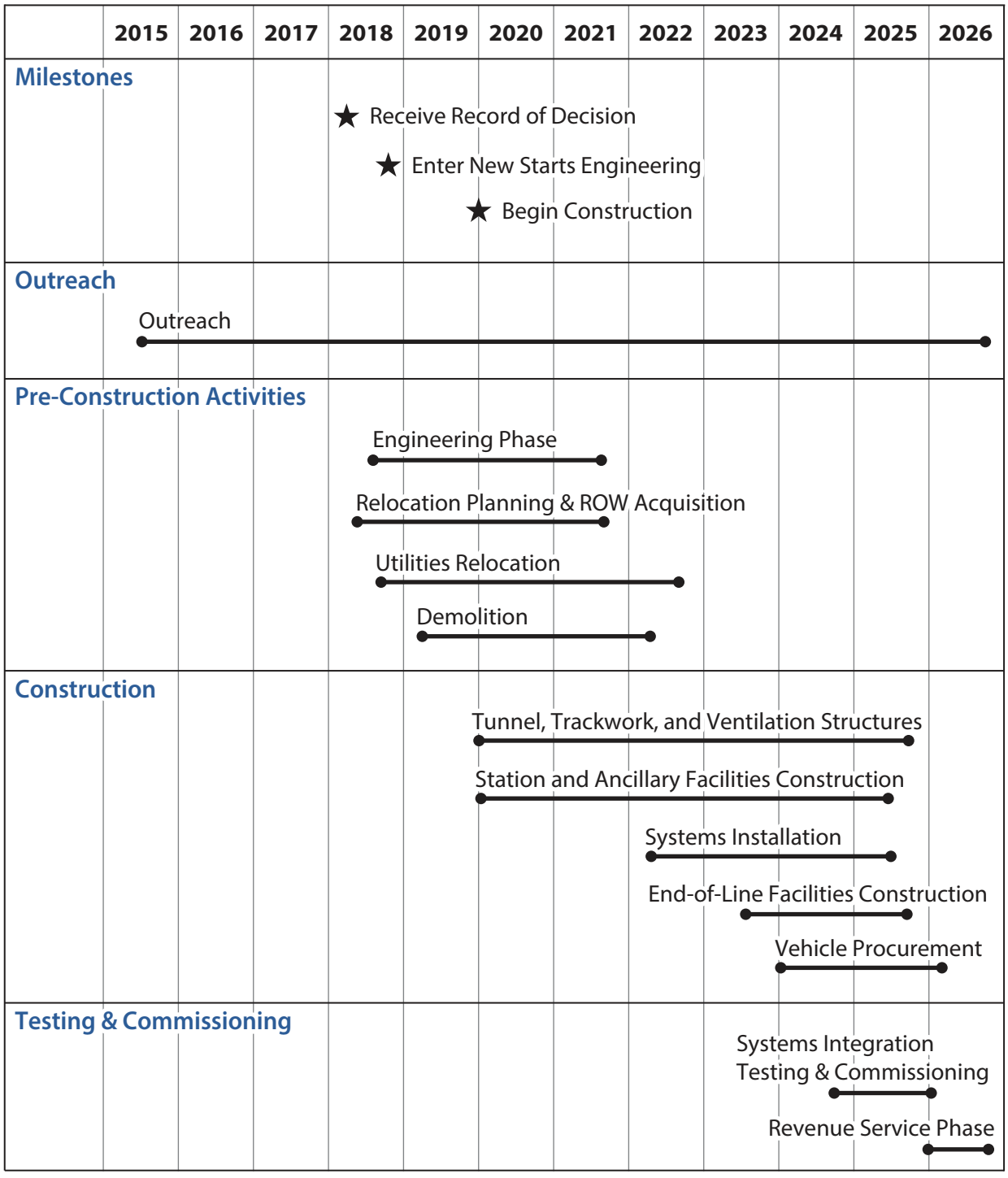
Providing a cost for the TOJD would be speculative at this time as it would depend on when the TOJDs are constructed and the cost of construction at the time.

2.6 Construction Schedule

~~With~~ If all of the permits and approvals secured in a timely manner, construction of the BART Extension is ~~still~~ projected to take at least 8 years. With preconstruction activities beginning in 2018, revenue service would begin in late 2025 or 2026 as shown on Figure 2-AA. ~~Chapter 5, *NEPA Alternatives Analysis of Construction*, provides a discussion of~~

~~construction activities and durations for the various activities. Figure 5-1, *Construction Schedule*, provides an overview of the construction timelines.~~

The TOJD associated with the CEQA BART Extension with TOJD Alternative may be constructed at the same time as the BART Extension Alternative (see Figure 2-AA) or later in time, dependent on the availability of funding and subject to market forces.



Source: VTA, 2017.

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Figure 2-AA
Construction Schedule
VTA's BART Silicon Valley–Phase II Extension Project

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