CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Jim Ortbal
Kim Walesh

SUBJECT: **BART PHASE II CITY PRIORITIES AND PREFERRED ALTERNATIVES**

DATE: September 7, 2017

Approved D.DSyL Date 9/8/17

COUNCIL DISTRICT: 3, 4 & 6

RECOMMENDATION

Adopt the following City of San José priorities and locally preferred alternatives for the BART Phase II project, as guidance to the City's VTA Board members in determining the final project description, completion of environmental clearance, and initiation of final design:

a. Support the West Station Option for the Downtown Station location
b. Support the North Station Option for the Diridon San José Central Station location
c. Support continued efforts by VTA, with the collaboration and support of BART, to determine a way to enable the Single Bore Tunnel method to be used in construction of the subway tunnel under Downtown San Jose to partially mitigate the significant construction impacts associated with Twin Bore, cut and cover construction methods
d. Emphasize the need for VTA to continue detailed levels of coordination with the City of San Jose on station access planning, integration with surrounding urban areas, and final station design to ensure that the stations and station areas appropriately represent San Jose.
e. Establish as a priority the effective integration of the BART project, station location, and portal entrances into the Diridon San José Central Station planning and area development
f. Emphasize the importance for VTA to develop an extensive Construction Outreach and Management Program (COMP).

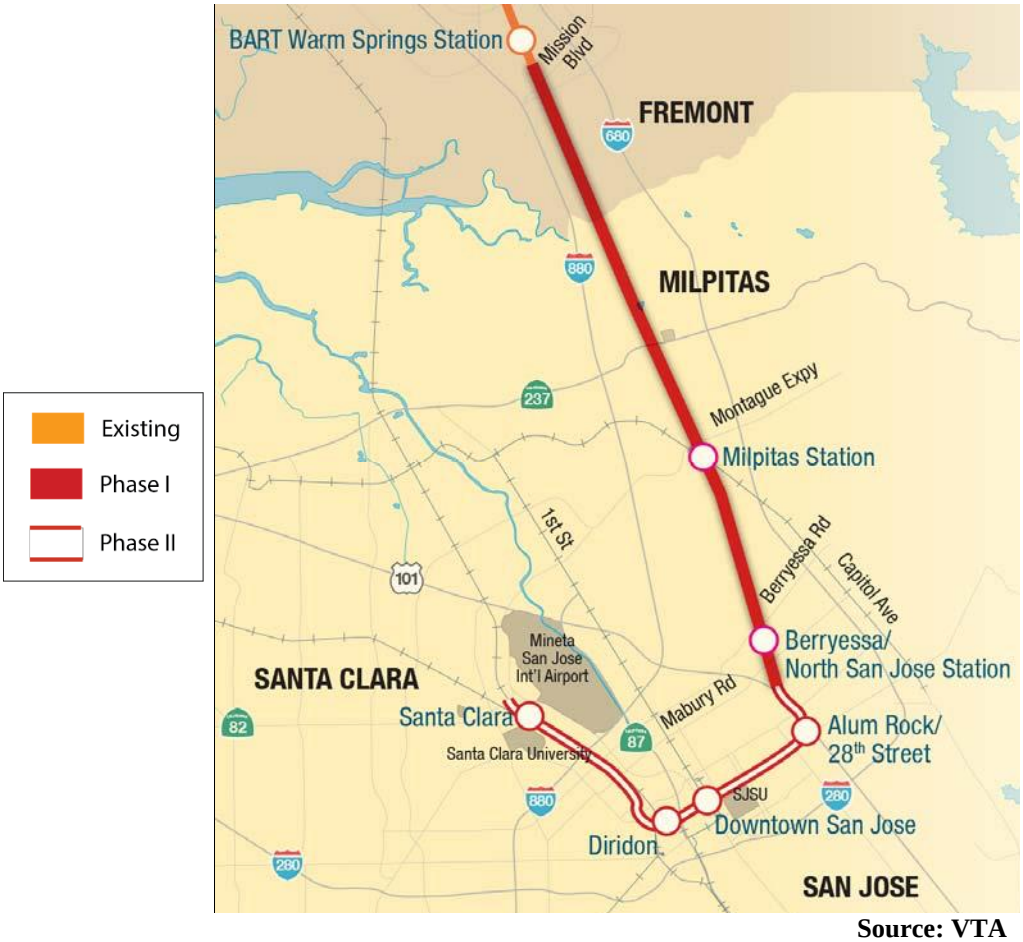
OUTCOME

To establish the City of San José's priorities and locally preferred alternatives for the BART Phase II project and provide guidance to the City Council's five appointed representatives to the VTA Board of Directors to effectively represent the City interests as the VTA selects a preferred alternative to include in the Final Environmental Impact Report/Statement at the VTA Board Meeting on October 5, 2017.

BACKGROUND

The VTA's BART Silicon Valley Extension is a planned 16-mile, six-station extension of the existing 104-mile Bay Area Rapid Transit (BART) system into San José and Silicon Valley. The project will bring travelers into San José and Silicon Valley with convenient connections to numerous transit systems, including commuter rail, light rail and bus services that serve major employment districts, residential areas, and other City and regional destinations. Figure 1 below depicts a map of the 16-mile, two phase extension.

Figure 1 – Phase I and Phase II BART Extensions



Source: VTA

BART Phase I, the Berryessa Extension, is a 10-mile, two-station extension south from the Warm Springs Station in Fremont, through Milpitas and to the Berryessa/North San José Station. Phase I construction is nearing completion, systems testing is underway, with an anticipated opening for revenue service by June 2018.

BART Phase II is a 6-mile extension from the Phase I terminus at the Berryessa/North San José station to the City of Santa Clara, including a 5-mile long subway tunnel under Downtown San

José. Four stations are planned for Phase II: 28th Street (Alum Rock), Downtown San José, Diridon Station, and the City of Santa Clara.

The estimated cost of the Phase II project is approximately $4.7 billion, and the funding plan includes a mix of local (2000 Measure A & 2016 Measure B), State (Cap & Trade, TCRP), and Federal (Federal Transit Administration (FTA) New Starts) funds.

Table 1 – Targeted Revenue Sources to Fund $4.7 Billion BART Phase II Extension

Funding Status	Source	Revenue Target
Expended	Measure A Sales Tax & State TCRP	$160 Million
Projected	2000 Measure A Sales Tax	$1 Billion
Projected	2016 Measure B Sales Tax	$1.5 Billion
Projected	Transit and Intercity Rail Capital Program	$750 Million[1]
Projected	FTA New Starts	$1.5 Billion
Total		**$4.91 Billion[2]**

Source: VTA

Current Status of the BART Phase II Project

BART Phase II is currently in the environmental review stage. The VTA issued the Draft Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report and Draft Section 4(f) Evaluation in December 2016. City staff submitted a formal comment letter in March 2017, with a focus on the following items:

- Diridon San José Central Station Access and Parking
- Construction Impact Mitigation Measures
- Transit-Oriented Joint Development (TOJD)
- Compatibility with historic buildings adjacent to and in the vicinity of the construction work for the BART Phase II project.
- City's preferences on BART construction methods and station locations would be forthcoming in advance of VTA Board action in October 2017.

After receiving the City's comment letter, the respective staffs of each agency have been working collaboratively to mutually understand and address the City's comments. VTA will provide formal responses in the Final EIR/EIS. In addition, VTA and their consultants, and City staff, have been coordinating on various project alternatives (e.g. tunnel construction method - Single or Twin Bore, working to identify and resolve potential project impacts, and planning access to the new stations and future transit-oriented development).

[1] VTA is targeting $750 million in State Cap & Trade funding through the Transit & Intercity Rail Capital Program. This program is competitive and any allocation awarded to VTA could be less than the targeted amount.
[2] The amount included in the funding strategy assumes a level of additional contingency resulting from the future risk assessment results.

VTA plans to schedule VTA Board consideration of a Final EIR/EIS in January 2018. The project is in the "Project Development" phase of the Federal Transit Administration (FTA) New Starts grant program process, and is on schedule to receive an environmental Record of Decision by Spring 2018. The project would then move into the New Starts engineering phase with the goal of receiving a Full Funding Grant Agreement (FFGA) from the FTA in 2019. Pre-construction work, such as boring or utility relocations, could begin as early as 2019, with the goal to complete the project and open for revenue service in 2026.

ANALYSIS

The analysis section of this report is organized into the following sections:

A. BART Station Characteristics, Locations, and Options in San José
B. BART Project Integration with Diridon San José Central Station Planning
C. Subway Tunnel and Station Construction Methods
D. Public Safety Planning and Design
E. Future Construction Planning and Impact Mitigation

A. BART Station Characteristics, Locations, and Options in San José

This section of the report describes the general station characteristics, location options, and future station access design considerations. For the Downtown San José and Diridon San José Central Station, the station location options studied in the formal environmental process are evaluated and a recommendation of the City's preferred location is provided.

BART stations include the following system elements: entrance portals, vertical circulation elements (escalators, stairs, and elevators), fare gates and ticketing machines, train platforms, power systems, emergency evacuation systems, and retail facilities in some stations. The actual design of each station would differ based on whether a Single Bore or Twin Bore tunnel and station construction method is used. Each station would include a minimum of two entrances, but may include more, depending upon expected ridership and peak demands.

Future Station Access and Design Considerations

Stations are key gateways to a City and should be designed as great and welcoming places. As environmental clearance is completed, and over the next 18 to 24 months, VTA and BART will engage in the final design of stations. The future design and location of the BART entrances and exits, whether on City street right-of-way or integrated into future transit-oriented development, will need the active participation of the City. As the owner of the street right-of-way and the lead agency for land development in San José, the City needs to be an equal partner with VTA and BART in developing the location, orientation, and design of BART entrances and exits at all three station sites. Coordinating City and VTA access planning with the design of BART access facilities will ensure the stations are

optimally integrated with the broader transportation and development initiatives in the City. Several station access design matters of special importance to the City include:

- Entrances and wayfinding that allow passengers to enter/exit in continuous directions to existing destinations and future development.
- Establish station access planning areas (approximately ¼ to ½ mile radius) around station entrances/exits.
- Design compatibility of new stations and ancillary structures with existing historic buildings.
- Ensure community participation as one of the key inputs into station design.

Figure 2 below depicts the three future San José stations included in BART Phase II:

1. 28th Street (Alum Rock) Station
2. Downtown San José Station (West and East Options)
3. Diridon San José Central Station (North and South Options).

Figure 2 – Phase II Extension Station Locations and Options

Source: VTA

1. 28th Street (Alum Rock) Station

The community around the 28th Street (Alum Rock) Station and the City have proactively planned for the opportunities created by a BART station. These plans include the Five Wounds Urban Village Plan and the Five Wounds/Brookwood Terrace BART Station Area Community Concept Plan. The adopted Five Wounds Urban Village Plan calls for the 28th Street Station to be the center of a new public plaza and mixed-use, transit-oriented development (TOD). The Five Wounds Plan also envisions a new pedestrian and bicycle trail connecting residential neighborhoods located to the north and south, while the East Santa Clara Street/Alum Rock Avenue corridor connects points from the east and west.

a. Location 28th Street

There is only one proposed location for the 28th Street Station (previously referred to as the Alum Rock Station). The 28th Street Station will run south from East St. James and 30th Streets to 28th Street just north of Five Wounds Lane (Attachment 1 conceptually depicts the station, platform, potential entrances, and other station equipment and facilities). For both the Single Bore and Twin Bore designs, two entrances would be located off-street: within the block at 28th Street north of Five Wounds Lane and centered in the block just south of East St. James Street.

b. 28th Street Station Access Recommendations

Staff recommendations for access listed below are based on the extensive community planning efforts mentioned above. Staff recommends that the City request that VTA and BART consider:

- Locating the southern entrance on 28th Street as close to the corner with Five Wounds Lane as possible. This will maximize visibility and pedestrian connections to East Santa Clara Street and Bus Rapid Transit.
- Re-orienting both entrances to face south, towards East Santa Clara Street and the new public plaza respectively. For Single Bore, this requires shifting the concourse to the south side of the tunnel.
- Relocating or adding a permanent Bus Rapid Transit (BRT) station at 28th and East Santa Clara Street to improve connectivity to the BART station.
- Rebuilding 28th Street to City Complete Street Standards including the section of Five Wounds Trail from East Santa Clara Street to Julian Street.

2. Downtown San José Station

Downtown is the economic, and cultural center of San José and the focus for a significant amount of future employment, housing, and visitor growth. As such, the best option in terms of station location is evaluated by determining how both the core Downtown area

and the BART system can mutually support and reinforce the success of each other. The information below describes the specific locations of the West and East station options under both the Single Bore and Twin Bore construction methods.

a. Location - West Option

The West Station Option would be located under Santa Clara Street between Market Street and 3rd Street (Attachment 2 conceptually depicts the station, platform, potential entrances, and other station equipment and facilities). Under the Single Bore design, potential entrances would be located on the north side of Santa Clara Street (on the VTA-owned block between Market and 1st Streets) and between 1st and 2nd Streets. Under the Twin Bore design, potential entrances would be located along Santa Clara Street at Market Street, on the VTA Block, in Fountain Alley, at 2nd Street, between 2nd and 3rd Streets, and on 3rd Street.

b. Location – East Option

The East Station Option would be located under Santa Clara Street between 3rd Street and 7th Street (Attachment 3 conceptually depicts the station, platform, potential entrances, and other station equipment and facilities). Under the Single Bore design, potential entrances would be located off-street on the south side of Santa Clara Street in the City Hall Plaza at the corner of 4th Street and the southeast corner of 6th and Santa Clara Street. Under the Twin Bore design, potential entrances would be in the sidewalk along Santa Clara Street between 2nd and 3rd, 4th Streets, and between 6th and 7th Streets.

Staff Recommends the West Station Location

The West Station location is recommended as the City's preferred Downtown Station location for the following reasons:

- *Better Supports Future Urban Development in the Downtown Core* – The area within a five-minute walk of the West location is zoned to accommodate 64% more square-feet of future development, and within ten-minute walk 27% more square feet of future development, compared to the East location. High intensity employment areas are the most effective drivers of transit ridership. Approximately one-third of the ten-minute walk watershed of the East station location contains low density residential neighborhoods with limited opportunities for dense transit supportive development in the future.
- *Supports Greater Current Land Use Density (Jobs and Housing)* – The entire core of Downtown San José, with the highest land use densities, is contained within a ten-minute walk of the West station location. The West Station location includes the most direct access to the main visitor district—the hotels, museums, and event/entertainment sites near Cesar Chavez Plaza and the Convention Center.

- *Greater Transit Connectivity* – The West station location has direct or closer connections to VTA Light Rail and Bus Transit in the Downtown Transit Mall (at 1st & 2nd Streets) than the East station location. Convenient connections are key when making trips involving multiple transit systems.
- *Placemaking* – Reinforces the central area of Downtown, between Almaden Boulevard and 4th Street, as the core of Downtown. VTA ownership of the block north of Santa Clara between Market and 1st Streets creates a prime transit oriented development site.
- *Preferences Employee Users* – Research shows that locating regional rail service closest to workplaces maximizes ridership.
- *Community and Stakeholder Support* – Supported by the San José Downtown Association, SPUR San José, and Horace Mann Elementary School.

Attachment 4 compares the two Downtown station options.

Downtown Station Access Recommendations

The Downtown San José station is projected to be the highest ridership station along the BART Phase II extension with an estimated weekday ridership in 2035 of more than 24,000, compared to a lower range at the other Phase II stations (e.g. 10,300 at 28th St. and 7,871 at Santa Clara). Staff recommends that the City communicate the following expectations to VTA and BART:

- Constructing sufficient station entrances to serve the diversity of Downtown destinations including commercial office buildings west of Market Street, the intermodal connections to light rail and bus transit on 1st and 2nd Streets, City Hall, and San José State University (SJSU).
  - If Single Bore, consider an entrance at the corner of 3rd and Santa Clara Streets.
  - If Twin Bore, consider entrances at the corners of Market, 2nd and 3rd Streets in addition to the VTA block.
  - Work with the City and SJSU staff to make the walking environment between the BART entrances and SJSU intuitive, active, and safe.
- Proactive and collaborative process where VTA, BART, and the City of San José work together as equal partners to further refine the precise locations, orientation, and design of the BART station entrances.
- Rebuild the Downtown and City Hall Bus Rapid Transit (BRT) stops as full, permanent stations.

3. Diridon San José Central Station

By 2030, Diridon San José Central Station will be the Bay Area's most important intermodal hub, a place where more high-capacity transit services converge than anyplace

else in Northern California – creating a key node in California's rapidly expanding statewide rail network. The station must fulfill a prominent role as a major statewide and regional transportation facility and a desirable destination that shapes Downtown San José's character.

b. Location - North Option

The North Station Option would be located under Santa Clara Street between White Street and Autumn Street (Attachment 5 conceptually depicts the station, platform, potential entrances, and other station equipment and facilities). Under the Single Bore design, two potential entrances would be located south of and directly adjacent to Santa Clara Street just east of the Caltrain tracks (closest Station connection to the Diridon Station) and at the southeast corner of Montgomery and Santa Clara Streets. Under the Twin Bore design, potential entrances would also be located south of and directly adjacent to Santa Clara Street a little further to the east of the Caltrain tracks and at the southwest corner of Montgomery and Santa Clara Streets.

c. Location – South Option

The South Station Option would run diagonally to the southwest between Santa Clara Street and the Vasona Light Rail Line (Attachment 6 conceptually depicts the station, platform, potential entrances, and other station equipment and facilities). The midblock location would be about 260 to 360 feet south of Santa Clara Street. Under the Single Bore design, potential entrances would be located about 200 feet north of the Caltrain station and off-street to the west of Autumn Street. Under the Twin Bore design, potential entrances would be located directly north of the Caltrain station main entrance and off-street to the west of Autumn Street.

Staff Recommends the North Station Location

The North Station location is recommended as the City's preferred Diridon San José Central Station location for the following reasons:

Facilitates Integrated Development of the Diridon Station Area Central Zone – A 2016 report by Strategic Economics concluded that the North Station location would optimize the opportunity to masterplan and develop the entire core area in the front of the station, including attractive public spaces. Staff believes that the North Station location provides the best opportunity to maximize the development potential and placemaking opportunity.

Avoids Conflicts between BART Alignment and Trammel Crow Planned Development – The below grade infrastructure in the Trammel Crow planned development would require the BART tunnel to be lowered to a greater depth to create sufficient

separation. If the North Station is selected, conflicts with the Trammel Crow planned development are avoided.

Attachment 7 compares the two Diridon San José Central station options.

Diridon San José Central Station Access Recommendations

BART will be the highest ridership transit system at Diridon San José Central Station. Locating the BART platforms at the north location begins to shift the center of gravity of Diridon San José Central Station towards Santa Clara Street. By doing so, the other rail services at Diridon should consider orienting their platforms and provide platform entrances to a new shared concourse towards Santa Clara Street at the north end of the current station. A shared concourse would provide convenient connections among the various rail systems. This first step towards laying the tracks and foundations of a new Diridon San José Central Station reinforces the need for a complete collaborative approach among the City, VTA, High Speed Rail, Caltrain, and property owners in the Diridon area to reach the full potential of the Diridon San José Central Station and surrounding Station Area development. The City requests that VTA and BART commit to:

- Bringing the future BART station design work at Diridon into an integrated design process for all transit facilities at Diridon San José Central.
- Determining the final design of portal locations and entrances as a result of the integrated Diridon San José Central design process.

Ultimately, BART is an essential component of the greater whole at Diridon San José Central Station. Currently five public agencies and multiple developers are planning or advancing projects through the Diridon Station or Central Zone in a manner that is coordinated but not 100% integrated. As discussed in the following section of this report, the agencies recognize the need to transition project planning and design from a coordinated approach to a fully integrated systems approach.

B. BART Project Integration with Diridon San José Central Station Planning

As discussed at the City Council Study Session on March 30, 2017, Diridon San José Central Station will become Northern California's most important intermodal transit hub with future BART and High Speed Rail, joining a diverse range of existing transit services including Caltrain, Amtrak Capitol Corridor, Altamont Corridor Express, VTA Light Rail and Bus Transit, and other transportation services. Attachment 8 depicts the preliminary projected transit passenger levels and transfers between systems in 2040, illustrating the significant ridership anticipated and the predominant transfer activity among the different transit systems.

Additionally, Google has entered into an exclusive negotiations agreement with the City to acquire public property and is contemplating the development of approximately eight million square feet of office and commercial space adjacent to the station that could make the Diridon station area a preeminent transit-accessible destination in Silicon Valley and the Bay Area. New transportation services and urban development will enhance Downtown San Jose, adding vitality from tens of thousands of new employees, doubling Downtown office capacity, and providing an opportunity to connect the Downtown core to Diridon Station.

In July 2017, following a study trip of central city train stations in the Netherlands and France funded by the Knight Foundation and organized by SPUR, officials from the Diridon public agency partners (City, VTA, BART, Caltrain, and High Speed Rail) developed a consensus that there is an urgent need for a "fresh and focused" approach to realize the full potential of Diridon and to effectively integrate the complex set of the planned projects to maximize this once-in-a century opportunity. In particular, the Diridon partners recognize the need to:

1. Align on a bold, collective, and unconstrained vision for the Station and Area.
2. Plan and design the new intermodal station from the rail platforms out. Effective station planning starts with the rail alignments and infrastructure so that the functionality of the station facility, rail systems, and passenger convenience is optimized. The rail alignments and rail/track infrastructure are a significant, defining investment and will not change for the next century. The rail alignments and station need to be considered in relation to the contribution they make to the effective, high quality urban design of the area.

As part of this fresh approach, the Diridon partners are focusing on the following activities:

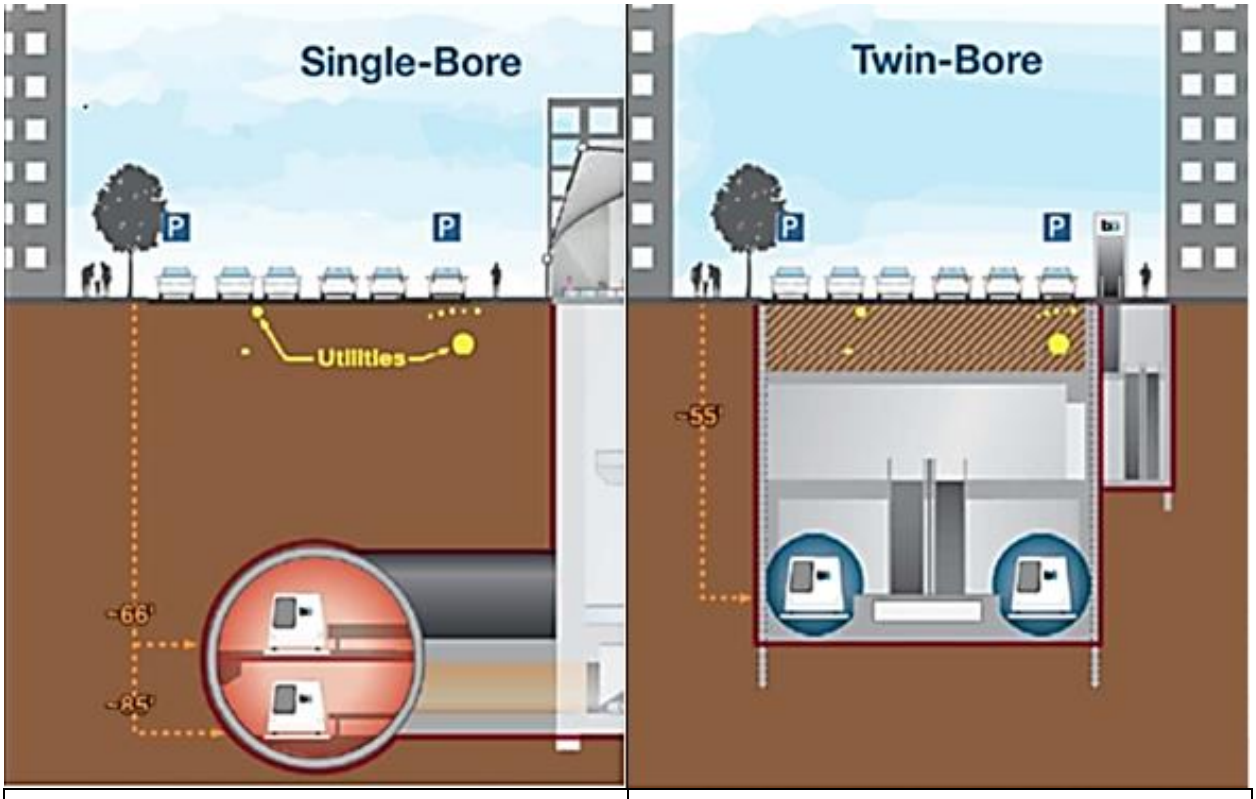
- Working to clarify and agree upon a bolder, more refined vision that all partners are fully committed to achieving.
- Infusing international experience in all aspects of station development from visioning, partnership development, and project implementation, to sequencing activities.
- Developing a more collaborative, integrated approach for the alignment of the rail and transit systems intersecting at Diridon, working together in the best possible way.
- At the right time, bringing property owners in the Diridon area into the planning process in an appropriate way, recognizing that station and rail planning influence the urban environment, its function and form.
- Hiring dedicated, experienced project management to guide the partnership work.

C. Subway Tunnel and Station Construction Methods

As part of the restart of the environmental process for the Phase II extension, VTA explored new and innovative tunnel construction methods. Attachment 9 depicts a modern tunnel boring machine used to construct subway tunnels. Since much of the original design plans for the Phase II extension were developed back in 2008, there have been advancements in the tunneling technology that provided an opportunity to examine both the new Single Bore method and re-evaluate the Twin Bore method. VTA has extensively examined both tunnel construction methods to support the consideration of the most appropriate method to match the conditions and circumstances for BART Phase II and Downtown San Jose that would address construction impacts, passenger experience, and operations and maintenance.

VTA, along with BART, are examining two potential methods for construction of tunnels through San José: Single Bore and Twin Bore as depicted below in Figure 3.

Figure 3 – Single Bore and Twin Bore Schematic Station Comparison



• One 45 ft. diameter tunnel • Two side platforms – 15.5 ft. wide • Platform depths: 66 – 85 ft. • Ticketing at ground level	• Two 20 ft. diameter tunnels • One center platform – 28 ft. wide • Platform depth – 55 ft. • Concourse level for ticketing

Source: VTA

Single Bore Tunnel Method – The Single Bore method uses one large diameter tunnel that encompasses two tracks – one above the other or side-by-side. This allows station construction excavation to be limited to the station portals (stairs, escalators, and elevators) as access to the platforms can occur horizontally from the portal versus from above through cut and cover. Under Single Bore construction, the tunnel would be under Santa Clara Street, while excavation for station entrances would be limited to off-street areas on adjacent parcels. A single 45 feet diameter tunnel bore, similar to the new Barcelona, Spain Metro Line 9, would integrate station platforms, train storage, crossovers, bypass tracks, and utility corridors inside a single tunnel. Each underground station consists of off-street cut-and-cover entrance structures, and ventilation shafts that also serve as emergency exits. The excavations for the station structures and shafts can be done off one side of the street with nominal impacts on traffic and utilities, which have the largest negative effect on the surrounding community and environment. Attachments 10 and 11 provide actual and schematic depictions of Single Bore subway stations.

Twin Bore Tunnel Method – The Twin Bore tunnel method uses two side-by-side but separate bored tunnels, one for each track. Stations are built by excavating the entire area between the two tunnels from the surface. A platform is then built between the two tracks, which is accessed via a mezzanine one level above the tracks. This method of constructing the "station box" is called "cut and cover" construction. The concourse level allows multiple passenger entrances to be placed either on- or off-street along the edge of the concourse. Prior segments of the BART system have been constructed in this manner. Cut-and-cover construction in the street right of way typically creates significant, widespread disruption at the surface level during construction. Additionally, the project will require approximately 33 cross-passages between the twin tunnels to meet the safety and emergency evacuation requirements. The cross-passage would require street level cut and cover or street level ground treatment to mine the cross-passages. Attachment 12 provides a schematic depiction of a Twin Bore subway station.

VTA Technical and Engineering Analysis of Single and Twin Bore Methods

VTA has been working on BART Phases I & II for a number of years. The design of Twin Bore tunnel was advanced to 65% completion in 2008 when the focus shifted to Phase I project delivery. As part of the Phase II project evaluations, and its impact during construction, and the lessons learned from other transit projects, VTA explored other available construction methods that would minimize the impact to Santa Clara Street and surrounding properties around stations. VTA embarked on the following three studies to thoroughly evaluate other tunneling methods:

1. Single Bore Feasibility Study – The Single Bore Feasibility Study, commissioned in 2016, examined the feasibility of using a single tunnel bore construction method with station platforms in the tunnel to reduce surface disruption at the stations. The study concluded that a single tunnel bore construction method was technically feasible for the prevailing ground conditions, and did not reveal any fatal flaws.

2. Single Bore Technical Review – In October 2016, VTA initiated Single Bore Tunnel Technical Studies to provide detailed verification of the findings of the prior Single Bore Feasibility Study, especially in relation to tunnel diameter, track alignment, depth of stations, passenger vertical circulation, operations, tunnel and station ventilation, and emergency egress. Project elements studied include the project alignment, station configurations, emergency egress and ventilation. Key findings of the study included:

    - The Single Bore methodology for tunneling and use at the Downtown San Jose Station is feasible and practical.
    - BART Facilities Standards (BFS) can be met.
    - BART comments were addressed, and no fatal flaws are identified in terms of BART Facilities Standards compliance.

3. Comparative Analysis – VTA prepared a comparative analysis of twin bore and single bore options in order to assess and compare the risks associated with each option. The scope of work included:

    - Review of Project Information: Single Bore and Twin Bore designs
    - Interviews with Subject Matter Experts & Peer Agencies
    - Assess Base Costs and Schedule – Both Options
    - Develop Risk Registers – Both Options
    - 2 Day Risk Assessment Workshop
    - Preliminary Assessment & Quantitative Analysis

    The study found that the Single Bore cost to construct is slightly less ($70 million), however the Single Bore does present a higher cost risk ($521 million) due to uncertainties of the level of design completed for the option. The report does describe that the higher risk can be minimized as the design of the Single Bore is advanced to a higher level.

    The Study also identified a number of other advantages of Single Bore over the Twin Bore Option:

    - Additional train operational flexibility: pocket tracks, additional train storage capacity, additional crossovers
    - Shorter construction schedule - revenue service could begin 10+ months earlier.
    - As VTA has advanced its technical studies and comparative analyses on the Single Bore method, they have closely coordinated the scoping, analysis and findings of that work with BART. As the Single Bore construction method would be new to the BART system, BART staff is taking a very deliberate approach to reviewing the safety, operating and maintenance aspects of the new method. Dialogue and review between VTA and BART on the Single Bore approach is continuing.

Staff Recommends VTA Move the Single Bore Method Forward

Staff recommends that the City support continued efforts by VTA, with the collaboration and support of BART, to determine a way to enable the Single Bore Tunnel method to be used in construction of the subway tunnel under Downtown San José for the following reasons:

Significantly Reduces Construction Impacts Downtown Station Area – The Single Bore station avoids the disruption, costs, and risks associated with utility relocations, street closures, excavation, and cut and cover construction in the heart of Downtown San José.

Potential to remove the 13th Street and Stockton Avenue ventilation structures – The Comparative Analysis identified the potential to eliminate mid-line ventilation structures while retaining emergency first responder access points at those locations, if Single Bore is chosen.

Faster Design and Construction Schedule – The Comparative Analysis identified potential to design and construct the Phase II extension over nine months sooner with Single Bore rather than Twin Bore.

Attachment 13 compares the Single Bore and Twin Bore construction methods.

D. Public Safety Planning and Design

1. Fire Life Safety

The design and construction of the both the Phase I and Phase II BART extensions to and through San José are required to meet all applicable national and state codes and standards, including the National Fire Protection Association (NFPA) Standard for Fixed Guideway Transit and Passenger Rail Systems (NFPA 130), California Building Code (CBC), and BART Facility Standards (BFS). These governing standards provide the prescriptive and performance-based criteria that ensures transit systems, like BART, to provide proper Fire Life Safety features and functionality.

The San José Fire Department is responsible for providing technical reviews, construction inspections, and T19 (Public Safety) and California Fire Code enforcement to maintain public safety on existing structures within City of San José. For many years, the Fire Department has been coordinating with both VTA and BART on the Fire Life Safety design features of the planned system extension. The main areas of focus for Fire Life Safety systems are as follows:

- Station evacuation
- Fire containment
- Tunnel design for safe rescue areas and the safe, rapid arrival of rescue train(s)

Over the past three years, VTA has met with staff multiple times during the development of both the single bore and twin bore design. Based on the input from the Fire Department, if the project meets the NFPA 130 requirements and secures resources such as staffing and equipment necessary to respond, both tunneling methods will meet their requirements. As system design progresses, the Fire Department will continue coordinate with VTA and BART to ensure systems are properly addressed in the final design.

Once design is complete and construction begins on the system's tunnels through San José, a dedicated Fire Rescue company will be needed. VTA is exploring how best to provide for that resource, including considering contracting for those services, as part of the overall project procurement, recognizing the limited resources and capacity of the San José Fire Department. When the BART Phase II extension opens for revenue service, currently projected in 2026, the Fire Department will need to acquire appropriate resources to address Fire Life Safety incidents, including proper station company staffing levels and advanced and specialized equipment for subway tunnel response.

2. Security and Police Services

The BART system and stations in Santa Clara County will be policed by both BART's own Police Department and the Santa Clara Sheriff's Office, which polices the VTA transit system. The San José Police Department has been coordinating with both the BART Police and the County Sheriff's Office around the policing of the BART extension to the Berryessa/North San José Station, which includes a BART police substation on-site. Experience from the opening and operations of the first station in North San José and from other stations on the BART system, especially the subway stations in San Francisco and Oakland, will provide valuable input into future station and system designs. As the Phase II extension proceeds into final design, the Police Department will be coordinating with VTA to incorporate Crime Prevention Through Environmental Design (CPTED) into the design of stations.

E. Future Construction Planning and Impact Mitigation

The multi-billion-dollar investment in the BART Phase II extension, including a 5-mile subway tunnel through Downtown, will inevitably involve multiple years of major construction. Accordingly, VTA, in collaboration with the City, will need to undertake development of an extensive Construction Outreach and Management Program (COMP) that effectively plans and anticipates potential impacts, identifies effective mitigations, and ensures timely and effective outreach, communication, and issue resolution. In addition, the City will require VTA, and its contractors, to comply with the San Jose Municipal Code provisions outlining the permit requirements for construction in the street right-of-way (Chapter 13.36) and Construction Impact Mitigation Plans (CIMP) for major construction projects in the street right of way (Section 13.36.200).

1. Community Outreach

For the past three years, VTA has engaged the station area communities through the 28th Street (Alum Rock) and Downtown/Diridon BART Project Community Working Groups on a wide range of project topics, including construction approaches and mitigation strategies. As the project moves from environmental review, through final design, to construction, VTA will need to systematically increase its outreach efforts to proactively inform affected residents, businesses, and property owners in advance of construction so that impacts can be avoided as much as possible, prepared for, and be resolved as expeditiously as possible when issues arise. VTA has discussed its intent at community meetings in San José to open field offices at each station location to perform community outreach and resolve issues that arise.

2. Mitigation Plans, Monitoring, Management

As outlined in the City's comment letter to VTA on the BART Phase II Draft Environmental Impact Report, the City and VTA expect to enter into a mutually-beneficial master cooperative agreement that would include broad construction outreach and impact mitigation plans and measures. The comment letter further outlined examples of the types of plans and actions the City expects VTA to take, to plan for, mitigate, and manage BART construction, including, but not limited to:

- A traffic/transportation management plan that outlines the timing of street, trail and transit service closures and alternative routes for all travelers.
- A detailed outreach and impact mitigation approach that proactively addresses the needs of businesses, residents, employees, and visitors, with clear, culturally competent, and multilingual communication channels, processes, and points of contact.
- Advance information about the processes for construction easements and/or damages, including for landlords and businesses that are concerned about leasing their properties in anticipation of the project.
- Truck haul routes that avoid further exacerbating construction impacts, an issue of particular importance under a twin-bore configuration where stations, cross-over tracks, and other underground facilities are built via cut-and-cover construction.
- New provisions and safeguards VTA will include in a CIMP based on lessons learned from BART Phase I and Alum Rock BRT projects.
- Obtaining permits and approvals required by the City and
- Surveying baseline conditions of historic resources, obtaining historic preservation permits where required under the San Jose Municipal Code, and repairing any new or expanded cracks in historic structures.

In follow up meetings with VTA staff about the City's comment letter, VTA has expressed their intention to undertake a proactive construction mitigation strategy, reaching out to understand business and resident access needs during construction and to

plan around them as much as possible rather than reacting to complaints as impacts occur. The City endorses this approach and expects the construction outreach and impact mitigation elements to be well-planned and coordinated, such that negative impacts, anticipated or not, can be responsibly, quickly, and thoroughly addressed. This will provide greater assurance and certainty for the City, community, and particularly the businesses, institutions, and residents most impacted by construction of this project. Attachment 14 describes preliminary estimated construction timeframes from the draft BART EIR.

EVALUATION AND FOLLOW-UP

Staff from the Department of Transportation provides quarterly reports to the Transportation and Environment Committee on Regional Transportation Funding and Projects, including updates on the BART Phase II project and integrated planning efforts around Diridon San José Central Station. City staff anticipates returning to City Council in Spring 2018 for Council consideration of a Master Cooperative Agreement, and associated reimbursement agreements, to appropriately fund City design review, permitting, and construction oversight and inspection activities that the City will need to provide.

PUBLIC OUTREACH

The City of San José has worked in close coordination with VTA as it conducted outreach on the BART Phase II extension. City staff participated in Community Working Groups for the 28th Street (Alum Rock) and Downtown/Diridon stations over the past three years. These covered a wide range of project topics, including tunneling, construction approaches, and mitigation strategies. On August 24, 2017, City staff participated in a joint San José Downtown Association and VTA public meeting on Phase II.

COORDINATION

This report has been coordinated with the City Attorney's Office, the Fire Department, Police Department, the Departments of Planning, Building and Code Enforcement, and Public Works. Given that this is a project of the Valley Transportation Authority, significant coordination has occurred with the project and technical staff at VTA.

COMMISSION RECOMMENDATION/INPUT

No commission recommendation or input is associated with this action.

NEXT STEPS

After Council takes action, City staff will work with both VTA and BART staff to ensure that the staff and boards of both agencies are informed of the City's priorities and preferences. As of now the VTA timeline for adoption of the Final Supplemental Environmental Impact Report/Statement is:

- **September 22:** VTA Board Workshop – Review Single and Twin Bore Construction Method Comparative Analysis, VTA Staff Recommendation on preferred Station Locations for the Final Environmental Project Description.

- **September 28:** Joint VTA/BART Board Workshop

- **October 5:** VTA Board Meeting – VTA Staff Recommendation on BART Phase II Environmental Project Description (selection of location for Downtown San José and Diridon Stations and Single-Bore or Twin- Bore Tunnel Construction Method).

- **January 2018**: VTA Board to consider Final SEIS/SEIR

- **March/April 2018**: FTA issues Record of Decision (ROD) and project exits New Starts Project Development (2-year period) and enters New Starts Project Engineering.

As the BART Phase II project approaches New Starts Project Engineering, staff expects to bring forth for City Council consideration a Master Cooperative Agreement, and associated reimbursement agreements, to appropriately fund City design review, permitting, and construction oversight and inspection activities that the City will need to provide. Prior to the commencement of any construction activities, including pre-construction utility relocation in 2019, staff will bring forward VTA's project construction and sequencing plan and the Construction Outreach and Management Program for City Council review in the fall of 2018.

CEQA

Not a Project, File No. PP17-009. Staff Reports, Assessments, Annual Reports, and Informational Memos that involve no approvals of any City action.

/s/
JIM ORTBAL
Director of Transportation

/s/
KIM WALESH
Director of Economic Development, Deputy City Manager

For questions, please contact Brian Stanke, Senior Transportation Specialist, at (408) 795-1834.

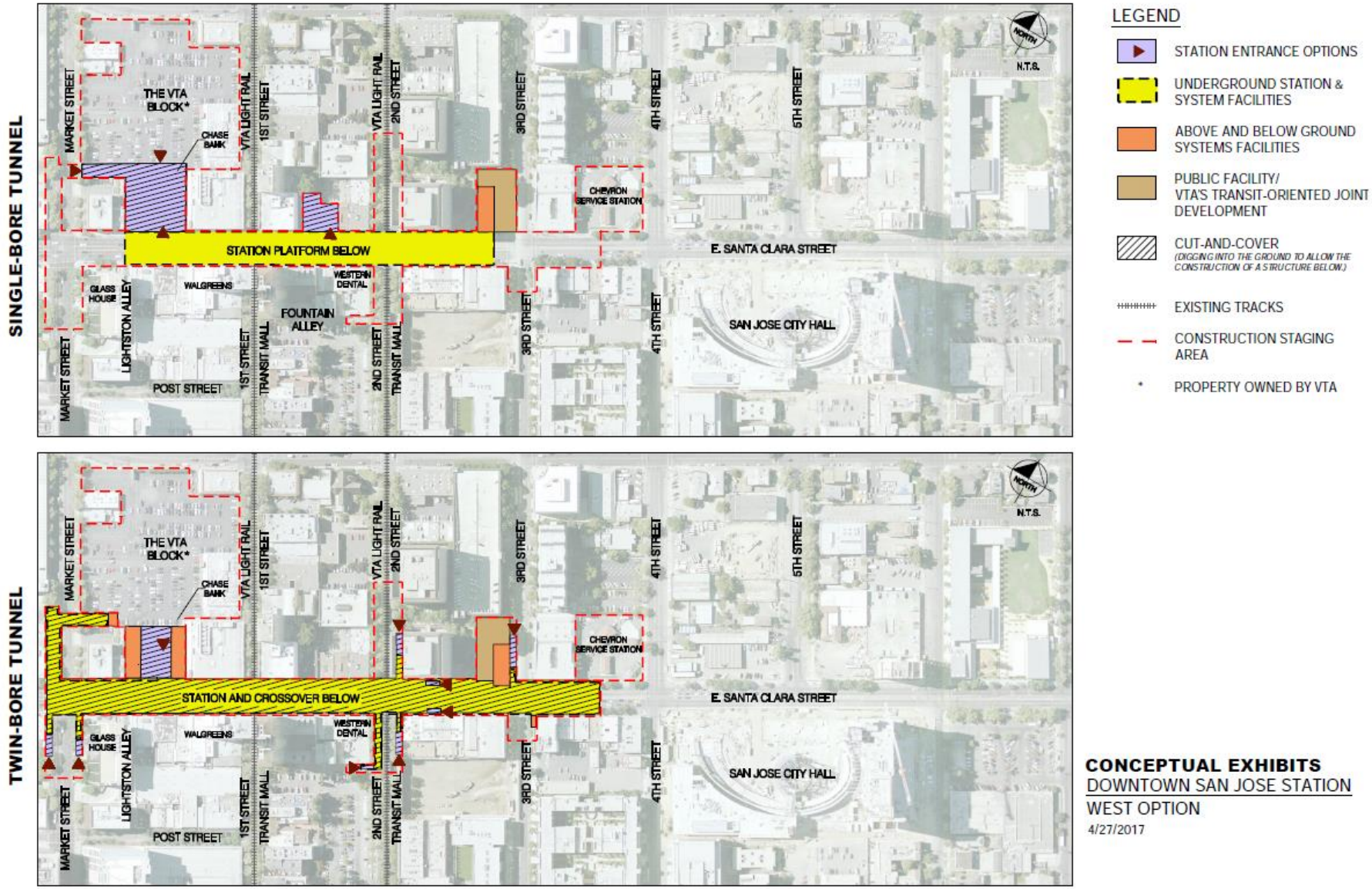
Attachment 1

28th Street Station – Conceptual Layout

Source: VTA

Attachment 2

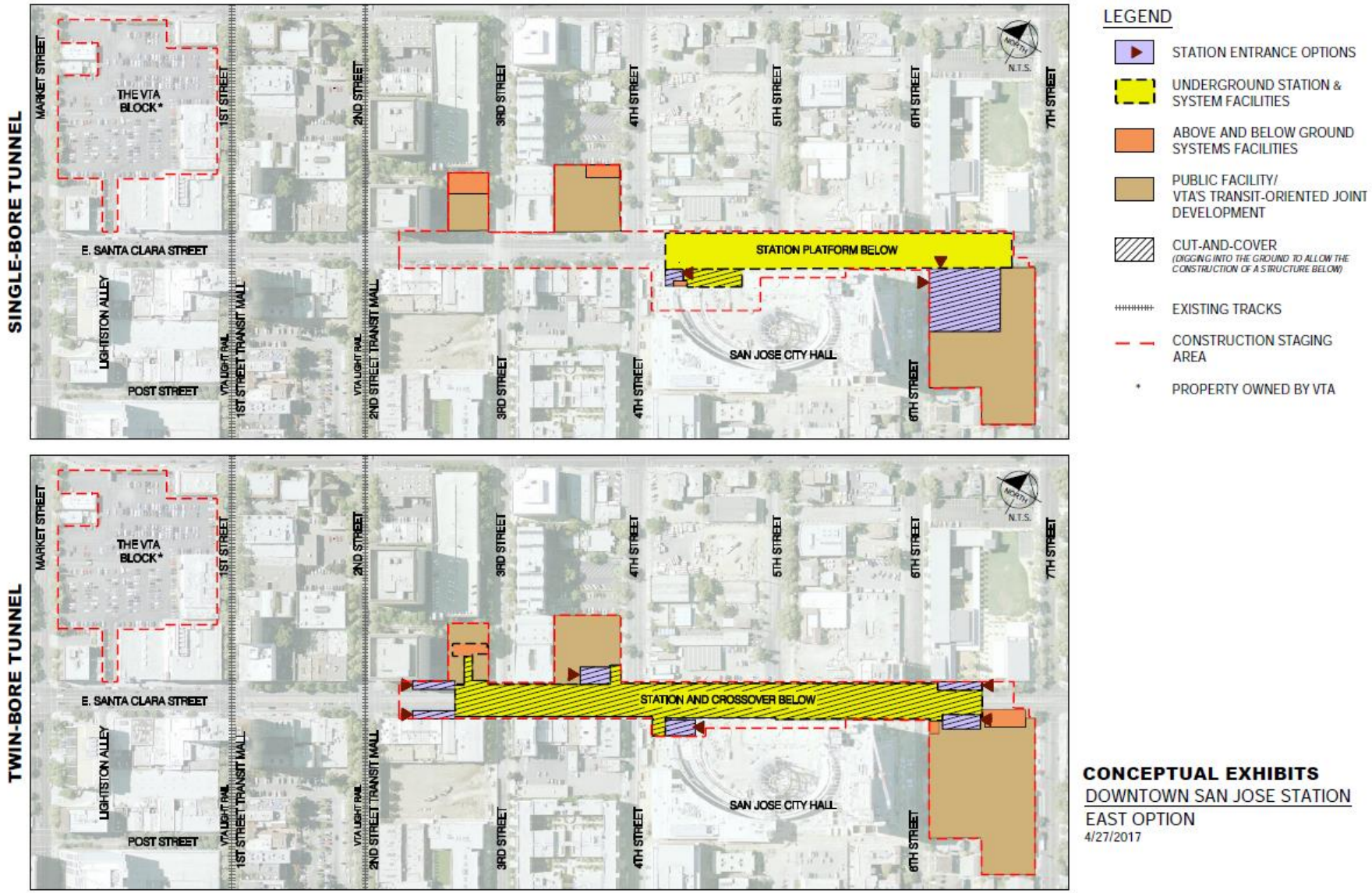
Downtown San José – West Option



Source: VTA

Attachment 3

Downtown San José – East Option



Source: VTA

Attachment 4

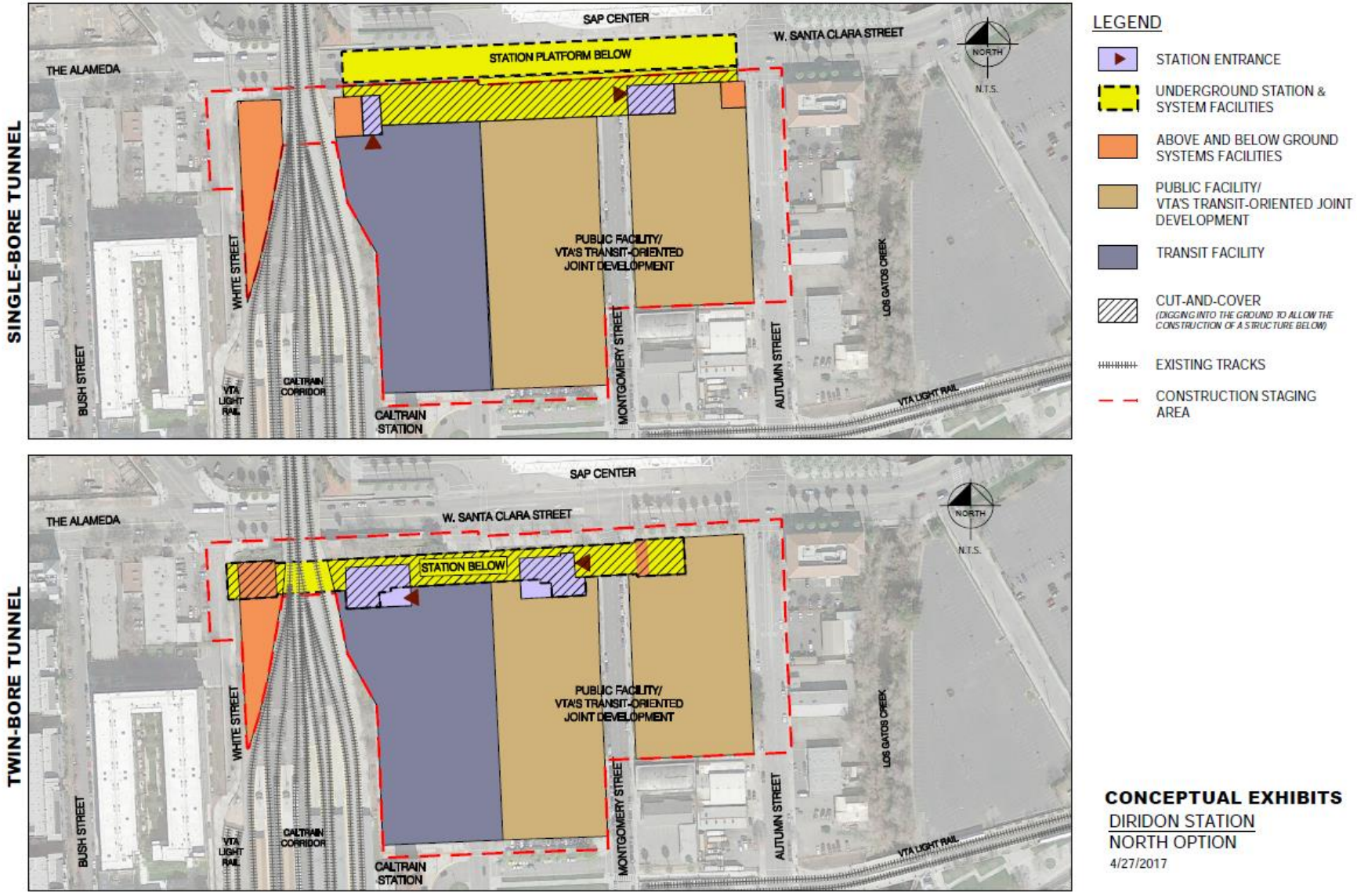
Downtown San José – Station Location Considerations

LONGER TERM CONSIDERATIONS		WEST OPTION		EAST OPTION
Support for Long Term Urban Development	+	The area within a 5-minute and 10-minute walk of West station option is zoned to accommodate 64% and 27% more square feet of development respectively, compared to the East location.	–	The area within a 5-minute and 10-minute walk of East station option has a large portion zoned low-density residential, reducing potential for transit-oriented development around the station.
Existing Land Use Density (Jobs and Housing)	+	The entire core of Downtown San Jose, with the highest land use densities, are contained within a 10-minute walk of the West station location.	–	Approximately one-third of the area within a 10-minute walk of the East station option contain low density residential neighborhoods with limited opportunities for dense transit supportive development.
Connectivity	+	The West station location has closer connections to the Downtown Transit Mall (VTA Light Rail and Bus) than the East station location, a key consideration by commuters when making trips involving multiple transit systems.	=	Several-block connection to Downtown Transit Mall (at 1st & 2nd Streets) (VTA Light Rail and Bus), direct connection to Santa Clara BRT.
Placemaking	+	Reinforces the central area of Downtown, between Almaden Blvd. and 4th Street, as the core of Downtown. VTA ownership of the block north of Santa Clara between Market and 1st Streets creates prime transit oriented development site.	=	Opportunity to activate the City Hall plaza, but fewer opportunities for placemaking.
Community and Stakeholder Support	+	Supported by Downtown Association, SPUR San Jose, and Horace Mann Elementary School PTO	–	Supported by San José State, opposed by Horace Mann Elementary School PTO.
NEAR TERM CONSIDERATIONS		**WEST OPTION**		**EAST OPTION**
Constructability & Construction Staging Areas	=	Allows for direct access to VTA-owned Mitchell block property as a key Construction Staging Area.	–	Major construction conflict with the SJSC Tower Development (at 4th/5th and Santa Clara), may require building redesign and financial impact. Partial demolition of City Hall garage may be required.
Construction Impacts, to sensitive locations and VTA Infrastructure	–	Construction will be impactful to downtown core. If cut and cover excavation is used rerouting of buses and temporary light rail closure (bus bridges).	–	Construction will be impactful to downtown core, Horace Mann Elementary School, and City Hall. Impacts Santa Clara BRT and buses.

More Favorable	+	=	–	Less Favorable

Attachment 5

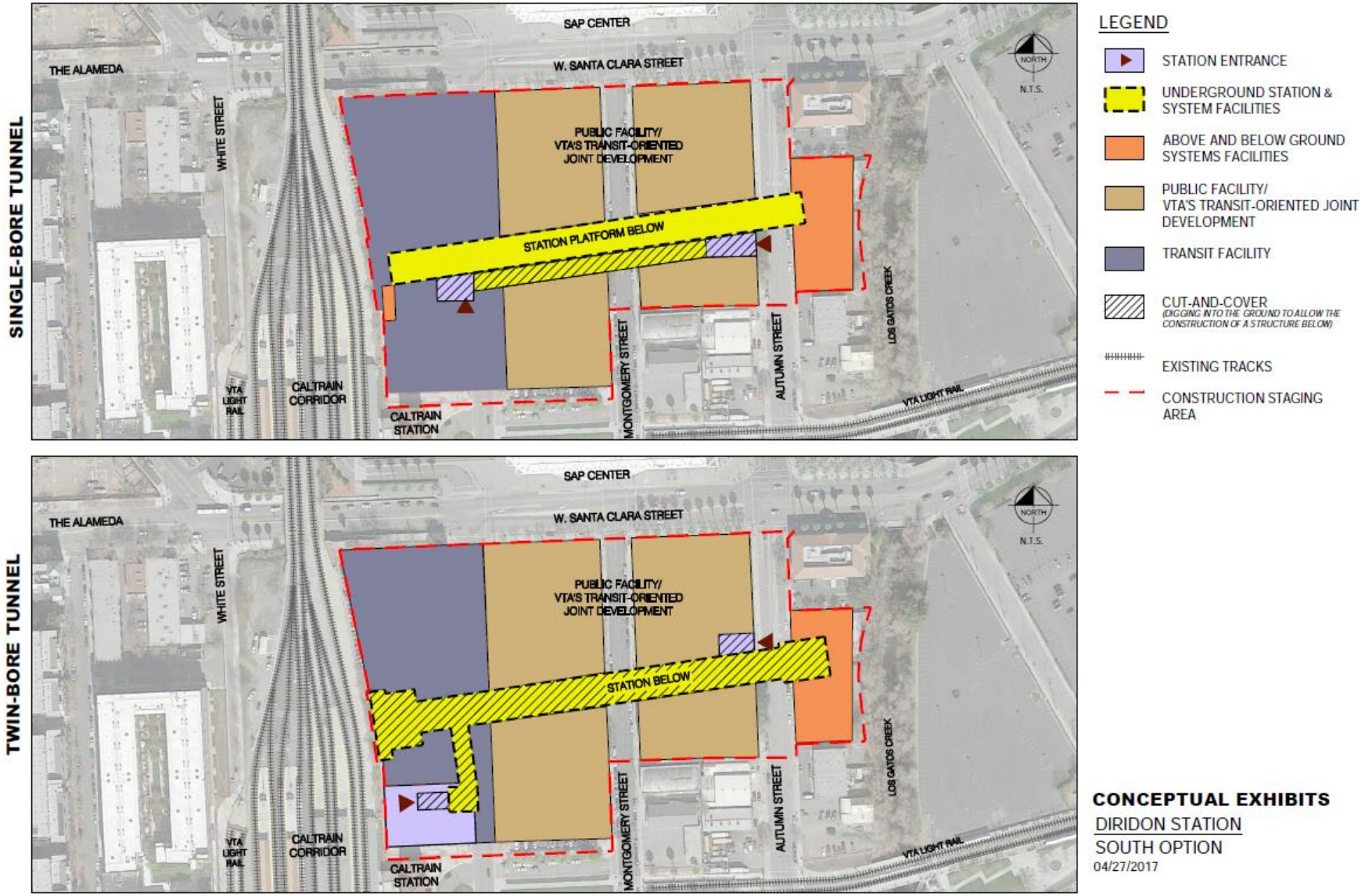
Diridon San José Central Station – North Option



Source: VTA

Attachment 6

Diridon San José Central Station – South Option



Source: VTA

Attachment 7

Diridon San José Central Station – Station Location Considerations

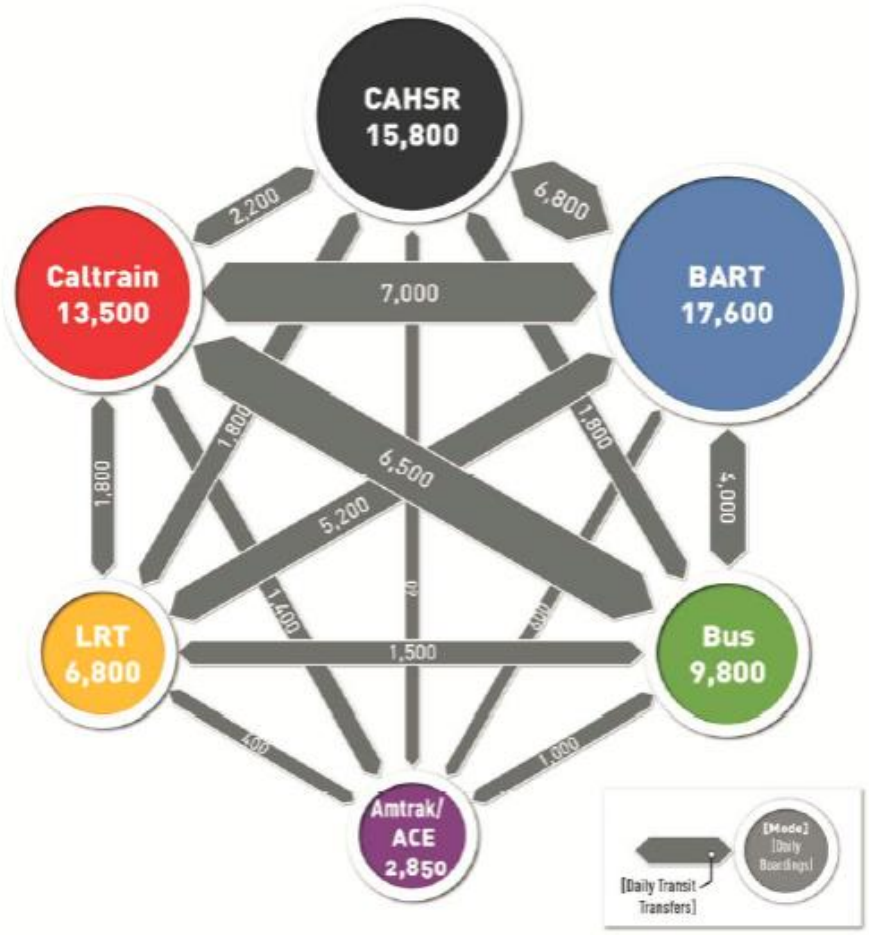
LONGER TERM CONSIDERATIONS		NORTH OPTION		SOUTH OPTION
Support for Long Term Urban Development	+	Maximizes development potential and flexibility by consolidating transit infrastructure along Santa Clara Street.	–	Location cuts diagonally across Diridon Central Zone. Light rail and BART alignments through core development area complicates site planning.
Existing Land Use Density (Jobs and Housing)	+	Central Zone, Innovation District and most of Southern Zone are contained within a ten-minute walk.	=	Central Zone, most of Innovation District, and Southern Zone are contained within a ten-minute walk.
Connectivity	+	Integrated rebuilding of Diridon station, including new entrances from regional rail/HSR platforms to BART concourse on south side of Santa Clara Street would create new transit transfer hub. Direct connection to BRT.	=	West entrance located next to historic station and existing bus loop. One-block connection to light rail and BRT on Santa Clara Street.
Placemaking	+	Can created unified hub at Diridon and Santa Clara street. Across the street from SAP Center	=	One-block walk to SAP Center
NEAR TERM CONSIDERATIONS		**NORTH OPTION**		**SOUTH OPTION**
Constructability & Construction Staging Areas	=	Station construction and potential excavation located south of Santa Clara Street.	-	Major construction conflict with the Trammel Crow development. Requires substantially deeper station or building redesign and financial impact.
Construction Impacts, to sensitive locations and VTA Infrastructure	=	Construction will impact Cahill, Autumn, and Monterey. Impacts to buses using Diridon station bus loop.	=	Construction will impact Cahill, Autumn, and Monterey. Impacts to buses using Diridon station bus loop.

More Favorable	+	=	–	Less Favorable

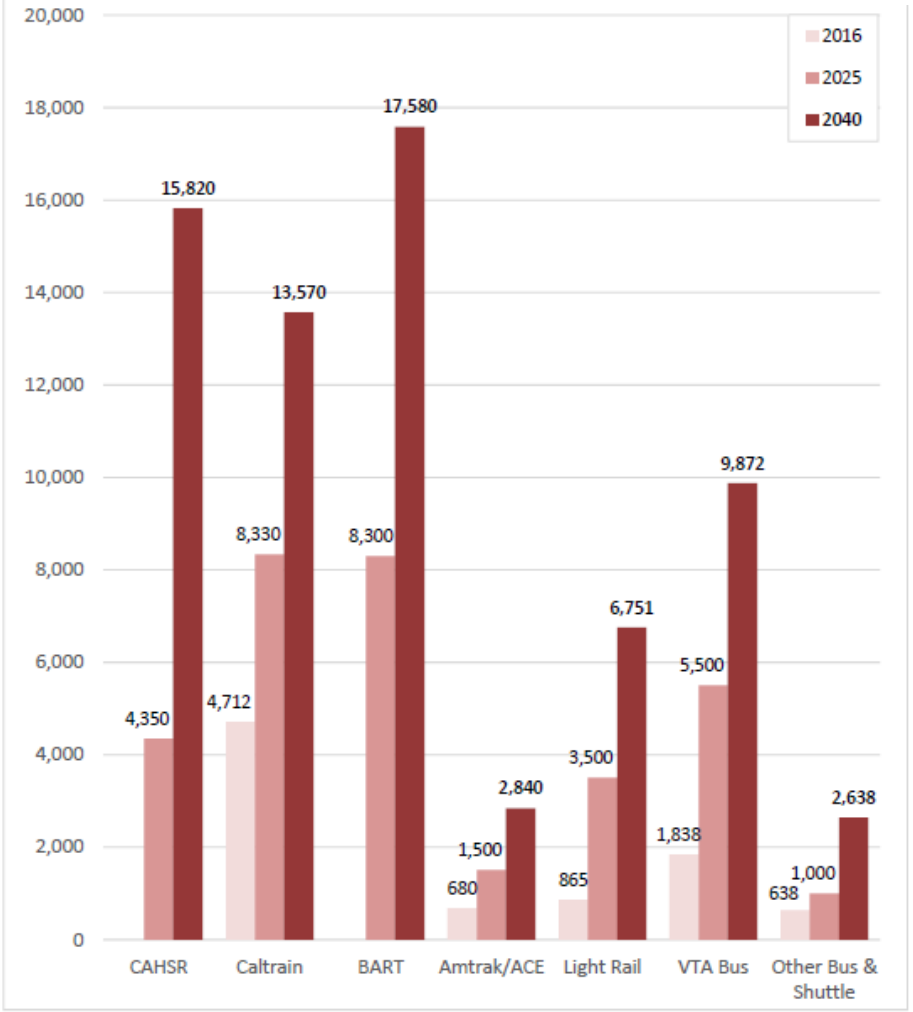
Attachment 8

Diridon Transit Transfers and Ridership

Preliminary Projections of Total Station Transfers



Diridon Station Boardings by Mode

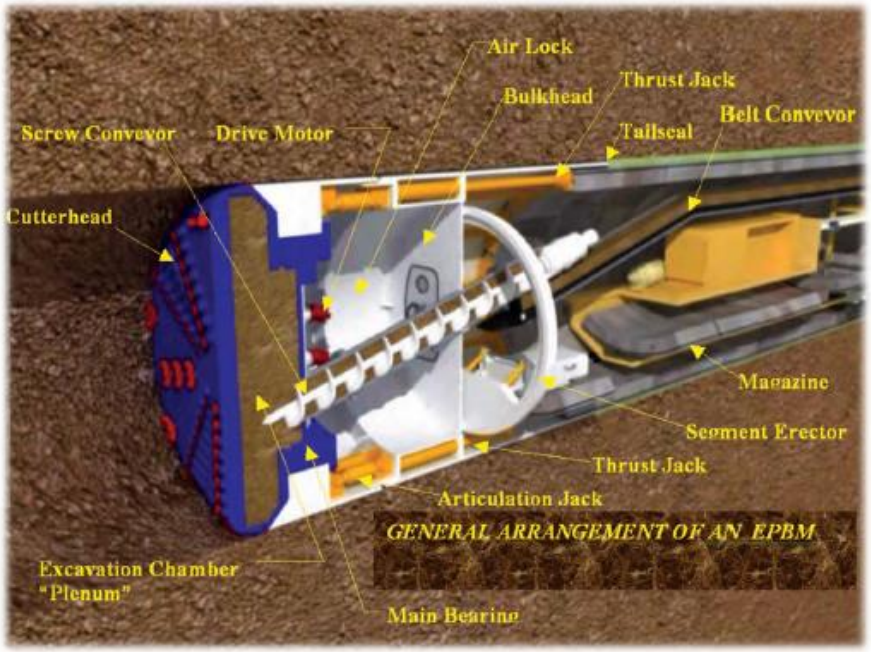


Note: No CAHSR or BART ridership data for 2016 (future services only)

Attachment 9

Tunnel Boring Machines

- Excavates ground material
- Creates tunnel structure
- Removes excavated material



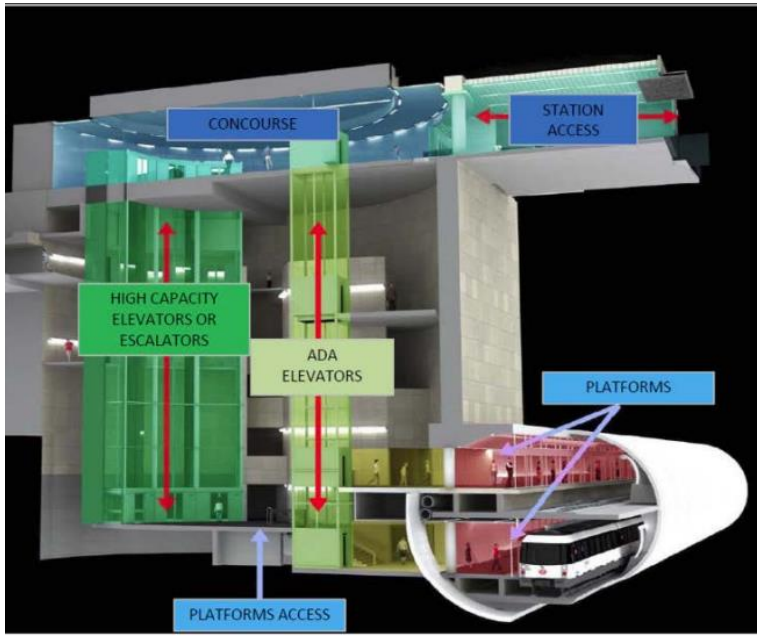
Source: VTA

Attachment 10

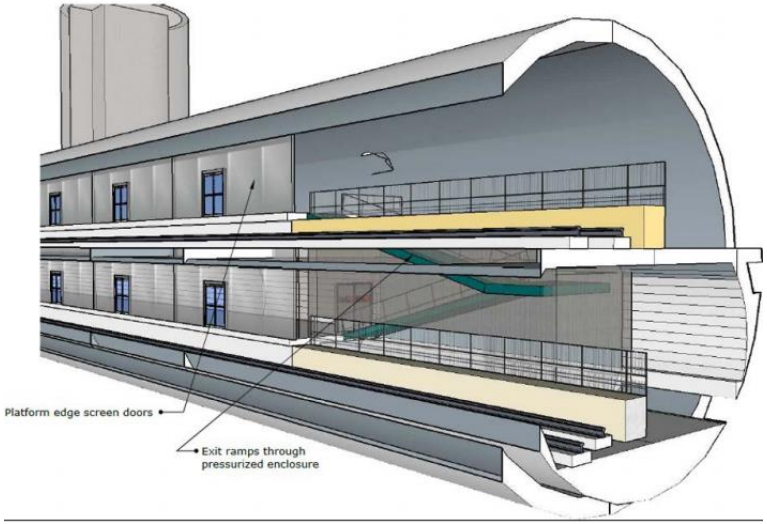
Single-Bore Stations

Barcelona station platform (inside single-bore)

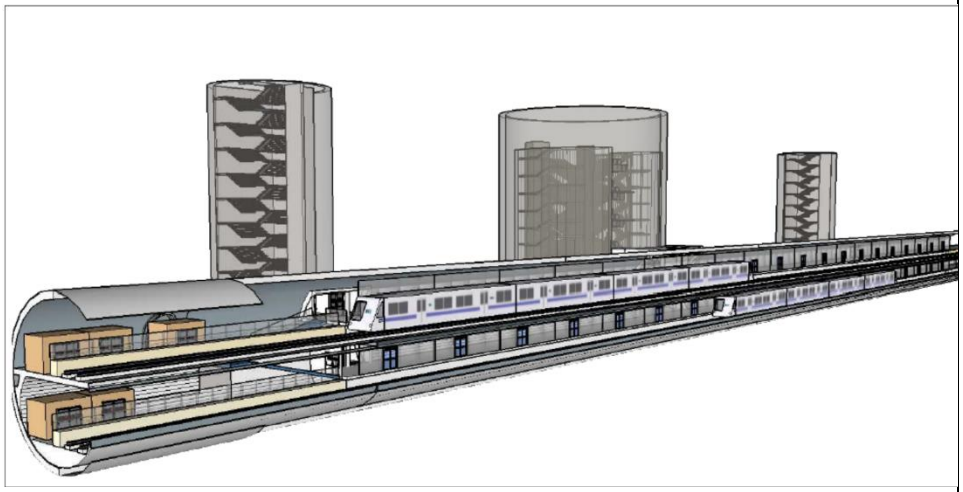
Pressurized emergency access stairs and tunnel ventilation shaft



Barcelona – Deep Station with high-speed elevators

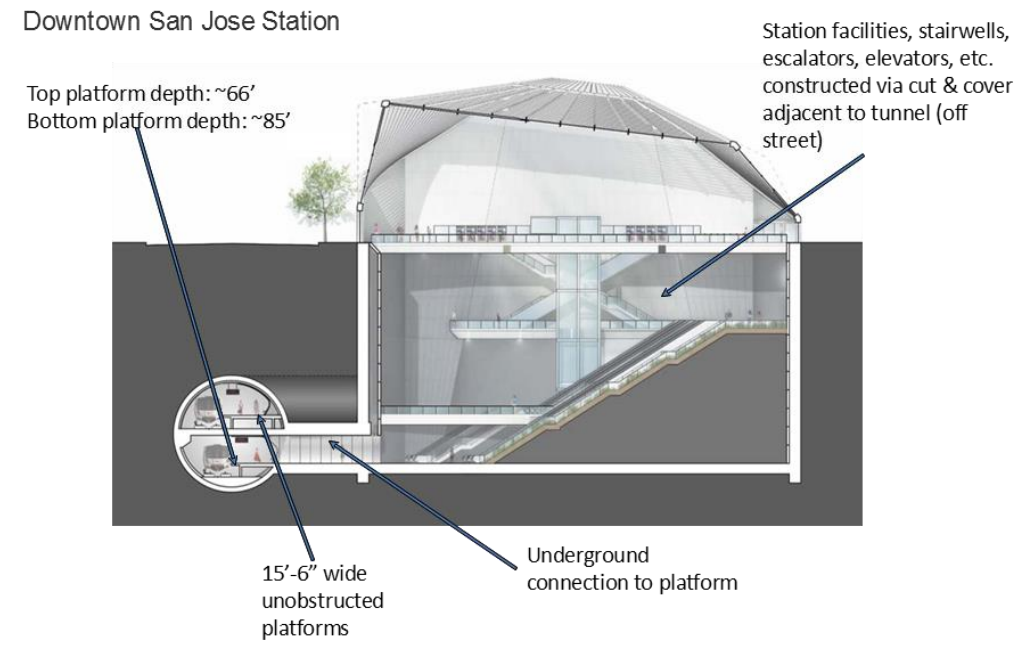


Emergency Egress ramps at the end of the platform



Station with platforms, access shafts, and emergency stairs/ventilation shaft

Single-Bore Stations



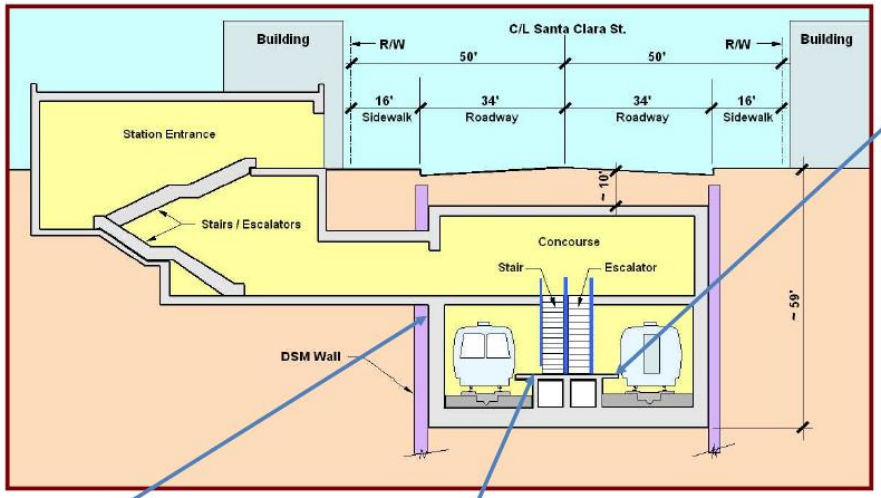
Example Single-Bore Station
(without concourse)

Downtown San José – Santa Clara between 1st and 2nd Streets

- Two separate side platforms, one per direction
- Each entrance is a separate structure. Passengers descend from surface to platform without concourse.
- Number of entrances decided in design. Separate off-street, cut and cover shafts needed for each entrance.

Twin-Bore Stations

Downtown San Jose Station Configuration



Platform depth: ~55'

28'wide center platform (serving both directions of travel)

Built via cut-and-cover

9'3" unobstructed width per side of platform

Example Twin-Bore Stations

Oakland 19th street and

- Shared island platform
- Concourse level for ticketing, wayfinding, and retail
- Currently 5 on-street and 1 off-street entrances
- Ability to add reconfigure on and off-street entrances to concourse over time

Downtown San José

- Shared island platform – 28 feet across

Attachment 13

Tunnel Construction Methodology – Considerations

LONGER TERM CONSIDERATIONS		SINGLE – BORE		TWIN – BORE
Construction Impacts and Constructability	+	Station construction in tunnel bore reduces street and utility disruptions.	–	Downtown Station construction will impact Santa Clara Street intermittently over the course of six years for utility relocation, shoring walls and excavation, and station construction
	+	Construction of station entrances and ventilation shafts will be located off-street.	–	Cut and cover construction Downtown will impact VTA light rail and bus operations, require significant alterations to transit operations and station/stop locations.
	+	No mined cross passages needed		
	+	Opportunity to remove ventilation structures at 13th St. and on Stockton Ave. while retaining emergency access.	–	Cross passages between bores may require soil treatment from surface and introduce construction risks
Passenger Experience / Station Accessibility	–	Station platforms 66 -88' below ground. Without concourses: Passengers exiting use one entrance from platform all the way to surface.	=	Station platforms 50-55' below ground level. Passengers can use concourse to orient their travel the desired direction.
	=	With concourse: Passengers can use concourse to orient their travel the desired direction.		
Operating Costs	–	Operating cost over 30 years is 2.8% higher than twin-bore	+	Operating cost over 30 years is 2.8% lower than single bore
	=	Without concourses: Entrances and fare gates are separated, necessitating an additional Station Agent at each station.		
Construction costs	+	Base Cost estimate $70 million less	–	Base Cost estimate $70 million more
	–	Total Potential Risk Cost $521 million more. Risk can be reduced through advancing the design of the project beyond current 15 to 20%	+	Total Potential Risk Cost is $521 million less. Twin Bore project has advanced design to 65%
Program Risk	=	Nine of top ten risks are technical capacity risks	=	Three of top ten risks require financial contingencies
Schedule Risk	+	Heavy Civil Construction finishes 293 days sooner	–	Heavy Civil Construction finishes 293 days later

More Favorable	+	=	–	Less Favorable

Attachment 14

Downtown San José Station – Twin-Bore Roadway Construction Impacts

ACTIVITY	DURATION	ADVERSE EFFECTS ON ROADWAYS
Advanced Utility Relocations	16–24 months	Temporary lane closures and some street closures along Santa Clara Street – one block, or one block and one intersection, or two blocks and one intersection at a time – for periods of up to 3 months at a time.
Support of Excavation Wall Installation	12–18 months	Temporary street closures along Santa Clara Street – one block or one block and one intersection, or two blocks and one intersection at a time – for periods of up to 3 months at a time. Light Rail Transit will require bus bridges at 1st and 2nd Street intersections for up to 3 months at each intersection.
Decking Installation	1–6 months	Temporary street closures along Santa Clara Street – one block or one block and one intersection, or two blocks and one intersection at a time – for approximately 2 weeks to 1 month at a time.
Station Box Excavation	10–18 months	Intermittent lane closures along Santa Clara Street.
Tunnel Boring Machine Removal	2–4 weeks	Intermittent lane closures on each end of the station – up to 4 weeks four times.
Station Structure Construction	18–30 months	Intermittent lane closures along Santa Clara and up to 2-month street closure of Market Street.
Decking Remove, Backfill and Street Restoration (Includes Street Resurfacing, Landscape, Sidewalk, Signals, Lighting)	18–24 months	Temporary one-block or one block and one intersection street closures of 1 to 2 months, with intermittent lane closures along Santa Clara Street and the effected cross street.

Source: VTA 2016. Table 5-2 in Draft SEIS/SEIR.