3.1 INTRODUCTION

The BART Extension Project would begin at the planned BART Warm Springs Station in Fremont (to be implemented by 2013) and proceed on the former Union Pacific railroad right-of-way (ROW) through Milpitas to near Las Plumas Avenue in San Jose. The extension would then descend into a subway tunnel, continue through downtown San Jose, and terminate at grade in Santa Clara near the Caltrain Station. The total length of the alignment would be 16.1 miles. Six stations are proposed, plus an additional future station in Milpitas. Passenger service for the BART Extension Project would start in 2016, assuming funding is available.

Several design changes occurred as the BART Extension Project moved from the Conceptual Engineering design phase, where design plans are developed to the 10 percent level, to the Preliminary Engineering design phase, where design plans are further developed to the 35 percent level. The BART Extension Project described in this chapter includes a discussion of the Project design changes only, unless otherwise noted. The reader should refer to the FEIR for the description of other design features that have been retained from the Conceptual Engineering design phase. However, both the design changes and the features retained from the Conceptual Engineering design phase, which collectively make up the design at the preliminary level, are presented graphically in Appendices C and D for the alignment and stations, respectively. In addition, to facilitate an understanding of what has and has not changed between the Conceptual Engineering design phase and the Preliminary Engineering design phase, Appendix B includes plans that show the preliminary design (in blue) superimposed over the conceptual design (in red) for the alignment only. The reader should refer to the FEIR, Appendix B, for the station designs at the conceptual level. Electronic or hard copies of the FEIR are available upon request from VTA.

Also included in this chapter is a description of various Project features to assist the reader's understanding of the electrical, communication, and other facilities required to operate the BART Extension Project. A Project schedule is included at the end of the chapter. Definitions for the terms used in this chapter and throughout the SEIR are included in Chapter 9.

3.2 DESIGN CHANGES

The design changes for the BART Extension Project discussed in this section are organized by city (Fremont, Milpitas, San Jose, and Santa Clara). Each change is numbered, to facilitate cross-referencing throughout the various chapters in this SEIR. Engineering stationing numbers are provided to assist the reader in locating Project features on the plans included in Appendix C for the preliminary design and Appendix B for the plans that graphically compare the conceptual and preliminary designs.[1] Several options for the BART Extension Project alignment, station configurations, and other features are presented. These options will be finalized during subsequent engineering phases of the Project.

Summary tables of the design changes are provided at the end of each city's section (Tables 3.2–1 to 3.2–4). These tables also indicate the environmental analysis sections in this SEIR that include a discussion of potential environmental impacts or benefits associated with a particular design change. All other environmental topical sections not listed in the summary tables below have been reviewed and updated from the FEIR, as necessary.

3.2.1 CITY OF FREMONT

The BART Extension Project in Fremont would begin slightly south of the planned BART Warm Springs Station. This station is the terminus station of the BART Warm Springs Extension Project.

Design changes in Fremont include: the addition of two aerial alignment options from north of Mission Boulevard to East Warren Avenue; the addition of electrical facilities; the identification of access easements/roads; the elimination of a locomotive wye option; the addition or relocation of crossover tracks; a slight modification to the configuration of the Kato Road underpass; and the inclusion of a railroad intrusion detection system, which would also be installed in the cities of Milpitas, San Jose, and Santa Clara.

The BART Extension Project in Fremont is shown in Figure 3.2–1, which also shows the locations of the design changes. Plans showing the BART alignment are included in Appendices B and C.

1 Engineering stationing numbers are sequential numbers of surveyed locations along an alignment. These numbers are included on the plans in Appendices B and C.

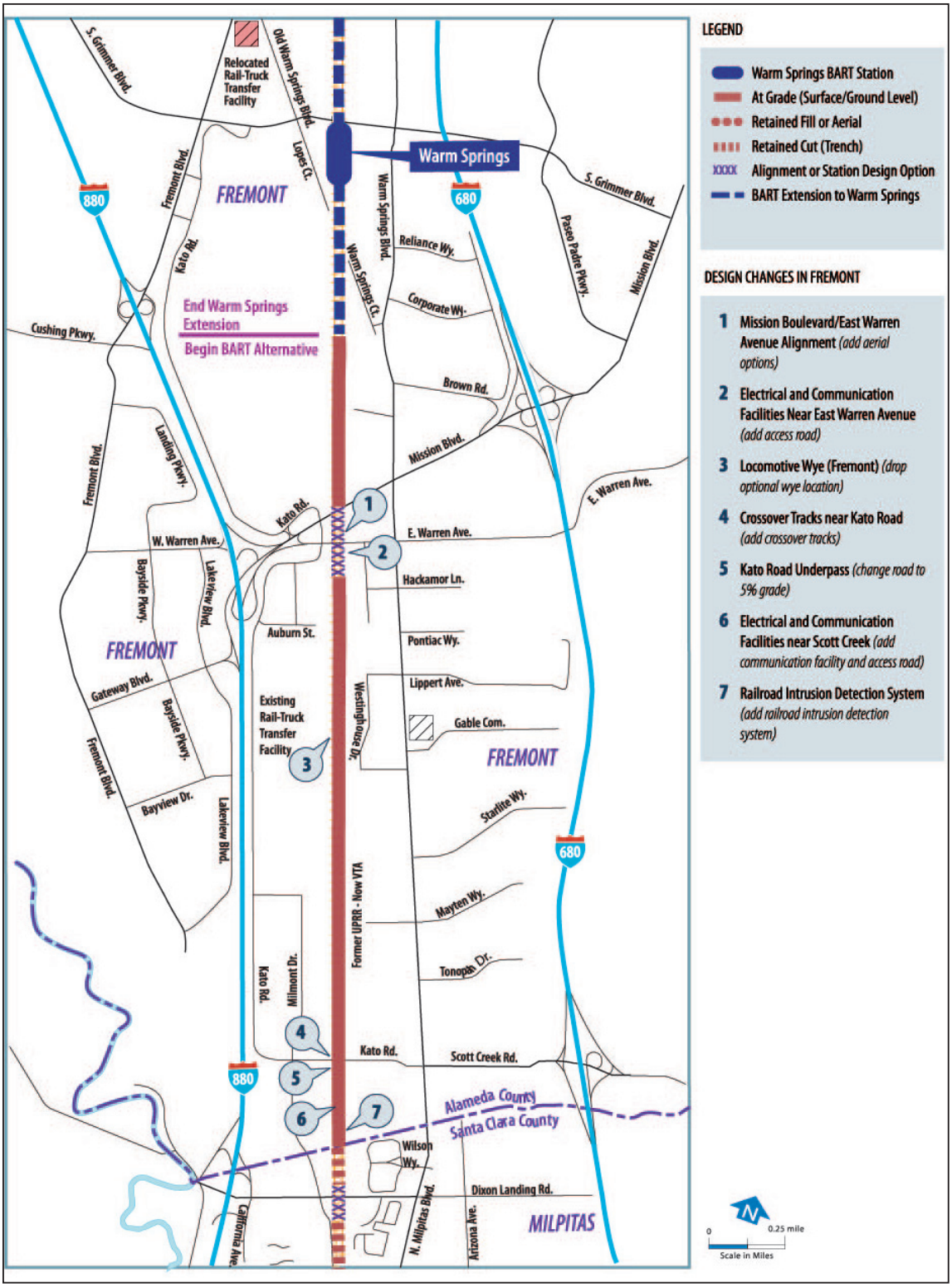

Figure 3.2-1: Design Changes in Fremont

Design Change 1. Mission Boulevard/East Warren Avenue Alignment. *In the FEIR, the BART alignment would travel at grade over the Mission Boulevard underpass. South of Mission Boulevard, the BART alignment would be at grade, and other agencies would reconstruct East Warren Avenue as a roadway underpass.*

From Mission Boulevard to south of East Warren Avenue, there are three options for the BART alignment: At Grade, Aerial, and Aerial East. The At Grade Option is discussed and analyzed in the FEIR. However, for easy reference, this option is also included in this SEIR. The At Grade Option assumes that other agencies would reconstruct the existing at grade East Warren Avenue as a new roadway underpass, therefore enabling BART to pass over the roadway on a new bridge structure. However, if East Warren Avenue were not reconstructed as a roadway underpass, BART would pass over the existing roadway on an aerial structure. Two aerial options are considered due to potential impacts to an existing truck-rail transfer facility and other properties.

The three alignment options from Mission Boulevard to south of East Warren Avenue are summarized as follows:

- **At Grade Option.** Under this option, BART would transition back into the railroad ROW south of the Warm Springs Yard (STA 60+00) and proceed at grade as the alignment approaches Mission Boulevard. Other agencies would reconstruct the existing at grade East Warren Avenue as a new roadway underpass. BART would therefore cross both Mission Boulevard and East Warren Avenue at grade on new bridge structures that pass over these roadways.
- **Aerial Option.**[2] Under this option, BART would also transition back into the railroad ROW south of the Warm Springs Yard (STA 60+00) and proceed at grade as the alignment approaches Mission Boulevard. BART would transition into an aerial configuration from Mission Boulevard to south of East Warren Avenue (STA 66+00 to 83+00). No improvements would be required for East Warren Avenue to accommodate BART. This option would displace an existing truck-rail transfer facility.
- **Aerial East Option.** Under this option, the BART alignment would remain to the east of the ROW as it crosses over Mission Boulevard and East Warren Avenue. The aerial configuration would be longer under this option, from north of Mission Boulevard to Auburn Court (61+00 to 91+00). No improvements would be required for East Warren Avenue to accommodate BART. This option would avoid an existing truck-rail transfer facility, but would require some property acquisition of industrial buildings east of the alignment.

Regardless of which option is implemented, other agencies would widen Mission Boulevard and construct drainage improvements at Agua Fria Creek/Line D, which is slightly south of Mission Boulevard (STA 71+00).[3]

Design Change 2. Electrical and Communication Facilities near East Warren Avenue. *In the FEIR, a traction power substation and train control building are located south of East Warren Avenue and east of the railroad ROW; however, access to the site is not discussed.*

Traction Power Substation SWA and Train Control Building S24 would be located south of East Warren Avenue on the east side of the railroad ROW (STA 78+50). These facilities and location are discussed and analyzed in the FEIR. In this SEIR, an access easement/road to Mission Falls Court is added to the site. The site would remain in the same location regardless of which alignment option is chosen from Mission Boulevard to south of East Warren Avenue (see Design Change 1, Mission Boulevard/East Warren Avenue Alignment).

2 The term "aerial" in this chapter refers to the elevated onfiguration of the alignment above existing grade. An aerial configuration could mean that the alignment is upported on retained fill or elevated on an aerial guideway. The exact configuration is nteed on the drawings in Appendix A.

3 I-880/Mission Boulevard (Route 262)/Warren Avenue Interchange Reconstruction and I-880 Widening. Phase 1B of the project would include the widening of Mission Boulevard, new UPRR railroad bridges over Mission Boulevard, and new ramps to Kato Road.

Design Change 3. Locomotive Wye (Fremont) *In the FEIR, one option for the locomotive wye would be located in Fremont on an undeveloped parcel on the west side of the railroad ROW, approximately 0.8 mile south of East Warren Avenue. The other option would be located in Milpitas.*

In the FEIR, two options are considered for a locomotive wye: Locomotive Wye Fremont Option and Locomotive Wye Milpitas Option. During the Preliminary Engineering design phase, discussions with UPRR determined that the Fremont wye location is unacceptable due to the distance of the location from the UPRR Milpitas Yard. Therefore, the Fremont wye location option is eliminated. The option in Milpitas is retained, plus an additional option (see Design Change 13, Locomotive Wye [Milpitas]).

Design Change 4. Crossover Tracks near Kato Road. *In the FEIR, there are no crossover tracks north or south of Kato Road.*

Crossover tracks would be located along the alignment at minimum distance intervals. Several crossover tracks are identified in the FEIR, including crossover tracks near Railroad Court that would be constructed on a floating track slab, a type of track construction used to provide vibration reduction. During the Preliminary Engineering design phase, these tracks were relocated to avoid constructing on the floating track slab (see Design Change 10, Crossover Tracks between Berryessa Creek and Railroad Court). To maintain minimum distance intervals, other crossover tracks along the alignment were also relocated, or added. Therefore, this SEIR includes crossover tracks that would be constructed both north and south of Kato Road (STA 157+00 and STA 170+00). This crossover would provide for 10-car train storage and allow single-track operations around an occasional stored train.

Design Change 5. Kato Road Underpass. *In the FEIR, the BART alignment would cross at grade on a new bridge structure over Kato Road, which would be reconstructed as a roadway underpass. The slope of Kato Road would be an 8 percent grade.*

The BART alignment would cross at grade on a new bridge structure over Kato Road, which would be reconstructed as a roadway underpass by VTA (STA 167+00). In the FEIR, the slope of the Kato Road underpass is an 8 percent grade. Due to the slope of the underpass, access to existing driveways serving businesses immediately north of Kato Road and east and west of the alignment would be either relocated or eliminated (with other access points remaining). During Preliminary Engineering, the slope was changed to a 5 percent grade, making the profile of Kato Road slightly longer. This revised slope would accommodate safe stopping distances for a design speed limit of 40 miles per hour, and would impact the same driveways as described in the FEIR.

Design Change 6. Electrical and Communication Facilities near Scott Creek. *In the FEIR, a traction power substation is located south of Scott Creek and west of the railroad ROW.*

Traction Power Substation SKR would be located south of Scott Creek/Line A on the west side of the railroad ROW, immediately south of Scott Creek (STA 175+00). This facility and location are discussed and analyzed in the FEIR. In this SEIR, Train Control Building S26 and an access easement/road to Milmont Drive are added to the site.

Design Change 7. Railroad Intrusion Detection System[4]. *In the FEIR, a railroad intrusion detection system is not included.*

A railroad intrusion detection system is not identified in the FEIR. In this SEIR, a railroad intrusion detection system would be installed to monitor the common boundary between the BART ROW and the UPRR railroad where both BART trains and freight trains operate. This common boundary includes the area from the northern Project limit in Fremont to Montague Expressway in Milpitas. It also includes the mainline area of the yard and shops facility in San Jose and Santa Clara (See Design Change 51, Yards and Shops Facility).

4 The Railroad Intrusion Detection System would be installed not only in Fremont, but also in Milpitas, San Jose, and Santa Clara.

TABLE 3.2-1:

Design Changes in the City of Fremont

NO.	PROJECT FEATURE [1]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
1	Mission Boulevard to East Warren Avenue	BART at grade	Retain at grade alignment; add Aerial Option and Aerial East Option	Noise and Vibration;Visual Quality and Aesthetics; Construction
2	Electrical and communication facilities near East Warren Avenue	Access to site not discussed	Add access easement/road to Mission Falls Court	Socioeconomics
3	Locomotive wye (Fremont)	Wye option located approximately 0.8 miles south of East Warren Avenue	Eliminate wye location option	Biological Resources and Wetlands; Socioeconomics; Construction
4	Crossover tracks near Kato Road	Not applicable	Add crossover tracks both north and south of Kato Road	Noise and Vibration
5	Kato Road underpass	Kato Road reconstructed as an underpass with an 8 percent grade	Change to a 5 percent grade	Socioeconomics; Construction
6	Electrical and communication facilities near Scott Creek	Traction power substation at this location	Retain traction power substation; add train control building; add access to Milmont Drive	Socioeconomics; Visual Quality and Aesthetics
7	Railroad intrusion detection system[1]	Not applicable	Add railroad intrusion detection system	Security and System Safety

[1] The railroad intrusion detection system would also be installed in Milpitas, San Jose, and Santa Clara where freight trains operate in close proximity to BART.

The railroad intrusion detection system is used to alert BART operations staff of a freight train derailment that has encroached onto the BART tracks. The system consists of two, redundant subsystems that together provide a highly reliable system with low incidents of false alarms. The first subsystem uses closed-circuit television cameras and special motion detection software to detect an intrusion across the common boundary. The cameras would be installed on poles located along the alignment at approximately 500- to 1,000- foot intervals. The poles would be approximately 15 feet above the top of rail, and each pole would support two cameras facing in opposite directions. The cameras would provide a narrow view angle aligned with the railroad ROW fence and focused on the BART ROW. This narrow focus would ensure that areas beyond the railroad ROW would not be within view.

The second subsystem uses continuous loops of cable located in the ROW fence to determine if there has been an intrusion. Any intrusion by a freight train would change the circuit characteristics of the in-fence loops causing the intrusion to be alarmed.

3.2.2 CITY OF MILPITAS

Design changes in Milpitas include: the addi-tion of one alignment option at Dixon Landing Road; the addition or relocation of crossover tracks; the addition or relocation of electrical and communication facilities; the identification of access easements/roads; the potential elimination of a locomotive wye; the addition of three alignment options south of Curtis Avenue; and the reconfiguration of Project features at the Montague/Capitol Station. The railroad intrusion detection system described for Fremont would also be installed in Milpitas (see Design Change 7, Railroad Intrusion Detection System).

The BART Extension Project in Milpitas is shown in Figure 3.2–2, which also shows the locations of the design changes. Plans showing the

BART alignment are included in Appendices B and C. There is one station in the city (Milpitas/Capitol Station) with a second station proposed for the future (South Calaveras Station). The plans for the Milpitas/Capitol Station are shown in Appendix D. The plans for the South Calaveras Station are included in the FEIR. There are no changes to this station in the SEIR. The four options described below for the alignment south of Curtis Avenue would continue into San Jose. However, this portion of the alignment is discussed entirely in this section.

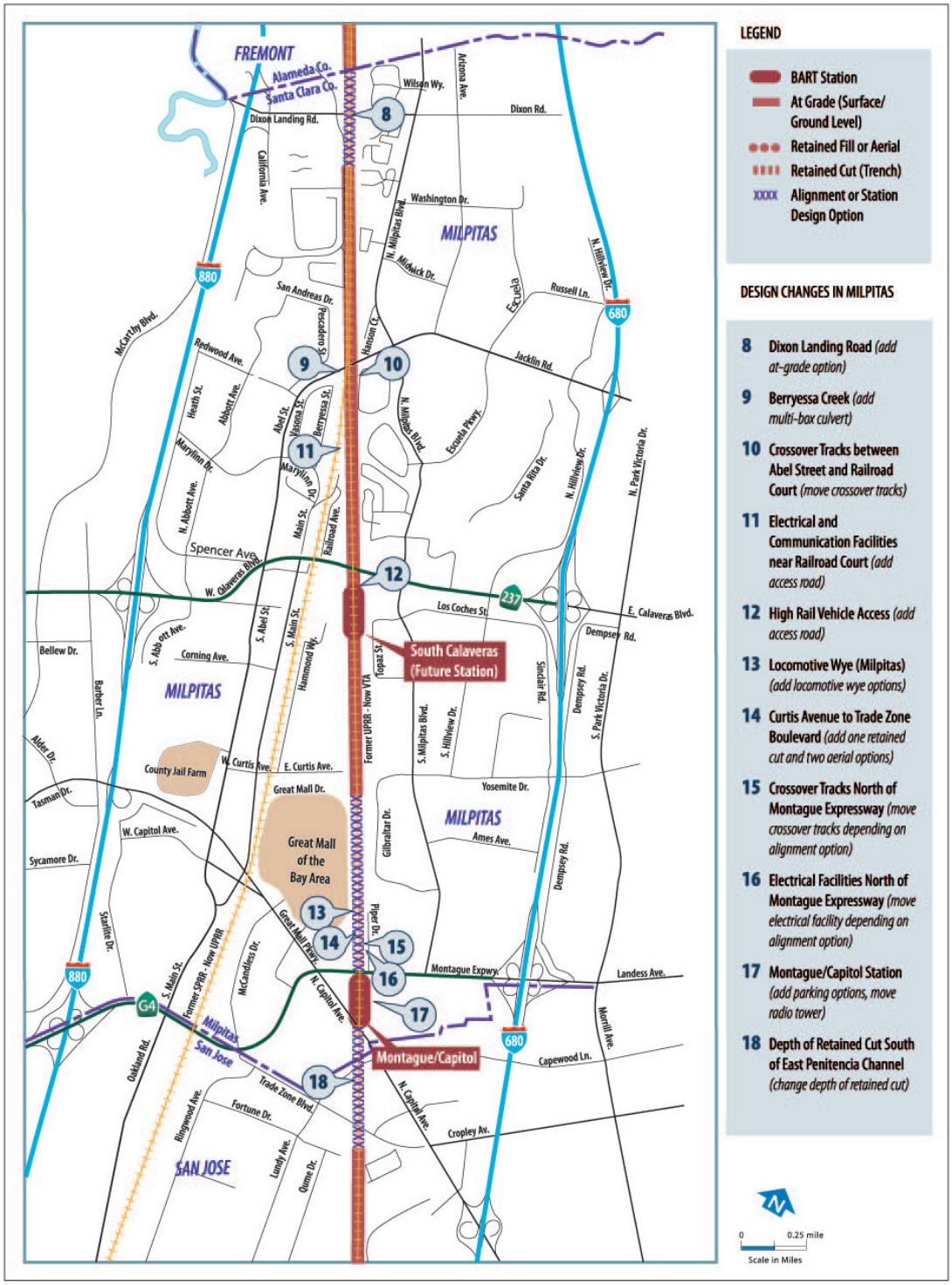

Figure 3.2-2: Design Changes in Milpitas

Design Change 8. Dixon Landing Road Alignment. *In the FEIR, the BART alignment would travel below grade in a retained cut under Dixon Landing Road. Dixon Landing Road would be supported above BART on a new roadway structure that would remain at grade.*

From the Alameda/Santa Clara county and Fremont/Milpitas city lines (STA 182+00) to south of Dixon Landing Road, there are two options for the BART alignment: Retained Cut and At Grade. The Retained Cut Option is discussed and analyzed in the FEIR. However, for easy reference, this option is also included in this SEIR. The Retained Cut option would grade separate the BART alignment from Dixon Landing Road. However, the UPRR crossing would remain at grade. To address this safety consideration, as well as traffic operations, an At Grade Option is also discussed and analyzed in this SEIR. Under this option, Dixon Landing Road would be reconstructed as a roadway underpass, thereby enabling both the BART and UPRR alignments to be grade-separated from the roadway.

The two alignment options from the county and city lines to south of Dixon Landing Road are summarized as follows:

- **Retained Cut Option.** Under this option, BART would transition into a retained cut at the county and city lines to south of Dixon Landing Road (STA 182+00 to 201+00). Dixon Landing Road would remain at grade, but be supported over the BART retained cut on a new roadway bridge structure. Property access on either side of the alignment would not be affected.

- **At Grade Option.** Under this option, BART would continue at grade past the county and city lines and remain at grade past Dixon Landing Road (STA 191+50). VTA would reconstruct Dixon Landing Road (which is currently at grade) as a new roadway underpass with BART passing over the roadway on a new bridge structure. Dixon Landing Road would be reconstructed for a design speed limit of 35 miles per hour. An adjacent cross street to the west of the ROW, Milmont Drive, would also be lowered due to the slope of Dixon Landing Road. Access to two existing driveways on the west side of the alignment, with one on the north side of Dixon Landing Road and the other on the south side, would be eliminated; however, each property would have multiple access points remaining.

Design Change 9. Berryessa Creek. *In the FEIR, BART would pass over Berryessa Creek on a new 100-foot-long bridge.*

BART would cross over Berryessa Creek on a new multi-box culvert. The box culvert would accommodate the planned Berryessa Creek Levees Project by the Santa Clara Valley Water District. This Project would provide flood protection from a 100-year flood event.

Design Change 10. Crossover Tracks between Berryessa Creek and Railroad Court. *In the FEIR, crossover tracks would be located near Railroad Court.*

As mentioned in Design Change 4, Crossover Tracks near Kato Road, the crossover tracks near Railroad Court were relocated to avoid construction of the tracks on a floating track slab. Therefore, the crossover tracks identified in the FEIR near Railroad Court are eliminated. Instead, the crossover tracks would be located farther north near the Berryessa Creek crossing (STA 258+00).

Design Change 11. Electrical and Communication Facilities near Railroad Court. *In the FEIR, a high voltage substation, traction power substation, switching station, and train control building would be located north of Railroad Court on the west side of the railroad ROW; however, access to the site is not discussed.*

High Voltage Substation SRC, Traction Power Substation SRR, Switching Station SRR, and Train Control Building S28 would be located south of the Berryessa Creek crossing (north of Railroad Court) (STA 259+00). These facilities and location are discussed and analyzed in the FEIR. The FEIR also includes a description of a new high voltage (115-kilovolt [kV]) line that would run from the high voltage

substation and connect to an existing Pacific Gas & Electric (PG&E) high voltage line. The FEIR does not describe any towers/poles required to run the line. In this SEIR, an access easement/road to Railroad Court is added to the site. To provide 115-kV service from PG&E to High Voltage Substation SRC with adequate clearance between BART and the existing overhead high voltage power lines, a new 60-foot-high tapered tubular steel tower would be constructed within PG&E's existing easement. A second, smaller tower/pole would also be constructed to the south and on the facility site. This tower/pole would allow the 115-kV line to transition down to the substation connection.

Design Change 12. High Rail Vehicle Access. *In the FEIR, a high rail vehicle access point would be located south of Calaveras Boulevard (State Route 237).*

A high rail vehicle (e.g., truck, manlift truck, flatbed truck) access point would be located just south of Calaveras Boulevard/SR 237. This location is discussed and analyzed in the FEIR. In this SEIR, an access easement/road to Railroad Avenue is added (STA 289+00).

Design Change 13. Locomotive Wye (Milpitas). *In the FEIR, one option for the locomotive wye would be located north of Montague Expressway and east of the railroad ROW. The other option would be located in Fremont.*

In the FEIR, two options are considered for a locomotive wye: Locomotive Wye Fremont Option and Locomotive Wye Milpitas Option. The Locomotive Wye Fremont Option is discussed in Design Change 3, Locomotive Wye [Fremont]. The Locomotive Wye Milpitas Option is discussed and analyzed in the FEIR. However, for easy reference, this option is also included in this SEIR, but is now called the Relocated Milpitas Wye Option. The SEIR also includes a second option: No Wye Option. Deciding which wye option to implement depends on: 1) discussions with UPRR regarding whether or not a locomotive wye is needed; and 2) negotiations with major industries east of the railroad ROW that use a freight train spur track for shipping service. Depending on the option chosen, the alignment south of Curtis Avenue would be affected (see Design Change 14, Curtis Avenue to Trade Zone Boulevard).

The two options are summarized as follows:

- **Relocated Milpitas Wye Option**. Under this option, the locomotive wye would be relocated to the north of the existing wye (STA 355+00). The wye would occupy a triangular area approximately 575 feet long with an additional tail track that would occupy a strip of land approximately 30 feet wide and 350 feet long. The wye would connect to an existing Milpitas Yard industry lead track. To accommodate the relocated wye, some property acquisition would be required east of the BART alignment.
- **No Wye Option.** Under this option, no wye would be constructed to replace the existing wye. VTA and UPRR would work together to ensure that freight train functionality were addressed if no locomotive wye were provided. This option would require severing freight access to three industries east of the BART alignment.

Design Change 14. Curtis Avenue to Trade Zone Boulevard. *In the FEIR, the BART alignment would be in a long retained cut starting from South of Curtis Avenue, continuing past the Great Mall and underneath Montague Expressway, Capitol Avenue, and Trade Zone Boulevard, and ending south of Trade Zone Boulevard. Montague Expressway, Capitol Avenue, and Trade Zone Boulevard would be supported above BART on new roadway structures. The retained cut configuration would allow a UPRR freight track to cross the BART alignment on a bridge to gain access to a new locomotive wye and an existing spur track that serves industries east of the BART alignment.*

South of Curtis Avenue (STA 330+00) to south of Trade Zone Boulevard, there are four alignment options for the BART alignment: Retained Cut Long, Retained Cut Short, Aerial Long, and Aerial Short. The Retained Cut Long Option is discussed and analyzed in the FEIR. However, for easy reference, this option is also included in this SEIR. If the Relocated Wye Option were implemented (see Design Change

13, Locomotive Wye [Milpitas]), either the Retained Cut Long Option or Aerial Long Option would be implemented, as these options would allow freight tracks to cross the BART alignment to gain access to the locomotive wye and a spur track that serves industries east of the railroad ROW. However, the Aerial Long Option would avoid construction within a known hazardous waste plume in the area. If the No Wye Option were chosen, either the Retained Cut Short Option or Aerial Short Option would be implemented, as it would no longer be necessary to allow freight tracks to cross the BART alignment. Implementing either short option reduces Project costs; however, the Aerial Short Option would also avoid a known hazardous waste plume.

The four alignment options from south of Curtis Avenue to south of Trade Zone Boulevard are summarized as follows:

- **Retained Cut Long Option.** This option is possible if the Relocated Milpitas Wye were chosen, as the length and depth of the retained cut enables the freight track to cross over the BART tracks to access the new locomotive wye and existing spur track.

  Under this option, BART would transition into a retained cut from south of Curtis Avenue, past the Milpitas/San Jose city lines, to south of Trade Zone Boulevard (STA 337+00 to 411+00). Accommodating the retained cut would require that the freight track be relocated 22 feet to the west; therefore, up to 20 feet of ROW from the easternmost portion of the Parc Metropolitan Condominiums would be required, including a park area to be dedicated to the City of Milpitas, and the Great Mall. The approximate 20-foot-wide strip of land acquired to accommodate the tail track and construction of the retained cut would continue for approximately 2,200 feet along Great Mall Drive. Then, the tail track would cross over the BART alignment on a new bridge structure near the southeast corner of the existing Great Mall parking garage. There, on the east side of the BART alignment, additional ROW would be acquired to accommodate the tail track and the new locomotive wye.

  Under the Retained Cut Long Option, Montague Expressway, Capitol Avenue, and Trade Zone Boulevard would be supported above BART on new roadway bridge structures (STA 369+00, 380+00, and 402+00, respectively).

- **Retained Cut Short Option.** This option is considered if the No Wye were chosen, as the shorter length of the retained cut does not enable the freight track to cross over the BART tracks to access the east side of alignment where the location for relocated wye has been identified or where the existing spur track is located. Thus, service to the industries accessed by the spur track would be discontinued.

  Under this option, BART would remain at grade past most of the Great Mall, and would transition into a retained cut north of Montague Expressway to south of Trade Zone Boulevard (STA 358+00 to 411+00). Under this option, the UPRR tail track would extend south from the Milpitas Yard, but would not cross the BART alignment. However, relocation 22 feet to the west and up to 20 feet of additional ROW from the easternmost portion of the Parc Metropolitan Condominiums (including a park area to be dedicated to the City of Milpitas, and the Great Mall) would still be required. The approximate 20-foot-wide strip of land acquired to accommodate the tail track would continue for approximately 1,800 feet along Great Mall Drive (to approximately STA 346+70). From this point south, a 5-foot-wide strip of land would be acquired to accommodate the end of the tail track (ends at STA 353+10) for approximately 700 feet.

  As with the Retained Cut Long Option, Montague Expressway, Capitol Avenue, and Trade Zone Boulevard would be supported above BART on new roadway bridge structures.

- **Aerial Long Option**. Like the Retained Cut Long Option, this option is possible if the Relocated Milpitas Wye were chosen, as the length of the aerial structure enables the freight track to cross under the BART tracks to access the new locomotive wye and existing spur track.

  Under this option, BART would transition into an aerial configuration north of the Great Mall to south of Trade Zone Boulevard (STA 333+00 to 415+00). Similar to the Retained Cut Long Option, the length of the aerial structure would allow a UPRR freight track to cross at grade under the BART alignment to

gain access to the east side of the railroad ROW. To accommodate this freight track, the same configurations and ROW requirements as described under the Retained Cut Long Option would apply.

No improvements would be required for Montague Expressway or Trade Zone Boulevard to accommodate BART. At Capitol Avenue, both the Tasman East LRT and BART cross over the roadway on aerial structures, with BART in between the roadway and the LRT aerial guideway. Therefore, to provide enough clearance between the BART aerial structure and Capitol Avenue, the roadway would be reconstructed below grade. Due to the slope of the new roadway, access to one residential and several commercial driveways would be relocated (with multiple access points remaining). One business in a retail center would also be impacted by construction of the roadway.

- **Aerial Short Option.** Like the Retained Cut Short Option, this option is considered if the No Wye were chosen, as the shorter length of the aerial structure does not enable the freight track to cross under the BART tracks to access the east side of alignment where the location for relocated wye has been identified or where the existing spur track is located. Thus, service to the industries accessed by the spur track would be discontinued.

  Under this option, BART would transition into an aerial configuration near the south end of Great Mall to south of Trade Zone Boulevard (STA 353+00 to 415+00). Under this option, the same configurations and ROW requirements for the UPRR tail track as described under the Retained Cut Short Option would apply.

  Like the Aerial Long Option, no improvements would be required for Montague Expressway or Trade Zone Boulevard. However, the same improvements at Capitol Avenue would be required.

Design Change 15. Crossover Tracks North of Montague Expressway. *In the FEIR, crossover tracks would be located north of Montague Expressway in a retained cut configuration.*

Under the Retained Cut Long Option for the alignment south of Curtis Avenue (see Design Change 14, Curtis Avenue to Trade Zone Boulevard), crossover tracks would be located near the location of the existing locomotive wye and within the retained cut (STA 363+00 and 368+00). This location is discussed and analyzed in the FEIR. Under the three additional alignment options in the SEIR from south of Curtis Avenue to south of Trade Zone Boulevard, the crossover tracks would be relocated accordingly. Under the Aerial Long Option, the crossover tracks would be located farther north and on the aerial structure (STA 352+00 to 357+00). Under the Retained Cut Short Option, the crossover tracks would be located in the same general location as under the Aerial Long Option, but in an at grade configuration (STA 353+00 to 360+00). Under the Aerial Short Option, the crossover tracks would be farther north (STA 345+00 to 350+00).

Design Change 16. Electrical Facilities North of Montague Expressway. *In the FEIR, a traction power substation would be located north of Montague Expressway and east of the railroad ROW.*

There are two alternate locations for Traction Power Substation SME, depending on the alignment chosen for south of Curtis Avenue. Under the Retained Cut Long or Aerial Long options, the substation would be located just north of Montague Expressway on the east side of the railroad ROW (STA 366+50). This location is discussed and analyzed in the FEIR. Under the Retained Cut Short or Aerial Short Options, the substation would be located farther north, near the Piper Drive cul-de-sac, on the east side of the railroad ROW (STA 356+00).

Design Change 17. Montague/Capitol Station. *In the FEIR, a three- to five-level parking structure would be constructed on 3.4 acres at the north end of the station area. A radio tower would be located at the northwest corner of the parking structure,*

either alongside or on top of the structure. A bus transit center would be located to the south of both the parking structure and South Milpitas Boulevard, which would be extended into the station area from Montague Expressway to Capitol Avenue.

Several design changes occurred to the Montague/ Capitol Station from the Conceptual Engineering design phase to the Preliminary Engineering design phase; therefore, all features of the station are discussed in this SEIR.

The Montague/Capitol Station area would be located between Montague Expressway and Capitol Avenue and on the east side of the rail ROW (starting at approximately STA 371+00), encompass up to 27 acres of land, and displace some existing uses including research and development industries to the east of the station and a storage area for a trucking company to the west. The configuration of the station would vary depending on the option chosen for the alignment south of Curtis Avenue (Retained Cut Long, Retained Cut Short, Aerial Long, or Aerial Short). For the retained cut options, the station would consist of two 700-foot-long, 16-foot-wide (minimum) side platforms in a retained cut. For the aerial options, the station would consist of a 700-foot-long, 29-foot-wide (minimum) center platform on an aerial structure. Access to either station platform would be from a mezzanine situated at street level. A pedestrian overcrossing would extend from the east side of Capitol Avenue over the roadway to the adjacent Montague LRT station situated in the median of Capitol Avenue. The station area also includes a train control room and radio tower. Train Control Room S40 would be located near the north end of the Montague/Capitol Station area. An approximately 60-foot-high radio tower and an associated equipment shelter would be located west of the railroad ROW and south of South Milpitas Boulevard.

There are two options for parking in the station area. Either option would be feasible regardless of the configuration of the station (retained cut or aerial).

- **Parking Structure with Surface Parking Option.** Under this option, a four- to eight-level parking structure on 2 acres would be constructed at the north side of station area, to the east of the station, and along Montague Expressway. New property acquisition would include the areas east and west of Gladding Court, to be designated as surface parking and/or future transit facilities. Additional surface parking and/or future transit facilities would be located as needed within the station area. A 16-bay bus transit center with kiss-and-ride facilities would be south of the parking structure, with the parking structure partially constructed over the transit center, and north of South Milpitas Boulevard.
- **Surface Parking Option.** Under this option, surface parking would be located within the station area in one or more locations. For example, the parking structure location under the Parking Structure Option would be used for surface parking and/or future transit facilities. The areas east and west of Gladding Court would be acquired and used for surface parking and/or future transit facilities. Additional surface parking and/or future transit facilities would be located as needed within the station area. A 16-bay bus transit center with kiss-and-ride facilities would be located in the same area as under the Parking Structure with Surface Parking Option.

TABLE 3.2-2:

Design Changes in the City of Milpitas

NO.	PROJECT FEATURE [1]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
8	Dixon Landing Road Alignment	BART in a retained cut	Retain retained cut alignment; add At Grade option	Noise and Vibration; Construction
9	Berryessa Creek	BART crosses over creek on a 100-foot-long bridge	Eliminate bridge; add multi-cell box culvert	Biological Resources and Wetlands; Water Resources, Water Quality, and Floodplains; Construction
10	Crossover tracks between Berryessa Creek and Railraod Court	Crossover tracks near Railroad Court	Eliminate crossover tracks near Railroad Court, add crossover tracks to the north	Noise and Vibration
11	Electrical and communication facilities near Railroad Court	Access to site not discussed	Add access easement/road to Railroad Court	Socioeconomics; Visual Quality and Aesthetics
12	High rail vehicle access south of Calaveras Boulevard	High rail vehicle access at this location	Retain high rail vehicle access; add access easement/road to Railroad Avenue	Socioeconomics
13	Locomotion wye (Milpitas)	Locomotive wye located east of the railroad ROW between Curtis Avenue and Montague Expressway	Retain location under the Retained Cut Long and Aerial Long options; add a No Wye Option associated with the Retained Cut Short and Aerial Short options	Socioeconomics
14	Curtis Avenue to Trade Zone Boulevard	BART in a long retained cut	Retain long retained cut alignment; add Retained Cut Short Option, Aerial Long Option, and Aerial Short Option	Hazardous Materials; Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
15	Crossover tracks north of Montague Expressway	Crossover tracks located in a retained cut north of Montague Expressway	Retain crossover tracks; other locations vary depending on alignment chosen for south of Curtis Avenue	Noise and Vibration
16	Electrical facilities north of Montague Expressway	Traction power substation at this location	Retain location under the Retained Cut Long or Aerial Long options; under the Retained Cut Short or Aerial Short options, substation located immediately north of Piper Drive	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics
17	Montague/Capitol Station	Three- to five-level parking structure on 3.4 acres at Montague Capitol Station; bus transit center south of South Milpitas Boulevard; radio tower at the northwest corner of parking garage	Add a Parking Structure Option with Surface Parking with a four- to eight-level parking structure on 2 acres with additional surface parking; add a Surface Parking Option with no parking structure; bus transit center north of South Milpitas Boulevard; radio tower at the southwest corner of the station area	Air Quality; Noise and Vibration; Socioeconomics; Transportation and Transit; Visual Quality and Aesthetics; Water Resources, Water Quality, and Floodplains
18	Depth of retained cut south of East Penitencia Channel	Depth of retained cut from south of East Penitencia Channel to south of Trade Zone Boulevard approximately 30 feet below grade	Under the Retained Cut Long and Retained Cut Short options, depth between 10 and 30 feet below grade	Noise and Vibration

NOTE:

[1] The railroad intrusion detection system described in Design Change 7, Railroad Intrusion Detection System, would also be installed in Milpitas where freight trains operate in close proximity to BART.

The number of parking spaces required to meet Year 2030 service levels would vary depending on whether or not the South Calaveras Future Station was built by Year 2030. If the South Calaveras Station were built by Year 2030, the number of parking spaces required at the Montague/Capitol Station at that time would be approximately 1,200. If the South Calaveras Station was not built by Year 2030, the number of passenger boardings at Montague/Capitol Station would increase noticeably and approximately 850 additional spaces would be required.

Access to the Montague/Capitol Station area would be from South Milpitas Boulevard on the northeast, Montague Expressway and Gladding Court on the north, and Capitol Avenue on the west. Traffic 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, traffic signals would be installed at the new intersections of South Milpitas Boulevard and Capitol Avenue and at South Milpitas Boulevard and Gladding Court.

Design Change 18. Depth of Retained Cut South of East Penitencia Channel. *In the FEIR, the depth of the retained cut from south of East Penitencia Channel to Trade Zone Boulevard is approximately 30 feet below grade.*

Under the Retained Cut Long and Retained Cut Short options for the alignment south of Curtis Avenue (see Design Change 14, Curtis Avenue to Trade Zone Boulevard), the depth of the retained cut south of East Penitencia Channel to Trade Zone Boulevard generally would be less than 30 feet below grade. Along the shallowest portion of the retained cut, the depth is only 10 feet below grade. This is less than the depth of the retained cut described and analyzed in the FEIR. The shallower depth would reduce the amount of excavation and, consequently, the cost of construction.

3.2.3 CITY OF SAN JOSE

Design changes in San Jose include: the addition or relocation of electrical, communication, or ventilation facilities; the identification of access easements/roads; the adjustment in the depth of some of the retained cuts; the reconfiguration of Project features at the Berryessa, Alum Rock, and Diridon/Arena stations; the consolidation of the Civic Plaza/SJSU and Market Street stations into a single downtown station; the addition or relocation of crossover tracks; the modification of the tunnel alignment in some locations; and other minor changes. The railroad intrusion detection system described for Fremont would also be installed in San Jose (see Design Change 7, Railroad Intrusion Detection System). The yard and shops facility, which is partially located in San Jose but mostly located in Santa Clara, is discussed in Section 3.2.4 for design changes in Santa Clara.

The BART Extension Project in San Jose is shown in Figures 3.2–3 and 3.2–4, which also show the locations of the design changes. Plans showing the BART alignment are included in Appendices B and C. There are four stations in the City: Berryessa Station, Alum Rock Station, Downtown San Jose Station, and Diridon/Arena Station. The plans for these stations are shown in Appendix D.

Design Change 19. Electrical Facilities South of Trade Zone Boulevard. *In the FEIR, a traction power substation is located south of Trade Zone Boulevard and west of the railroad ROW.*

Traction Power Substation SMB would be located south of Trade Zone Boulevard partially within commercial parking areas on the west side of the railroad ROW (STA 416+00). This facility and location are discussed and analyzed in the FEIR. Two options for an access easement/road are under consideration. Either access easement/road would connect the site to Qume Drive.

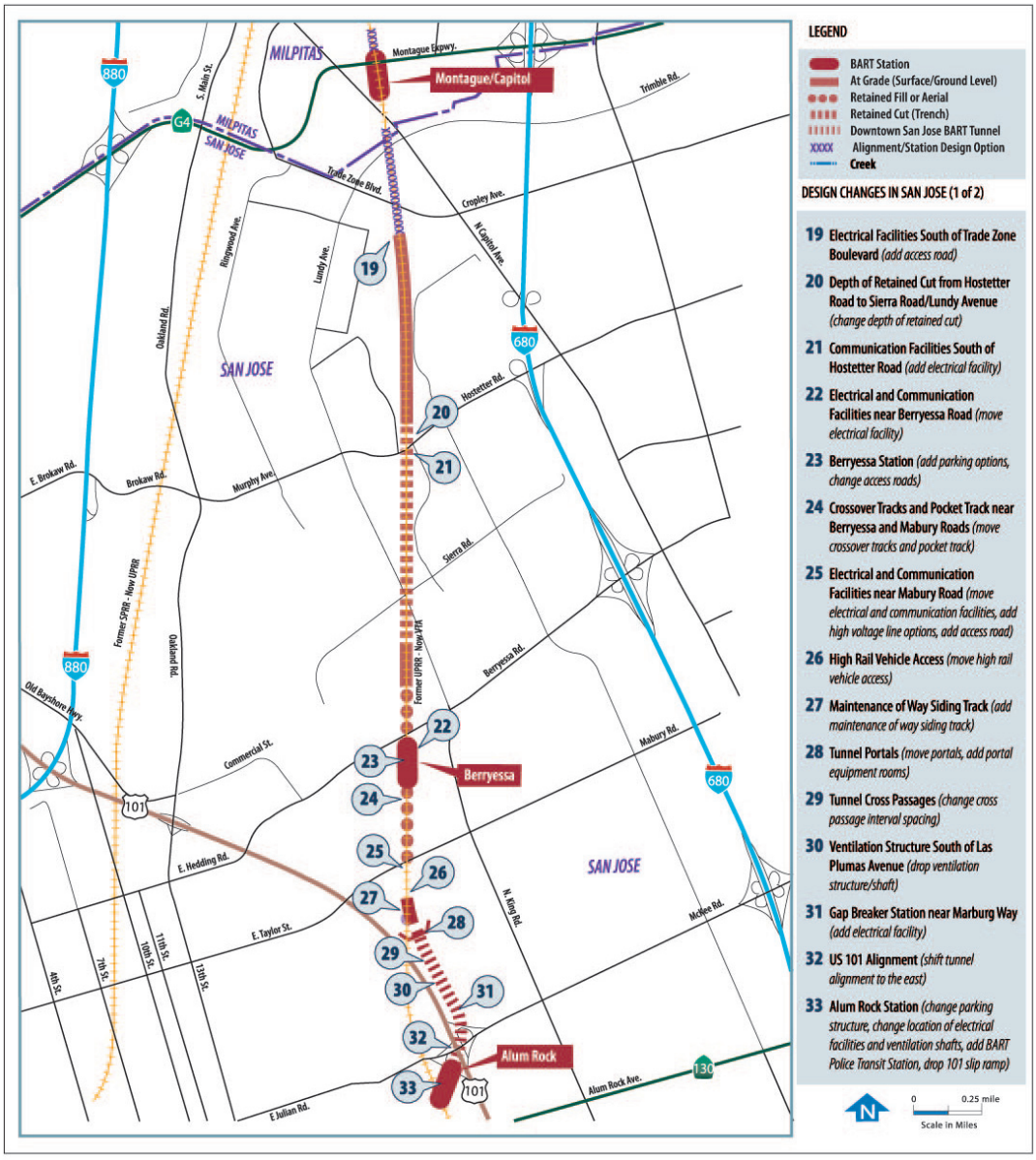

Figure 3.2-3: Design Changes in San Jose

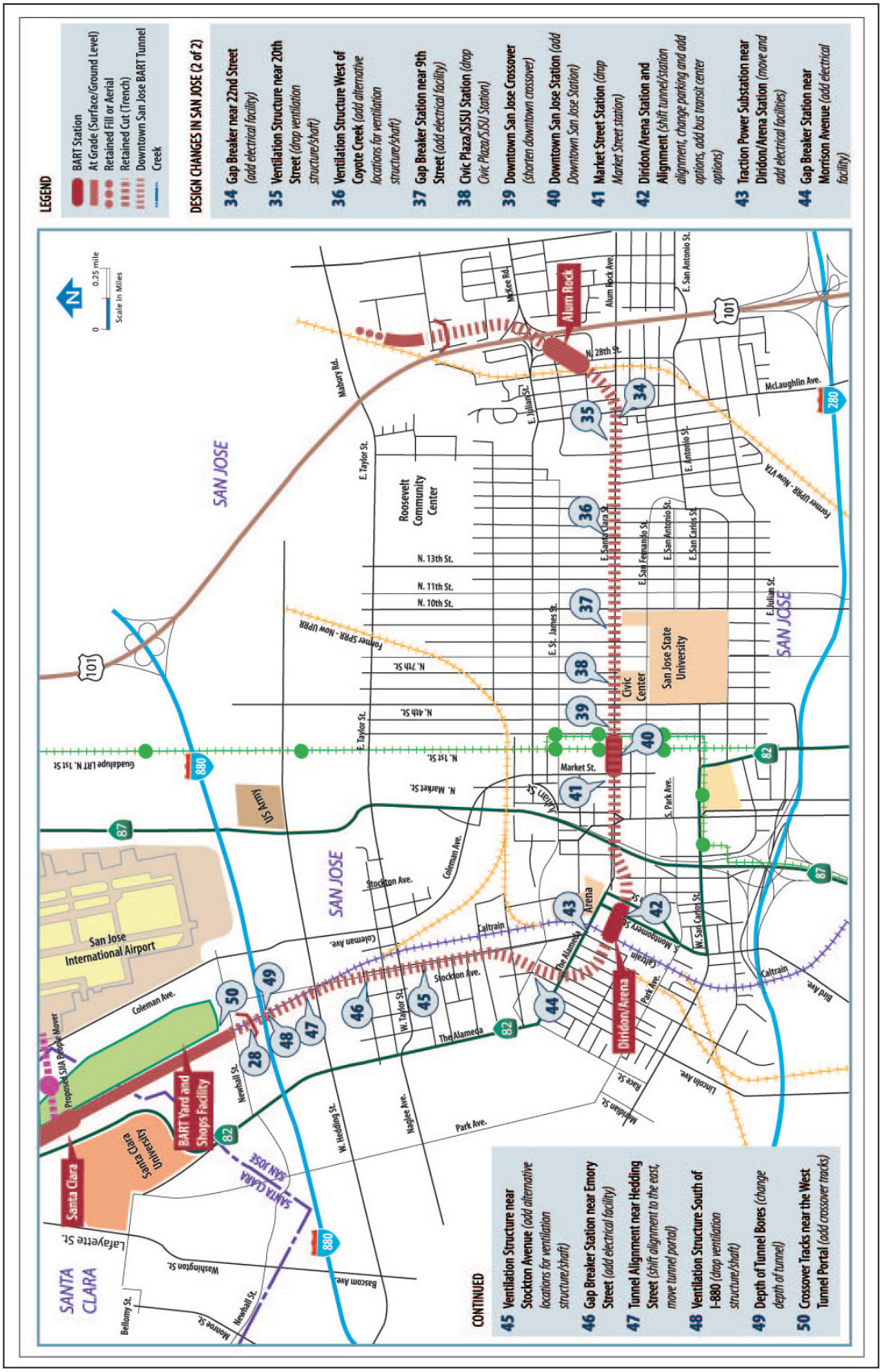

Figure 3.2-4: Design Changes in San Jose

Design Change 20. Depth of Retained Cut from Hostetter Road to Sierra Road/Lundy Avenue. *In the FEIR, the depth of the retained cut from north of Hostetter Road to south of Sierra Road/Lundy Avenue varies from approximately 20 to 50 feet below grade. The deepest portions are under the Hostetter Road and Sierra Road/Lundy Avenue overcrossings.*

The depth of the retained cut from north of Hostetter Road to south of Sierra Road/Lundy Avenue would varies from approximately 20 to 25 feet below grade. This is less than the depth of the retained cut described and analyzed in the FEIR. The shallower depth would reduce the amount of excavation and, consequently, the cost of construction.

Design Change 21. Communication Facilities South of Hostetter Road. *In the FEIR, a train control building is not identified south of Hostetter Road.*

Train Control Building S44 would be located immediately south of Hostetter Road on the east side of the railroad ROW (STA 458+00). This facility or location is not identified in the FEIR.

Design Change 22. Electrical and Communication Facilities near Berryessa Road. *In the FEIR, a traction power substation would be located west of the railroad ROW, and either south of Aschauer Court or north of Berryessa Road.*

In the FEIR, two alternate locations for a traction power substation are identified north of Berryessa Road and west of the railroad ROW. During the Preliminary Engineering design phase, this substation was relocated to reduce impacts to properties north of Berryessa Road. Therefore, Traction Power Substation SBE would be located south of Berryessa Road under the BART aerial structure at the north end of the Berryessa Station (STA 525+00). This site would also include Train Control Room S50.

Design Change 23. Berryessa Station. *In the FEIR, there are two options for the parking structure. One option includes a three- to six-level parking structure on 5.1 acres in the northeast section of the station area. A second option includes a three- to six-level parking structure on 6.2 acres in the southwest section of the station area. Access to the station area from the north would be from Berryessa Road via a new street along the west side of the railroad ROW. The ROW required for this access road would displace up to 400 vendor stalls at the San Jose Flea Market.*

The Berryessa Station design underwent several changes from the Conceptual Engineering design phase to the Preliminary Engineering design phase; therefore, all features of the station are discussed in this SEIR.

The Berryessa Station area would be located between Berryessa Road and Mabury Road (starting at approximately STA 525+50), would encompass approximately 55 acres, and would displace approximately 115 vendor stalls at the San Jose Flea Market. The station area would be set back approximately 150 to 200 feet from the tops of the banks of both Upper Penitencia Creek and Coyote Creek (except where access is provided from Berryessa Road). The station would be located at the north end of the site, and would contain an approximately 7 ulti-story parking structure.

- **Surface Parking Option.** Under this option, surface parking would be located within the station area in one or more locations. For example, the parking structure location under the Parking Structure Option would be for surface parking and/or future transit facilities. Additional surface parking would be provided as described under the Parking Structure with Surface Parking Option. The approximate 60-foot-high radio tower and an associated equipment shelter would be located in the same general area as under the Parking Structure with Surface Parking Option.

The number of parking spaces required to meet Year 2030 service levels varies slightly depending on whether or not the South Calaveras Future Station was built by Year 2030. If the South Calaveras Station was built by Year 2030, the number of parking spaces required at the Berryessa Station at that time would be approximately 2,145. If the South Calaveras Station was not built by Year 2030, the number of parking spaces required would be approximately 2,185.

Access to the station area from the north would

be from Berryessa Road via a new street on the east side of the railroad ROW. Access to the two parking areas at the south end of the station area would be from newly constructed streets originating at Mabury Road. Intersection improvements, including traffic signals, would be required at these three locations.

Design Change 24. Crossover Tracks and Pocket Track near Berryessa and Mabury Roads. *In the FEIR, three crossover tracks would be located on the aerial structure from south of Berryessa Station to south of Mabury Road. A pocket track would be located between the three crossover tracks.*

The crossover tracks identified in the FEIR on the aerial structure and south of Mabury Road are eliminated. Two crossover tracks and a pocket track, which allows storage of a train adjacent to the main-line(s), would be constructed on the aerial structure from south of Berryessa Station to Mabury Road in the same general location as described in the FEIR.

Design Change 25. Electrical and Communication Facilities near Mabury Road. *In the FEIR, a high voltage substation, switching station, gap breaker station, and train control building would be located north of Mabury Road and east of the railroad ROW. Approximately 1,400 feet of new high voltage line would run from the substation along the north side of Mabury Road and connect to an existing Pacific Gas & Electric (PG&E) high voltage line near the intersection of Mabury and King roads.*

During the Preliminary Engineering design phase, High Voltage Substation SMR, Switching Station SSM, Gap Breaker Station SXB, and Train Control Building S56 were relocated to south of Mabury Road on the west side of the ROW, and the overhead high voltage line along the north side of Mabury Road was eliminated, as San Jose no longer permits overhead lines at this location. In the SEIR, these facilities would be located south of Mabury Road on the west side of the ROW (STA 551+00), with two options for the high voltage line. An alternate site to the south at the San Jose Mabury Yard is also considered for the high voltage substation and switching station (STA 566+00). An access easement/road to DOT Way (a private street that leads to the San Jose Mabury Yard) is added to the site.

The two options for a high voltage line connection from the high voltage substation to the PG&E Mabury Substation located south of the King Road/Las Plumas Avenue intersection are as follows:

- **Mabury Underground Option.** Under this option, the new high voltage line would run underground within the ROW of Mabury Road, beginning at the high voltage substation and extending to King Road. An existing PG&E overhead high voltage line on King Road would be upgraded, extending for approximately 2,500 feet from Mabury Road to the PG&E Mabury Substation. The upgrade would consist of either of an additional circuit (overhead wires) on existing towers or a new pole line.
- **Las Plumas Overhead Option.** Under this option, the new high voltage line would begin at the high voltage substation, run south parallel to the BART alignment, continue along Marburg Way, then run along Las Plumas Avenue to King Road. The existing PG&E high voltage line on King Road would be upgraded, extending for approximately 550 feet to the PG&E Mabury Substation. If the high voltage substation and switching station were located at the San Jose Mabury Yard site, the Las Plumas Overhead Option would be the only feasible high voltage line configuration.

Design Change 26. High Rail Vehicle Access. *In the FEIR, a high rail vehicle access point would be located south of Mabury Road, with an access road connecting to the San Jose Mabury Yard.*

A high rail vehicle access point would be located slightly south of the location described in the FEIR, and the access point connecting to the San Jose Mabury Yard is eliminated. In this SEIR, an access easement/road to Nicora Avenue is added (STA 558+50).

Design Change 27. Maintenance of Way Siding Track. *In the FEIR, a maintenance of way siding track is not located south of Mabury Road.*

A maintenance of way siding track, which allows for the storage of track and wayside maintenance vehicles (e.g., ballast tamper, rail-grinder, track

and tunnel vacuum, work train), high rail vehicles, and other miscellaneous vehicles would be constructed to the west of the ROW just south of Mabury Road to just south of the east tunnel portal (STA 558+50 to 570+00). This facility and location are not identified in the FEIR.

Design Change 28. Tunnel Portals. *In the FEIR, the east tunnel portal is north of Las Plumas Avenue and the length of the cut and cover excavation required between the portal and headwall is approximately 600 feet. The west tunnel portal is west of I-880 and the length of the cut and cover excavation required between the portal and headwall is approximately 1,000 feet. Tunnel portal equipment rooms are not discussed.*

The east tunnel portal would be near Las Plumas Avenue and the length of cut-and-cover excavation required between the portal and headwall (where the bored tunnels begin) is reduced to approximately 150 feet. The new location and the reduced length of cut-and-cover would minimize property acquisition. The west tunnel portal would be near Newhall Street and the length of cut-and-cover excavation required between the portal and headwall is reduced to approximately 200 feet. This new location would avoid conflict with the I-880 bridge foundations. Above each tunnel portal, an aboveground structure would provide access leading down to a tunnel portal equipment room. The approximate dimensional requirements of each aboveground structure are 21 by 11 feet, and 10 feet high.

Design Change 29. Tunnel Cross Passages. *In the FEIR, cross passages between the two tunnel bores would be spaced every 650 to 800 feet.*

During the Preliminary Engineering design phase, cross passage interval distance was updated to reflect appropriate standards. BART Facilities Standards, Release 1.2 (May 2004) gives a cross passage interval distance of 300 feet. The *National Fire Protection Association 130, Standard for Fixed Guideway Transit and Passenger Rail Systems*, gives a cross passage interval distance of no further than 800 feet. Therefore, cross passages between the two tunnel bores would be located at approximately equal intervals along the tunnel, and would be spaced at 300- to 800-foot intervals. Depending on the interval distance, a minimum of 27 and a maximum of 61 cross passages would be constructed. The decision as to the number of cross passages and their locations will be determined during subsequent engineering phases of the Project.

Design Change 30. Ventilation Structure South of Las Plumas Avenue. *In the FEIR, a ventilation structure and vent shaft is located between Las Plumas Avenue and Lower Silver Creek.*

During the Preliminary Engineering design phase, the mid-tunnel ventilation structures and associated vent shafts were eliminated, added, or relocated to meet ventilation requirements for the tunnel portion of the alignment, exclusive of the underground stations. Consequently, the ventilation structure and vent shaft located between Las Plumas Avenue and Lower Silver Creek is eliminated.

Design Change 31. Gap Breaker Station near Marburg Way. *In the FEIR, there is no gap breaker station north of Marburg Way.*

Gap Breaker Station SXC would be located just north of Marburg Way and east of US 101 (STA 584+00). This facility and location are not identified in the FEIR.

Design Change 32. US 101 Alignment. *In the FEIR, the tunnel alignment would curve under US 101 in potential conflict with abandoned bridge foundations at the US 101/McKee Road/Julian Street interchange.*

During the Preliminary Engineering design phase, the tunnel alignment from near the east tunnel portal to near 25th Street along East Santa Clara Street was shifted to the east. This shift would avoid the abandoned bridge foundations still in place where the tunnel crosses underneath the US 101/McKee Road/Julian Street interchange (STA 565+00 to 621+00). This shift would also allow the design speed of BART to increase from 50 miles per hour (mph) to 70 mph around the curve.

Design Change 33. Alum Rock Station. *In the FEIR, a three- to five-level parking structure would be constructed on 4.2 acres at the north end of the station area. A traction power substation would be located underground at the southwest end of the Alum Rock Station beneath 28th Street. Two vent shafts would be located at either end of the station along 28th Street. A BART Transit Police Station was not included at the Alum Rock Station. A slip ramp would be constructed to provide direct access from the parking garage to southbound US 101.*

Several design changes occurred to the Alum Rock Station from the Conceptual Engineering design phase to the Preliminary Engineering design phase; therefore, all features of the station are discussed in this SEIR.

The Alum Rock Station area would be located between US 101 and 28th Street (starting at approximately STA 600+00) near the US 101/McKee Road/East Julian Street interchange. The station area would encompass approximately 19 acres and displace existing industrial uses on the site. The station area would include a BART Transit Police Station.

The station "box" would be underground, approximately 850 to 950 feet long and 65 feet wide, and would consist of a platform area, a mezzanine one level above, and ancillary areas at the ends of the station box. Ancillary facilities include an electrical room, emergency equipment room, fire sprinkler equipment, ventilation equipment, and staff break room. The depth of the station, measured from ground level to the top of the station box (the roof of the mezzanine), would be 8 to 15 feet. The center platform would be approximately 700 feet long and 28 feet wide.

Pedestrian access to the mezzanine would be from both the north and south ends of the station. At the south end of the station, pedestrian access (elevators and escalators) would connect the mezzanine level with a plaza. At the north end, pedestrian access would connect the mezzanine level with the parking structure. Kiss-and-ride facilities would be located both along 28th Street, on the west side of the station site, and to the east of the bus transit center. Two station emergency exits to allow for evacuation in the event of a fire or other significant hazardous incident would be located at each end of the station, with one hatch opening up at the north end near the vent shafts and the other at the south end in the plaza area.

The Alum Rock Station would include a five-level parking structure on 3.9 acres at the north end of the station area. Additional surface parking and/or future transit facilities would be located as needed within the station area. The number of parking spaces required to meet Year 2030 service levels varies slightly depending on whether or not the South Calaveras Future Station was built by Year 2030. If the South Calaveras Station were built by Year 2030, the number of parking spaces required at the Alum Rock Station at that time would be approximately 4,300. If the South Calaveras Station were not built by Year 2030, the number of parking spaces required at would be approximately 4,450.

The station also includes electrical, ventilation, and communication equipment. Traction Power Substation SAR would be located aboveground at the north end of the station. Auxiliary Power Substation SAN and an emergency generator would be located near the traction power substation. The station would include one emergency ventilation facility at each end of the station in the ancillary areas. At the north end of the station, the ventilation facility would include three fans with three vent shafts leading to the surface near the traction power substation. The south end of the facility would contain two fans with two vent shafts located near the plaza. There would be one fresh air intake/exhaust facility with an associated shaft at each end of the station. The station area would also include Train Control Room S60.

Access to the Alum Rock Station area would be primarily from East Julian and 28th streets at the north end of the station site and East Santa Clara and 28th streets at the south end of the site. East Julian Street would be widened between 28th Street and the southbound US 101 on-ramp. New or modified traffic signals would be installed at the intersections of 28th/East Julian streets and 28th/East Santa Clara streets. The intersection of 28th/East Santa Clara streets would be designed as a pedestrian/transit gateway into the station area with pedestrian links to buses and potential LRT operating on East Santa Clara Street/

Alum Rock Avenue.[5] Note that the FEIR included a slip ramp that would be constructed to provide direct access from the parking garage to southbound US 101. In the SEIR, this slip ramp is eliminated, as it does not meet the California Department of Transportation's (Caltrans') design criteria.

Design Change 34. Gap Breaker Station near 22nd Street. *In the FEIR, there is no gap breaker station near East Santa Clara and 22nd streets.*

Gap Breaker Station SXD would be located on the north side of East Santa Clara Street at 22nd Street (STA 630+00). This facility and location are not identified in the FEIR.

Design Change 35. Ventilation Structure near 20th Street. *In the FEIR, a ventilation structure and vent shaft is located south of East Santa Clara Street on the east side of 20th Street.*

During Preliminary Engineering the locations of mid-tunnel ventilation structures and associated vent shafts were eliminated, added, or relocated to meet ventilation requirements for the tunnel portion of the alignment. Consequently, the ventilation structure and vent shaft located south of East Santa Clara Street on the east side of 20th Street is eliminated.

Design Change 36. Ventilation Structure West of Coyote Creek. *In the FEIR, the ventilation structure and vent shaft would be located at the northwest corner of East Santa Clara and 13th streets.*

West of Coyote Creek, there are four alternate locations for a Tunnel Ventilation Structure FSS, an aboveground structure with an associated vent shaft. These alternate locations were identified during the Preliminary Engineering design phase to allow for possible future development plans by the City of San Jose. Each location has varying impacts on the surrounding properties. One potential location at the northwest corner of East Santa Clara and 13th streets is discussed and analyzed in the FEIR (STA 660+00). However, for easy reference, this location is also included in this SEIR. Another site is on the south side of East Santa Clara Street between 16th and 17th streets (STA 648+00). Two other sites are also on the south side of East Santa Clara Street between 15th and 16th streets (650+00, and 651+00). Any of the sites would also include Auxiliary Power Substation SFF.

The site on the north side of East Santa Clara Street at 13th Street is currently occupied by a surface parking area for the San Jose Medical Center. The site on the south side of East Santa Clara Street between 16th and 17th streets is currently occupied by Walgreens and an associated parking area, which would be acquired. This site is also adjacent to a residential area.

The two other sites on the south side of East Santa Clara Street between 15th and 16th streets are located in the same general area. However, one site would be located more towards 15th Street and the other site would be located more towards 16th Street. Each site includes one residential building. Both sites include the same vacant lot (located approximately in the middle of the block) and are adjacent to a residential area. Depending on which of these two locations were chosen, one or the other residential building would be acquired, as well as the vacant lot.

Design Change 37. Gap Breaker Station near 9th Street. *In the FEIR, there is no gap breaker station near East Santa Clara and 9th streets.*

Gap Breaker Station SXE would be located on the northwest corner of East Santa Clara and 9th streets (STA 673+00). This facility and location are not identified in the FEIR.

Design Change 38. Civic Plaza/SJSU Station. *In the FEIR, the Civic Plaza/SJSU Station would be located underground between 4th and 7th streets. Station entrances would be located between 4th and 8th streets. The station would include two vent shafts. One shaft would be near the southwest corner of East Santa Clara and 7th streets. The other vent shaft would be north of East Santa Clara between 4th and 5th streets.*

In the SEIR, the Civic Plaza/SJSU Station and all associated station features, such as station entrances and vent shafts, are consolidated into a single downtown station (see Design Change 40, Downtown San Jose Station).

5 VTA is currently evaluating both light rail and bus rapid transit alternatives for the Santa Clara/Alum Rock corridor.

During the Preliminary Engineering design phase, analysis determined that a consolidated downtown station would not result in a significant loss of passenger boardings when compared to the two downtown stations discussed and analyzed in the FEIR (also see Design Change 41, Market Street Station). In addition, a consolidated station substantially reduces Project costs. Therefore, the Civic Plaza/SJSU Station and all associated station features, such as station entrances and vent shafts, are consolidated into a single downtown station.

Design Change 39. Downtown San Jose Crossover. *In the FEIR, crossover tracks are located in the tunnel west of the Civic Plaza/SJSU Station between 2nd and 4th streets. The crossover box to accommodate these tracks is approximately 685 feet long.*

In the SEIR, crossover tracks are located east of the Downtown San Jose Station (see next design change) between 2nd and 4th streets. The crossover tracks are accommodated within the station box, with the crossover portion of the box reduced from the FEIR to 535 feet long.

Design Change 40. Downtown San Jose Station. *In the FEIR, there is no underground station located between 4th and San Pedro streets.*

The Downtown San Jose Station is not identified in the FEIR; however, this station consolidates the two downtown stations previously analyzed in the FEIR (see Design Changes 38, Civic Plaza/SJSU Station, and 41, Market Street Station). The station box would be located underground from San Pedro to 4th streets. The box would be approximately 1,500 and 1,700 feet long and 65 feet wide, and would consist of a platform area, a mezzanine one level above, ancillary areas at the ends of the station box, and the downtown crossover at the east end of the box (see Design Change 39). The depth of the station, measured from ground level to the top of the station box (the roof of the mezzanine), would be 5 to 15 feet. The center platform would be approximately 700 feet long and 28 feet wide.

Pedestrian access (elevators and escalators) to the mezzanine would be from several station entrances between 2nd and San Pedro streets (previously identified as a Market Street Station entrance in the FEIR). One entrance would be located at the southwest corner of West Santa Clara and Market streets. Another entrance would be located on the south side of East Santa Clara Street between 1st and 2nd streets. There are three options for this entrance at either the Bank of America building, the Ravioli building, or the Western Dental building. The last entrance would be located on the north side of East Santa Clara Street mid-block between Market and 1st streets (previously identified as a Market Street Station entrance in the FEIR). One potential future entrance would be located on the north side of East Santa Clara Street mid-block between 1st and 2nd streets.

Four station emergency exits would be located along or near East/West Santa Clara Street, with the hatches opening at street level within the sidewalk area. The station area would include pedestrian links to buses (with a connection to VTA's Guadalupe LRT) and potential LRT operating on East Santa Clara Street/ Alum Rock Avenue. The station area would not include a multi-level parking structure or surface parking.

The ancillary areas would include ventilation facilities and associated vent shafts, a traction power substation, an auxiliary power substation, and a train control room. An emergency generator would be located near the east end of the station in either an underground or aboveground location. One emergency ventilation facility would be located at each end of the station. Each facility would include two fans and one vent shaft leading to the surface. At the east end, the vent shaft would be located on the north side of East Santa Clara Street between 2nd and 3rd streets. At the west end, another vent shaft would be located on the south side of West Santa Clara Street between San Pedro and Market streets. Three fresh air intake/ exhaust facilities and associated shafts would be within the station area. Two of the facilities would be in the same locations as the emergency ventilations facilities (one at each end of the station). The third facility would be located on the north side of East Santa Clara Street between 2nd and 3rd streets. An alternate location would also be on the north side of East Santa Clara Street between 1st and 2nd streets. This alternate location would be considered if it is determined

during subsequent engineering phases of the Project that one of the three other locations is not preferred. Traction Power Substation SDN and Auxiliary Power Substation SSJ would be located underground at the east end of the station. The station area would also include Train Control Room S70.

The station also includes streetscape improvements along East/West Santa Clara Street between 4th and San Pedro streets to create a vibrant pedestrian corridor connecting the Civic Center and San Jose State University with the Downtown Commercial District. The 16-foot-wide sidewalks on both sides of East/West Santa Clara Street would be replaced and landscaped with street trees. The streetscape also includes accent street lighting, bus transit furniture, signage, and other street furnishings appropriate to the character of downtown. Streetscape improvements will be guided by the City of San Jose's Master Streetscape Plan.

Design Change 41. Market Street Station. *In the FEIR, the Market Street Station would be located underground between 1st Street and Almaden Avenue. Station entrances would be located between 2nd Street and Almaden Avenue. Station entrances would be located between 2nd and San Pedro streets. The station would include two vent shafts. One shaft would be north of East Santa Clara between 1st and 2nd streets. The other vent shaft would be located at the southeast corner of West Santa Clara and Almaden Avenue.*

In the SEIR, the Market Street Station and all associated station features, such as station entrances and vent shafts, are consolidated into a single downtown station (see Design Change 40, Downtown San Jose Station).

During the Preliminary Engineering design phase, analysis determined that a consolidated downtown station would not result in a significant loss of passenger boardings when compared to the two downtown stations discussed and analyzed in the FEIR (also see Design Change 38, Civic Center/SJSU Station). In addition, a consolidated station substantially reduces Project costs. Therefore, the Market Street Station and all associated station features, such as station entrances and vent shafts, are consolidated into a single downtown station.

Design Change 42. Diridon/Arena Station and Alignment. *In the FEIR, this station would be partially constructed under the Caltrain railroad tracks north of the San Jose Diridon Caltrain Station. The station would include two vent shafts. One vent shaft would be located at east end of the station at the southeast corner of Crandall and Montgomery streets, and the other would be located at the west end of the station at White Street. The station area would include two large multi-level parking structures. A four- to six-level structure would be located on 2.8 acres within an existing parking area adjacent to and immediately west of the HP Pavilion. A pedestrian overcrossing would connect this parking garage with the south side of West Santa Clara Street. A second four- to six-level structure with a potential bus transit facility would be located east of the Caltrain Station and south of West San Fernando Street.*

Several design changes occurred to the Diridon Station from the Conceptual Engineering design phase to the Preliminary Engineering design phase; therefore, all features of the station are discussed in this SEIR. In addition, the alignment of the station was shifted to avoid construction under the San Jose Diridon Caltrain railroad tracks. Due to this modified station alignment, the tunnel alignment would shift slightly to the south starting at the west end of the station. The tunnel would transition back to the original alignment, as described in the FEIR, near The Alameda.

The Diridon/Arena Station area would be located between Los Gatos Creek to the east and the San Jose Diridon Caltrain Station to the west, and on both the north and south sides of West Santa Clara Street. The underground station box would be approximately 800 to 1,000 feet long and 65 feet wide. The depth of the station, measured from ground level to the top of the station box (the roof of the mezzanine), would be 5 to 15 feet. The center platform would be approximately 700 feet long and 28 feet wide, with the mezzanine one level above. Pedestrian access to the mezzanine would be from both the north and south ends of the station. Street level pedestrian connections would be provided from the station to the San Jose Diridon Caltrain Station, Diridon LRT station, and HP Pavilion. Two station

emergency exits would be located at each end of the station, with one hatch opening up at the north end near the Cahill Street and the other at the south end near Autumn Street.

The ancillary areas would include ventilation facilities, associated vent shafts, and a train control room. One emergency ventilation facility would be located at each end of the station. Each facility would include two fans and two vent shafts leading to the surface. At the east end, the two shafts would be located east of Autumn Street. At the west end, the two shafts would be located west of Cahill Street. There would be one a fresh air intake/exhaust facility at each end of the station. The station area would also include Train Control Room S80.

There are two options for parking in the station area.

- **Parking Structure Option.** Under this option, a four-level parking structure on 4.5 acres would be located north of West Santa Clara Street and west of the HP Pavilion. The station area would not include surface parking. A pedestrian overcrossing would connect the parking garage with the south side of West Santa Clara Street. The number of parking spaces required to meet Year 2030 service levels would vary slightly depending on whether or not the South Calaveras Future Station is built by Year 2030. Therefore, the number of parking spaces required by Year 2030 would be approximately 1,320.
- **No Parking Option.** Under this option, no parking structure would be constructed and no surface parking would be provided. However, additional parking would be provided at the Santa Clara Station (see Design Change 52, Santa Clara Station).

There are also two options for a 15-bay bus transit center.

- **North Bus Transit Center Option.** Under this option, an existing bus transit center located south of West Santa Clara Street between the Caltrain railroad tracks and Cahill Street would be expanded.
- **South Bus Transit Center Option.** Under this option, the bus transit center would be located north of San Fernando Street between Cahill and Montgomery streets. To construct this facility, property may be required from the Peninsula Corridor Joint Powers Board.

Design Change 43. Traction Power Substation near Diridon/Arena Station. *In the FEIR, this traction power substation would be located underground at the east end of the Diridon/Arena Station between Autumn and Montgomery streets.*

During the Preliminary Engineering design phase, Traction Power Substation SDS was relocated from underground at the east end of the Diridon/Arena Station to street level at the southeast corner of White and West Santa Clara streets. This enabled the length of the station box to be reduced and allowed the station and tunnel to be realigned to avoid construction under the San Jose Diridon Caltrain railroad tracks (see Design Change 42, Diridon/Arena Station and Alignment). In this SEIR, Auxiliary Power Substation SDA and an emergency generator is added to the site.

Design Change 44. Gap Breaker Station near Morrison Avenue. *In the FEIR, there is no gap breaker station near Morrison Avenue.*

Gap Breaker Station SXF would be located north of The Alameda on the west side of Morrison Avenue (STA 761+00). This facility and location are not identified in the FEIR.

Design Change 45. Ventilation Structure near Stockton Avenue. *In the FEIR, one ventilation structure and vent shaft would be located west of Stockton Avenue and north of Cinnabar Street. Another facility would be located east of Stockton Avenue and north of Taylor Street.*

During the Preliminary Engineering design phase, the two mid-tunnel ventilation structures near Cinnabar and Taylor streets were eliminated. In the SEIR, there are five alternate locations near Stockton Avenue between Schiele Avenue and Taylor Street for Tunnel Ventilation Structure STS, an aboveground facility with an associated vent shaft (STA 786+00 to STA 791+00). These alternate locations were identified

to allow for possible future development plans by the City of San Jose. Each location has varying impacts on the surrounding properties. One potential location is on the west side of Stockton Avenue near Schiele Avenue. Two sites are on the east side of Stockton Avenue, also near Schiele Avenue. Two other sites are on the east side of Stockton Avenue near Villa Avenue. Any of the sites would also include Auxiliary Power Substation SST. Any of these sites would also require construction within the street ROW.

The site on the west side of Stockton Avenue near Schiele Avenue is currently occupied by a parking lot, which would be acquired. This acquisition would eliminate access on the south side of a printing business warehouse; therefore, this building may be acquired. This site is also adjacent to a residential area.

The two sites on the east side of Stockton Avenue near Schiele Avenue are located in the same general area. However, one site would be located closer to Schiele Avenue, and the other site would be located slightly north. The site located closer to Schiele Avenue includes a parking area and large industrial building, as well as smaller structures. The site located slightly north includes a parking area and one industrial building. Depending on which of these two locations were potentially chosen, one or more buildings would be acquired.

The two sites on the east side of Stockton Avenue near Villa Avenue are located in the same general area. However, one site would be located closer to Villa Avenue, and the other site would be located slightly north. The site located closer to Villa Avenue includes a parking area for a private coach bus company. This area has been identified as a potentially contaminated site. A portion of the parking area would be acquired, which would reduce the available parking for buses. The site located slightly to the north includes a building with several businesses. A portion of this building would be acquired.

Design Change 46. Gap Breaker Station near Emory Street. *In the FEIR, there is no gap breaker station near Emory Street.*

Gap Breaker Station SXG would be located at the southwest corner of Stockton Avenue and Emory Street (STA 803+00). This facility and location are not identified in the FEIR.

Design Change 47. Tunnel Alignment near Hedding Street. *In the FEIR, the tunnel alignment near Hedding Street runs along the east side of the Caltrain railroad ROW. The tunnel begins to ascend south of the I-880 overpass, with the west tunnel portal located south of Newhall Street.*

During the Preliminary Engineering design phase, the tunnel alignment from south of Hedding Street to Newhall Street was shifted to the east, and the west tunnel portal was moved to the north of Newhall Street. This new configuration would avoid conflict with the I-880 bridge foundations.

Design Change 48. Ventilation Structure South of I-880. *In the FEIR, a ventilation structure and vent shaft would be located south of I-880 and east of the Caltrain railroad ROW.*

During Preliminary Engineering, the locations of mid-tunnel ventilation structures and associated vent shafts were eliminated, added, or relocated to meet ventilation requirements for the tunnel portion of the alignment. Consequently, the ventilation structure and vent shaft located south of I-880 and east of the Caltrain railroad ROW is eliminated.

TABLE 3.2-3:

Design Changes in the City of San Jose

NO.	PROJECT FEATURE [1,2]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
19	Electrical Facilities south of Trade Zone Boulevard	Traction power substation at this location	Retain traction power substation; add two potential locations for access road to Qume Drive	Noise and Vibration; Socioeconomics
20	Depth of retained cut Hostetter Road to Sierra Road/Lundy Avenue	Depth of retained cut from north of Hostetter Road to south of Sierra Road/Lundy Avenue between 20 to 50 feet below grade	Depth between 10 and 35 feet below grade	Noise and Vibration; Construction
21	Communication facilities south of Hostetter Road	Not applicable	Add train control building south of Hostetter Road and east of the railroad ROW	Socioeconomics; Visual Quality and Aesthetics
22	Electrical and communication facilities near Berryessa Road	Traction power substation located north of Berryessa Road either near Aschauer Court or Berryessa Road	Substation located south of Berryessa Road under the BART aerial structure at the north end of the Berryessa Station area	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics
23	Berryessa Station	Parking structure located northeast or southwest of Berryessa Station; access from Berryessa Road from a new street along the west side of the railroad ROW; up to 400 vendor stalls would be displaced at the San Jose Flea Market	Add a Parking Structure with Surface Parking Option with a four- to six-level parking structure on 3.4 acres; add a Surface Parking Option with no parking structure; add access road east of railroad ROW and north of Mabury Road; change configuration of access road off Berryessa Road	Air Quality; Biological Resources and Wetlands; Noise and Vibration; Socioeconomics; Transportation and Transit; Visual Quality and Aesthetics
24	Crossover tracks and pocket track near Berryessa and Mabury roads	Three crossover tracks and a pocket track located on aerial guideway from Berryessa Station to south of Mabury Road	Two crossover tracks and a pocket track from Berryessa Station to Mabury Road	Noise and Vibration
25	Electrical and communication facilities near Mabury Road	High voltage substation located north of Mabury Road and east of the railroad ROW; high voltage line along the north side of Mabury Road that connects to an existing Pacific Gas & Electric (PG&E) high voltage line near the intersection of Mabury and King roads; site includes switching station, gap breaker station, and train control building	Change location of facilities to south of Mabury Road and west of the railroad ROW, add two options for high voltage line connection: Mabury Underground Option and Las Plumas Overhead Option; add access easement/road to DOT Way	Cultural and Historic Resources; Noise and Vibration; Visual Quality and Aesthetics
26	High rail vehicle access south of Mabury Road	High rail vehicle access at this location with access road to San Jose Mabury Yard	High rail vehicle access farther south with access to Nicora Avenue	Socioeconomics
27	Maintenance of way siding track	Not applicable	Add a maintenance of way siding track south of Mabury Road	Noise and Vibration; Socioeconomics
28	Tunnel portals	East tunnel portal located north of Las Plumas Avenue; cut and cover excavation is approximately 600 feet long; west tunnel portal located west of I-880; cut and cover excavation is approximately 1,000 feet long; tunnel portal equipment rooms not discussed	Tunnel headwall farther north, add aboveground structure to provide access to tunnel portal equipment room	Socioeconomics; Construction
29	Tunnel cross passages	Cross passages spaced every 650 to 800 feet	Cross spaced every 300 to 800 feet	Security and System Safety
30	Ventilation structure south of Las Plumas Avenue	Ventilation structure/shaft located between Las Plumas Avenue and Lower Silver Creek	Eliminate ventilation structure/shaft	Visual Quality and Aesthetics

NO.	PROJECT FEATURE [1][2]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
31	Gap breaker station near Marburg Way	Not applicable	Add gap breaker station north of Marburg Way and east of US 101	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
32	US 101 alignment	Tunnel curves under US 101 in conflict with abandoned bridge foundations at US 101/McKee Road/Julian Street interchange	Shift alignment to the east to avoid abandoned bridge foundations	Noise and Vibration
33	Alum Rock Station	Three- to five-level parking structure on 4.2 acres; traction power substation located underground at the southwest end of the station beneath 28th Street; two vents shafts; no BART Transit Police Station; slip ramp provides direct access from parking garage to US 101	Change to five-level parking structure on 3.9 to 6 acres; traction power substation located aboveground at the north end of the station; add an auxiliary power substation; change location of vent shafts; add vent shafts; add a BART Police Transit Station; drop slip ramp	Air Quality; Community Services and Facilities; Cultural and Historic Resources; Noise and Vibration; Security and System Safety; Transportation and Transit; Visual Quality and Aesthetics; Construction
34	Gap breaker station near 22nd Street	Not applicable	Add facility at the northwest corner of East Santa Clara and 9th streets	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
35	Ventilation structure near 20th Street	Ventilation structure/shaft located south of East Santa Clara Street on the east side of 20th Street	Eliminate ventilation structure/ shaft	Visual Quality and Aesthetics
36	Ventilation structure west of Coyote Creek	Ventilation structure/shaft located at the northwest corner of East Santa Clara and 13th streets	Four alternate sites include the location in the FEIR, plus three locations south of East Santa Clara Street: one between 16th and 17th streets and two between 15th and 16th; add auxiliary power substation	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
37	Gap breaker station near 9th Street	Not applicable	Add facility at the northwest corner of East Santa Clara and 9th streets	Cultural and Historic Resouorces; Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
38	Civic Plaza/SJSU Station	Station located underground between 4th and 7th streets; station entrances between 4th and 8th streets; vent shafts located at either end of the station	Consolidate station with Market Street Station into a single downtown station	Socioeconomics
39	Downtown San Jose Crossover	Crossover tracks located in tunnel west of Civic Plaza/SJSU Station; crossover box approximately 685 feet long	Crossover tracks within Downtown San Jose Station box; crossover portion of box approximately 535 feet long	Noise and Vibration
40	Downtown San Jose Station	Not applicable	Add station between 4th and San Pedro streets; station entrances located between 2nd and San Pedro streets; add vent shafts; add traction power sub-station and auxiliary power substation	Cultural and Historic Resources; Energy; Geology, Soils, and Seismicity; Hazardous Materials; Noise and Vibration; Socioeconomics; Transportation and Transit; Utilities; Visual Quality and Aesthetics; Construction
41	Market Street Station	Station located underground between 1st Street and Almaden Avenue; station entrances between 2nd Street and Almaden Avenue; vent shafts located at either end of the station	Consolidate station with Civic Plaza/SJSU Station into a single downtown station	Cultural and Historic Resources; Socioeconomics

	PROJECT FEATURE [1,2]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
42	Diridon/Arena Station and alignment	Station under the Caltrain tracks; one vent shaft located at each end of the station; 4-6 level parking structure on 2.8 acres east of HP Pavilion plus 4-6 level parking structure southeast of San Jose Diridon Caltrain Station	Shift station away from the Caltrain tracks; shift tunnel alignment to the south from the Caltrain tracks to The Alameda; two vent shafts located at each end of the station; 4 level parking structure on 4.5 acres west of HP Pavilion; eliminate parking structure southeast of San Jose Diridon Station; add No Parking Option; add two options for bus transit center	Air Quality; Hazardous Materials; Noise and Vibration; Socioeconomics; Transportation and Transit; Visual Quality and Aesthetics; Construction
43	Traction power substation near Diridon/Arena Station	Substation located at the east end of the Diridon/Area Station between Autumn and Montgomery streets	Substation located west of the Caltrain tracks at the southeast corner of White and West Santa Clara streets	Cultural and Historic Resources; Noise and Vibration; Visual Quality and Aesthetics
44	Gap Breaker station near Morrison Avenue	Not applicable	Add facility north of The Alameda and west of Morrison Avenue	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
45	Ventilation structure near Stockton Avenue	One ventilation structure/shaft located west of Stockton Avenue and north of Cinnabar Street, the other located east of Stockton Avenue and north of Taylor Street	Eliminate the two facilities in the FEIR; add five alternate locations for one facility: one on the west side of Stockton Avenue near Schiele Avenue; two on the east side of Stockton Avenue, also near Schiele Avenue; and two on the east side of Stockton Avenue near Villa Avenue; add auxiliary power substation	Cultural and Historic Resources; Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
46	Gap breaker station near Emory Street	Not applicable	Add facility at the southwest corner of Stockton Avenue and Emory Street	Noise and Vibration; Socioeconomics; Visual Quality and Aesthetics; Construction
47	Tunnel alignment near Hedding Street	Tunnel near Hedding Street runs along the east side of the Caltrain railroad ROW and ascends south of I-880; tunnel portal south of Newhall Street	Tunnel is shifted to the east and ascend at I-880; tunnel portal north of Newhall Street	Noise and Vibration; Socioeconomics; Construction
48	Ventilation structure south of I-880	Ventilation structure/shaft located south of I-880 and east of the Caltrain railroad ROW	Eliminate ventilation structure/ shaft	Visual Quality and Aesthetics
49	Depth of tunnel bores	Depth at approximately 20 to 60 feet below ground surface to top of tunnel bores	Depth at approximately 20 to 75 feet below ground surface to top of tunnel bores	Noise and Vibration
50	Crossover tracks near the west tunnel portal	Not applicable	Crossover tracks located in retained cut north of tunnel portal	Noise and Vibration

NOTE:

1 The railroad intrusion detection system described in Design Change 7, Railroad Intrusion Detection System, would also be installed in San Jose where freight trains operate in close proximity to BART.

2 The yard and shops facility, which is partially located in San Jose but mostly located in Santa Clara, is described in Design Change 51 in Santa Clara.

Design Change 49. Depth of Tunnel Bores. *In the FEIR, 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 depth of the tunnel, measured from the ground or street level, to the top, or crown, of the tunnel would vary from 20 feet to 75 feet. At the east and west tunnel portals, where the tracks begin to descend to the headwall of the tunnel, the depth ranges from the ground level to 20 feet below ground. The tunnel would be at its deepest when passing under the Guadalupe River to avoid a retaining wall

that was recently constructed as part of the Guadalupe River Park and Flood Protection Project.

Design Change 50. Crossover Tracks near the West Tunnel Portal. *In the FEIR, there are no crossover tracks near the west tunnel portal.*

Crossover tracks would be located in a retained cut just north of the west tunnel portal (STA 833+00 to 839+00). These are no crossover tracks identified at this location in the FEIR.

3.2.4 CITY OF SANTA CLARA

Design changes in Santa Clara include the re-configuration of Project features at the yard and shops facility and the Santa Clara Station. The yard and shops facility, which is partially located in San Jose but mostly located in Santa Clara, is discussed entirely in this section. The railroad intrusion detection system described for Fremont would also be installed in Santa Clara (see Design Change 7, Railroad Intrusion Detection System).

The BART Extension Project in Santa Clara is shown in Figure 3.2–5, which also shows the locations of the design changes. Plans showing the BART alignment are included in Appendices B and C. There is one station in the city: Santa Clara Station. The plans for this station are shown in Appendix D. The yard and shops facility, which is partially located in San Jose but mostly located in Santa Clara, is discussed entirely in this section.

Design Change 51. Yard and Shops Facility.

San Jose. *In the FEIR, the yard and shops facility in San Jose would include property from south of I-880 and east of the Caltrain railroad ROW to the San Jose/ Santa Clara city line. Buildings south of I-880 would include a train control building; a two-story, 30,000-square foot Station/Structure Maintenance and Training Facility; and a 20,000-square foot Systems, Wayside Equipment, and Non-Revenue Vehicle Maintenance Facility and Shops. A ventilation structure and vent shaft would be located at this site. A radio tower would be located midway between Brokaw Road and Newhall Street. The site would include a BART Transit Police Station.*

Santa Clara. In the FEIR, the yard and shops facility in Santa Clara would be located from the San Jose/Santa Clara boundary line to De La Cruz Boulevard, where tail tracks would continue to Lafayette Boulevard.

The design of the yard and shops facility (formerly called the BART Maintenance Facility in the FEIR) underwent several changes from the Conceptual Engineering design phase to the Preliminary Engineering design phase. Most notably, several buildings in San Jose were relocated from south of I-880 to north of I-880. This eliminated the need for property acquisition south of I-880. The tail track area was reconfigured to terminate just north of De La Cruz Boulevard, which eliminated the need for property acquisition north to Lafayette Boulevard. The BART Transit Police Station was relocated to the Alum Rock Station to provide a more centralized location along the alignment. Several other design changes also occurred; therefore, all features of the facility are discussed in this SEIR.

The yard and shops facility would be located in both San Jose and Santa Clara, and would be the terminus of the BART Extension Project. The facility would begin north of the west tunnel portal at Newhall Street and extend to De La Cruz Boulevard, where a single tail track would go under the De La Cruz Avenue overpass and terminate on the other side of the overpass. The facility would be long and narrow, encompassing approximately 69 acres, and would be constructed on the former UPRR Newhall Yard (purchased by VTA in 2004). The facility would displace the western portion of the Food Machinery Corporation (FMC) manufacturing facility (owned by City of San Jose), and possibly a portion of the Arcadia Development Company site depending on the location of the revenue processing building (see below). The tail track alignment would require some property acquisition from Federal Express and the relocation of two cellular towers. Secured entrances would be provided for employees and emergency personnel at various locations. The site would include service roads to all buildings on site along with provisions for approximately 470 parking spaces for employees, authorized visitors, and delivery and service vehicles.

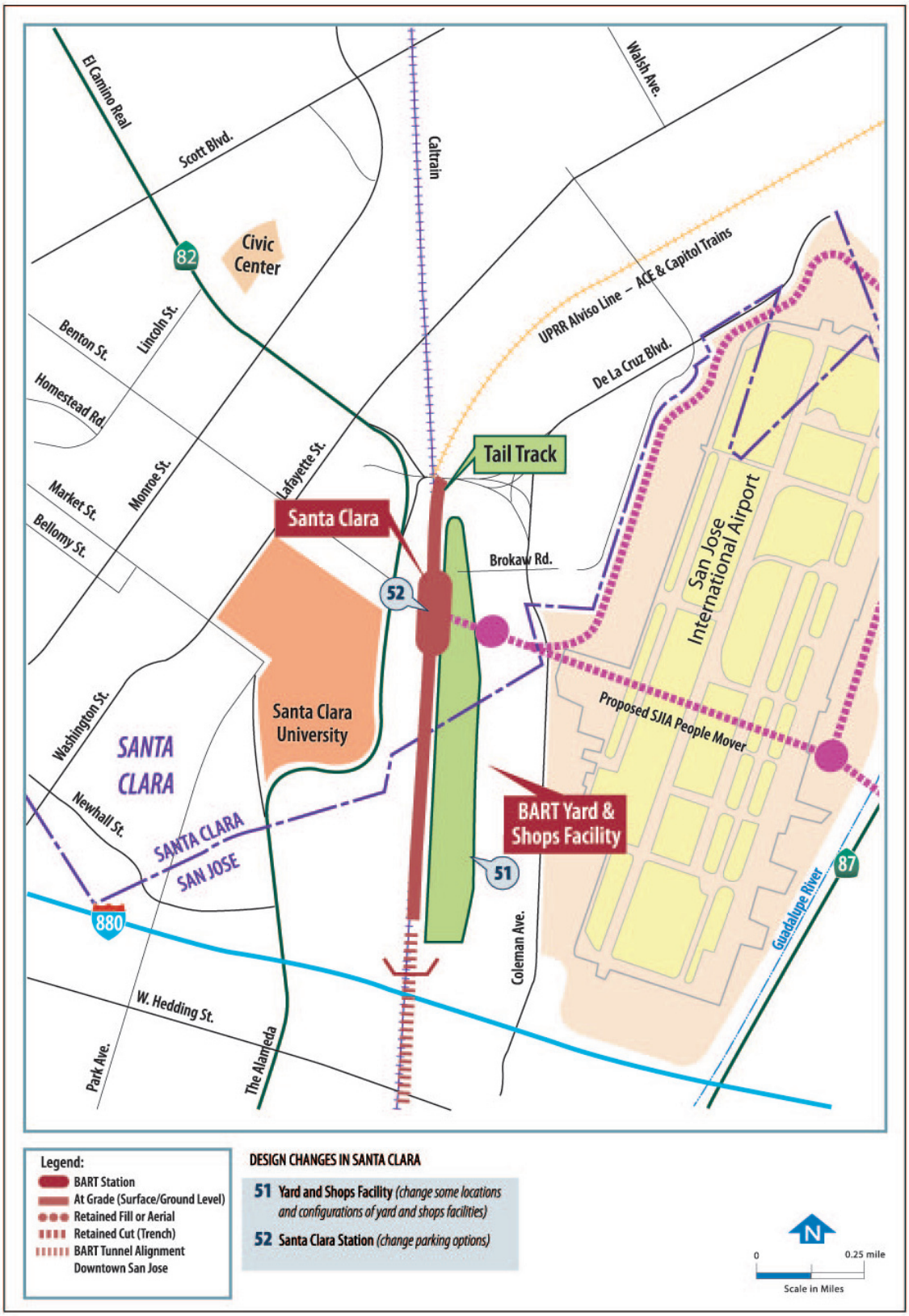

Figure 3.2–5: Design Changes in Santa Clara

The facility would serve three general purposes: 1) cleaning, maintenance, and storage of BART train cars; 2) major repair and overhaul functions, involving body damage, wheel and truck assemblies, electromagnetic systems (e.g., door mechanisms, brakes), and electronics (e.g., train control and communication equipment); and 3) other functions such as cash handling. To provide for these functions, several buildings and numerous transfer and storage tracks would be constructed. Notable buildings and facilities would include a revenue processing building, vehicle turntable, non-revenue vehicle maintenance shop and maintenance and engineering offices, revenue vehicle maintenance shop, train car washer, car interior cleaner facility, window replacement platform, inspection facility, blowdown facility, wheel truing facility, and yard control tower. The structures would vary in height from one to two stories to up to three stories for the yard control tower. Each of these buildings or facilities is described below.

- **Revenue Processing Building.** The revenue processing building would be located either adjacent to Newhall Drive or Newhall Street. The Newhall Street site would be located on a portion of the Arcadia Development Company site. Either location would require approximately 1.5 to 1.9 acres for the building, parking, and tractor/trailer turnaround operations. The specially constructed, stand-alone building would be approximately 14,500 square feet. The facility would be used to store and document revenue delivered from the BART stations.
- **Vehicle Turntable.** The approximate 85-foot-diameter vehicle turntable would be located on a spur track close to the storage tracks. The vehicle turntable would be used for turning cars that must be oriented in the correct direction before they are added to a consist. Turntable rotation would be motorized, as there would be no third rail.
- **Non-revenue Vehicle Maintenance Shop and Maintenance and Engineering Offices.** The non-revenue vehicle maintenance shop would be for non-revenue service vehicles such as rubber-tired vehicles and maintenance of way cars for the maintenance of track and equipment. The building would be approximately 29,000 square feet. The shop would contain maintenance bays for rubber-tired vehicles and a service bay with a depressed pit for train maintenance, and a storage area for replacement parts. The shop would contain an overhead crane, vehicle hoists, and diagnostic repair equipment. The maintenance and engineering offices would be on the second level above the shop.
- **Maintenance and Engineering Shops.** The maintenance and engineering shops would be for maintenance of power and mechanical systems, servicing BART facilities other than non-revenue or revenue vehicles. The building would be approximately 10,000 square feet. The shop would contain maintenance bays for mechanical and power components, as well as hoists, diagnostic repair equipment, and a storage area for replacement parts.
- **Diesel Fuel Station.** The diesel fuel station would be located southeast of the non-revenue vehicle maintenance shop building. The facility allows maintenance vehicles such as pickup trucks and rail mounted maintenance equipment to fuel up within the yard.
- **Revenue Vehicle Maintenance Shop.** The revenue vehicle maintenance shop would be approximately 131,000 square feet. Tracks would lead to and through the building to allow for double ended access and flexibility in operations for the vehicles to enter or exit the facility. Vehicle car lifts, bridge cranes, and jib cranes would be located within the first floor shop. The second floor would be primarily for administration offices. The major functions carried out in the shop would include car inspections and repairs, parts storage, heavy component repairs, electro-mechanical repairs, and electronic repairs.
- **Train Car Washer.** The train car washer is an open-ended, automated vehicle washing machine. As each train returns to the yard for storage, it would be driven through the car wash where the exterior would be cleaned.
- **Car Interior Cleaner Facility.** The car interior cleaner facility would be approximately 9,500 square feet, and would include storage areas for cleaning carts and tools (cleaning chemicals, mops, brooms, squeegees, vacuum

cleaners, etc.). The configuration of the building would allow for the interior of BART cars to be cleaned in the Santa Clara Station area.

- **Window Replacement Platform.** The window replacement platform would be located near the revenue vehicle maintenance shop and covered with a canopy. The facility would provide for easy access for the replacement of vehicle windows.
- **Inspection Pit.** The inspection pit would be located adjacent to the blowdown facility, and would be enclosed in a shed approximately 1,200 square feet. The shed would be open at each end to allow trains to travel over a depressed pit so that the underside of trains could be inspected.
- **Blowdown Facility.** The blowdown facility would be approximately 7,000 square feet and located near the train car washer and inspection pit. The length of the facility would accommodate two cars. The facility would be primarily for cleaning the underside of trains in a combined wet and dry process in preparation for scheduled inspections. The cleaning operation would be performed within a service pit.
- **Wheel Truer Facility.** The wheel truer facility would be located near the revenue vehicle maintenance shop in a stand-alone building approximately 5,000 square feet. The primary function of this facility would be to enclose the wheel truing pit and equipment to facilitate the maintenance and repair of BART vehicle wheel sets.
- **Yard Control Tower.** The yard control tower would be approximately three stories high and 10,000 square feet. The tower would be situated to have a proper view of train operations in the yard and shops area. Employees staffing the tower would control the majority of train movements with in the yard and shops area.
- **Electrical and Communication Facilities.** The yard and shops facility includes several electrical and communication facilities. High Voltage Substation SNH, Switching Station SNS, and Traction Power Substation SNS would be located north of Newhall Street (STA 834+00). Approximately 500 feet of new high voltage line would run overhead from High Voltage Substation SNH to the PG&E substation located near Newhall Street and Stockton Avenue. This line would require approximately 60-foot-high tapered tubular steel towers spaced every 400 to 500 feet. Traction Power Substation SSY, Auxiliary Power Substation SNY, Gap Breaker Station SZA, Gap Breaker Station SZB, and Train Control Building S84 would be located in the Newhall Yard area. Traction Power Substation SSC and Auxiliary Power Substation SCS/SYA would be located north of the Santa Clara Station near the tail track area. An approximately 150-foot-high radio tower and an associated equipment shelter would be located in the tail track area.
- **Material Storage Areas.** The material storage areas are utilized to store maintenance equipment and stockpile supplies. There are two material storage areas: one is located east of the Santa Clara Station and the other is located east of Auxiliary Power Substation SNY.

In addition to these facilities, two detention basins would be constructed to retain stormwater, and would release the water at a controlled rate to the storm drain system. One detention basin would be approximately 12,000 square feet and located near the Train Control Building S84 in San Jose. The other detention basin would be approximately 26,000 square feet and located near Auxiliary Power Substation SNY in Santa Clara. The size of each facility is designed to accommodate increased stormwater runoff during a 100-year flood event due to the yard and shops development.

Design Change 52. Santa Clara Station

In the FEIR, there are two options for the parking structure. One option includes a three- to five-level parking structure on 3.6 acres north of Brokaw Road. A second option includes a three- to five-level parking structure on 4 acres south of Brokaw Road.[6] *A pedestrian overcrossing would connect the the Santa Clara Caltrain,*

6 On May 26, 2004, the Silicon Valley Rapid Transit Corridor Policy Advisory Board recommended the Parking Structure North Option only, which is reflected in the FEIR, Volume II, Chapter I, Introduction. However, on December 4, 2004 (the certification date of the FEIR), the VTA Board of Directors recommended retaining the Parking Structure South Option in addition to the Parking Structure North Option for further study.

the station mezzanine, and the bus transit center and kiss-and-ride area.

The Santa Clara Station area would be located primarily between the Caltrain tracks on the west, Coleman Avenue on the east, and Brokaw Road on the south. The station area would encompass approximately 12 acres, and would displace (along with the yard and shops facility) the Federal Express site. The station would be at grade, centered at the end of Brokaw Road, and would contain an approximately 700-foot-long, 28-foot-wide center platform with a mezzanine one level above. An approximate 400-foot-long, pedestrian overcrossing would connect the Santa Clara Caltrain, mezzanine level of the BART station, and five-bay bus transit center and kiss-and-ride area. The pedestrian connection to the Caltrain Station would require the relocation of the historic Santa Clara Tower and Utility Sheds (components of the Santa Clara Caltrain Station) north of Benton Street to approximately 30 feet south of the Santa Clara Station Depot to maintain the historic relationship between the Tower, Sheds, and Depot. A proposed Automated People Mover would link the BART station and the Santa Clara Caltrain Station with SJIA. Train Control Room S90 would be located within the Santa Clara Station area.

The Santa Clara Station would include a three to four level parking structure on 3.3 acres at the north end of the station area, north of Brokaw Road. Additional surface parking and/or future transit facilities would be located to the east within the station area, as needed. The number of parking spaces required to meet Year 2030 service levelswould vary slightly depending on whether or not the South Calaveras Future Station is built by Year 2030. Therefore, the number of parking spaces required by Year 2030 would be approximately 1,700. However, if the No Parking Option were chosen for the Diridon/Arena Station (see Design Change 42, Diridon/Arena Station and Alignment), the number of spaces required to meet Year 2030 service levels would increase to approximately 2,600. To accommodate the increase in the number of parking spaces, the parking structure would be five to six levels. Again, additional surface parking, as needed, and/or future transit facilities would be located to the east within the station area.

Access to the Santa Clara Station area would be from Brokaw Road off Coleman Avenue. Brokaw Road would be widened to four lanes.

see Table 3.2-4 >>

TABLE 3.2-4:

Design Changes in the City of Santa Clara

NO.	PROJECT FEATURE[1]	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
51	Yard and shops facility	In San Jose, the facility includes property south of I-880 and east of Caltrain railroad ROW to the city line In Santa Clara, the facility consists of several facilities on a site located north of the city line to De La Cruz Boulevard with tail tracks extending to Lafayette Street	In San Jose, no property required south of I-880; facilities located north of Newhall Street; reconfigure size and location of some buildings and facilities; drop radio tower; drop BART Transit Police Station; add retention pond; and private parking spaces In Santa Clara, Tail tracks end north of De la Cruz Boulevard; reconfigure size and location of some buildings and facilities; add radio tower; add retention pond; and private parking spaces	Community Services and Facilities; Noise and Vibration; Security and System Safety; Socioeconomics; Visual Quality and Aesthetics; Water Resources, Water Quality, and Floodplains
52	Santa Clara Station	Parking structure located north or south of Brokaw Road	Eliminate parking structure south location; retain parking structure north location; two alternate designs for parking structure depending on parking option chosen for the Diridon/Arena Station	Air Quality; Cultural and Historic Resources; Hazardous Materials; Noise and Vibration; Socioeconomics; Transportation and Transit; Visual Quality and Aesthetics

NOTE:

[1] The railroad intrusion detection system described in Design Change 7, Railroad Intrusion Detection System, would also be installed in Santa Clara where freight trains operate in close proximity to BART.

3.3 CHANGES TO OTHER PROJECT FEATURES

In addition to the design changes described above, changes between the FEIR and the SEIR include changes to the construction staging areas, BART core system access requirements, VTA and BART fleet requirements, VTA and BART operating plans, and station boardings. While these are not necessarily design changes, they are listed here as such for consistency.

Other than the construction staging areas, the changes are due primarily to the difference in the long-range planning horizon where the FEIR includes projections for Year 2025 service levels and the SEIR includes projections for Year 2030. A summary table of design changes to other Project features is provided below (Table 3.3–1), followed by a discussion of the changes.

3.3.1 CONSTRUCTION STAGING AREAS

Design Change 53. Construction Staging Areas. *In the FEIR, there are 11 primary construction staging areas identified. Several of these areas encompass the locations of permanent facilities such as station areas.*

In the SEIR, the locations (footprints) of all permanent facilities would be used as construction staging areas, as each of these locations would involve some degree of construction equipment usage and storage, construction vehicle parking, and materials storage. These permanent facility locations would include stations areas, electrical and communication facilities areas, the yard and shops facility, etc. Since permanent facilities in and of themselves were not considered in the FEIR as construction staging areas but are considered as such in the SEIR, this increases the overall number of staging areas in the SEIR. In addition, the SEIR identifies 12 primary construction staging areas that are not part of the permanent facility footprints; 5 of these areas are included in the FEIR, although the acreages and configurations of these 5 areas are different in the SEIR.

3.3.2 BART CORE SYSTEM ACCESS

Design Change 54. BART Core System Access. *In the FEIR, parking for the BART core system access (parking) for stations north of the BART Extension Project is based on Year 2025 service levels. In that year, 3,235 spaces were projected to be required.*

Parking expansion at existing BART stations was assumed to be limited to 3,235 parking spaces, based on existing constraints and in recognition of BART's and local communities' interest in use of some properties in the vicinity of core system stations for

transit-oriented development projects. According to ridership estimates, provision of 3,235 additional core parking spaces would support 103,717 daily boardings in 2030. The consequence of holding the core parking demand to the level approved in the FEIR, results in 900 fewer daily boardings (the current ridership modeling indicates that 4,466 core parking spaces would support 104,645 boardings per day in 2030). Ongoing analysis will assess whether it is feasible to provide access improvements consistent with BART policies, to support higher ridership. However, for purposes of the SEIR, the environmental analysis has taken a conservative approach and assumed the higher number of 104,645 boardings per day.

The BART core system access expansion would be funded by VTA pursuant to the VTA/BART Comprehensive Agreement. Chapter 5, *BART Core System Access Analysis*, contains a more detailed discussion.

TABLE 3.3-1:

Design Changes for Other Project Features

NO.	PROJECT FEATURE	FEIR	SEIR	ENVIRONMENTAL ANALYSIS SECTION
53	Construction staging areas	11 primary staging areas, plus the stations area	Footprints of all permanent facilities used as construction staging areas, plus 12 other primary construction staging areas	Socioeconomics; Construction
54	BART core system parking	For Year 2025 service levels, approximately 3,235 spaces required	For Year 2030 service levels, parking was limited to 3,235 spaces	Chapter 5
55	Fleet requirements	Existing fleet size based on 2002 data, future fleet size projected for Year 2025 included 106 to 126 additional BART cars	Existing fleet size based on 2006 data, future fleet size projected for Year 2030 includes 166 additional BART cars	See Design Change 51
56	Operating plan	Eight VTA bus routes to provide service to major destinations Bus routes to 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 routes to operate in the reverse-peak commute direction	Six VTA bus routes to provide service to major destinations Bus routes to operate at 5- to 60-minute headways in the peak direction from about 5:00 a.m. to 9:00 a.m. in the morning peak and from 3:00 p.m. to 7:00 p.m. in the evening peak Five routes to operate in the reverse-peak commute direction	Transportation and Transit
57	Station Boardings	A total of 83,585 daily boardings were projected in 2025 for the 7 stations without the future Calaveras Station	A total of 104,645 daily boardings were projected in 2030 for the 6 stations without the future Calaveras Station	Air Quality; Energy; Transportation and Transit

3.3.3 FLEET REQUIREMENTS

Design Change 55. Fleet Requirements. *In the FEIR, the existing fleet sizes for VTA and BART are given for Year 2002. Projected fleet requirements are given for Year 2025.*

The FEIR included a projected increase in VTA and BART fleet size based on the 2002 fleet size and anticipated Year 2025 service levels. The SEIR updates this information to include the 2006 fleet size and anticipated Year 2030 service levels. Table 3.3–2 summarizes the differences between the FEIR and the SEIR given these adjustments.

If the BART Extension Project were not built, a total VTA bus fleet of 552 vehicles is estimated to meet Year 2030 service levels, which represents 27 additional VTA buses over the current year (2006) fleet. Bus service would be implemented over time as

demand warrants and as funding becomes available. There are no proposed modifications to Valley Bus services; therefore, there is no anticipated change in fleet size. While the light rail network will expand by 2030, it will be able to be served with no increases to the existing light rail fleet of 100 vehicles. With implementation of the BART Extension from Fremont to Warm Springs Project, plus increased BART service overall, the total BART fleet is expected to expand with the addition of 229 cars, with the total number of cars estimated at 899.

With the BART Extension Project, a total VTA bus fleet of 568 vehicles is estimated to meet Year 2030 service levels, which represents 16 additional VTA buses over Year 2030 no Project conditions. For Valley buses, modifications to existing services are anticipated, as well as some new service. However, there would be 4 less Valley buses under the BART Extension Project, as BART service would replace some of the Valley bus service. The total light rail fleet is not anticipated to change, with the total number of vehicles estimated at 100. An estimated 166 additional BART vehicles would be required compared to Year 2030 no Project conditions. The BART fleet for the entire system with the Project would consist of 1,065 vehicles.

TABLE 3.3-2:

Comparison of Fleet Requirements Between the FEIR and SEIR

SERVICE	FEIR			SEIR		
	2002 EXISTING	2025 PROJECTED (w/o BART EXTENSION)	2025 PROJECTED (w/ BART EXTENSION)	2006 EXISTING	2030 PROJECTED (w/o BART EXTENSION)	2030 PROJECTED (w/ BART EXTENSION)
VTA Buses	506	600	642	525	552	568
Valley Buses	—	22	47	36	36	32
VTA Light Rail	50	91	91	100	100	100
BART Cars	—	878 to 898	1,004	670	899	1,065

Source: VTA, July 2002; Connetics 2006.

3.3.4 OPERATING PLAN

Design Change 56. Operating Plan. *In the FEIR, BART would operate every day from 4:00 a.m. to 1:00 a.m., with 6-minute headways from 6:00 a.m. to 7:30 p.m. After 7:30 p.m. and on weekends, the average headway would be 10 minutes. Eight VTA bus routes would provide service to several major employment destinations, activity centers, and transit facilities in the Silicon Valley. VTA 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. Bus service from the Central Valley would operate at the sole discretion of the respective local transit agencies and would terminate at the Warm Springs BART Station.*

In the SEIR, BART service would operate as described in the FEIR.

The BART Extension Project would include an expansion of bus service between the planned BART Warm Springs Station and various Silicon Valley destinations in Santa Clara County. This service would add to improvements planned in Valley Transportation Plan 2030 (VTP 2030), adopted by VTA in February 2005. Six new routes would serve Lockheed/Martin, Sunnyvale/Mountain View Industrial Parks, Oakmead (two routes), SJIA, and Dixon Landing. Three of the routes (serving Oakmead and SJIA) would be truncated at their northern ends at the Montague/Capitol BART Station; the route serving SJIA would

also be converted to all-day local feeder service with 20-minute peak and 30-minute base service headways. Some of VTA's local bus routes within the SVRTC study area also would be rerouted to serve BART stations. VTA bus routes would operate at 5- to 60-minute headways in the peak direction from about 5:00 a.m. to 9:00 a.m. in the morning peak and from 3:00 p.m. to 7:00 p.m. in the evening peak. Five of the six bus routes would also operate in the reverse-peak commute direction. The local feeder route serving SJIA and other applicable VTA local bus routes would serve BART stations throughout the day.

Valley bus service from the Central Valley, which would be operated at the discretion of SJRTD, would terminate at the BART Warm Springs Station.

3.3.5 STATION BOARDINGS

Design Change 57. Station Boardings. *In the FEIR, 83,585 station boardings were projected in 2025 for seven stations without the Calaveras Station. The Montague/Capitol, Market Street, and Santa Clara Stations were all projected to have over 14,000 boardings per day.*

In the SEIR, a total of 104,645 boardings were projected in 2030 without the Calaveras Station. A comparison of the 2025 FEIR and 2030 SEIR boardings by stations is provided in Table 3.3-3. The 2030 SEIR boardings are substantially higher than the 2025 FEIR primarily due to forecasting five more years into the future and the ridership models' use of ABAG's regionally adopted "Smart Growth" land use scenario. The Montague/Capitol, Downtown, and Santa Clara Station are all projected to have over 20,000 boardings per day. The SEIR boardings with the Calaveras Station are slightly lower than without the Calaveras Station due to the increased travel times from an additional stop.

TABLE 3.3-3:

Comparison of 2025 FEIR and 2030 SEIR Daily Station Boardings

STATION NAME	FEIR 7 STATIONS	SEIR 6 STATIONS	SEIR 6 STATIONS + CALAVERAS
South Calaveras	0	0	4,293
Montague/Capitol	19,247	31,010	27,757
Berryessa	6,537	7,932	7,972
Alum Rock	9,115	10,927	10,598
Civic Center/SJSU	6,236	—	—
Market Street	17,866	—	—
Downtown	—	23,474	22,749
Diridon/Arena	9,667	11,236	10,760
Santa Clara	14,919	20,066	19,532
TOTAL	83,587	104,645	103,661

Source: Connetics 2006

3.4 DESCRIPTION OF PROJECT FEATURES

3.4.1 ELECTRICAL FACILITIES

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

TRACTION POWER SUBSTATIONS AND SECTIONALIZING STATIONS

Traction power substations provide the power required to run BART trains on the mainlines, storage tracks, yard and shops tracks, and so forth. These substations transform 34.5-kV AC to 1,000-V DC for distribution through BART's contact rail. Traction power substations include both outdoor and indoor equipment housed in enclosures. The equipment consists of 34.5-kV AC metal clad walk-in type switchgear, transformer-rectifier assemblies, 1,000-V DC switchgear circuit breakers, control equipment, electrical auxiliary equip-ment, protection relays, meters and telemetering devices, supervisory control and data acquisition system (SCADA), and connecting AC and DC power and control cables.

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

Twelve traction power substations would be located along the alignment. All but one would be located aboveground. The location of one of the aboveground substations would vary depending on the alignment option chosen for south of Curtis Avenue (Retained Cut Long/Aerial Long Options or Retained Cut Short/Aerial Short Options). One substation would be located underground within an ancillary area of the Downtown San Jose Station. Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities such as gap breaker

stations and train control buildings. Some aboveground sites would require construction of an access road. Minimum approximate dimensional requirements for aboveground traction power substations are 60 by 200 feet and 15 feet in height. The minimum approximate dimensional requirement for the underground substation is 50 by 220 feet and 15 feet in height. Approximate dimensional requirements of sectionalizing stations are 30 by 20 feet, and the equipment would be combined with the traction power substations 34.5-kV AC switchgear assembly.

HIGH VOLTAGE SUBSTATIONS AND SWITCHING STATIONS

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

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

Three high voltage substations and three switching stations would be located along the alignment, all aboveground. Each facility would require installation of high voltage (115-kV) power feed lines connecting to nearby existing PG&E towers/lines and/or PG&E substations. Permanent overhead or underground easements would be required for the 115-kV lines. Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities such as traction power substations and train control buildings. However, approximate dimensional requirements are 75 by 160 feet or 75 by 190 feet and 20 feet in height for high voltage substations and 30 by 60 feet and 20 feet in height for switching stations. Some sites would require construction of an access road.

AUXILIARY POWER SUBSTATIONS

Auxiliary power substations provide the power required to run the stations, ventilation facilities, and yard and shops. Electric power to the substations would be supplied by nearby overhead and underground medium voltage 480-V, 12.47-kV and 21-kV transmission lines. Short (typically less than 1,000 feet) sections of overhead and underground power lines would be constructed from existing transmission facilities to the new facilities. Transformers and switching equipment would be located within ancillary areas at stations and ventilation facilities. At the Alum Rock and Diridon/Arena stations, some of this equipment is co-located aboveground with traction power substations.

Each BART underground station and each ventilation facility would be powered from two independent sources for reliability: 1) a single local utility (PG&E) transmission facility; and 2) the BART 34.5-kV sub-transmission cable system. Aboveground stations would have two local utility services (PG&E or Silicon Valley Power). In addition, each station and the yard and shops would have a standby diesel-electric generator located aboveground. However, for the Downtown San Jose Station, the standby diesel-electric generator would be in either an underground or an aboveground location. Additional standby diesel-electric generators would be located at pump stations, tunnel portal equipment rooms, and possibly located at train control buildings.

GAP BREAKER STATIONS

Gap breaker stations isolate appropriate electrified third rail sections for maintenance and repair purposes or de-energize third rail sections during an emergency. Gap breaker stations include indoor equipment in pre-fabricated enclosures or custom built buildings. The equipment consists of 1,000-V DC switchgear circuit breakers and associated ancillary equipment such as relays and meters. DC power cables run in ductbanks from the gap breaker circuit breakers to BART's electrified third rail. The vertical portions of the ductbank systems, called cable shafts, enable gap breaker stations to serve contact rail sections in the tunnel.

Eight gap breaker stations would be located along the alignment. All would be located aboveground. Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities. However, approximate dimensional requirements for gap breaker stations are 30 by 40 feet and 15 feet high.

3.4.2 TRAIN CONTROL AND COMMUNICATION EQUIPMENT

TRAIN CONTROL EQUIPMENT

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

COMMUNICATION EQUIPMENT

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

The BART Extension Project would require the expansion of BART's existing 800-megahertz trunked radio system. To achieve this, a 150-foot-high (measured from ground level) radio tower and associated equipment shelters (approximately 12 by 20 feet and 15 feet in height) would be located in the Newhall Yard area to support communications. Two smaller radio towers may also be needed, one at the Montague/Capitol Station and one at the Berryessa Station. Each tower would be tapered tubular steel 2 to 3 feet in diameter at the base with a concrete foundation and multiple antennas at the top.

3.4.3 RAILROAD INTRUSION DETECTION SYSTEM

A railroad intrusion detection system detects the intrusion of derailed freight railroad trains into the BART ROW. The system consists of closed-circuit television cameras (connected to special motion sensing software) installed where necessary on poles along the alignment at approximate 500- to 1,000-foot intervals. The poles are approximately 15 feet above the top of rail, and each pole supports two cameras facing opposite directions. The cameras provide a narrow view angle aligned with the railroad ROW fence and focused on the BART ROW. This narrow focus ensures that areas beyond the railroad ROW would not be within view.

3.4.4 CROSS PASSAGES

Cross passages are underground connections located between the two tunnel bores and fitted with fire-rated doors. Cross passages are not required within the underground station boxes. Cross passages permit crossing from one tunnel bore to the other tunnel bore for purposes of emergency evacuation. For example, in the event of a fire, cross passages would provide the means to evacuate passengers from the tunnel bore with the fire incident to the other tunnel bore. This other tunnel bore would also serve as a point where rescue trains could be accessed.

3.4.5 TUNNEL AND UNDERGROUND STATION VENTILATION FACILITIES

EMERGENCY VENTILATION FACILITIES

Emergency ventilation facilities would be located along the tunnel alignment between the underground stations (called mid-tunnel ventilation structures) and within the underground stations. The facilities include fans, vent shafts, and associated facilities and operate primarily to remove smoke/air exhaust in cases of emergency. In addition, the facilities limit air velocities due to the train piston effect and ventilate the tunnel when diesel propelled vehicles are being used during tunnel maintenance. Periodic testing of the facilities is required to ensure their proper operation.

There would be two mid-tunnel ventilation structures: one located west of Coyote Creek and another located along Stockton Avenue south of Taylor Street. The mid-tunnel facilities would include an aboveground structure, or building, that houses the equipment required to ventilate the tunnel. The area required to accommodate each facility would be approximately 110 by 160 feet (including a small parking area for maintenance personnel) with the equipment housed in a structure approximately 90 by 140 feet and 25 feet in height. A vent shaft would connect the structure to the tunnel below. The shaft opening would be located on the roof of the structure with the smoke/air exhaust discharging vertically out of a protective grate.

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

FRESH AIR INTAKE AND EXHAUST FACILITIES

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

3.4.6 PUMP STATIONS

Pump stations collect groundwater seepage and/or rainwater at the lowest elevation points of the alignment, i.e., in the tunnel bores, in underground stations, in the retained cut segments, and underneath roadways that are reconfigured to pass under the alignment. In cases of emergency, pump stations also collect water discharged from fire hydrant valves.

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

For other areas along the alignment, some surface facilities may be required if the equipment could not be located entirely underground. These facilities may include a pump house and/or electrical control building. Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities. However, approximate dimensional requirements are 12 feet by 12 feet.

Pump stations would be located at each of the underground stations, and at or near the following additional locations along the alignment:

- Kato Road.
- Dixon Landing Road for both the Retained Cut and At Grade options.
- South of Curtis Avenue with the Retained Cut Long Option (near the UPRR at grade bridge over BART).
- Piper Drive for both the Retained Cut Long and Retained Cut Short options.
- Trade Zone Boulevard for both the Retained Cut Long and Retained Cut Short options.
- Capitol Avenue for both the Aerial Long and Aerial Short options.
- Hostetter Road.
- Sierra Road/Lundy Avenue intersection.
- In the tunnel portals.
- In the tunnel south of Lower Silver Creek.
- In the tunnel between 12th and 17th streets (location varies depending on location of the ventilation structure [see Design Change 36, Ventilation Structure and Auxiliary Power Substation West of Coyote Creek]).
- In the tunnel west of SR 87.
- In the tunnel between Schiele and Villa avenues (location varies depending on location of the ventilation structure [see Design Change 45, Ventilation Structure near Stockton Avenue]).

3.4.7 MAINTENANCE AND EMERGENCY ACCESS

Maintenance access to the BART ROW would be provided through locked 4-foot gates or doors (in soundwalls) and located at approximate 1/2-mile intervals along the at-grade sections of the alignment between the Warm Springs Yard and the east tunnel portal. These access points would also serve as one way to access the alignment for emergency response. The locations of access gates or doors would be from adjacent public streets, where possible, or parking lots. The locations would also be near existing fire hydrants or where installation of a fire hydrant would be possible. Some of the locations would require permanent easements. The exact locations of access gates or doors would be determined during the subsequent engineering phases of the Project.

3.5

PROJECT SCHEDULE

The BART Extension Project would take 8 to 9 years to construct and perform start-up and testing activities, as shown in Figure 3.5–1. Passenger service for the Project would start in 2016, assuming funding is available.

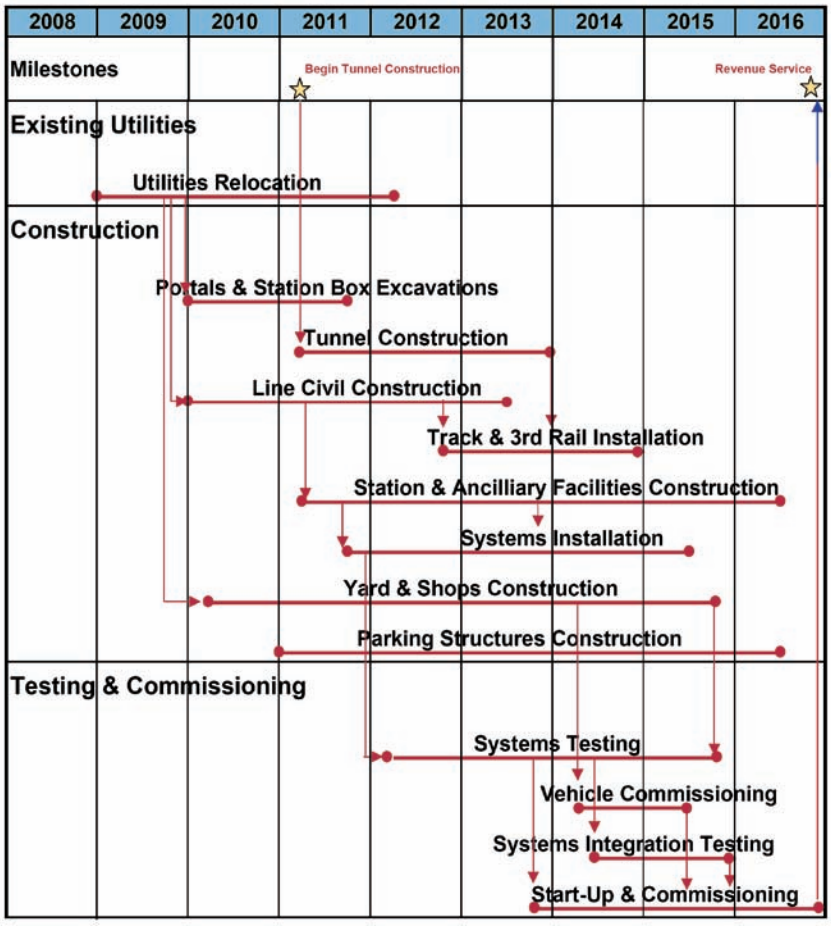

Figure 3.5-1: Project Schedule