Santa Clara Valley Transportation Authority

MEMORANDUM

FROM: Chief Capital Megaprojects Delivery Officer, Tom Maguire

DATE: July 15, 2025

SUBJECT: Follow up Documents from May 2025 VTA BSVII Oversight Committee

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BACKGROUND:

Since the Federal Transit Administration (FTA)'s August 2024 announcement regarding the VTA's BART Silicon Valley Phase II Extension (BSVII) Project's acceptance into New Starts Engineering, the next stage in the federal funding process, VTA has focused on a comprehensive project wide cost saving effort to align project cost within available funding. This includes the development of cost saving concepts, pursuit of additional non-local funding sources, and a review of the project's contracting and procurement approach. Staff have provided regular updates to the community, stakeholders, the BSVII Oversight Committee and VTA Board of Directors.

Staff has continued advancing cost saving ideas including establishing a "Level 3" list with ideas included from FTA's Project Management Oversight Consultant (PMOC) and the BSVII Oversight Committee Subject Matter Expert Gall Zeidler (GZ). As part of these efforts, a Level 3 Tunnel Task Force was also established further evaluating and reviewing previous assumptions in development of tunnel and station configurations along with construction methodologies.

As part of this effort, Gall Zeidler provided the attached memo (Attachment A), proposing ten cost saving ideas earlier this spring. Each of GZ's ideas are being studied by the BSVII team, via task forces that include GZ staff. The GZ document does not include cost estimates, but it is a good starting point to understand the concepts and technical insights that GZ has brought forward through this process. BSVII Project and GZ staff are working together to analyze them in a robust way.

Staff is also providing a matrix (Attachment B), summarizing the cost savings ideas that GZ and the PMOC have shared with VTA through this effort. This document contains a description of each idea, and an explanation of how each idea is being studied by the BSVII team. Staff is available to further discuss or respond to any follow-up questions as necessary.

Gall Zeidler Consultants
Geotechnics | Tunnel Design | Engineering

111 John Street, Suite 1270
New York, New York 10038
Phone: 703•726•2700
www.gzconsultants.com

MEMORANDUM

To: VTA BART – BSV II Design Team

From: Nasri Munfah, GZ Consultants

Cc: Scott Johnson (MGO)

Subject: Level 3 Cost Saving Ideas

Date: March 15, 2025

In support of the Level 3 Cost Saving initiative, we conducted several internal brainstorming sessions to identify potential high level cost saving ideas by reconfiguring the project yet meeting its goals. It should be noted that although the total anticipated cost of the project is estimated today at $12.75B. Assuming the funding gap of $700M to $1.2B can be closed, the amount committed to date is about $1.9B, therefore the cost saving should be able to complete the project for a total amount of $10.85B. In order to be able to meet this goal, modifications to the design requirements, the design criteria, commitments made to project stakeholders and the public, must be re-evaluated and adjusted as needed to reduce construction cost, yet maintaining a safe and operational system and meeting the intent of the commitments made to the project stakeholders.

Some of the proposals presented here may be outside the project DCM or commitments made to project stakeholders or the public, but the proposals are safe, meet industry standards, and have been implemented on other projects. Modifications to the contract packaging and the delivery methods will be required in order to attain the maximum benefits.

It should be noted that if any of these proposals, or any other proposals that will change the project configuration, are to be adopted, some of the work packages already awarded such as the TBM procurement and the West Portal Structure and Launch Shaft should be stopped immediately to minimize spending.

The following is a list of the proposals with a short description of each. They have not been designed but evaluated for their feasibility. Further refinement of these proposals would be

required to address any issues. They are categorized based on their level of deviation from the present design configuration.

Category 1 - Basic Reconfiguration:

1. **Proposal 1 - Silver Creek Fault Basis of Design:** Until recently, the Silver Creek Fault was classified as inactive fault. Recently, its classification was changed to potentially active. The exact location of the fault is unknown. Although further investigations may narrow down its potential location, its extent was identified within an area of 2200 ft long along the tunnel alignment.

   The present tunnel design with the additional internal space to allow for the movement of the fault while maintaining the ability to re-align the tracks after an event, does not work as designed. Also, the placement of omega seal to prevent soil intrusion into the tunnel potentially creating a void behind the liner which may undermine the liner causing its collapse is not necessary.

   1.1 Propose deletion of the Omega Seal. The intent of the Omega seal is to prevent not just water from intruding the tunnel, but also the soil behind the precast segmental liner resulting in a void behind the liner, eliminating the tunnel confinement causing its collapse. In order for this situation to happen several aspects must occur: 1) the soil must be susceptible to liquefaction, 2) the circumferential joints open, 3) the annular grout severely cracks, 4) the cracked annular grout coincides in its location with the open circumferential joints, 5) the void is large enough that the liner stresses will not distribute longitudinally.

   It is unlikely that these conditions will occur all at the same location. We propose to address this issue using the risk management approach by identifying the probability of these factors happening all at the same time and at the same location and the potential consequences. If the risk is low, then do nothing now and plan to repair the tunnel when the fault rupture and the tunnel is damaged. Although the rail service will be interrupted for a short period of time, the cost of repair will be significantly less than the cost of installing the omega seal.

   If the intent is to prevent water intrusion into the tunnel in a seismic event, a double gasket solution, similar to LA metro projects, can be used.

   1.2 Propose eliminating the additional internal space requirement for fault rupture. The proposed design does not provide the intended goal of the ability to re-align the tracks in a best fit alignment within the additional space because it does not maintain the tunnel intact in event of a fault rupture. Traditionally, if there is a defined active fault, the tunnel will be designed as a tunnel-in-a-tunnel concept. In this concept a larger tunnel is built, and the interior structure is seismically isolated by constructing within the tunnel with either having a void or compressible materials between the two envelops. See Figure 1 below.

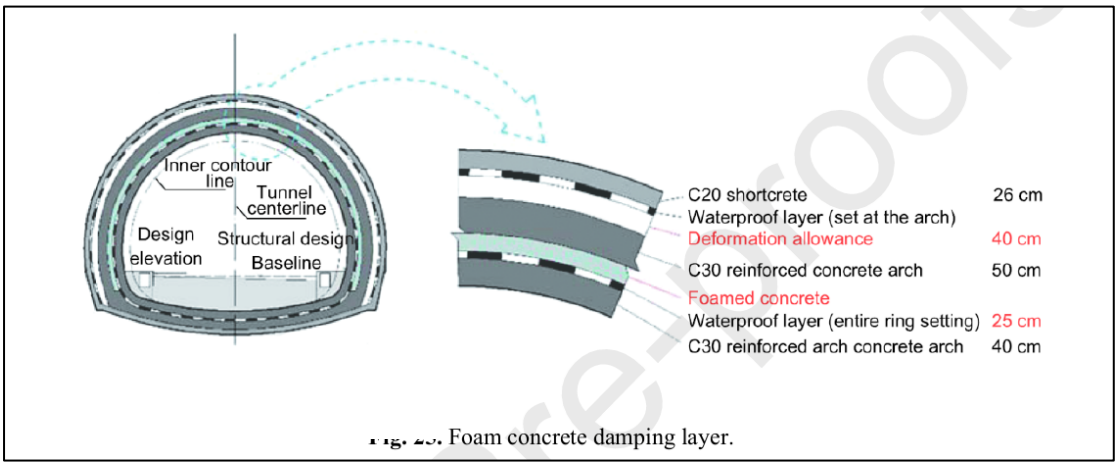


Fig. 25. Foam concrete damping layer.

Figure 1 – Approach to dealing with Fault Rupture

In case of a fault rupture, the tunnel as designed will shear off losing its structural integrity. Furthermore, any design to deal with the potential active fault for a distance of 2200ft should not be the basis for making the tunnel larger than needed for 5 miles. We propose to address the potential fault rupture either by risk management approach similar to the Omega Seal proposal or by implementing a local solution such as designing, tunnel-in-tunnel approach, using steel segmental liner rather than concrete, providing ground improvement, or modification to the construction method for the length of the fault zone.

We recommend using a smaller tunnel diameter sufficient to accommodate the tracks and the car geometrical clearance requirements. For a mid-size tunnel for two tracks, a tunnel interior diameter of about 34' is suitable.

2. **Proposal 2 - The Hybrid Solution:** Previously submitted. This proposal consists of tunnelling from the East Portal using 34' ID tunnel (38 ft TBM) with two tracks within the tunnel separated by a center wall. The vertical alignment will be raised to provide one-half to one tunnel diameter of cover over the tunnel. The 28th Street Station will be constructed at a shallow depth using the cut & cover method with side platforms. The junction between the East tunnel and the West Single Bore Tunnel will be at either 13th Street or 3rd Street. The TBMs removals will be either by a shaft in the street or through an off-street shaft with an underground connection between the two tunnels. It was estimated that a saving in the project schedule of 12 to 18 months can be achieved. This concept was further evaluated by the Project Team at Cost Saving Level 2 Task Force and was rejected indicating that the cost is higher, and the schedule is longer than the present design.

   This concept should be re-evaluated identifying the issues rendering it not suitable and addressing them rather than rejecting the proposal. The smaller tunnel will result in a faster procurement, faster launching, less excavation, less muck removal, less concrete, simpler

internal structure, and a faster advance rate. Tunnelling from both sides will shorten the construction duration. Furthermore, having side platforms will reduce the length of the station excavation to the length of the station platform (700ft) plus additional space for ventilation duct and the MEP distribution for a total of 800ft length of excavation. Although a mezzanine is desirable for passenger distribution, for side platform a mezzanine can be omitted by designing the passengers' distribution at the entrance(s) headhouse(s).

3. **Proposal 3 - Tunnelling from the East and West using 34' ID Tunnel with two tracks in the tunnel:** Similar to the Hybrid Solution proposal (Tunnelling from the East), we propose to tunnel from the East and the West simultaneously using a mid-size TBM housing two tracks. We believe the tunnel inside diameter of 34 ft is suitable which will result in a TBM in the range of 38ft in diameter. The alignment will be raised to provide a cover of one tunnel diameter.

    a. The tunnel will be provided with a center wall equipped with fire rated doors for cross passages.

    b. All crossovers will be within the tunnel by eliminating the center wall at the locations of the crossovers. The station lengths will be limited to the platform length only

    c. The 28th Street Station and Diridon Stations will be constructed as cut and cover with side platforms. The advantages of shallower stations, the side platforms, the potential elimination of the mezzanines as described above in the Hybrid Solution will result is significant cost and schedule saving.

    d. Diridon Station can be constructed either within and under the street ROW or in the adjoining parking lot in the southern alignment. Since the crossover will be within the tunnel, the station does not need to be extended under Caltrain tracks eliminating the needs for a special construction using box jacking method or Sequential Excavation Method (SEM).

    e. San Jose Downtown Station will be constructed using Sequential Excavation Method (SEM) – See Figures 2 to 7 below.

        - Ground improvement using dewatering or freezing will be required. Dewatering will be done by creating a bathtub using non-structural bentonite cut-off walls tied to an impermeable layer or a bottom plug.

        - The station can be constructed as side platform of a center platform. Using side platform will make the station shorter to only the length of the platform (700ft) plus additional space for ventilation duct and MEP utility access. Passengers' distribution will be at mezzanine in the Cross Cut.

        - If the station is to be constructed as center platform, additional space would be required at each end in the order of 250 to 300 ft to allow the tracks to transition around the platform. In either case (side platforms or a center platform) the crossover will be in the running TBM tunnel rather than at the end of the station in order to minimize the station length.

- Either the Station cavern can be constructed first or the TBM will pass first. The latter is more advantageous.
- The construction will be similar to Chinatown station in San Francisco by constructing a cross-cut from the headhouse shaft, then excavating the station in both directions simultaneously. See sketches below.
- Ground Freezing can be done vertically from the surface with the pipes and the headers placed in trenches under the street and decked to allow vehicular and pedestrian traffic, or they can done horizontally from the TBM tunnel.
- If the TBM tunnel is constructed first, ground freezing can be done from within the TBM tunnel to create an envelope of frozen ground around the tunnel suitable to construct the station using the SEM method.
- We evaluated four different scenarios for constructing the station: 1) TBM First with Dewatering, 2) TBM first with Ground Freezing; 3) SEM Cavern first with Dewatering; and 4) SEM Cavern first with Ground Freezing. All options revealed significant schedule saving and obtaining Revenue Service in 2034. Construction schedules are attached herein.
- This proposal will save significant cost and reduce construction duration:
    - Smaller tunnels will result in less excavation, less concrete, simpler internal structure, faster advance rate.
    - Raising the profile will result in less station excavation, shorter escalator and elevator runs, smaller headhouses.
    - Side platforms will further reduce the excavation depth and length. With side platforms the passenger movement will be at the head house and the cross-overs will be within the tunnel immediately at the end of the station rather than be within the station.
    - If the cut and cover stations are constructed prior to the TBM tunnels, the TBM will be “walked” through the station excavation allowing the possibility of extensive maintenance of the TBMs.
- This proposal will require having two 38’ EPB TBMs. The attached schedules accommodate the TBMs procurement period.
- This proposal will allow re-packaging the scope of work of CP2 contract as follow. Although interfacing among the packages will be more, smaller contracts will attract more bidders, more competitive bids, and potentially lower cost.
    1. TBM tunnels (Mine and Line) one or two separate contracts (East and West)

2. Diridon and 28th Street stations can be a combined contract for both stations or two individual contracts.
3. San Jose Downtown Station can be a separate contract with a specialty SEM contractor.

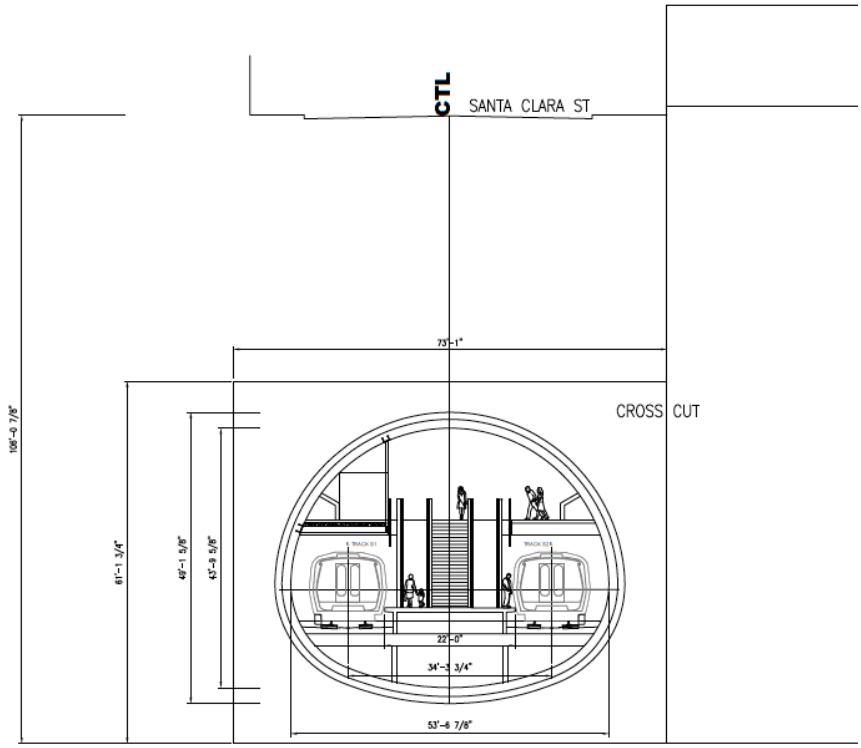


Figure 2 - Station Configuration – Center Platform. Side Platform is Similar

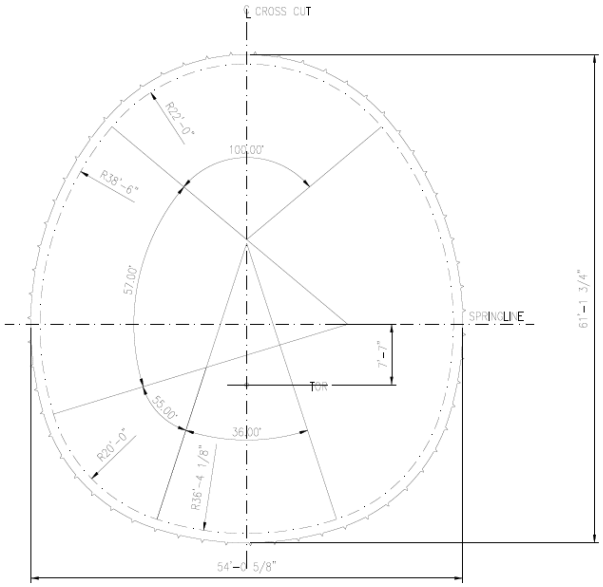


Figure 3 - Cross Cut

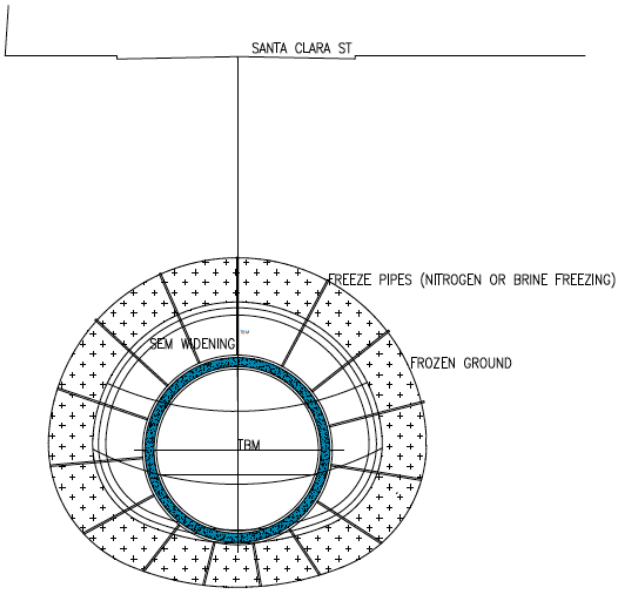


Figure 4 - Horizontal Ground Freezing from the TBM tunnel

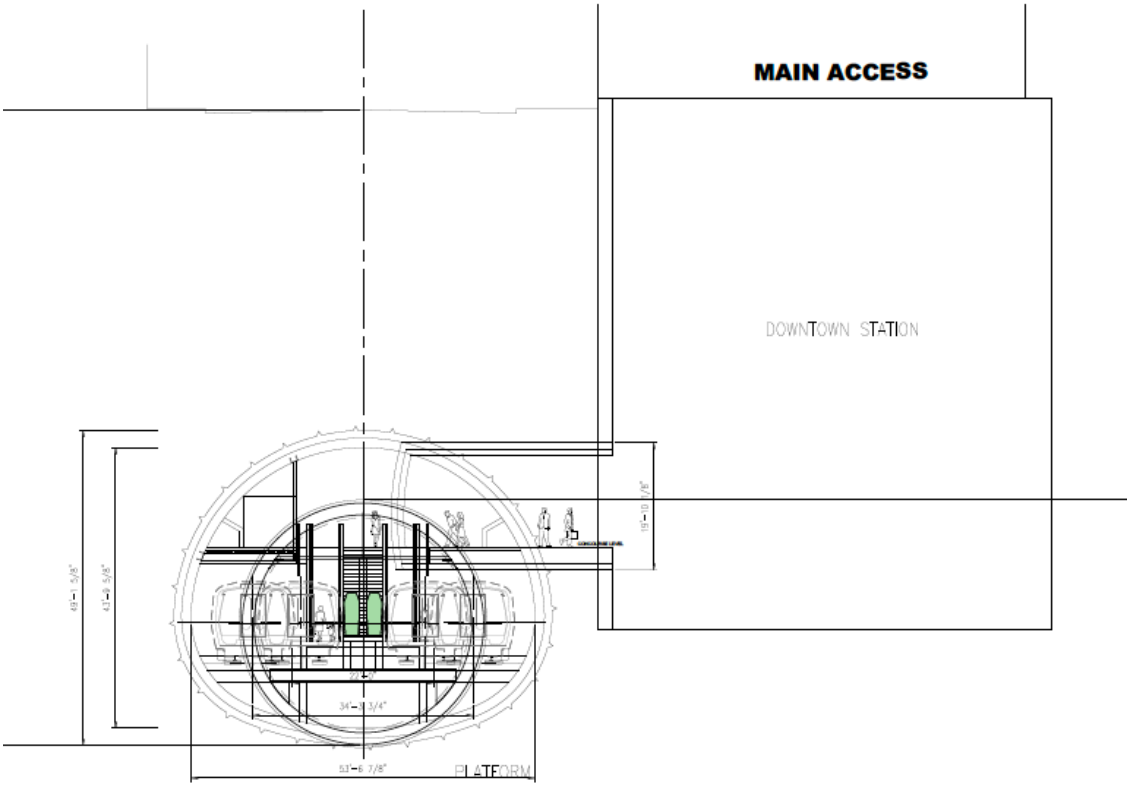


Figure 5 - Tunnel/Station Interfacing

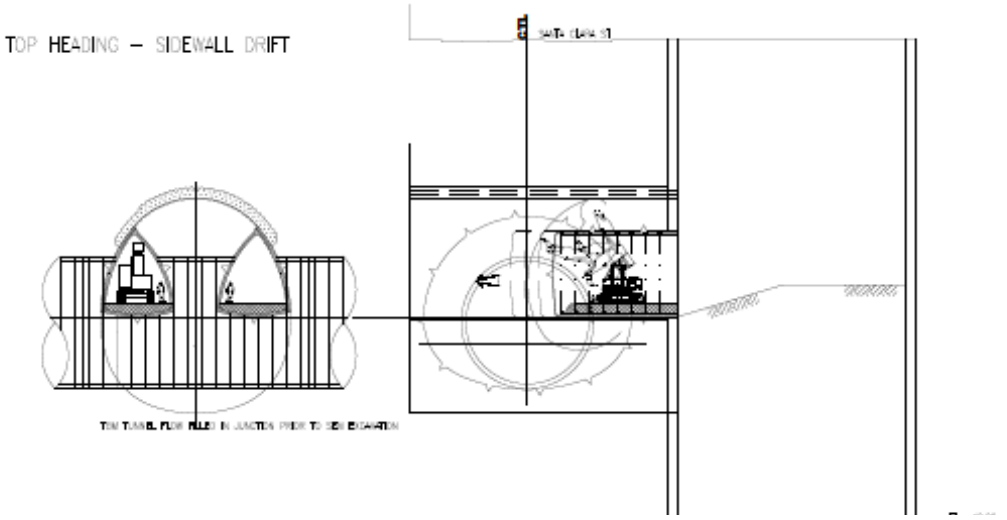


Figure 6 - Cross Cut Excavation – TBM First – Top Heading Side Drifts

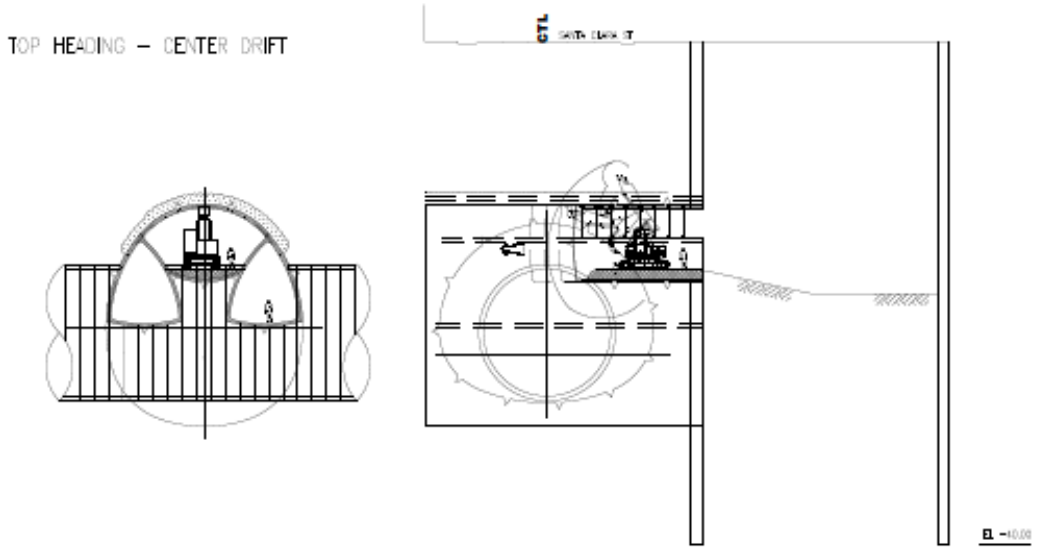


Figure 7 - Cross Cut Excavation – TBM First – Top Heading Center Drift

4. **<u>Proposal 4 - Twin Tunnels from East and West:</u>** This is similar to proposal 3 above, however, instead of a single mid-size TBMs for two tracks, two individual TBM tunnels each housing one track will be constructed.

   Two TBMs will construct two tunnels from the East and two TBMs will construct two tunnels from the West meeting at 13th Street ventilation shaft site where they can be extracted. The tunnel diameter will be approximately 21' ID and the TBM diameter will be 24' diameter. Cross passages will be provided between the twin tunnels at 750 ft spacing to meet NFPA 130 or closer to meet BART's requirements.

   The tunnels can be constructed at a shallower depth (one-half to one tunnel diameter) resulting in shallower station excavation and shorter vertical circulation elements.

   Similar to proposal 3 above, Diridon and 28th Street Stations will be constructed as cut and cover while the Downtown Station will be constructed using the SEM method. See Figures 8, 9, and 10. All stations will have a center platform.

   Ground improvement similar to Proposal 3 using dewatering or freezing will be needed. Having the two TBM tunnels excavated first will allow the installation of the freeze pipes from within the tunnels to create the frozen arch.

   A crosscut similar to that of proposal 3 will be constructed to allow the SEM excavation and to provide a mezzanine for passenger access.

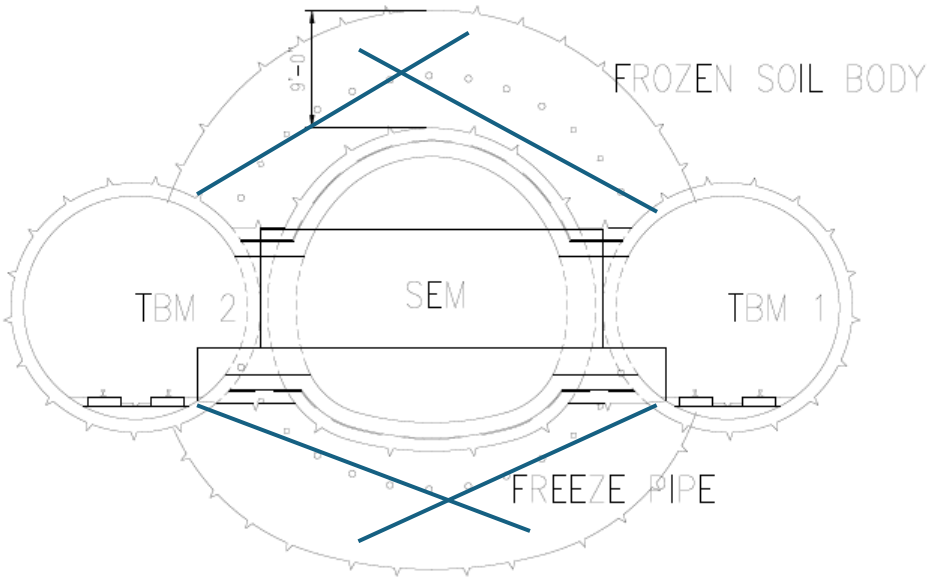
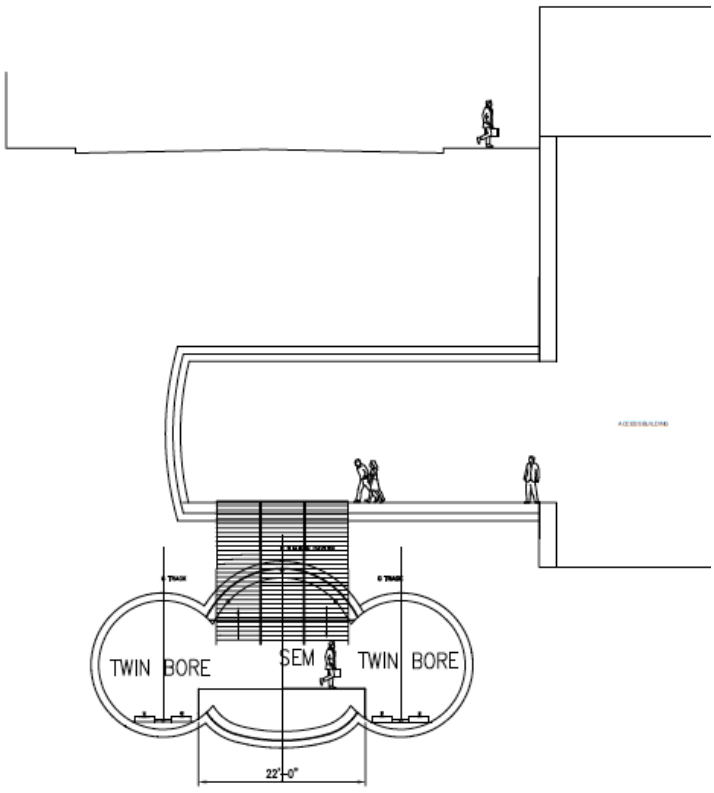


Figure 8 - Downtown Station – Twin Tunnels, SEM Cavern station – Horizontal Freezing



Potential Configuration of a Triple Arch TBM/SEM Station

A deviation of this method is constructing the Downtown Station as of a triple arch station as shown below in Figure 9. The two TBM runs will through the station, then using the newly constructed tunnels, ground improvement can be performed between the two tunnels from within the TBM tunnels and the platform cavern can be constructed with supporting columns spaced at about 25 ft center to center and a load transferring girders as shown in Figure 9 below.

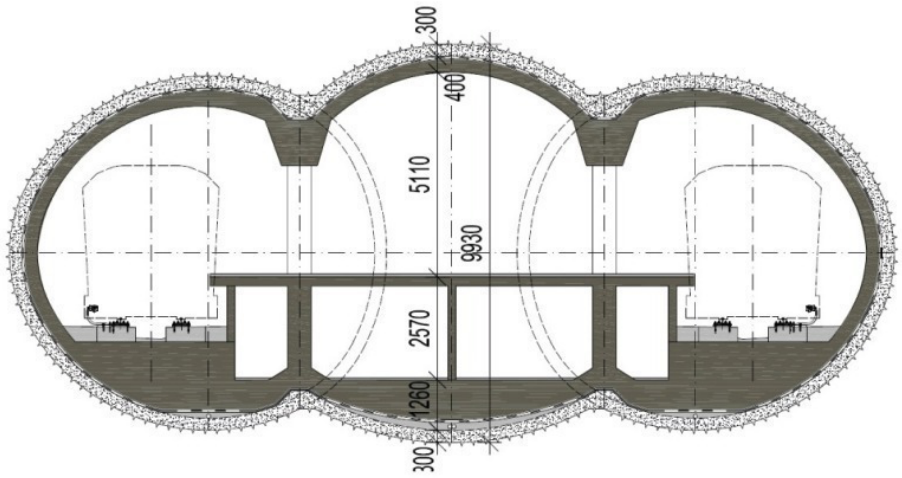


Figure 9 - Triple Arch TBM/SEM station - Prague

An alternative configuration will be as shown below in Figure 10 with center columns. This approach was used on several systems in Europe, Canada, and in Washington DC. The photograph below shows Fort Totten Station in Washington DC. See Figure 11.

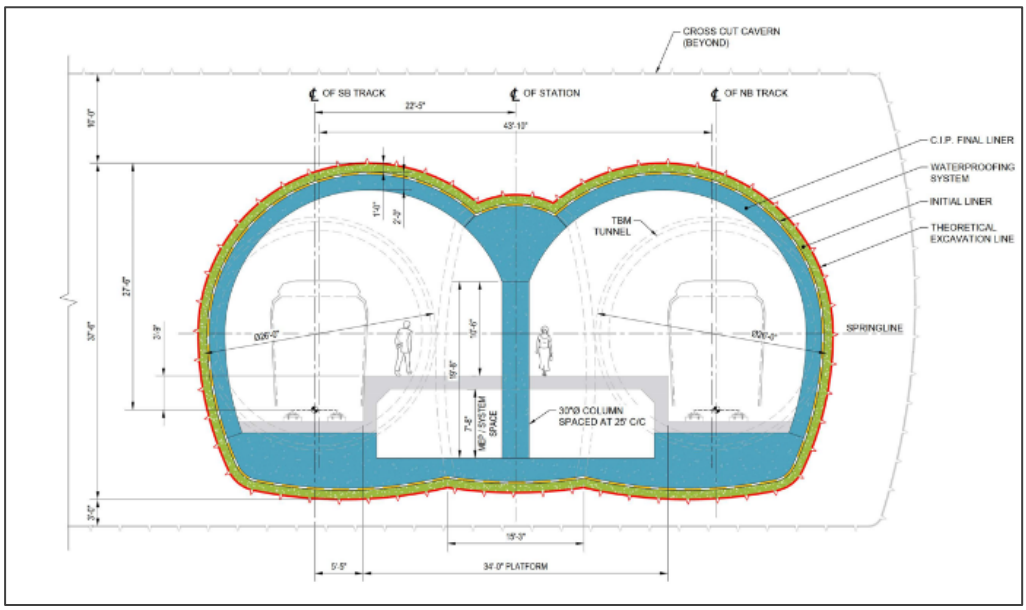


Figure 10 - TBM tunnels and SEM Station with Center Columns

Figure 11 – Fort Totten Station – Washington DC.

This proposal has similar advantages as Proposal 3 including high alignment profile, less potential settlement, less tunnel excavation, less concrete, shallower stations, shorter vertical circulation elements, shorter construction duration, etc. However, the main disadvantages are the required cross passages for fire-life safety requirements, the potential needs for mid-tunnel ventilation plants, having the crossovers be part of the station increasing the station length, and the needs for four TBMs (two TBMs from the East and two TBMs from the West) to expedite the construction schedule.

5. **Proposal 5 – Variation of Proposals 3 and 4 constructing the Downtown Station using Cut & Cover:** In this proposal using either Proposal 3 or 4 described above but constructing the San Jose Downtown Station using the cut & cover method.

   Unlike the described cut and cover method as presented in the GEC's Report entitled *"Twin Bore Estimate Update"* Dated September 2024, the Downtown station can be constructed using staged cut and cover method. In this method, similar to the construction of the Second Ave. Subway in New York, The Purple Line in Los Angeles, the Central Subway in San Francisco and many other projects throughout North America. The support of excavation (SOE) can be installed using either slurry walls or secant piles. To install the secant piles only one lane closure will be needed during the secant piles installation. For slurry walls, two lanes will be needed to install the slurry walls because the slurry wall rigs are bigger than the secant pile rigs.

   Santa Clara Street is 60 ft wide curbline to curbline in addition to two sidewalks of about 20 ft each for a total width of 100 ft building line to building line. This width allows the installation of the support of excavation (SOE) while having at least three lanes open to

traffic at all times. Upon completion of the slurry wall installation on one side of the street, the rig will be moved to the other side and the work will be repeated. Upon the completion of the SOE walls, decking beams and concrete decks will be installed to allow full opening of the street to traffic. Decking beams installation will also be in stages allowing at least two lanes of traffic. Figure 12 shows the construction of the slurry wall for Second Ave. Subway and Figure 13, shows the decking of Second Ave. Subway.

Construction across cross streets will also be staged to allow through traffic. See Figure 14. Utilities will be relocated or supported in place under the decking. Figure 15, shows the decking beams and the supported utilities from the decking beams.

Although this approach has more impact on the downtown traffic, utilities, businesses, and the community, its lower cost, its traditional construction, and its less risk entice a second look of this solution that was developed over 20 years ago.

Figure 12 – Slurry Wall Installation – Typical Work Zone - Second Ave. Subway - NY

Figure 13 – Street Decking - Second Ave. Subway - NY

Figure 14 – Staged Construction Across a Side Street - Second Ave. Subway - NY

Figure 15 – Decking Beams and Support of Utilities - Second Ave. Subway - NY

6. **Proposal 6 – Initial Operating Segment (IOS):** In this proposal the project will be divided into an initial operating segment (IOS) and a subsequent operating segment (SOS) in order to meet the financial constraints, yet providing BART rail service to San Jose to the maximum possible in the Initial Operating Segment. When future funding becomes available, the remaining portions of the project can be completed for the complete service. It is important to develop the IOS in a way not to preclude future construction of the SOS.

   In this proposal, a midsize single bore tunnel 34ft ID (38ft TBM) housing two tracks will proceed from the East Portal toward West passing through the 28th Street/Little Portugal Station and advancing to Downtown Station and then to Diridon Station.

   The construction of the 28th Street/Little Portugal Station will be deferred for the SOS except for the headwalls which will be constructed in the IOS as part of the tunnelling contract to facilitate the future construction of the station. The Downtown station will be constructed in SEM with a center platform as described above. Diridon Station will be constructed as shallow cut & cover with side platforms as described above.

   West of Diridon Station tail tracks and a crossover will be provided to allow train reverse movement. The tail tracks can be extended to a sufficient distance to allow for a TBM retrieval shaft and to provide sufficient storage space for trains to be used during events in the SAP arena.

28th Street/Little Portugal Station, Santa Clara Station, and the Newhall Storage and Maintenance Yard will be deferred to the SOS.

For the SOS, a similar size TBM (38') for a two-track tunnel will be launched from the Newhall Yard and advanced toward Diridon Station and connecting with the then existing tail tracks. The 28th Street/Little Portugal Station will be completed around the existing tunnel while the railroad is operational. The Newhall Yard and the Santa Clara Station can also be constructed independently from the operational railroad.

This proposal has numerous advantages including:

- The ability to construct an operating system connected to the already existing operational facility constructed in Phase I allowing early BART service to San Jose
- Meeting the financial constraints and the funding shortfall
- Providing access to Downtown San Jose and to Diridon, supporting the downtown development and the connection to Caltrain and the future CHSR.
- Ability to extend the IOS system to Santa Clara and building Santa Clara Station if additional funds are obtained during the IOS
- Ability to expand the system in the future with no interruption to the initial operating system

7. **Proposal 7 – Station Optimization:** This proposal applies to all four stations. It is recommended that re-evaluation of the station layouts to minimize footprints, "back of the house" spaces and vertical circulation elements.
    a. Reduce overall station footprints by 15-20% through space optimization
    b. Use side platforms configuration rather than center platform (Diridon, 28th Street, and Santa Clara)
    c. Minimize the depth of the stations and use cut & cover construction whenever possible.
    d. Move many of the back of the house rooms to above ground such as transformers, switchgears, ventilation fans, signal rooms, SCADA, etc.
    e. For cut and cover stations (28th Street and Diridon) eliminate the mezzanine and use the headhouses for passengers' distribution to inbound and outbound tracks.
    f. For San Jose Downtown Station use elevators only; or if using escalators allow multiple switchbacks and use 35-degree inclination escalators to reduce the shaft diameter. Also consider crisscross escalator arrangement to reduce the shaft width.
    g. Consolidate entrances and exits where pedestrian flow allows and reduce mezzanine sizes by optimizing fare collection areas at the headhouses

h. Simplify architectural finishes while maintaining durability and aesthetics. Use low maintenance materials for finishes

i. Implement modular design elements that can be mass-produced and use precast members to the maximum possible

j. Standardize station components across all stations

k. Use modular station design (kit-of-parts)

8. **Procurement and Contracting Strategies:**

   a. Consider opportunities for P3 models using TOD at station locations

   b. Modify contract packages to reduce the size of the packages allowing more competitive bids and specialty contractors for specialty work

   c. Although early contractor involvement to identify cost saving opportunities is important, avoid PDB of large contract values

   d. Implement Alternative Delivery methods (DB and CMGC) to potentially reduce costs and transfer risk

   e. Restructure contingency allocations based on refined risk assessment and establish risk sharing contingency pool to be controlled by VTA with incentives/disincentives

   f. Implement target-price contracting with shared savings incentives/disincentives and implement design to budget contracts terms and conditions.

   g. Reduce consultancy and oversight costs through streamlined project governance and management and reduce extended overhead costs through efficient project management

   h. Compress overall project timeline to reduce exposure to escalation costs

   i. Pre-procure long lead items and materials subject to high price escalation and subject to tariff; and Owner-procure standard railroad materials such as rails, switches, transformers, switchgears, etc. eliminates contractor's markups

Category 2 – Out of the Box Ideas:

9. **Proposal 9 – Single Track in San Jose Downtown Station:** This proposal is similar to proposal 3 above, however San Jose Downtown Station will be constructed within the mid-size single bore tunnel (34ft ID) with only one track in the station.

   At the location of the Downtown Station, the northern track (inbound to San Jose) will be omitted and replaced with a station side platform. The station headhouse and shaft will be connected to the platform as presently designed with connecting adits directly to the platform. No mezzanine will be required.

Two crossovers will be located within the tunnel one on each side of the station to allow staged rail operation into and out of the station. With train headway of 10 minutes or more, the single-track operation of the station is feasible.

The advantages of this proposal are numerous including eliminating the construction of the Downtown Station by either SEM or cut & cover, significantly reducing the station cost, no impact on street traffic, utilities, businesses and the public. However, its feasibility depends on the rail operation aspects, acceptance of BART of this mode of operation, and potentially loss of flexibility in rail operation under perturbed condition.

10. **Proposal 10 – Partially Elevated Alignment:** In this proposal the tracks will be partially above ground on a viaduct at the east and west end of the alignment while they will be underground in Downtown San Jose and Diridon.

    The alignment starts from the existing tail track of the Berryessa Station on a viaduct following the general horizontal alignment, passing over US 101 in a viaduct. The 28th Street /Little Portugal will be elevated station in its present location. Following Santa Clara Street and passing over Coyote Creek and be elevated over Santa Clara street. It will descend underground in a trench between 16th and 13th Street and be in a cut and cover section from 13th street. The alignment continues underground under Santa Clara Street using a midsize TBM tunnel (34ft ID) or twin tunnels. The Downtown station will be constructed underground either as SEM construction or staged cut and cover construction as described above. The alignment continues underground to Diridon Station which will be constructed by cut and cover as described above.

    When the alignment reaches Stockton Ave., it will rise above ground in a viaduct continuing pass and over UPRR and I-880, then descending to the Newhall Yard at grade and to Santa Clara Station at grade.

    This configuration will reduce the tunnelling length by about half, will cross Silver Creek fault in an elevated structure, will place the 28th Street/Little Portugal Station above ground, and will reduce the project cost.

    The concept needs to be fully vetted and its disadvantages identified including the impact on the project environmental clearance, the needed ROWs, the location of transition from an elevated to an underground system, design development, etc.

VTA's BART Silicon Valley Phase II (BSVII) Extension Project
Summary of Cost Saving/Value Engineering Ideas from VTA's BSVII Oversight Subject Matter Expert Gall Zeidler and FTA/PMOC

Cost Saving proposals from Gall Zeidler (GZ):

GZ Proposal #	GZ Cost Saving Idea	Summary Description	VTA Status
1	Silver Creek Fault Basis of Design	Propose deletion of omega seal, eliminate additional internal space requirements for fault rupture	Level 1 and Level 3. This idea contributes to the $168M ROM (rough order of magnitude) Level 1 savings that are being attributed to Design Criteria modification.
2	Hybrid Solution	Concurrent tunneling from the east with smaller single bore tunnel to 13th Street or 3rd Street	Level 2 concluded that a tunnel from the east was feasible, but to save money, it would need to be smaller than current design criteria allow. For that reason, the team is looking at this in Level 3, in combination with revising the design criteria that drive tunnel design.
3	Tunnelling from the East and West using 34' ID Tunnel with two tracks	Concurrent tunneling from the east and west with smaller single bore tunnel; SEM for Downtown San Jose Station	Level 3 – see item #2 above for why this is being considered in Level 3, not Level 2.
4	Twin Tunnels from East and West	Concurrent tunneling from east and west with twin bores (meet at 13th Stret); SEM for Downtown San Jose Station	Because this concept would change the project alignment/definition it may be considered as part of Level 4 pending Level 3 findings
5	Variation of Proposals 3 & 4 Constructing the Downtown Station using Cut & Cover	Concurrent tunneling from east and west with smaller single bores or twin bores; Cut & Cover for Downtown San Jose Station	Level 3 – looking at options to minimize surface disruption while pursuing this concept. May be furthered considered as part of Level 4 pending Level 3 findings
6	Initial Operating Segment (IOS)	IOS: Smaller single bore from east to west of Diridon with tail tracks and crossover (28th Street deferred, SEM for Downtown San Jose; Cut & Cover for Diridon) Subsequent Operating Segment (SOS): Smaller single bore from west towards Diridon, complete 28th Street, Newhall Yard/Santa Clara Station)	Because this concept would change the project alignment/definition it may be considered as part of Level 4 pending Level 3 findings
7	Station Optimization	Review station footprints, Back-of-House, vertical circulation, architectural finishes, etc.	Level 1; $68M ROM Savings
8	Procurement & Contracting Strategies	Review delivery methods, package sizes, etc.	Being evaluated as part of Contracting Task Force. Findings will be shared with BSVII Oversight Committee in June.
9	Single Track in San Jose Downtown Station	Similar to proposal 3 with only a single track and side platform at the Downtown San Jose Station	Level 3
10	Partially Elevated Alignment	Viaduct over US101, elevated 28th Street Station, with elevated guideway to 13th Street, followed by underground to Stockton Avenue, followed by elevated guideway over I-880 then at grade to Santa Clara Station	Because this concept would change the project alignment/definition it may be considered as part of Level 4 pending Level 3 findings

VTA's BART Silicon Valley Phase II (BSVII) Extension Project
Summary of Cost Saving/Value Engineering Ideas from VTA's BSVII Oversight Subject Matter Expert Gall Zeidler and FTA/PMOC

Value Engineering Ideas brainstormed with FTA/PMOC:

PMOC Idea	PMOC Idea	Summary Description	VTA Status
1	Reduce tunnel diameter to original approved 43 feet tunnel	Revert to previous CP2 RFP design which included stacked stations at Downtown and Diridon and transitions	Level 3
2	Consider twin bore with SEM stations	Twin bore tunnels with mined downtown San Jose Station and cut & cover at Diridon and 28th Street Station	SEM construction is being evaluated for Level 3 and may be further considered as part of Level 4 pending Level 3 findings
3	Consider ~30 feet single-bore with off-street open-cut stations in parking lot @ Diridon, and an underground station with limited open-cut for side platforms only under sidewalk @ Downtown San Jose, 28th Street station configuration similar to Milpitas Station.	Smaller single bore tunnel with cut & cover side platform stations at Diridon, Downtown, and 28th Street Stations; for Downtown, cut and cover from sidewalk to build platforms	Level 3
4	Consider minimizing the cut-and-cover impact by utilizing de-watering wells and soil stabilization techniques in the Downtown	Evaluate various ground improvement ideas	Level 3
5	Station platform construction as an alternative to the cut-and-cover platform construction.	Access north and/or south side of tunnel to build station platforms	Variation being evaluated as part of Level 3
6	Consider significantly reduced TBM shaft by going 53 feet to ~30 feet (minimum tunnel diameter to be evaluated)	Reduce tunnel diameter	Level 3
7	For the 53 feet tunnel, consider the trackwork at the invert level and eliminate the inverted U or segmental bridge.	Lower internal trackwork within tunnel closer to invert (between stations)	Variation evaluated as part of Level 2