

## CHAPTER 2.0: RECOMMENDED PROJECT

### 2.1 BART EXTENSION ALTERNATIVE

The BART Extension Alternative (BART Alternative) consists of a BART heavy rail transit line partially constructed on the former UPRR right-of-way (ROW) owned by VTA. The BART Alternative would begin at the planned BART Warm Springs Station (to be implemented by 2011) in the City of Fremont and proceed through Milpitas to near 28<sup>th</sup> and East Santa Clara streets in San Jose on the railroad ROW. The extension would then turn into downtown San Jose in a subway (Figure 2.1-1) and terminate at grade in the City of Santa Clara near the Caltrain Station. Service for the BART Alternative could start in 2015, assuming all proposed funding is available.



**Figure 2.1-1: BART Subway Station**

**Stations.** The 16.3-mile BART Alternative would have seven stations, plus one future station:

- South Calaveras (Future) – at Calaveras Boulevard (SR 237) and the rail ROW
- Montague/Capitol – at the rail ROW between Montague Expressway and Capitol Avenue
- Berryessa – at Berryessa Road and the rail ROW
- Alum Rock – at 28<sup>th</sup> Street between East Julian and East Santa Clara streets
- Civic Plaza/San Jose State University (SJSU) – at East Santa Clara Street between 4<sup>th</sup> and 7<sup>th</sup> streets
- Market Street – at West Santa Clara Street between 1<sup>st</sup> Street and Almaden Avenue
- Diridon/Arena – south of and parallel to West Santa Clara Street between Autumn and White streets
- Santa Clara – at Benton Street/Brokaw Road between El Camino Real and Coleman Avenue.

**Segments.** Since the alignment passes through a diverse array of communities, each containing unique alignment characteristics, the following description of the BART Alternative is divided into five segments, making it easier to locate a specific portion of the alignment that might be of interest. The five segments, as shown on Figure 2.1-2, include:

- Segment 1 – Planned BART Warm Springs Station to Trade Zone Boulevard
- Segment 2 – Trade Zone Boulevard to Mabury Road
- Segment 3 – Mabury Road to 19<sup>th</sup> Street
- Segment 4 – 19<sup>th</sup> Street to I-880
- Segment 5 – I-880 to Lafayette Street

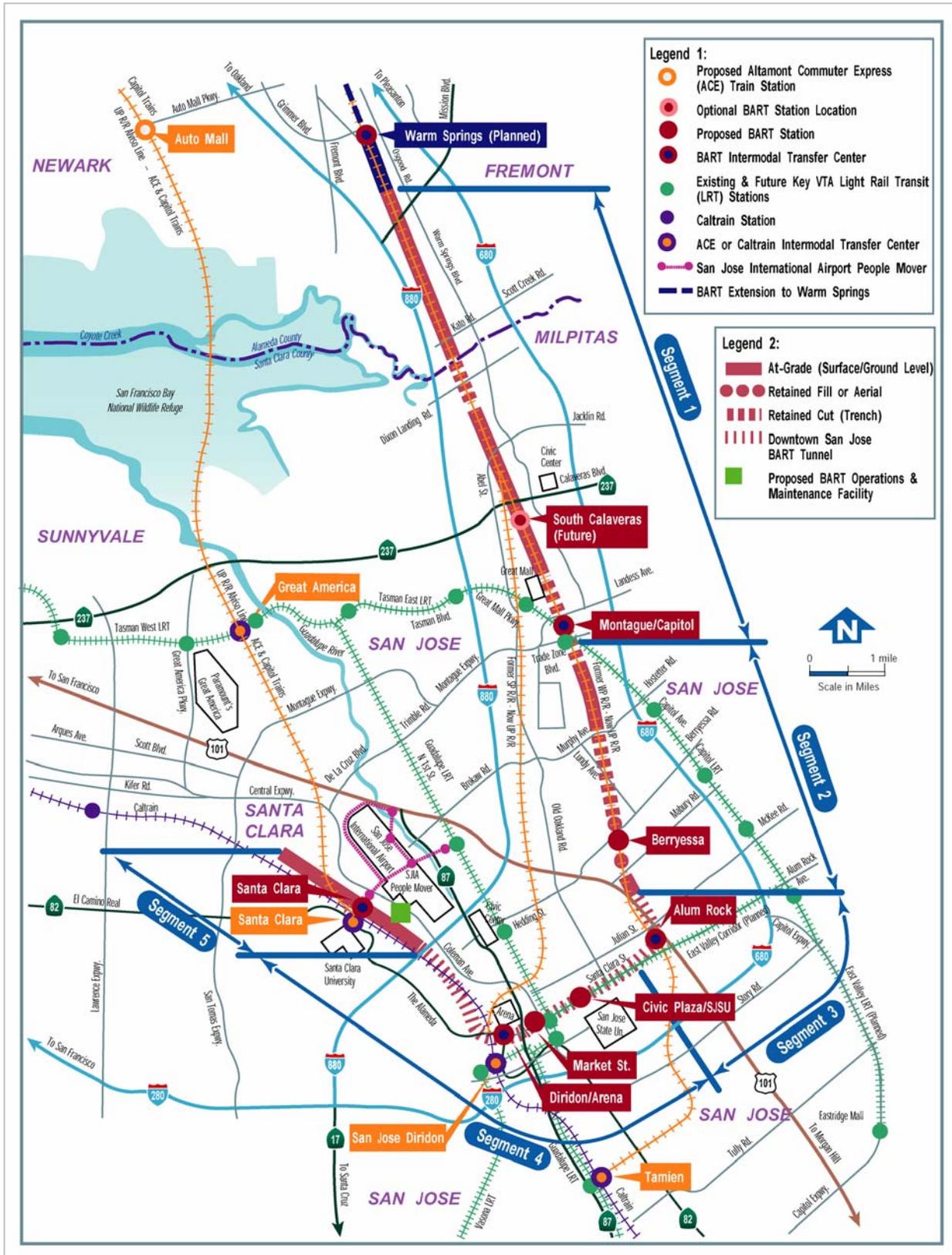


Figure 2.1-2: BART Extension Alternative Recommended Alignment and Segments

Each segment discussion includes a description of alignments (including design options), physical characteristics, and station locations (including design options). Maps and other graphics are included in Volume I, Appendices A and B. Other related facilities (i.e., electrical and train control equipment, BART Maintenance Facility, freight railroad wye, and a relocated truck transfer facility) are described in Section 2.1.6.

## **2.1.1 SEGMENT 1 – PLANNED BART WARM SPRINGS TO TRADE ZONE BOULEVARD**

Segment 1 of the BART Alternative is shown in Figures 2.1-3 and 2.1-4. Drawings showing the BART alignment and profile in this segment are provided in Appendix A, Figures A-5 through A-22.

### **2.1.1.1 Alignment**

As shown on Figures A-5 through A-8, the new, two-track BART rail line would proceed at grade south from the southern boundary of the planned BART Warm Springs Extension Project located about 2,200 feet north of Mission Boulevard in Fremont at the Alameda County Flood Control and Water Conservation District Channel. The BART alignment would be east of the rail ROW and south of the planned BART Warm Springs Station (STA 45+00) and would transition back into the rail ROW east of UPRR's Warm Springs Yard (STA 60+00). This alignment would reduce the amount of track relocation and eliminate the need to relocate a pipeline, but would require the acquisition and relocation of three large industrial buildings.

BART would travel at grade over the Mission Boulevard underpass, which will be widened by other agencies (Volume I, Section 3.7.1). South of Mission Boulevard, the BART alignment would be at grade and other agencies would reconstruct East Warren Avenue as a roadway underpass (Volume I, Section 3.7.1). A new bridge would be constructed for BART, and others would construct a new two-track bridge for the UPRR.

The BART alignment would eliminate truck access from East Warren Avenue to a rail-truck tank car transfer facility located in the middle of the railroad ROW south of East Warren Avenue, remove the easternmost transfer facility track, and encroach on a related truck holding facility immediately to the east of the ROW.

South of East Warren Avenue, the BART alignment would continue at grade on the eastern portion of the railroad ROW, passing by industrial buildings along Westinghouse Drive and crossing over an underground culvert that contains Toroges Creek. An abandoned freight spur would be removed at this location.

An undeveloped parcel on the west side of the ROW is one of two optional locations (Locomotive Wye Fremont Option) for VTA to construct a locomotive wye turnaround track to replace the existing UPRR locomotive wye turnaround located north of Montague Expressway, which would be severed by the BART line. The two optional locations for the replacement wye are discussed in Section 2.1.6.3.

The BART alignment would continue at grade, crossing over Kato Road, which would be reconstructed as an underpass (Figure A-11). Two new bridges would be constructed over Kato Road: one for BART and one for the UPRR (Figure A-12). Access points for office parking lots immediately north of Kato Road and east and west of the BART alignment may require closure or relocation because of the underpass slopes. Sufficient width would be left along the west side of the remaining railroad ROW for a second UPRR track, which would extend south to the UPRR's Milpitas Yard.

Proceeding south from Kato Road, the BART line would continue at grade, crossing Scott Creek, which is underground in a culvert, and the Alameda/Santa Clara County line. The BART line would continue

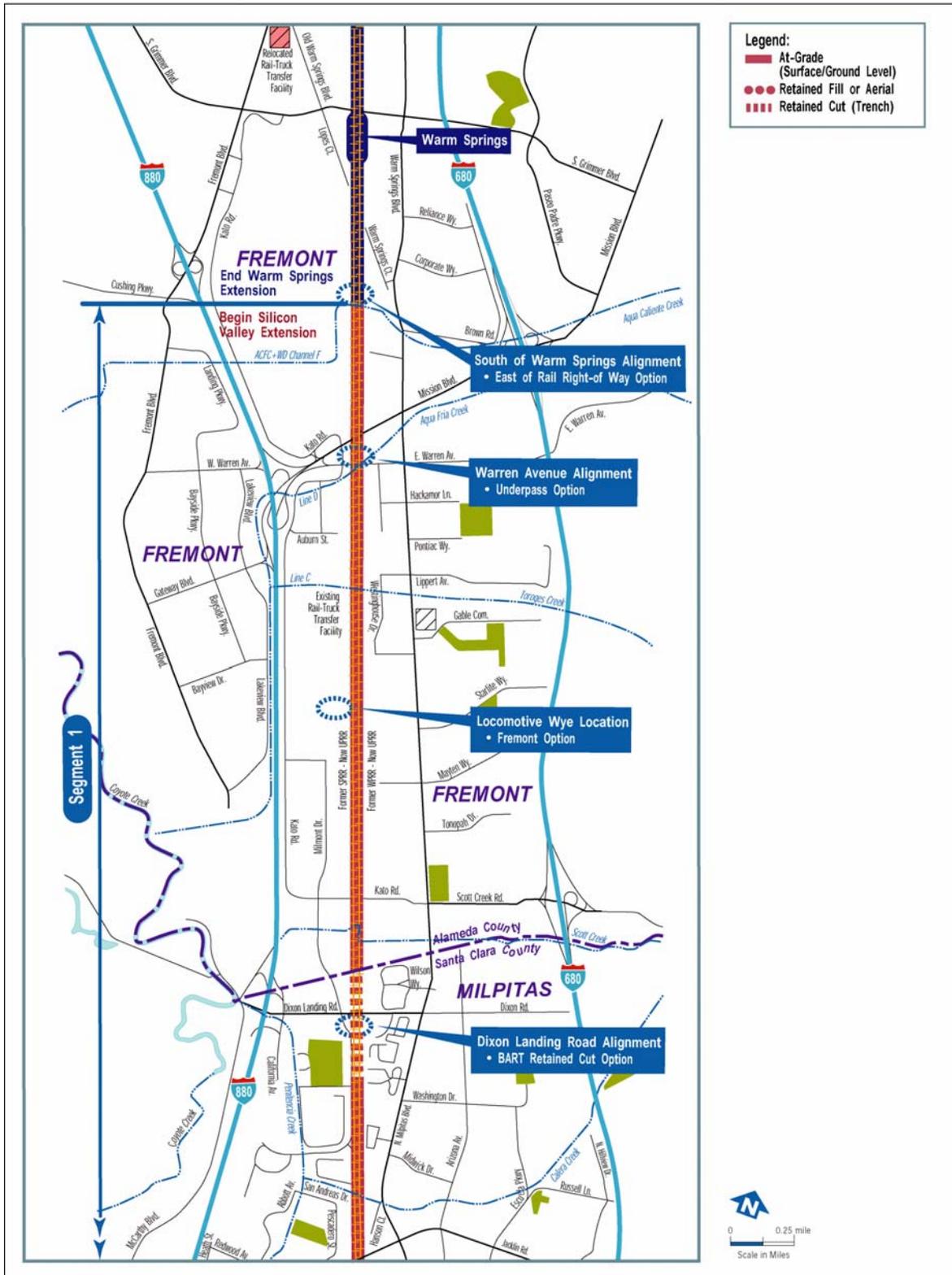


Figure 2.1-3: Segment 1 – BART Warm Springs Station to Trade Zone Boulevard (northern portion of segment)

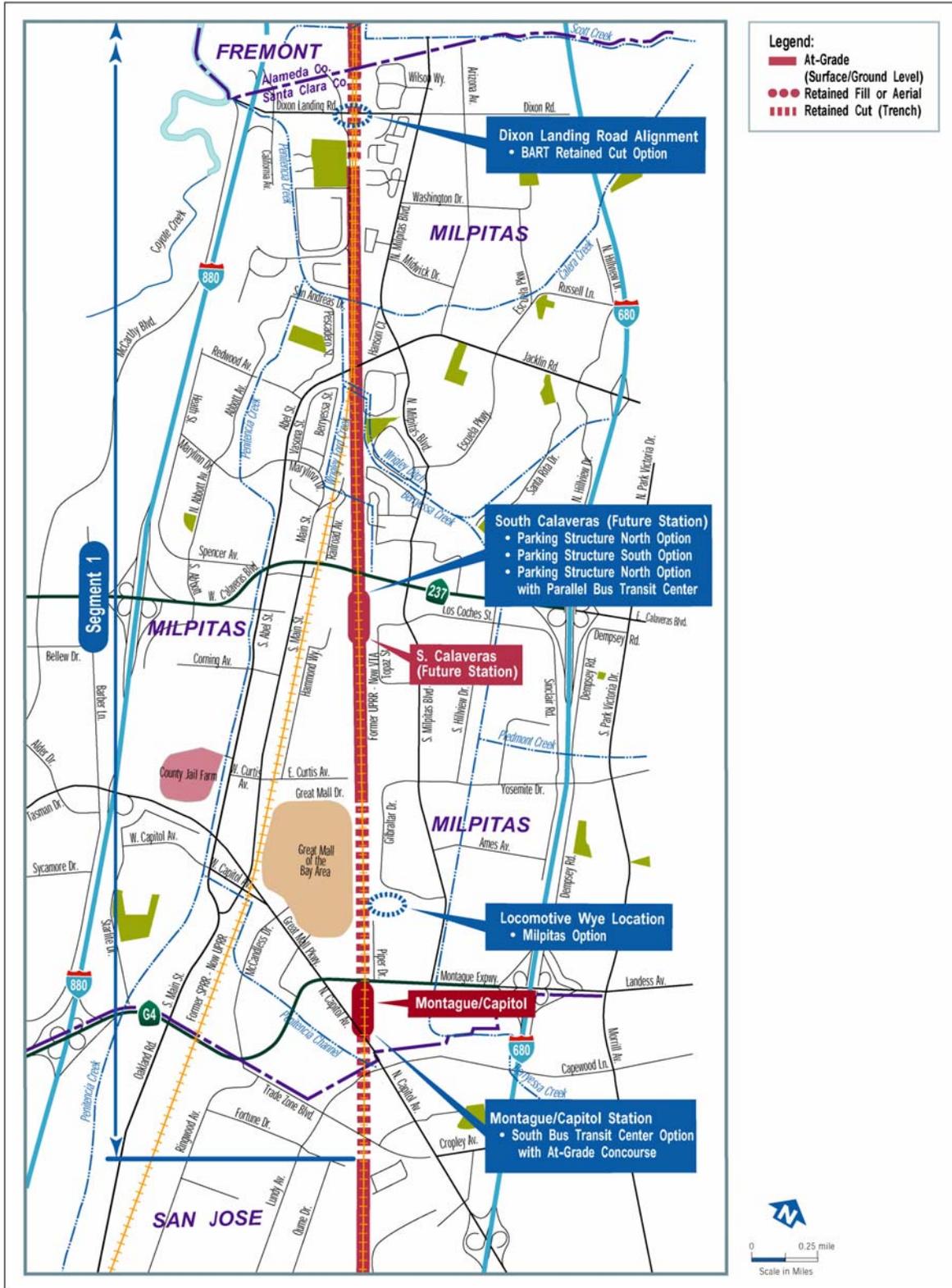


Figure 2.1-4: Segment 1 – BART Warm Springs Station to Trade Zone Boulevard (southern portion of the segment)

south, passing apartment complexes and homes bordering on the east, and would cross Dixon Landing Road. BART would pass underneath Dixon Landing Road in a 2,200-foot-long, approximately 22-foot-deep retained cut centered at the roadway. Dixon Landing Road would be supported above BART on a new roadway structure that would remain at grade.

Approaching Abel Street, the BART alignment would continue at grade on the east side of the railroad ROW, crossing an underground culvert containing Calera Creek before passing under the existing Abel Street overcrossing (Figure A-17). The BART line would pass over Berryessa Creek on a new 100-foot-long bridge. New two-track bridges would be constructed over Calera Creek and Berryessa Creek for the UPRR. South of Berryessa Creek, the two freight railroad corridors diverge and their ROWs narrow considerably to approximately 60 feet each.

South of Abel Street, BART would use 60 feet for its two-track alignment until Curtis Avenue and then partially share the 60-foot ROW with the UPRR from Curtis Avenue to about 1,000 feet north of Montague Expressway. Construction of the BART line in the constrained ROW would require relocation of two existing UPRR Milpitas Yard lead tracks to the west side of the ROW and construction of a new two-track bridge over Wrigley Creek. The new lead track would be used by the railroad to gain access to the Milpitas Yard from the north. New replacement tracks would also be constructed in the yard and would connect with a single freight lead track serving industries south of the Milpitas Yard. After crossing and then bordering Wrigley Creek on the west (Figure A-18), the BART line would pass at grade below the existing Calaveras Boulevard (SR 237) overpass and parallel the UPRR's Milpitas Yard at grade on the east. Toward the southern end of the yard, the BART line would cross the Hetch-Hetchy aqueduct on a structure and abut the Milpitas Yard employee parking area (Figure A-19).

South of Curtis Avenue (Figures A-19 and A-20), the BART alignment would descend into a retained cut 16 to 20 feet deep to allow a UPRR freight lead track to cross over the BART line on a 440-foot-long bridge and gain access to several major industries south of the UPRR Milpitas Yard and east of the ROW. To accommodate this UPRR lead track, approximately 20 feet of additional ROW would need to be acquired from the easternmost portion of the Great Mall Shopping Center and the Parc Metropolitan condominium complex, including a park area to be dedicated to the City of Milpitas (Volume I, Section 3.7.3). The UPRR lead track would need to be relocated up to 22 feet to the west to accommodate the BART alignment. The 20-foot-wide strip of land acquired to accommodate the lead track and construction of the retained cut would continue for approximately 1,800 feet along Great Mall Drive until the lead track crossed over the BART alignment near the southeast corner of the existing parking garage. At that point, a 20-foot-wide strip extending south for 800 feet would be acquired on the eastern side of the ROW.

The second option for the relocated locomotive wye turnaround track (Locomotive Wye Milpitas Option; Figure A-20, STA 355+00) would be located north of Montague Expressway east of the rail ROW (Volume I, Section 3.4.6.3). South of Montague Expressway, freight service would be discontinued by the UPRR and the rail freight line would be removed in its entirety to make room for the two-track BART line. Thus, the BART alignment would no longer be sharing the rail ROW with freight tracks or service from this point south. UPRR has filed or will file a petition with the federal Surface Transportation Board to abandon freight rail service in this railroad corridor south of Montague Expressway in Milpitas.

BART would continue in a retained cut past the Great Mall and would pass beneath Montague Expressway, Capitol Avenue, and Trade Zone Boulevard, each of which would be supported above BART on new roadway structures (Figures A-20 and A-22). An underground culvert (siphon) would be constructed below the BART retained cut to facilitate storm drainage into East Penitencia Channel.

The railroad ROW contains an oil pipeline owned by Chevron generally located along the east side of the ROW extending from Gimmer Boulevard to Mabury Road. MCI/World Com owns a fiber optics cable that

is generally located along the west side of the ROW in the segments between Warm Springs and 28<sup>th</sup>/Santa Clara streets. Other utility lines also share the railroad ROW for short segments.

To ensure a safe environment for UPRR freight trains and BART operating in close proximity in a "common corridor," safety measures would be implemented in accordance with the California Public Utilities Commission and Federal Railroad Administration guidelines. VTA and BART would jointly assess "common corridor" safety to determine the most appropriate and cost-effective design treatment(s) where BART would operate in close proximity to a freight or passenger railroad. These may include electronic intrusion detection and alarm systems, crash barrier walls, and raised BART trackways.

### 2.1.1.2 Station Locations

Segment 1 would have two stations as described below. All figures referred to in this section are found in Volume I, Appendix B.

- **South Calaveras Future Station** (Figure B-1). A future station for mid-town Milpitas will be constructed south of Calaveras Boulevard on the east side of the railroad ROW. The at-grade station would contain a 700-foot-long, 28- to 32-foot-wide center platform with a mezzanine one level above. Access to the station platform would be from the mezzanine level. Pedestrian connections would extend from the mezzanine level to a 10-bay intermodal bus transit center and kiss-and-ride area. A multi-level parking structure accommodating up to 1,200 parking spaces is proposed. Three design options are under consideration for the station area:
  - **Parking Structure North Option** (Figures B-2 and B-3). This option would provide a multi-level parking structure on the north side of the bus transit center and would accommodate future transit facilities south of the bus transit center. The bus transit center would be located perpendicular to the station.
  - **Parking Structure South Option** (Figures B-4 and B-5). This option would provide surface parking north of the bus transit center and a multi-level parking structure south of the bus transit center. The bus transit center would be located perpendicular to the station.
  - **Parking Structure North Option with Parallel Bus Transit Center** (Figures B-6 and B-7). With this option, the bus transit center would be parallel to the station. East of the bus transit center, this option would provide a multi-level parking structure at the north end and surface parking on the south end.

The South Calaveras Future Station area would encompass up to 22 acres of land and require several business relocations. Wrigley Creek may be relocated several feet to the west, but would remain in an open, natural channel. Road widenings are assumed along Milpitas Boulevard and Los Coches Street to facilitate traffic flow into and out of the station area. The main access to the parking areas would be provided from Los Coches Street.

VTA has met with Community Working Groups (CWGs) (including representatives of affected agencies, jurisdictions, businesses, and communities) to develop the preliminary station concept plans for the South Calaveras Future Station, as well as all other stations. These plans are found in Volume I, Appendix B. The input received on the station concepts is summarized in the *Station and Urban Design Comment Summary Report* that covers the period from April 15, 2002 through October 31, 2002. This comment report also describes the public outreach process involved in sponsoring multiple station and urban design workshops for the community. VTA intends to continue these community coordination efforts to evaluate detailed station designs for the BART Alternative through Preliminary Engineering and Final Design.

- **Montague/Capitol Station** (Figure B-8). This station, which would extend between Montague Expressway and Capitol Avenue along the BART alignment, would contain two 700-foot-long, minimum 16-foot-wide side platforms in a retained cut. Access to the station platforms would be from a mezzanine situated above the track level. Elevated pedestrian connections would extend from the BART station mezzanine to the adjacent Tasman East aerial light rail transit (LRT) station situated in the median of Capitol Avenue. Pedestrian connections to a 14-bay intermodal bus transit center, kiss-and-ride area, and a multi-level parking structure containing 1,200 to 1,600 spaces would be located east of the station. This station will include the following design element:
  - **South Bus Transit Center Option with At-Grade Concourse** (Figures B-11 and B-12). Under this option, a multi-level parking structure would be located to the north, with limited surface parking to the south of the bus transit center. Within the station building, the concourse would be at-grade. The bus transit center would be located perpendicular to the station, south of the BART station central roadway.

Vehicular access would occur from Milpitas Boulevard on the northeast, Montague Expressway and Gladding Court on the north, and Capitol Avenue on the west. The station area, including a plaza situated on a triangular parcel between the mezzanine and Capitol Avenue, would encompass up to 21 acres. Existing uses, including research and development industries to the east and a storage area for a trucking company on the west, would be removed.

Traffic and pedestrian movement into and out of the station area would be facilitated by roadway improvements on Montague Expressway and an extension of South Milpitas Boulevard beginning on the south side of Montague Expressway, continuing through the station area, and terminating at Capitol Avenue. In addition, a new traffic signal would be installed at the new intersection of South Milpitas Boulevard and Capitol Avenue.

## **2.1.2 SEGMENT 2 – TRADE ZONE BOULEVARD TO MABURY ROAD**

Segment 2 of the BART Alternative is shown in Figure 2.1-5. Drawings showing the BART alignment and profile in this segment are provided in Volume I, Appendix A, Figures A-22 through A-25.

### **2.1.2.1 Alignment**

South of Trade Zone Boulevard, the BART line would transition from retained cut to an at-grade configuration. Adjoining land uses are commercial/industrial on the west and residential on the east. The BART line would abut the residences along Tradan Drive, Flickinger Way, Flickinger Place, Flickinger Court, Flickinger Avenue, and Silvertree Drive. Approaching Hostetter Road, BART would descend into a retained cut and remain 16 to 20 feet below grade until immediately north of Berryessa Road. Roadway structures above the BART trench would be constructed at Hostetter Road and Lundy Avenue/Sierra Road.

North of Berryessa Road, BART would transition from below grade to an elevated configuration, first on retained fill extending 550 feet and then on an aerial structure 22 feet above grade just north of the Berryessa Station. The aerial alignment would cross Berryessa Road, Upper Penitencia Creek, and Mabury Road, which would remain in their present configurations. The aerial alignment would pass over and not affect the Santa Clara Valley Water District (SCVWD) planned subsurface drainage bypass structure crossing under the ROW south of Berryessa Road or the existing 66-inch-diameter central pipeline that parallels the BART alignment south of Berryessa Road and crosses to the west under the existing railroad north of Mabury Road.

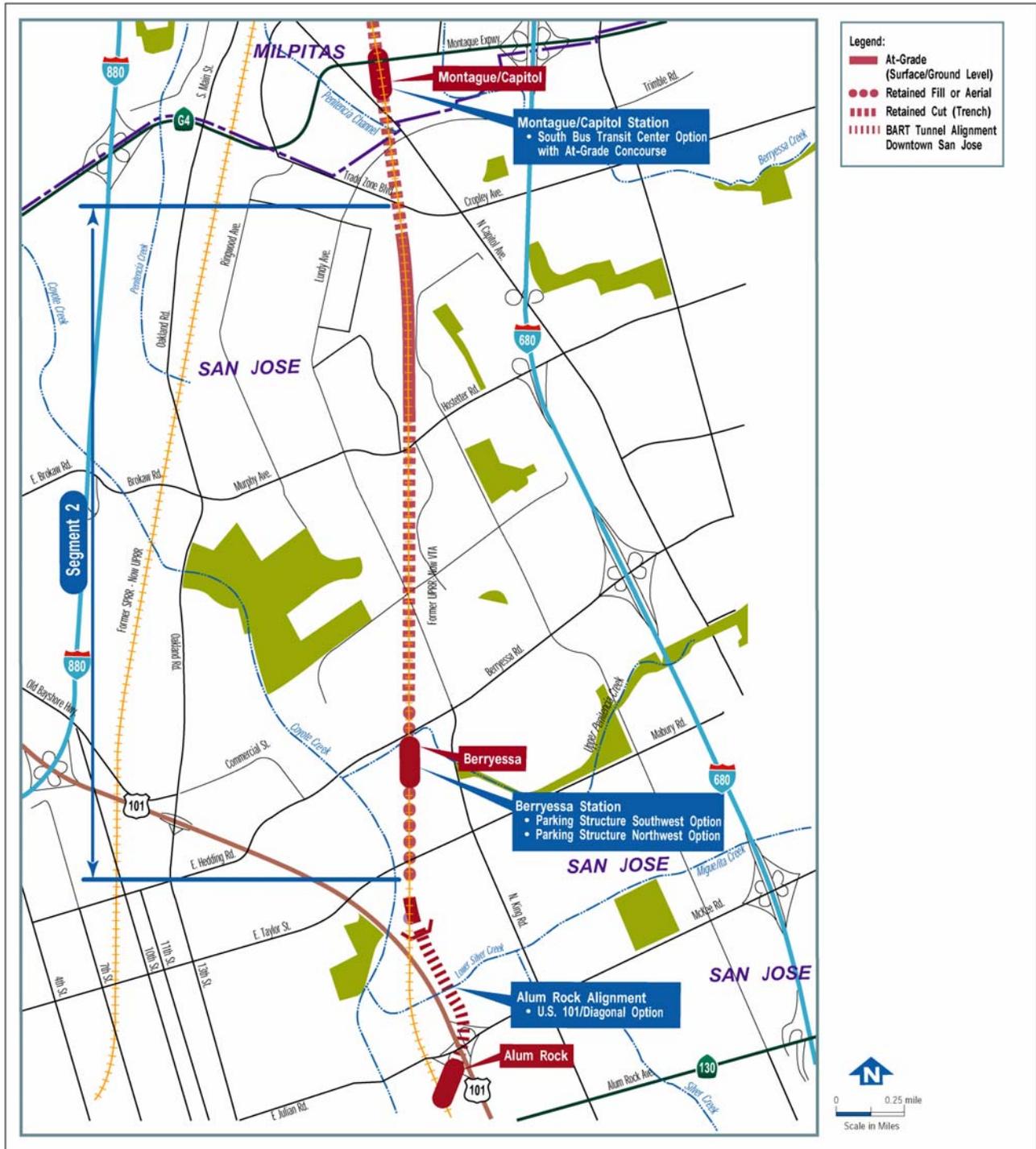


Figure 2.1-5: Segment 2 – Trade Zone Boulevard to Mabury Road

A BART combination crossover and pocket track would be installed on the elevated guideway from approximately 500 feet south of Berryessa Station to approximately 1,100 feet south of Mabury Road. Railroad access to the industries located near the rail alignment at Mabury Road and immediately north of US 101 would be severed and not replaced.

The alignment in Segment 2 is contained within the existing railroad ROW. No additional ROW is needed for the BART alignment in this segment.

### **2.1.2.2 Station Locations**

The Berryessa Station is the only proposed station for Segment 2. All figures referred to in this section are found in Volume I, Appendix B.

- **Berryessa Station** (Figure B-17). This station would be an elevated, 700-foot-long, 28- to 32-foot-wide center platform station centered between Berryessa Road and the planned subsurface SCVWD drainage bypass structure to the south. The mezzanine level, situated at grade beneath the elevated BART platform, would provide direct access to the station platform. Two design options are under consideration for the Berryessa Station area.
  - **Parking Structure Northeast Option** (Figures B-18 and B-19). This option would locate station facilities on approximately 43 acres to the east and west of the station. An eight-bay bus transit center, plaza, and kiss-and-ride area would be located on the west. Access would be provided from Berryessa Road on the north and by a newly constructed street originating at Mabury Road and paralleling the BART ROW on the west. Surface and multi-level parking facilities accommodating 1,500 to 2,500 vehicles would be located east of the station, with a small surface lot north of the bus transit center. Vehicular access to the parking facilities would be from Berryessa Road and from a new street originating at King Road and continuing parallel to or on top of the planned SCVWD drainage bypass structure. For this option, several businesses east of the ROW would be relocated. In addition, up to 400 vendor stalls would be displaced at the San Jose Flea Market – approximately 20% of the total.
  - **Parking Structure Southwest Option** (Figures B-20 and B-21). This option would involve up to 43 acres, on the west side of the ROW. The bus transit facility, plaza, and kiss-and-ride area would remain immediately west of the station as in the Parking Structure Northeast Option. Surface and multi-level parking facilities accommodating 1,500 to 2,500 vehicles would be located in the San Jose Flea Market overflow parking lot between the SCVWD drainage bypass structure and Mabury Road, with a small surface lot north of the bus transit center. Vehicular access would be from Berryessa Road and from Mabury Road via a new street along the west side of the BART ROW. Like the Parking Structure Northeast Option, up to 400 vendor stalls would be displaced at the San Jose Flea Market.

### **2.1.3 SEGMENT 3 – MABURY ROAD TO 19TH STREET**

Segment 3 of the BART Alternative is shown in Figure 2.1-6. Drawings showing the BART alignment and profile in this segment are provided in Volume I, Appendix A, Figures A-26 through A-32.

#### **2.1.3.1 Alignment**

South of Mabury Road, the BART line would continue elevated on retained fill for 940 feet before descending into a short (840-foot) retained cut north of US 101. The line would continue to descend into a cut-and-cover tunnel (extending 640 feet) as it diverts from the railroad ROW under Marburg Way, which parallels the east side of US 101 in this area. The depth of the tunnels as measured from the



ground or street level to the top, or crown, of the tunnels varies from 20 feet to 60 feet. The tunnels would generally be 40 feet deep when they pass beneath residences and businesses. To construct these tunnels, property easements would be required.

The US 101/Diagonal Option (Figures A-26 through A-28) was selected for this segment. A tunnel-boring machine (TBM) would be employed past Las Plumas Avenue (where industrial buildings and storage areas line Marburg Way) to construct the tunnel portion of this segment. The bored tunnel would curve under US 101 at McKee Road/East Julian Street and traverse the block between US 101 and 28<sup>th</sup> Street (south of East Julian Street), where a former steel company building and other industrial facilities are located. The bored tunnel would then curve under 28<sup>th</sup> Street, the railroad ROW, and 27<sup>th</sup> and 26<sup>th</sup> streets before passing under East Santa Clara Street. The tunnel would continue underneath a 100-foot-wide East Santa Clara Street ROW.

### **2.1.3.2 Station Locations**

The Alum Rock Station is the only proposed station for Segment 3. All figures referred to in this section are found in Volume I, Appendix B.

- **Alum Rock Station** (Figure B-22). Vehicular traffic would be directed into the station area primarily through East Julian and 28<sup>th</sup> streets. East Julian Street may be widened between 28<sup>th</sup> Street and the northbound US 101 off-ramp. In addition, a possible slip ramp may provide direct access from the parking garage to southbound US 101. New or modified traffic signals would be installed at the intersections of 28<sup>th</sup>/East Julian and 28<sup>th</sup>/East Santa Clara streets, as well as at McKee Road and the existing US 101 northbound off-ramp. The intersection of 28<sup>th</sup>/East Santa Clara streets would also be designed as a pedestrian/transit gateway to the station area and would provide pedestrian links with buses and possible LRT operating on East Santa Clara Street and Alum Rock Avenue. A multi-level parking structure accommodating 1,500 to 2,500 cars would be constructed.

For the selected US 101/Diagonal Option (Figures B-23 through B-24), the subway station would be located north of East Santa Clara Street between US 101 and 28<sup>th</sup> Street on approximately 15 acres of land currently occupied by industrial uses. The station would be constructed on a diagonal using cut-and-cover techniques. The depth of the station, measured from the ground or street level to the top of the station box (the roof of the mezzanine or concourse), would be from 10 to 15 feet. The station box would be approximately 950 to 1000 feet in length and 65 feet in width. Direct access to the 700-foot-long, 28- to 32-foot-wide center platform would be provided through a subsurface mezzanine one level above the platform. Elevators and escalators would connect the mezzanine level with a “town square” entry plaza on the surface east of 28<sup>th</sup> Street. Station entrances potentially may be integrated into new or existing adjacent buildings. The multi-level parking structure would be constructed on the north side of the station area between 28<sup>th</sup> Street and US 101.

### **2.1.4 SEGMENT 4 – 19TH STREET TO I-880**

Segment 4 of the BART Alternative is shown on Figure 2.1-7. Drawings showing the BART alignment and profile in this segment are provided in Volume I, Appendix A, Figures A-32 through A-42.

#### **2.1.4.1 Alignment**

BART would continue in a subway under East/West Santa Clara Street, passing below Coyote Creek, Los Gatos Creek, and the Guadalupe River to the vicinity of the HP Pavilion (aka San Jose Arena) and San Jose Diridon Caltrain Station, a distance of 2.4 miles. The subway would be constructed using a TBM. The depth of the tunnels, measured from the ground or street level, to the top, or crown, of the tunnel

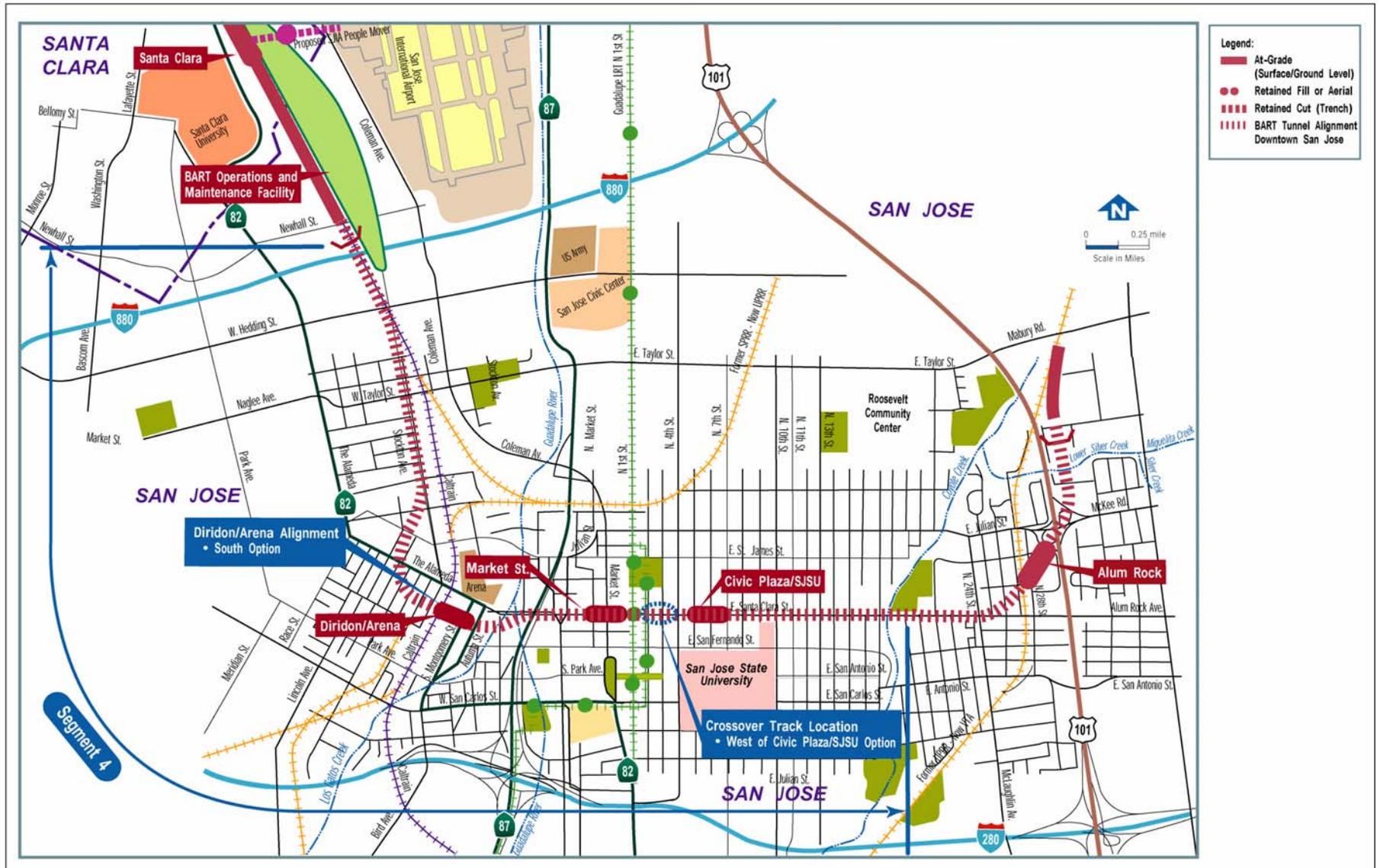


Figure 2.1-7: Segment 4 – 19th Street to I-880

varies from 20 feet to 60 feet. The tunnels are at their deepest when they pass under Coyote Creek between 19<sup>th</sup> and 17<sup>th</sup> streets, and are at their shallowest when they pass under Stockton Avenue between Lenzen Avenue and McKendrie Street. The tunnels would generally be 40 feet deep when they pass beneath residences and businesses. Construction would occur within the 100-foot-wide public ROW of East/West Santa Clara Street, which includes the 68-foot-wide street and 16-foot-wide sidewalks on each side. To construct these tunnels, property easements would be required. The BART subway would encounter multiple subsurface utility lines in the downtown area at the three downtown subway stations (Volume I, Section 3.4.4.2). These subway stations would be constructed using cut-and-cover methods; thus, the utilities would have to be supported in place/reinforced or relocated. A BART double crossover track to be located in a cut-and-cover subway box structure would be located West of the Civic Plaza/SJSU station, between 4<sup>th</sup> and 2<sup>nd</sup> streets.

The selected South Option (Figures A-38 through A-40) for the Diridon/Arena alignment would divert from West Santa Clara Street east of SR 87, passing under the planned/approved nine-story Marriott Hotel site, the Guadalupe River, a parking area development site owned by the San Jose Water Company, Los Gatos Creek, an office building along Autumn Street, and the former Crandall Street ROW. The alignment would travel beneath parking lots between Autumn and Cahill streets that are owned by VTA, the City of San Jose, and Caltrain. The BART subway would continue under the Caltrain and UPRR tracks, White Street, and Bush Street, where the historic Del Monte Cannery residential reuse project and the new Avalon residential project are located.

West of Bush Street, the subway would begin a sweeping curve beneath commercial and residential structures fronting The Alameda and Rhodes Street. It would continue under blocks containing residential and industrial uses on West Julian and Cinnabar streets before entering the public ROW under Stockton Avenue at Lenzen Avenue. At this point, the tunnel would be located entirely underneath the 80-foot-wide Stockton Avenue ROW.

Where Stockton Avenue crosses the Caltrain ROW south of Hedding Street, the alignment would divert from Stockton Avenue and pass under the railroad tracks, which are located at grade. The BART subway would continue on the east side of the Caltrain ROW, tunneling under the Hedding Street overpass, several industrial buildings, and storage areas that border the ROW. Approaching the I-880 overpass (over the railroad), the BART alignment would begin to ascend in a cut-and-cover subway box below the I-880 railroad overpass and would displace two large industrial buildings and storage areas that front Stockton Avenue, north of McKendrie Street. Cut-and-cover construction would extend over 1,300 feet, passing beneath the I-880 overpass to a subway portal just south of Newhall Street. ROW would be acquired between McKendrie and Newhall streets.

#### **2.1.4.2 Station Locations**

Segment 4 would have three subway stations as described below. These stations would be constructed using cut-and-cover techniques. The depth, measured from the ground or street level to the top of the station box (the roof of the mezzanine or concourse), would vary from 10 to 15 feet. All figures referred to in this section are found in Volume I, Appendix B.

- **Civic Plaza/SJSU Station** (Figures B-27 through B-29). This subway station would be located under East Santa Clara Street in an approximately 950- to 1000-foot-long by 65-foot-wide subway box located between 4<sup>th</sup> and 7<sup>th</sup> streets. The 700-foot-long, 28- to 32-foot-wide center platform would be constructed with passenger access provided from the mezzanine one level above. Street level escalator and elevator entrances would enable passenger access to the mezzanine level from several different possible locations between 4<sup>th</sup> and 8<sup>th</sup> streets, with potential underground walkways that may lengthen the mezzanine level at either end of the station. The seven potential station entrances may be integrated into existing or new adjacent buildings. However, the final decision on which entrances to be constructed and where will be made during Preliminary Engineering and Final

Design and will be based on a number of factors including cost, constructibility, availability of land, pedestrian connectivity, and safety and security. After that decision, supplemental environmental documentation may be required. The station would have bus connections at various designated locations. However, no parking would be incorporated into the station plan.

- **Market Street Station** (Figures B-30 through B-32). This subway station would be under West Santa Clara Street in an approximately 950- to 1000-foot-long by 65-foot-wide subway box located between 1<sup>st</sup> Street and Almaden Avenue. The 700-foot by 28- to 32-foot center platform would be constructed in a station box similar to that described for the Civic Plaza/SJSU Station. The platform would have access from the mezzanine one level above. Street level escalator and elevator entrances would provide access to the mezzanine level from several different possible locations between 2<sup>nd</sup> Street and Almaden Avenue, with potential underground walkways that may extend from the mezzanine level at either end of the station and along 1<sup>st</sup>, Market, and San Pedro streets. The eleven potential station entrances may be integrated into existing or new adjacent buildings. However, the final decision on which entrances to be constructed and where will be made during Preliminary Engineering and Final Design and will be based on a number of factors including cost, constructibility, availability of land, pedestrian connectivity, and safety and security. After that decision, supplemental environmental documentation may be required. The station would have bus connections at various designated locations and would include a connection to VTA's existing Guadalupe LRT. No parking would be incorporated into the station plan.
- **Diridon/Arena Station** (Figures B-33 through B-35). This station would be under the former Crandall Street ROW between Autumn Street and the Caltrain Station tracks leading to the San Jose Diridon Caltrain Station. The 700-foot-long, 28- to 32-foot-wide station platform would be constructed in an approximately 950- to 1000-foot-long by 65-foot-wide subway box. The station platform would be connected to the mezzanine one level above. Street level escalator and elevator entrances would provide access to the mezzanine level at several different possible locations between Autumn Street and Stockton Avenue. Pedestrian connections from the Diridon/Arena Station to the San Jose Diridon Caltrain Station, the nearby Vasona LRT station, and HP Pavilion would be provided. Station entrances intended to serve the HP Pavilion would be placed to minimize pedestrian/rider impacts from surges during high-use periods. There are six potential entrances with the Diridon/Arena Station. However, the final decision on which entrances to be constructed and where will be made during Preliminary Engineering and Final Design and will be based on a number of factors including cost, constructibility, availability of land, pedestrian connectivity, and safety and security. After that decision, supplemental environmental documentation may be required.

To replace lost parking for the Caltrain Station and the HP Pavilion, and to add 1,500 to 2,200 new park-and-ride spaces for the BART station at this location, two large multi-level parking structures would be built. One would be located on a parking area adjacent to and immediately west of the HP Pavilion and north of West Santa Clara Street, and another east of the San Jose Diridon Caltrain Station and south of West San Fernando Street (Figures B-34, B-35, B-37, and B-38). The parking structure south of West San Fernando Street may also contain a bus transit center that would replace the VTA bus transit facility located south of West Santa Clara Street and immediately east of the San Jose Diridon Caltrain Station.

### **2.1.5 SEGMENT 5 – I-880 TO LAFAYETTE STREET**

Segment 5 of the BART Alternative is shown in Figure 2.1-8. Drawings showing the BART alignment and profile in this segment are provided in Volume I, Appendix A, Figures A-42 through A-45.

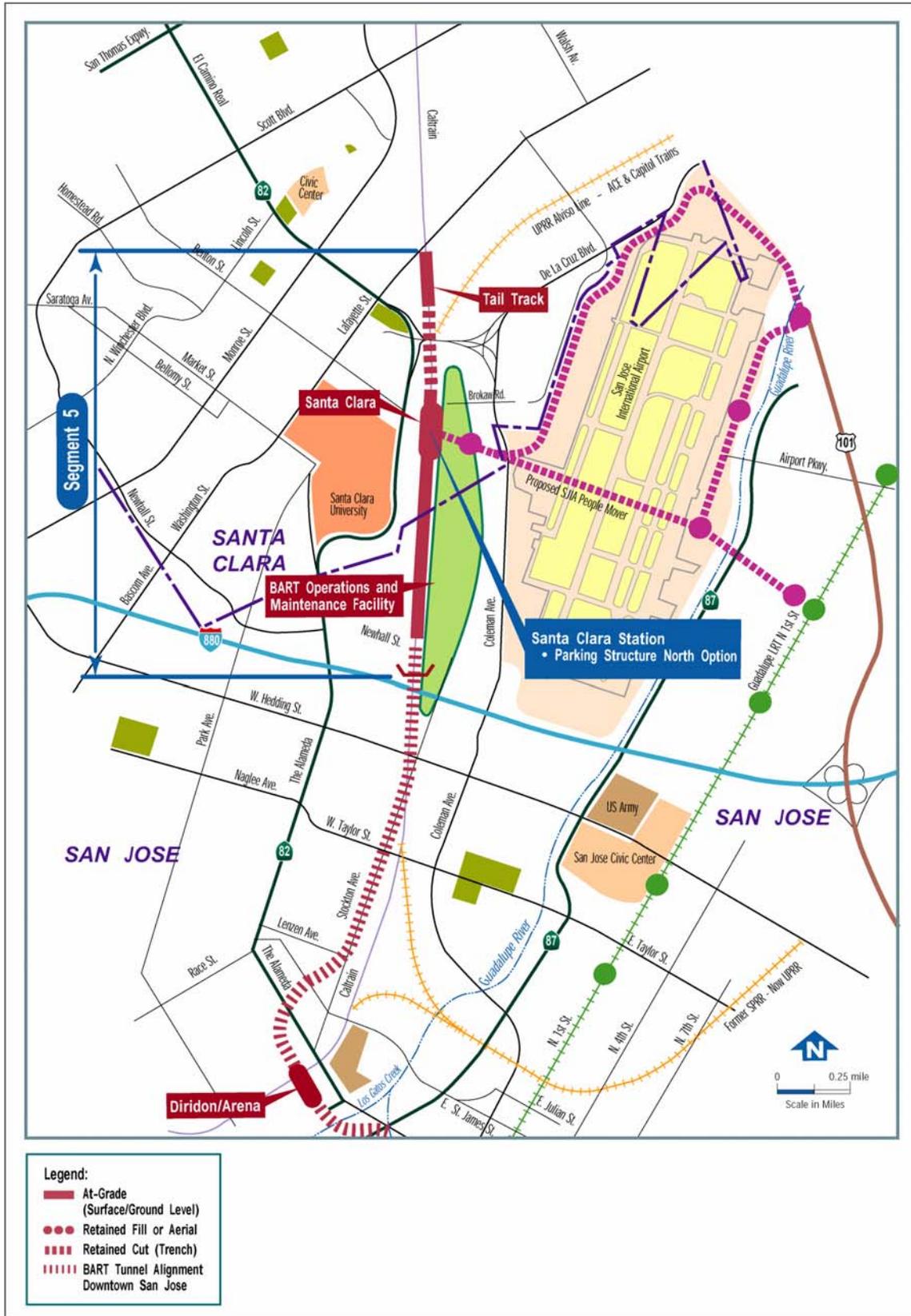


Figure 2.1-8: Segment 5 – I-880 to Lafayette Street

### 2.1.5.1 Alignment

From the Newhall Street subway portal to the end of the line, BART would travel in a retained cut for approximately 400 feet before continuing at grade to the Santa Clara Caltrain Station. The alignment would use the eastern (vacant land) side of the UPRR Newhall Yard opposite the Santa Clara Caltrain Station (which also serves ACE, Capitol Corridor, and Amtrak trains).

Immediately east of the alignment, a BART Maintenance Facility would be constructed (Section 2.1.6.1). Two tail tracks would extend approximately 2,250 feet beyond the Santa Clara Station toward Lafayette Street and pass in a retained cut-and-cover subway under the UPRR Coast Route alignment and under De La Cruz Boulevard.

The truck-rail facility and 4 light industrial properties would be relocated to accommodate the alignment and BART Maintenance Facility. The tail track between De la Cruz Boulevard and Lafayette Street would also require the relocation of 10 light industrial properties and 75 storage units.

### 2.1.5.2 Station Locations

There is one proposed station for Segment 5. All figures referred to in this section are found in Volume I, Appendix B.

**Santa Clara Station.** This station would be located on the northeast side of the UPRR ROW, approximately centered on Brokaw Road, and on the western portion of the Federal Express facility site (Figure B-39 shows the station area footprint). The 700-foot-long, 28- to 32-foot-wide center platform would be located at grade centered on Benton Street, Brokaw Road, and just northeast of the Santa Clara Caltrain Station platforms. An approximate 400-foot-long elevated pedestrian connection would link the BART station platforms with the Caltrain platforms, bus plaza, and kiss-and-ride area on the west side of the Caltrain ROW. In addition, a pedestrian overcrossing would extend from the BART station to the west over the Caltrain tracks and within the Brokaw Road ROW. A component of the Santa Clara Caltrain Station, the historic Santa Clara Tower (historic Tower), is proposed to be moved south of the overpass landing and near Benton Street to retain the relationship between the historic Tower and the historic Santa Clara Station Depot. A multi-level parking structure (Figure B-40 and B-41) would be located on the north side of Brokaw Road on the site of the Federal Express facility. The bus transit center would include five bus bays, a bus shelter, and kiss-and-ride. The Federal Express property would be acquired for the station structure, the pedestrian connection, and an 800- to 1,200-car multi-level parking structure.

A proposed Automated People Mover would link the BART and Caltrain/ACE/Capitol Station with the SJIA terminals (Section 3.7.1).

## 2.1.6 OTHER RELATED FACILITIES

### 2.1.6.1 BART Alternative Ancillary Facilities

#### Electrical Equipment

BART trains run from an electrified third rail adjacent to each track and would require electrical power supply substations and bulk power substation/switching stations that would interface with Pacific Gas & Electric Company (PG&E) and possibly Silicon Valley Power (SVP).

- **Traction Power Substations.** Substations include both outdoor and indoor types of equipment housed in a pre-fabricated building. The equipment consists of 34.5 kilovolt (kV) alternating current (AC) metal clad walk-in type switchgear, transformer-rectifier assemblies, 1,000 volt (V) direct

current (DC) switchgear circuit breakers, control equipment, electrical auxiliary equipment, protection relays, meters and telemetering devices, supervisory control and data acquisition system (SCADA), and connecting AC and DC power and control cables. These facilities are used to transform 34.5kV AC to 1000V DC electric power for distribution to the traction electrification system through the contact rail system, which provides power to the vehicles, the passenger stations, and the maintenance and shop facilities. Approximate dimensional requirements of traction power substations are 60 by 200 feet (outdoor installation) and 110 by 125 feet or 50 by 220 feet (indoor installation).

- **1,000V DC Gap Breaker Stations.** These stations consist of indoor type 1,000V DC switchgear circuit breakers housed in a pre-fabricated building. They are complete with protection relays and meters, SCADA, and connecting DC power cables to the 1,000V contact rail to provide a continuous DC loop over the entire system during normal operating conditions. During maintenance, repairs, or emergency conditions, the gap breaker stations are used to isolate appropriate contact rail sections. Approximate dimensional requirements of gap breaker stations are 30 by 40 feet.
- **Bulk Power Substations.** These substations include outdoor type equipment consisting of power utility interface equipment such as a disconnect switch, a metering potential and current transformers and revenue metering facility, an 115kV outdoor-type power circuit breaker, a power transformer, a 34.5kV indoor-type power circuit breaker, and electrical auxiliary equipment for control and utilization equipment, protection relays, meters, telemetering devices and SCADA. This facility is used to transform 115kV AC utility power to 34.5kV AC power for distribution to the dual 34.5kV sub-transmission cable system. Approximate site dimensional requirements of bulk power substations are 70 by 160 feet, and 75 by 190 feet for a combined bulk power substation and switching station.
- **34.5kV Switching Stations.** These stations consist of 34.5kV metal-clad, walk-in-type switchgear circuit breakers, protection relays and meters, and SCADA which is used for switching, distribution, and protection to the entire dual redundant 34.5kV sub-transmission cable system. Approximate dimensional requirements of switching stations are 30 by 40 feet.
- **34.5kV Sectionalizing/Gap Breaker Stations.** These facilities consist of (normally open position) metal-clad, walk-in-type 34.5kV switchgear circuit breakers, protection relays and meters, and SCADA, which is used to tie-in existing BART 34.5kV cable distribution circuits or new 34.5kV cable distribution circuits to obtain a flexible and reliable power supply system during contingency operations. Approximate dimensional requirements of sectionalizing/gap breaker stations are 30 by 20 feet. This equipment would be combined with the traction power substation 34.5kV AC switchgear assembly.

Ten traction power substations are proposed at the following locations:

- Traction Power Substation #1 (TPSS #1), south of East Warren Avenue on east side of rail ROW – (Figures A-5 and A-6, STA 79+00).
- TPSS #2, south of Kato Road on west side of rail ROW (Figure A-13, STA 174+00).
- TPSS #3, between Railroad Court and the rail ROW south of the Abel Street rail overcrossing (Figure A-18, STA 260+00).
- TPSS #4, north of Montague Expressway on east side of rail ROW (Figure A-20, STA 366+00 and Figure A-21).
- TPSS #5, south of Trade Zone Boulevard next to commercial parking area on the west side of the rail ROW (Figure A-22, STA 415+00).
- TPSS #6, north of Berryessa Road on west side of rail ROW. There are two options that are currently being considered:

- Immediately south of Aschauer Court (Figure A-24, STA 509+00); or
  - Immediately north of Berryessa Road (Figure A-25, STA 518+00).
- TPSS #7, southwest end of the Alum Rock Station, beneath the new landscaped 28<sup>th</sup> Street (Figure A-27, STA 606+00).
  - TPSS #8, west end of the underground Civic Plaza/SJSU Station (Figure A-34, STA 686+00).
  - TPSS #9, east end of Diridon/Arena Station (Figure A-39, STA 735+00).
  - TPSS #10, south of the Santa Clara Station and east of the UPRR Newhall Yard (Figure A-42, STA 852+00).

Three bulk substation/switching stations are proposed at the following locations:

- Station #1, between Railroad Court and the rail ROW south of the Abel Street rail overcrossing (Figure A-18, STA 258+00, and Figure A-46).
- Station #2, at Mabury Road and the rail ROW on east side of ROW (Figure A-25, STA 547+00, and Figure A-47).
- Station #3, north of the I-880 overpass over the active freight and passenger rail line at Newhall Street (Figure A-42, STA 824+00, and Figure A-48).

All three of the proposed bulk substation/switching stations at Railroad Court, Mabury Road, and Newhall Street would require installation of high-voltage (115kV) power feed lines from nearby power supply sources (e.g., existing PG&E towers/lines). Approximately 400 feet of new high-voltage line would run from Bulk Power Station #1 northwest across Wrigley Creek and connect to the existing high-voltage line southeast of the intersection with Berryessa and Calero streets (Figure A-46). Approximately 1,400 feet of new high-voltage line would run from Bulk Power Station #2 east along the north side of Mabury Road and connect to the existing high-voltage line near the intersection of Mabury and King roads (Figure A-47). Approximately 300 feet of new high-voltage line would run from Bulk Power Station #3 to the PG&E Substation located near Newhall Street and Stockton Avenue (Figure A-48). These high-voltage power lines would require approximately 60-foot high tapered tubular steel towers spaced every 400 to 500 feet.

A separate traction power substation may be required for operating the shop tracks and maintenance storage tracks. The BART Maintenance Facility would also have a substation to supply power to the maintenance buildings. A gap breaker station would be placed at the mainline yard transfer zone. The Maintenance Facility would contain an emergency generator as a back-up power supply.

### **Facilities Power Supply**

The BART Alternative stations, ventilation fan plants, and new Maintenance Facility will be supplied with electric power by nearby overhead and underground medium voltage 480V, 12.47kV and 21kV PG&E transmission lines. The Santa Clara Station will be supplied with electric power from nearby SVP medium voltage lines. The specific physical improvements required to make these electric power supply connections cannot be determined until Preliminary Engineering has been performed. There will be a need to construct short (typically less than 1,000 feet) sections of overhead and underground electric lines from existing power transmission facilities to the new BART Alternative facilities. Each BART Alternative station and each ventilation fan plant will be powered from two independent sources for reliability: 1) local PG&E or SVP transmission facility; and 2) the BART 34.5kV sub-transmission cable system. In addition, each station and the BART Maintenance Facility will have a standby diesel-electric generator located aboveground.

### **Train Control Equipment**

Train control equipment would be installed for the extension to integrate operations with the existing BART system. This would include such things as Advanced Automatic Train Control (AATC) equipment and train control houses.

- **Advanced Automatic Train Control.** This equipment is a radio-based train positioning and controlling system. AATC would use radios and antennae mounted along the ROW on small masts or on brackets in tunnel ceilings.
- **Train Control Houses.** AATC would also require train control houses or bungalows. These facilities would be co-located with traction power sites or stations and consist of small pre-fabricated metal buildings.

### **Communications**

Expansion of BART's existing 800 MHz trunked radio system is assumed. In addition, radio towers would be installed along the extension to support communications.

- **Radio Towers.** Three radio towers would be needed for the BART Alternative. Each radio tower would be approximately 60 feet high, as measured from the ground level. The tower would be tapered tubular steel 2 to 3 feet in diameter at its base with a large concrete foundation and multiple antennas at the top. The three radio tower locations would be as follows:
  - **Montague/Capitol Station.** The radio tower would be northeast of the station at the northwest corner of the multi-story parking structure fronting on Montague Expressway, either alongside or on top of the parking structure (Figure A-20, STA 371+00).
  - **Berryessa Station.** Two options are being considered for the location of this radio tower, depending on the station option (Figure A-25, STA 536+00):
    - **Parking Structure Southwest Option.** The tower would be located southwest of the station at the northeast corner of the multi-story parking structure, either alongside or on top of the parking structure midway between Berryessa Road and Mabury Road.
    - **Parking Structure Northeast Option.** This tower would be located northeast of the station at the southwest corner of the multi-story parking structure, either alongside or on top of the parking structure approximately 300 feet south of Berryessa Road.
  - **Maintenance Facility.** This tower would be located between the main revenue vehicle shop building and the transportation building/yard control tower, midway between Brokaw Road and Newhall Street (Figure A-42, STA 849+00).

### **Subway Support Facilities**

Various facilities are needed to support the subway section in San Jose including cross-passageways, emergency exits, and tunnel ventilation structures.

- **Ventilation Structures.** Tunnel vent shafts would be located at various points along the underground alignment. Ventilation structures would typically be approximately 20 by 35 feet in size and 10 to 15 feet in height. However, each ventilation structure's final configuration and size would be a function of the specific design issues at each site. In Segment 3, four vent structures are proposed. In Segment 4, ten vent structures are proposed. The locations are described below.

### Segment 3

Four vent structures are proposed: one adjacent to the east side of US 101 between Las Plumas Avenue and Lower Silver Creek (Figure A-26, STA 575+00); one at each end of Alum Rock Station (Figures A-26, STA 598+00 and A-28, STA 606+00); and one on the southeast corner of East Santa Clara and 20th streets (Figure A-28, STA 633+00).

### Segment 4

Three vent structures would be located between 19<sup>th</sup> and 4<sup>th</sup> streets: one at the northwest corner of East Santa Clara and 13<sup>th</sup> streets (Figure A-33, STA 656+20), and one at each end of the Civic Center/SJSU Station (Figure A-33, STA 677+20 and STA 687+00).

At the Market Street Station, two vent structures – one at each end – are proposed: at the northeast corner of East Santa Clara and 1<sup>st</sup> streets (Figure A-34, STA 696+00) and one at the southeast corner of West Santa Clara Street and Almaden Avenue (Figure A-35, STA 708+50).

At the Diridon/Arena Station, two vent structures are proposed: one would be located at the southeast corner of Crandall and Montgomery streets (Figure A-39, STA 733+50) and the other at the northeast corner of Crandall and White streets (Figure A-39, STA 741+40).

For the alignment west of the Diridon/Arena Station, three vent structures are proposed: one vent structure would be located at the vacant lot west of Stockton Avenue and north of Cinnabar Street (Figures A-36 and A-40, STA 767+20); one would be located east of Stockton Avenue and north of West Taylor Street (Figures A-37 and A-41, STA 790+00); and one on the east side of the Caltrain tracks and south of I-880 (Figure A-42, STA 818+20).

### New BART Maintenance Facility

A new BART maintenance and storage facility would be located on approximately 59 acres in the eastern portion of the UPRR Newhall Yard and the western portion of the Food Machinery Corporation (FMC) manufacturing facility in San Jose and Santa Clara and south of I-880 (refer to Figures A-42 and 4-43). This new facility is needed at the terminus of the BART Alternative due to the sheer length of the extension. Without it, trains would have to travel significant distances to existing BART facilities, generating greater wear-and-tear on the vehicles and increasing operating and maintenance costs. In addition, existing BART maintenance and storage facilities have capacity constraints. The new facility would accommodate a fleet of up to approximately 240 BART cars to store new vehicles acquired for the extension, as well as some of BART's existing vehicles needed for morning start-up service, "ready-reserve," maintenance, and future growth. The 240 cars include 120 cars (12 10-car trains) available for the Santa Clara/San Francisco line and 42 cars (6 7-car trains) for the Santa Clara/Richmond line (42 cars) morning start-up service. It also includes 10 cars (1 10-car train) available for ready reserve, approximately 30 cars as maintenance spares, and approximately 40 cars as 20% growth contingency. The new BART maintenance and storage facility would include the following:

- **Main Revenue Repair Facility.** The main car repair shops building would consist of a shop floor of approximately 50,000 square feet; component repair (electronic repair shop and electro-mechanical repair shop) of approximately 18,000 square feet; back shop (heavy repair) of approximately 12,500 square feet; 10,000 square feet for administrative offices; and a store room of approximately 20,000 square feet.
- **Turntable.** The turntable would be located in the main yard and controlled by the yard tower operator. The turntable would be able to reverse the direction of any control car.

- **Train Washer.** The train washer would be a programmable logic controlled 10-car train washer with 20-minute intervals and would reclaim 80 percent of the water used in accordance with state and federal guidelines.
- **Yard Control Tower.** The yard control tower would be centrally located to have visual oversight to nearly all train movement. The tower would be able to control all train movements automatically and track all car locations.
- **Building Maintenance Facility.** A building maintenance facility would be constructed to provide a work location for personnel who maintain the 16.3-mile BART service, including the station facilities.
- **Transfer Tracks.** Transfer tracks lead to and from the yard from the mainline tracks. Either BART's central control or the tower supervisor would automatically control these tracks to bring trains into and out of the yard. The transfer tracks would accommodate 10-car trains.
- **Station/Structure Maintenance and Training Facility.** The station/structure maintenance and training building would be two stories for a total of 30,000 square feet. Station/structure maintenance will require 25,000 square feet and include parts storage, upholstery repair, glass repair, automatic fare vending machine and fare gate repair, carpentry, HVAC, electric/plumbing, paint shop, and radio/electronics repair. The training facility would require 5,000 square feet on the second floor and include modern visual and training aides. The training amenities would include a training simulator for train operators, training test equipment for transit vehicle mechanics and technicians, training aides for elevator and escalator technicians, training aides for wayside train control technicians, and other mechanical and technical training needs, as required.
- **Systems, Wayside Equipment and Non-Revenue Vehicle Maintenance Facility and Shops.** The non-revenue vehicle shop would be located in an approximate 20,000-square-foot building containing an overhead crane, rail pits, vehicle hoists, and fueling facility. The facility will include BART rail connections to the yard and mainline tracks, enough area for rail storage, and a railroad spur to the storage yard.
- **Car Cleaner Facility.** The car cleaner facility would be a stand-alone building approximately 3,500 square feet in size and centrally located along the BART vehicle storage tracks. The building would have storage capacity to hold seats, equipment, and supplies necessary to clean up to 240 rail vehicles.
- **Cash Handling Building.** The cash handling building would be a stand-alone, special construction building requiring approximately 15,000 square feet of space. The site would require a minimum of 30,000 square feet for tractor/trailer turnaround operations and parking facilities for cash handling vehicles.
- **Police Facility.** A BART police facility would be located on the maintenance yard site.
- **Employee and Visitor Parking.** Employee and visitor parking would be established in two locations totaling approximately 200 spaces in the maintenance and storage area. One parking area for operators would be located at the train dispatch facility. Another would be located near the main revenue repair facility.

### **2.1.6.2 BART Core System Parking Analysis**

To achieve the anticipated ridership for the BART Alternative, additional parking for those passengers driving to BART core system stations north of the extension would need to be accommodated. That is, potential new riders generated by the BART Alternative may not be able to board at one of the BART core system stations if parking is not available. It is projected that parking for riders who would get on at BART stations north of the extension would require approximately 3,200 spaces in 2025. This core system parking expansion would be funded by VTA pursuant to the VTA/BART Comprehensive Agreement. Volume I, Chapter 5, *BART Core System Parking Analysis*, contains a more detailed

discussion, with a programmatic-level evaluation of parking expansion at existing BART stations attributed to the BART Alternative.

### **2.1.6.3 Associated Railroad Improvements**

#### **Freight Railroad Wye**

An existing set of tracks known as a wye is used to turn freight locomotives around. The existing wye is in a location that is incompatible with the BART Alternative. A new freight railroad wye would be constructed in one of two alternative locations:

- **Locomotive Wye Fremont Option** would be located on private property on the west side of the corridor, about 0.8 miles south of East Warren Avenue (Figure A-9, STA 117+00 for location and Figure A-10 for details).
- **Locomotive Wye Milpitas Option** would be located on the east side of the corridor, between Curtis Avenue and Montague Expressway (Figure A-21).

#### **Warm Springs Rail-Truck Tank Car Transfer Facility Relocation**

The alignment for the BART Alternative would eliminate the current truck access from East Warren Avenue to a rail-truck tank car transfer facility located in the middle of the railroad ROW south of East Warren Avenue, requiring removal of the eastern-most transfer facility track, and encroachment on a related truck holding facility immediately to the east of the ROW. To remedy this lost access, VTA will work with other agencies to possibly relocate the rail-truck tank car transfer facility adjacent to the existing "Sno-boy" rail-truck tank car transfer facility located north of South Grimmer Boulevard and west of Warm Springs Boulevard, as specified in VTA's ROW purchase agreement with UPRR (Figure A-4).

The Sno-boy facility would be a transfer facility between railcars and tank trucks located off Industrial Drive in Fremont, adjacent to the railroad corridor ROW. Its primary activity is the transloading of dry and liquid products, both hazardous and non-hazardous, between railcars and tank trucks. The rail yard normally operates between 6:00 a.m. and 6:00 p.m., although specific customer requests can lead to loading anytime. An average of 16 trucks per day access the site, with peak days reaching 25 trucks. On a regular basis, additional loads occur that would add 3 to 4 trucks per day. The trucks are usually dispersed throughout the business day, although 6:00 a.m. to 10:00 p.m. could be considered the peak period.

#### **UPRR Newhall Yard Rail-Truck Transfer Facility**

An existing rail-truck transfer facility is located in the northeast portion of the UPRR Newhall Yard that has a capacity of approximately 60 railroad cars. This facility provides for the transfer of sand, gravel, and other rock products from railroad hopper cars to trucks, and the transfer of petroleum products and other chemicals from railroad tank cars to trucks. This facility would be relocated to make room for the BART Maintenance Facility. A specific new location has not yet been identified for this truck-rail transfer facility; however, likely new locations would be along UPRR's Coast main line in either south San Jose between Curtner and Capitol avenues, or in Morgan Hill, San Martin, or Gilroy.

### **2.1.7 BART EXTENSION OPERATING PLAN**

BART train service would operate every day from 4:00 a.m. to 1:00 a.m. From 6:00 a.m. to 7:30 p.m., service headways would average 6 minutes (12 minutes on the Richmond-Fremont-San Jose line, and 12 minutes on the San Francisco-Fremont-San Jose line) between the Warm Springs BART Station and Downtown San Jose/Santa Clara. This represents a reduction of 3 minutes from current BART 15-minute

service headways. After 7:30 p.m. and on weekends, the average headways would be 10 minutes (20-minute service headways on each BART line). The San Francisco-Fremont-San Jose line would terminate at the 24<sup>th</sup>/Mission Station in San Francisco instead of continuing into San Mateo County.

Eight VTA "SVRTC" express bus routes (Lockheed/Martin, NASA/Shoreline Industrial Parks, Sunnyvale/Mountain View Industrial Parks, Oakmead (two routes), SJIA, northeast San Jose, and Dixon Landing) would be retained from the Baseline Alternative, but seven routes would be truncated at their northern ends at the Montague/Capitol BART Station. Two of the seven express routes (SJIA and northeast San Jose Industrial Parks) would be converted to feeder service. Some of VTA's local bus routes within the SVRTC also would be rerouted to serve BART stations. Express bus service from the Central Valley, Tri-Valley, and central Contra Costa County, which would be operated at the sole discretion of the respective local transit agencies, would terminate at the Warm Springs BART Station. Caltrain, ACE, Capitols, and VTA's LRT would retain the same levels of service identified under the No-Action Alternative.

VTA "SVRTC" express bus routes would operate at 10- to 60-minute headways in the peak direction from 4:30 a.m. to 8:30 a.m. in the morning peak and from 3:00 p.m. to 7:00 p.m. in the evening peak. Three of the express bus routes would also operate in the reverse-peak commute direction. The two converted feeder routes would operate all-day long at 30-minute headways in both directions. VTA's local bus routes also would serve BART stations throughout the day.

#### **2.1.8 BART AND VTA FLEET REQUIREMENTS**

An estimated 106 to 126 additional BART vehicles will be required for the BART Alternative to meet required Year 2025 service levels.

#### **2.1.9 PROJECT COSTS**

This section summarizes the capital and operating costs associated with the BART Alternative. Detailed cost information is found in Volume I, Chapter 8: Financial Considerations.

Total capital costs in 2003 dollars are estimated at \$4,193 million for the BART Alternative, assuming the design options recommended by the Policy Advisory Board (PAB) and the low cost alternatives for the Locomotive Wye and Berryessa Station options. The cash flow for the BART Alternative is shown in Table 2.1-1.

In 2025, annual operating and maintenance costs for all modes under the BART Alternative are projected to grow by \$73.3 million (2003 dollars). The costs to operate and maintain the BART Alternative in 2025 are estimated at \$65.1 million.

#### **2.1.10 PROJECT SCHEDULE**

The anticipated BART Alternative construction schedule is shown in Figure 2.1-9. The BART Alternative would take seven to nine years to construct and perform start-up train and testing activities. If funding proceeds as planned, the BART Alternative could start passenger service in 2015.

**Table 2.1-1: Preliminary Cash Flow for the BART Alternative Final Design**

**Total Escalated Dollars by VTA Fiscal Year**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	June 2015	Sept. 2015	Total
Conceptual Engineering	\$19,789	\$25,211													\$45,000
Preliminary Engineering		\$35,817	\$106,031	\$28,153											\$170,000
Final Design					\$67,575	\$77,475									\$145,050
Civil Construction					\$10,042	\$139,220	\$541,177	\$575,793	\$574,642	\$531,211	\$333,023	\$239,508	\$83,715		\$3,028,330
System Installation						\$794	\$41,326	\$92,390	\$117,175	\$112,201	\$98,896	\$74,213	\$31,837		\$568,831
Systems Testing and Integration												\$32,302	\$40,168	\$6,522	\$78,992
Vehicles							\$53,604	\$110,314	\$114,175	\$118,497	\$122,308				\$518,898
Property Costs	\$80,428	\$1,372		\$115,772	\$106,310	\$110,334	\$97,468	\$88,816	\$91,924	\$71,639					\$764,062
<b>Total</b>	<b>\$100,217</b>	<b>\$62,399</b>	<b>\$106,031</b>	<b>\$143,925</b>	<b>\$183,927</b>	<b>\$327,822</b>	<b>\$733,575</b>	<b>\$867,313</b>	<b>\$897,917</b>	<b>\$833,547</b>	<b>\$554,226</b>	<b>\$346,022</b>	<b>\$155,720</b>	<b>\$6,522</b>	<b>\$5,319,163</b>
<b>Cumulative Total</b>	<b>\$100,217</b>	<b>\$162,616</b>	<b>\$268,647</b>	<b>\$412,572</b>	<b>\$596,499</b>	<b>\$924,321</b>	<b>\$1,657,896</b>	<b>\$2,525,209</b>	<b>\$3,423,125</b>	<b>\$4,256,673</b>	<b>\$4,810,899</b>	<b>\$5,156,921</b>	<b>\$5,321,641</b>	<b>\$5,319,163</b>	<b>--</b>

Notes:  
 Project Value: \$4.193 billion (Year 2003 dollars).  
 Escalation based on Final Design starting in January 2007 and project completion in September 2015.

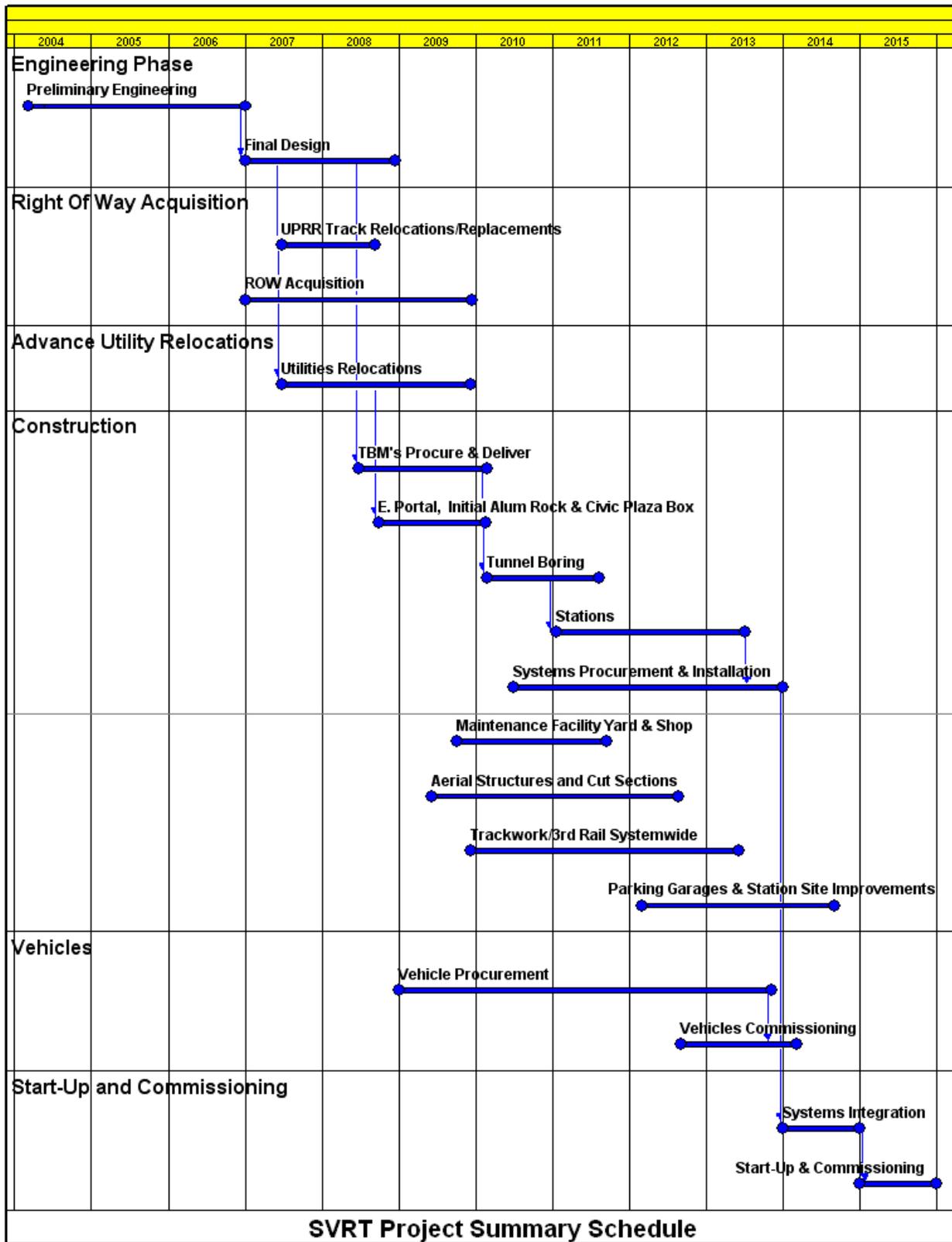


Figure 2.1-9: Project Schedule for the BART Alternative