CHAPTER 2: ALTERNATIVES

This chapter discusses the three alternatives considered in the EIS: No Build; Silicon Valley Rapid Transit Project (SVRTP); and Berryessa Extension Project (BEP). The latter two alternatives are referred to as Build Alternatives as they propose major new rail transit and related improvements within the Silicon Valley Rapid Transit Corridor (SVRTC).

Background information on the development of the Build Alternatives is presented in Section 2.1, Alternatives Development Process. The main features of each of the three alternatives are described beginning with Section 2.2, No Build and Build Alternative Comparisons. For the two Build Alternatives, information is provided about how they would be constructed and operated; a general schedule of when improvements would be made; and their capital and operating costs, which are compared to the No Build Alternative condition.

Other transportation improvement alternatives and design options for the SVRTC that were considered and withdrawn from further study prior to preparation of the EIS are described in Section 2.7, Alternatives Considered and Withdrawn.

2.1 ALTERNATIVES DEVELOPMENT PROCESS

The development of transit improvements for the SVRTC has a long history. Initial studies of transportation conditions, needs, and strategies for addressing identified needs go back over 30 years. In conjunction with the technical planning and conceptual design studies, local and regional public agencies have taken actions to advance the refinement of "project level" solutions to the corridor's transportation problems, including approving funding for their implementation.

2.1.1 MAJOR INVESTMENT STUDY

Section 1.5 of the Purpose and Need chapter, briefly reviewed key prior studies that led to the VTA Board of Directors' recommending the SVRTP Alternative for detailed evaluation in this EIS. The principal study defining the locally preferred alternative—or preferred investment strategy—for the SVRTC was the Major Investment Study (MIS). The MIS was formally initiated in March 2001. The MIS represents one of the first steps in FTA's project development process, which can lead to an application for federal funds to assist with the implementation of proposed capital improvements.

The MIS process enables communities to focus on issues and potential solutions to their transportation problems. Decision-makers are provided both technical information and public feedback that allow them to select the preferred transportation investment for

a corridor. The *Silicon Valley Rapid Transit Corridor MIS* was wide-reaching, a combination of technical studies and public outreach. Public involvement during the MIS was extensive. Three "rounds" of public meetings were held, in May, July, and October 2001. Each round actually consisted of several activities: five community "working group" meetings held throughout the corridor, four public open houses (held in Fremont, Milpitas, San Jose, and Santa Clara), and various interest group stakeholder meetings. Over 1,000 public comments were received.

The planning studies, informed by the public involvement process, developed a long list of possible improvement strategies, which were screened to provide 11 public transit improvement alternatives that potentially would address corridor transportation needs. These alternatives were evaluated against study goals and objectives and a number of evaluation criteria/performance objectives, summarized in Table 2-1.

Six of the 11 alternatives were further refined and subjected to additional technical analyses, including comparative-level assessment of potential environmental effects. Each was evaluated against the adopted evaluation criteria. The public involvement process was used to obtain public and agency input on the alternatives, their design details, and potential impacts. A composite rating of how each alternative, including any design options, performed was established. The six alternatives ranked top to bottom were:

- Alternative 11: *BART on the former UPRR Alignment*, which had seven "high" and "medium high" ratings, the highest goals achievement ranking of the six alternatives
- Alternative 2: *Busway on the former UPRR Alignment*, which placed second with four "high" and "medium high" ratings
- Alternative 1: *Baseline Alternative*, which had two "high" and two "medium high" ratings
- Alternative 9: *LRT on the former UPRR Alignment*, which had three "medium high" ratings
- Alternative 3: *Commuter Rail Alternative on the Alviso Alignment*, which had one "medium high" rating
- Alternative 5: *Commuter Rail Alternative on the former UPRR Alignment*, which had no "high" or "medium high" ratings, the lowest goals achievement ranking of the alternatives.

Upon evaluating the performance of the alternatives and considering public comment, which favored the BART mode over light rail or other new modal options, the VTA on November 9, 2001, unanimously selected Alternative 11: *BART on the former UPRR Alignment* as the locally preferred alternative/preferred investment strategy. It was the environmentally superior alternative and best achieved the goals and objectives for the

Table 2-1: SVRT MIS Goals, Objectives, and Evaluation Criteria

Goals	Objectives	Evaluation Criteria
Goal 1: Congestion Relief	▪ Reduce Traffic in Highly Congested Corridors ▪ Provide Alternative Transportation for Highly Congested Corridors	▪ Number of Peak Trips Removed from Roadway System ▪ Equivalent Capacity of Freeway Lanes Provided ▪ Number of Highly Congested Corridors Served
Goal 2: Mobility Improvements and Regional Connectivity	▪ Build Transit Usage ▪ Reduce Travel Time ▪ Promote Multimodal Connectivity ▪ Enhance Accessibility for Low-Income, Minority and Transit Dependent Population ▪ Promote Transit Services that Accommodate Work and Non-Work Trips ▪ Increase the Use of Commute Alternatives by Providing More Transit Service, Ridesharing and Bicycle/Pedestrian Facilities ▪ Provide an Important Extension or Connection to the Transit System that Increases Accessibility to Transit Service	▪ Travel Time Savings for All Users of Transportation Systems ▪ Number of Low-Income Households Within ½-Mile of Boarding Points ▪ New Transit Riders ▪ Number of Average Weekday Riders ▪ Number of Work Trips on Transit ▪ Number of Non-Work Trips on Transit ▪ Reduced Vehicle Miles Traveled ▪ Number of Intermodal Connections ▪ Number of Transfers Required ▪ Average Travel Speeds ▪ Park-and-Ride Availability ▪ Jobs Within ½-Mile of Boarding Points ▪ Degree of Access from Low-income Neighborhoods ▪ Number of Off-Peak Transit Routes Available

Goals	Objectives	Evaluation Criteria
Goal 3: Environmental Benefits and Impacts	▪ Minimize Noise and Vibration Impacts ▪ Conserve Historic and Cultural Resources ▪ Conserve Non-renewable Resources ▪ Support Regional Air Quality Plans ▪ Minimize Impacts on Natural Resources ▪ Minimize Residential and Business Displacements ▪ Minimize Impacts on Low-Income and Minority Population ▪ Consider Cumulative Environmental Impacts Resulting from Other Private and Public Works Development Projects	▪ Number of Historic Properties and Archaeological Sites Affected ▪ Level of Noise and Vibration Impact of Federal Threshold ▪ Net Change in Air Pollutant Emissions ▪ Net Change in Greenhouse Gas Emissions ▪ Net Change in Energy Consumption ▪ Change in Wetlands and Threatened and Endangered Species Habitat
Goal 4: Transit Supportive Land Use	▪ Support Local Land Use and Development Policies ▪ Promote Transit-oriented Development at Transit Stations through Formal Partnerships with Local Jurisdictions ▪ Design Pedestrian-oriented Facilities ▪ Provide Incentives that are Designed to Encourage Local Governments to Make Land Use Decisions Which Enhance Use of Public Transportation ▪ Minimize Displacement of Low-Income and Minority Population	▪ Transit-supportive Land Use Policies and Zoning Regulations in the Corridor and at Station Areas ▪ Growth Management Policies in the Corridor ▪ Tools to Implement Transit Supportive Land Use ▪ Pedestrian Facilities ▪ Acres of Land Available for Development/ Redevelopment within ½-Mile of Stations and Transfer Points
Goal 5: Operating Efficiencies and Customer Benefits	▪ Seek Cost-effective Solutions to Transportation Needs ▪ Increase Transit System's Operating Efficiency and Cost Recovery Ratio by Adding New Riders and Promoting Operating Cost Efficiencies ▪ Enhance Service for Transit Riders by Addressing Important Needs in Terms of the Quantity and Quality of Service Provided, including Reliability, Convenience, Safety and Comfort	▪ Operating Cost per Passenger Mile ▪ Farebox Recovery Ratio ▪ Passenger Mile per Vehicle Mile ▪ Passengers per Vehicle Mile ▪ Compatibility with Existing Transit and Freight Services ▪ Capacity Enhancements/Constraints

Goals	Objectives	Evaluation Criteria
Goal 6: Cost Effectiveness	▪ Provide Transportation Improvements to Make Efficient Use of Constrained Financial Resources ▪ Provide Positive Fiscal Impacts on Local Governments	▪ Travel Time Savings per Incremental Cost of Project ▪ Cost per Rider ▪ Cost per New Rider ▪ Capital Cost per Amount of Peak Hour Transit Capacity
Goal 7: Local Financial Commitment	▪ Maintain Adequate Funding to Sustain the Existing System while Securing New Funding Sources for System Expansion	▪ Capital Financing Plan has Stable and Reliable Sources for Local Matching Funds ▪ 20-year Operating Plan has Stable and Reliable Base ▪ Conforms with Voter-approved Conditions on Funding
Goal 8: Community and Stakeholder Acceptance	▪ Provide Opportunity for the General Public, Organized Community Groups, and Stakeholder Agencies to Provide Comments on the Alternatives Considered	▪ Degree of Community Support ▪ Degree of Public Agency Support
Goal 9: Environmental Justice / Socioeconomic and Geographic Equity	▪ Ensure Equitable Distribution of Transportation Investments and Benefits to all Communities in the Corridor Regardless of Socioeconomic Status ▪ Ensure that the Burdens of Project Construction and Operation do not Fall Primarily on Low-Income and Minority Communities, as well as Other Transit Dependents ▪ Provide Balance Geographically in Terms of Investment in Transit Infrastructure	▪ Enhanced Transit Service and Access to Low-Income and Minority Areas, as well as Other Transit Dependents ▪ Benefits and Cost Impacts on Low-Income and Minority Communities, as well as Other Transit Dependents
Goal 10: Safety and Security	▪ Ensure Safe and Secure Operation of Transportation Improvements for the Adjacent Communities	▪ Miles of Exclusive Guideway ▪ Number of At-grade Crossings ▪ Number of At-grade Crossings with Significant Traffic Volumes ▪ Number of Pedestrian Crossings ▪ Number of Adjacent Schools Near At-grade Crossings
Goal 11: Construction Impacts	▪ Minimize Construction Impacts for Transportation Improvements on the Surrounding Communities, including Low-Income and Minority Population	▪ Severity and Duration of Construction Impacts ▪ Potential Available Mitigation Measures

Source: VTA, 2001.

corridor. When compared to the other alternatives, the BART on the former UPRR Alignment alternative offered the fastest travel times to passenger destinations; the greatest congestion relief; improved air quality; best regional connectivity; lowest traffic and safety impacts due the fully grade-separated guideway; and, the most consistency with local land use plans and policies.

The VTA Board directed that the alternative be further evaluated in the environmental review and compliance phase of project development in accordance with state and federal guidelines. For objective comparison of the benefits and impacts of *BART on the former UPRR Alignment*, the VTA Board further directed that the *Baseline Alternative* (MIS Alternative 1*: Expanded Express Bus service on freeway HOV lanes*) be carried forward into the environmental compliance phase for informational purposes to fulfill FTA project development guidelines.

The VTA Board at this time also approved a comprehensive cooperative agreement with BART that identified the terms and conditions for implementing and operating the locally preferred alternative/preferred investment strategy. On November 12, 2001, the BART Board adopted the terms and conditions for the cooperative agreement.

It should be noted that the MIS completed by VTA satisfies FTA requirements for project sponsors to conduct an Alternatives Analysis prior to beginning formal environmental review and engineering of alternatives in the EIS phase.

Further detail on the alternatives dropped from further evaluation based on results of the MIS and other studies is provided in Section 2.7, Alternatives Considered and Withdrawn.

2.1.2 DRAFT EIS/EIR AND FINAL AND SUPPLEMENTAL EIR

The formal environmental review phase initially involved consideration *of BART on the Former UPRR Alignment* and various alignment and station options that emerged during the MIS and the Draft EIS scoping period. From March to May 2002, information on these options for the BART Alternative was presented to policy and technical advisory committees and the public. The public involvement program for this phase of project development provided VTA important feedback and participation from the community. The VTA Board of Directors adopted the BART to Milpitas, San Jose and Santa Clara alternative as the project description for evaluation in a combined Environmental Impact Statement/Environmental Impact Report (EIS/EIR) on November 9, 2001.

The project description included multiple alignment and station options. Each of the options was analyzed based on criteria such as access opportunities and constraints; transit-oriented development (TOD) potential; construction impacts; environmental effects; and cost implications. The purpose of analysis was to establish a more defined project that could be carried forward into the Draft EIS/EIR for focused review. In addition to analyzing and then eliminating various BART alignment and station options, the VTA Board recommended that an airport people mover (APM) link the BART

extension to the San Jose International Airport instead of including a direct connection as part of the *BART on Former UPRR Alignment Alternative.* The APM is now being considered as a separate project.

For a detailed review of the design options, review process, findings, and reasons for withdrawal of design options, see *Policy Advisory Board Status Report #2: Alignment and Station Options*, April 2002, and *Policy Advisory Board Status Report #3: Recommended Project Description,* May 2002. Both documents are available from VTA.

Draft EIS/EIR. On January 29, 2002, VTA distributed a Notice of Preparation to advise interested agencies and the public that an EIR would be prepared on the renamed BART Extension Project, including two minimum operating segments, and also a No-Build Alternative and Baseline Alternative. On February 6, 2002, FTA published a Notice of Intent in the Federal Register stating that an EIS would be prepared covering these three alternatives. The combined Draft EIS/EIR was circulated for public review and comment for 60 days from March 16, 2004 through May 14, 2004. Three public hearings were held in April 2004 in the cities of Milpitas, San Jose, and Santa Clara.

Final EIR/Supplemental EIR. The Draft EIS/EIR was initially written as a combined federal/state document in accordance with the National Environmental Policy Act (NEPA) and CEQA. However, subsequent to the public review of the Final EIS/EIR, VTA withdrew the BART Alternative from the federal environmental review and preliminary engineering process. VTA agreed with FTA to address funding and project cost effectiveness Issues before proceeding with the federal process. In December 2004, the VTA Board of Directors certified the Final EIR and approved the BART Extension Project.

As the design of the project advanced and policy and technical matters emerged, requiring some changes in the project definition, VTA determined to update California Environmental Quality Act (CEQA) environmental documentation. On July 21, 2006, VTA distributed a Notice of Preparation (NOP) to advise interested agencies and the public that a Draft Supplemental EIR (SEIR) would be prepared to address proposed project changes since certification of the Final EIR. Potential environmental impacts from 57 changes to the 2004 project were evaluated. Subsequently, in June 2007, the VTA Board of Directors certified the 2007 SEIR and a revised BART Extension Project.

2.1.3 CURRENT EIS PHASE

As the state CEQA EIR process was concluding, VTA proposed to FTA to re-enter the federal EIS phase of project development. VTA proposed to complete NEPA environmental review of the BART Extension Project, redesignated the Silicon Valley Rapid Transit Project (SVRTP), with the project presented as two Build Alternatives in this EIS. One alternative would extend BART improvements through the SVRTC from the Warm Springs station in Fremont to a station in the Berryessa district of northeast San Jose. This alternative was designated the Berryessa Extension Project (BEP Alternative). The other Build Alternative would extend BART through the corridor to

downtown San Jose and south Santa Clara. This alternative was designated the full Silicon Valley Rapid Transit Project (SVRTP Alternative).

FTA concurred and had published in the federal register in September 2007 a Notice of Intent to prepare an EIS. As noted in Chapter 1, Purpose and Need, VTA and FTA conducted public and agency scoping meetings in October 2007 and through 2008 completed environmental studies and the preparation of this document.

Since the completion of the MIS, it should be noted, VTA has continued to pursue environmental clearance of, and secure funding for, basically the same set of transit improvements in the SVRTC. The interruptions experienced in completing the NEPA EIS process were not the result of major changes to the scope of the full SVRTP or major changes in local/regional policy direction. The additional time has been necessary to address funding and technical challenges not uncommon on a very large and complex project.

2.2 NO BUILD AND BUILD ALTERNATIVE COMPARISONS

2.2.1 PURPOSE OF NO BUILD ALTERNATIVE

The No Build Alternative provides a basis for comparing impacts of the Build Alternatives. Impacts are assessed for 2030 conditions to determine long-term consequences of each alternative. However, the assessments presented in this document also have considered short-term impacts in certain instances, including construction impacts of the Build Alternatives. Operating and maintenance costs of the Build Alternatives are compared with those of the No Build Alternative in the opening year of revenue service as well as 2030.

The impacts assessment in this EIS is intended to reflect worst-case conditions. The analysis is conservative in defining proposed improvements so as to not exclude any possible actions and their potential impacts (i.e., the analysis considers the full range and extent of actions and their consequences). Therefore, the analysis has looked at all reasonable options for implementing the Build Alternatives and compared them to the No Build condition. At some point, possibly at the close of the Draft EIS phase and prior to preparing a Final EIS, the preferred Build Alternative will be identified with all project features fully defined. This Build Alternative will be further evaluated and compared to the No Build Alternative in a Final EIS and, when approved by the project sponsors, proceed to final design and construction.

2.2.2 RATIONALE FOR TWO BUILD ALTERNATIVES

If proposed project improvements are environmentally acceptable and approved, VTA intends to implement the 16.1-mile SVRTP Alternative. The SVRTP Alternative transit service is planned to begin operations in 2018. VTA is securing funding for construction from various sources. One source would be New Starts capital grants administered by

FTA under Section 5309 of the Safe Accountable Flexible Efficient Transportation Equity Act—A Legacy for Users (SAFETEA-LU, 2005-2009) and successor legislation.

New Starts funding would be requested for a portion of the full SVRTP Alternative. The segment from the terminus of the Warm Springs Extension in Fremont to Berryessa Station in San Jose is the current candidate for federal funding. It includes approximately 9.9 miles, out of the total 16.1-mile SVRTP Alternative, and two stations: one in Milpitas and one in San Jose. This segment corresponds to the BEP Alternative.

In order to be eligible for federal funding, the 9.9-mile segment must meet New Starts performance criteria (in terms of benefits versus costs) and be included in formal NEPA environmental reviews. VTA is therefore evaluating the BEP Alternative improvements separately from the SVRTP Alternative to accurately document BEP Alternative features and quantify BEP Alternative ridership potential, costs, environmental impacts, and other performance measures. The analysis of the BEP Alternative is presented alongside the SVRTP Alternative to facilitate comparison of both alternatives.

The analysis presents the BEP Alternative as an independent project, capable of being implemented apart from the SVRTP Alternative although, as noted, VTA intends to construct the full complement of corridor improvements simultaneously or in close sequence.

2.2.3 FORMAT FOR PRESENTING ALTERNATIVES AND THEIR IMPACTS

The alternatives and discussion of their impacts are presented in the following order throughout this document:

- No Build Alternative
- BEP Alternative
- SVRTP Alternative

This sequence reflects the increasing level of investment that is possible in the corridor, from lowest cost alternative (No Build Alternative) to highest (SVRTP Alternative). A description of existing conditions is provided under the No Build Alternative when relevant for establishing the context in which changes could occur under No Build and Build conditions.

2.3 FUTURE NO BUILD ALTERNATIVE

The No Build Alternative consists of the existing transit and roadway networks and planned and programmed improvements in the SVRTC that are identified in the Bay Area's Regional Transportation Plan (RTP), *Mobility for the Next Generation – Transportation 2030 Plan for the San Francisco Bay Area* (Transportation 2030 Plan),

adopted by MTC in February 2005, and the *Valley Transportation Plan 2030* (VTP 2030), adopted by VTA in February 2005.

2.3.1 TRANSIT SYSTEM

Existing Transit System

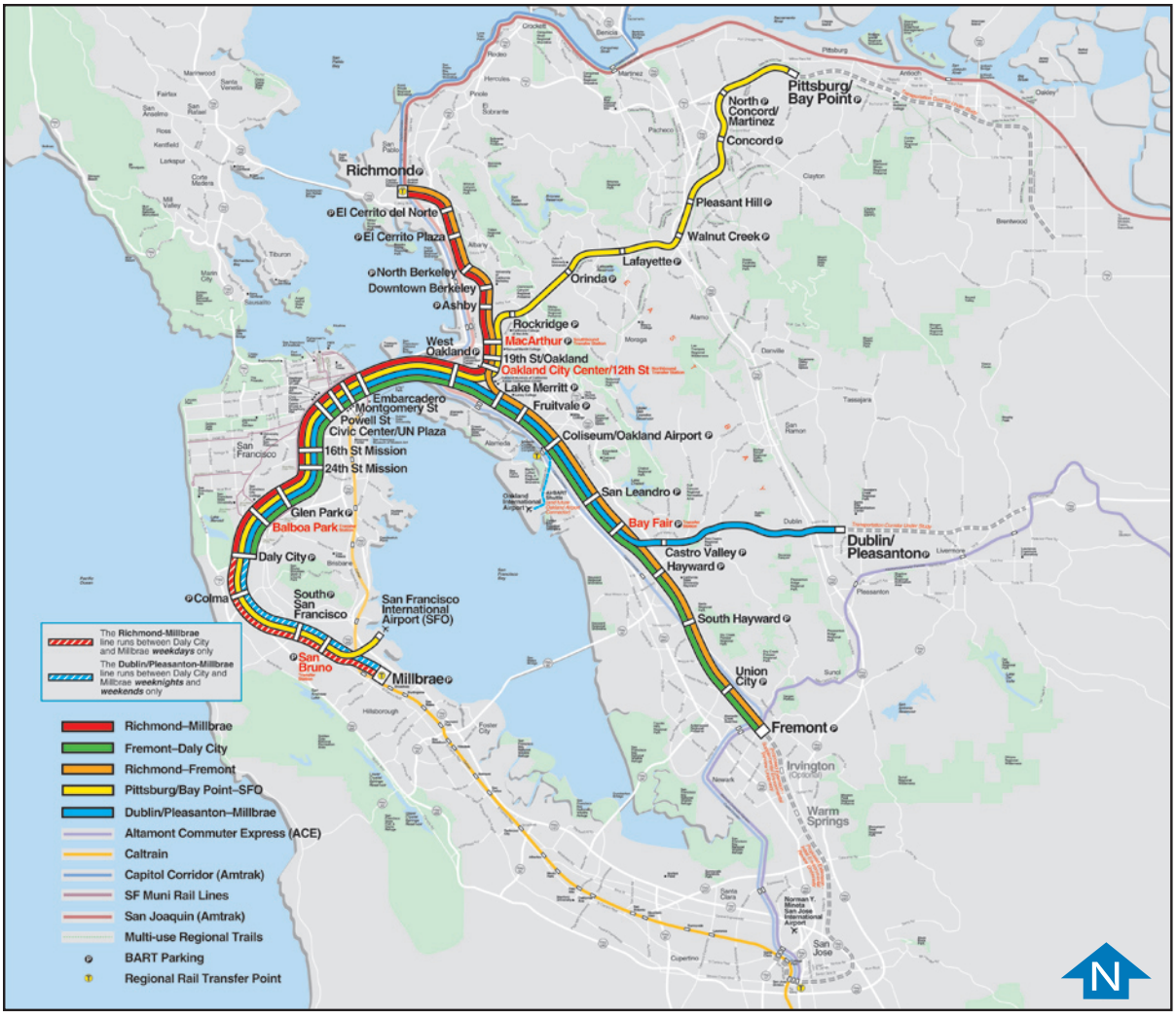
Existing transit services include bus services, light rail transit (LRT), shuttle services, paratransit service, and inter-county services, and are briefly described below. A complete description of existing services is included in VTA's *Short Range Transit Plan FY 2006-2015* (VTA 2006).

VTA currently operates 69 bus routes, which include 14 mainline arterial routes, 13 additional routes that support the mainline routes, 25 feeder routes, 6 limited stop routes, and 11 express routes. In addition, a number of commuter subscription routes from the Central Valley region serve major employment destinations in Santa Clara Valley. The San Joaquin Regional Transportation District (SJRTD) provides this service.

VTA also operates three LRT routes including Ohlone/Chynoweth to/from Almaden, Alum Rock to/from Santa Teresa, and Mountain View to/from Winchester. Total fleet size to operate the LRT service is 100 light rail vehicles (including spare vehicles). VTA provides shuttle service serving LRT stations and major Silicon Valley employment destinations, activity centers, and transit facilities and offers accessible paratransit services for seniors and the disabled community. VTA is a member of the Peninsula Corridor Joint Powers Board, which operates Caltrain service between Santa Clara, San Mateo, and San Francisco counties and the ACE rail service between San Joaquin, Alameda, and Santa Clara counties. VTA is also a member of the Capitol Corridor Joint Powers Board, which operates service from Placer County to Santa Clara County.

BART currently operates five routes including the Pittsburg/Bay Point to/from SFO, Fremont to/from Richmond, Fremont to/from Daly City, Richmond to/from Millbrae and to Daly City during evenings and weekends, Dublin/Pleasanton to/from Daly City and Millbrae during evenings and weekends. Figure 2-1 shows these existing routes. Total fleet size to operate BART service is 669 cars.[1]

[1] BART is in the process of updating its operating plan. It is anticipated that the new operating plan will have minimal impact on fleet requirements.



Source: BART and VTA, 2008.

Figure 2-1: BART System Map

Planned and Programmed Improvements through 2030

New transit services and capital projects planned and programmed for the SVRTC through 2030 are provided in Tables 2-2 and 2-3, which include bus rapid transit projects, an LRT extension, rail service upgrades, and the Airport People Mover to the San Jose International Airport.

Table 2-2: 2030 No Build Alternative Transit Improvements in SVRTC

Transit Projects	Notes
1. Downtown/East Valley: Santa Clara/Alum Rock corridor and Capitol Expressway LRT extension[a]	15-minute intervals, terminate at Alum Rock Station
2. Bus Rapid Transit (BRT) – New Line 522 (previously Line 22/Line 300)	Limited stop (Line 300) at 15-minute intervals, 15% travel time reduction on El Camino Real from downtown San Jose to Palo Alto (Line 22)
3. BRT – Monterey Highway – Line 66/Line 68	Downtown San Jose to Santa Teresa LRT, 15-minute headway for limited stops, 10% travel time reduction on Lines 66 and 68 on Monterey Highway to San Carlos
4. BRT – Stevens Creek Boulevard – Line 23	Downtown San Jose to Cupertino, 15-minute headway for limited stops, 10% travel time reduction
6. Caltrain commuter rail service upgrades	Increase service to 120 trains/day San Jose to San Francisco, 30-minute peak/60-minute off peak serving Gilroy, electrify system, Coyote Valley Station, double-track segments between San Jose and Gilroy, extension to new San Francisco Transbay Terminal
7. ACE commuter rail service upgrade	16 peak direction trains weekday (8 in AM, 8 in PM) service
8. Capitols commuter and intercity rail	11 round trips/day, Sacramento to San Jose trains, new Coliseum and Union City intermodal stations
9. Mineta San Jose International Airport Airport People Mover to BART, Caltrain, and LRT	3-minute intervals all day, connection to LRT in 2015, BART and Caltrain by 2030
10. Future rail corridors to be determined by Major Investment Studies	n/a
11. California High Speed Rail	n/a

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

Sources: Transportation 2030 Plan and VTP 2030, 2005.

Table 2-3: 2030 No Build Alternative Transit Improvements in Alameda County

Transit Projects	Notes
1. BART Extension from Fremont to Warm Springs (5.4 miles)	12-minute peak/mid-day intervals each train (6-minute combined frequency), BART Irvington and Warm Springs stations
2. Union City BART Intermodal Terminal	n/a

Sources: Transportation 2030 Plan (MTC) and VTP 2030 (VTA), 2005.

The LRT service map for service through 2030 is shown in Figure 2-2. It should be noted that while the figure shows LRT along Santa Clara Street and Alum Rock Avenue, VTA is currently evaluating both light rail and rapid transit bus alternatives for this corridor.

The BART Extension to Warm Springs Project is included in the *Transportation 2030 Plan*. The BART Board of Directors approved the project in 1992 after several years of recognition as a project by state and regional agencies. In 2003, the BART Board approved modifications and updates to the project. The approval of the project was based on the purpose and need of alleviating traffic congestion, improving air quality, and reducing energy consumption related to travel demand within BART's service area. The terminus at Fremont connects the project to the existing BART system, and the terminus at Warm Springs was directed by state legislation (S.B. 1715) and established by the 1992 project approval. Figure 2-1, shows the BART operating plan for service through 2030 and includes the BART Extension to Warm Springs Project. In addition, the 2030 No Build Alternative assumes partial system-wide implementation of BART's Advanced Automated Train Control (AATC) system. Under AATC, trains are able to operate with less spacing between each other, resulting in faster operating speeds and a run time savings of about 5 to 7 percent for each route.

Year 2030 Fleet Requirements

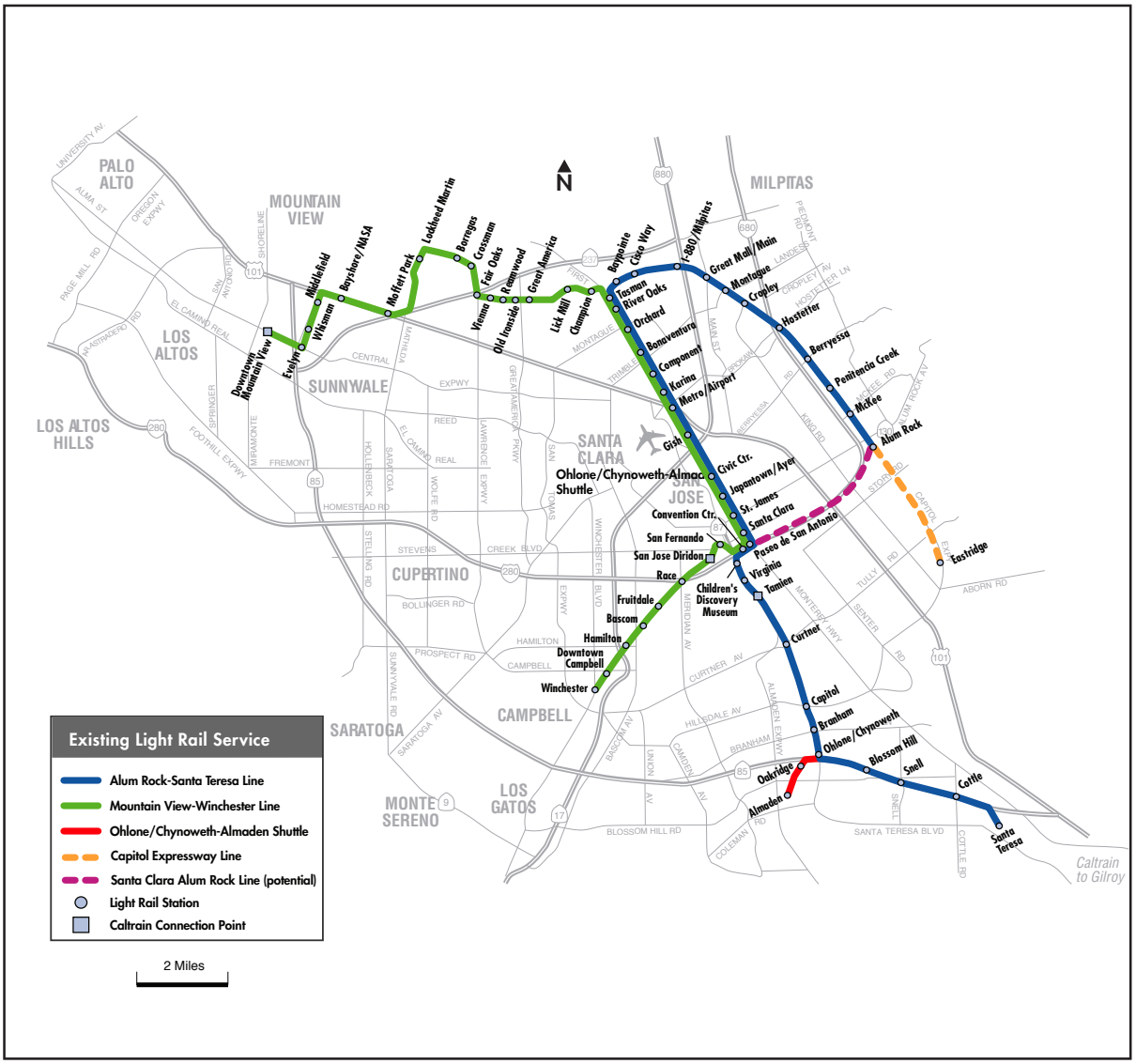
A total VTA bus fleet of 509 vehicles is estimated to meet Year 2030 service levels, which represents a slight decrease over the current year (2007) fleet. While the light rail network will expand by 2030, it will be served with no increases to the existing light rail fleet of 100 vehicles. With implementation 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 287 cars, with the total number of cars estimated at 956. Table 2-4 summarizes this information.

Table 2-4: 2030 No Build Alternative Fleet Size

Service	Existing Service (2007)	No Build Alternative (2030)
VTA Buses	525	509
Light Rail Transit	100	100
BART Cars (entire BART system)[a]	669	956

[a] Number of BART vehicles will be based on the BART Fleet Management Plan under development and planned changes to BART's operating plan.

Sources: Connetics Transportation Group and VTA, 2008



Source: VTA, 2008.

Figure 2-2: LRT Service Map

Year 2030 Facility Requirements

The buses operated by VTA and identified under the No Build Alternative would be stored and maintained at existing bus operating and maintenance facilities, which include the Cerone Bus Operating Division and Overhaul and Repair Facility in North San Jose, the Don Pedro Chaboya Bus Operating Division in South San Jose, and the North Bus Operating Division in Mountain View. These facilities have sufficient land area to enable any potential future need for expansion as necessary to accommodate additional buses above the Year 2030 fleet levels. As the LRT fleet size is not anticipated to change by Year 2030, LRT vehicles would be stored and maintained at the existing Guadalupe Light Rail Maintenance facility near downtown San Jose.

2.3.2 ROADWAY SYSTEM

Existing Roadway System

The SVRTC contains two major north-south regional freeways, I-880 and I-680, which parallel one another from southern Alameda County into northern Santa Clara County. The freeways are part of a more extensive regional roadway system that converges in Santa Clara County around the San Jose Central Business District. Other freeways and expressways that traverse the corridor include US 101, State Route (SR) 237, SR 87, Montague Expressway/San Thomas Expressway, and Central Expressway.

Major arterials, such as Calaveras Boulevard (SR 237), Hostetter Road/Murphy Avenue/Brokaw Road, Berryessa Road/Hedding Street, Mabury Road/Taylor Street, McKee Road/Julian Street, and Alum Rock Avenue/Santa Clara Street/The Alameda/El Camino Real (SR 82) traverse the corridor from east to west. Major north-south streets within the corridor include Mission Boulevard (SR 238), Warm Springs Boulevard/Milpitas Boulevard, Capitol Avenue/Capitol Expressway, the 10th/11th Street couplet, 13th Street/Old Oakland Road, Monterey Highway (SR 82), Coleman Avenue, and De La Cruz Boulevard/Trimble Road.

Planned and Programmed Improvements Through 2030

New roadway improvements planned and programmed for the SVRTC through 2030 include projects in Santa Clara and Alameda counties. These roadway improvements include widenings and new interchanges on existing routes. No new freeways or other major roadways are planned.

The following list identifies Santa Clara County roadway improvements (in the SVRTC) under the No Build Alternative assumed by 2030[2]:

- Montague Expressway/San Tomas Expressway/US 101/Mission College Boulevard Interchange
- SR 87/US 101 ramp connection to Trimble interchange
- Montague Expressway/I-880 interchange reconfiguration improvements
- I-680 southbound HOV lanes: Alameda/Santa Clara County line to Calaveras Boulevard
- Montague Expressway widening from six to eight lanes; I-680 to US 101
- Montague Expressway grade-separation at Capitol Avenue
- I-880/SR 237 freeway interchange (Stages A, B, and C); Stage C under construction
- Upgrade Guadalupe Freeway (SR 87) to six-lane (four mixed-flow plus two HOV) freeway from US 101 to SR 85; under construction
- US 101/Hellyer Avenue interchange modifications; City of San Jose Project
- US 101/Blossom Hill Avenue interchange modifications; City of San Jose Project
- US 101 auxiliary lane widening; SR 87 to Great America Parkway
- Tully Road/US 101 interchange modifications
- Tennant Avenue/US 101 interchange improvements in Morgan Hill
- 10th Street (SR 152) extension and US 101 interchange improvements in Gilroy
- SR 25/Santa Teresa Boulevard/US 101 interchange construction
- Buena Vista/US 101 interchange construction
- SR 237 widening for HOV lanes between SR 85 and US 101
- SR 237 westbound auxiliary lanes between Coyote Creek Bridge and North 1st Street

[2] This list was generated from the Transportation 2030 Plan and VTP 2030.

- I-880 widening from SR 237 to Alameda County line; 10 lanes (eight mixed-flow plus two HOV)
- I-680 northbound HOV lane (Calaveras Boulevard to Alameda/Santa Clara County Line)
- Improvements to I-880/Stevens Creek Boulevard interchanges
- I-280/I-680 connector to southbound US 101- braided ramp with Tully Road exit ramp
- Widen SR 85 from I-280 to Fremont Avenue
- SR 85 northbound to I-280 northbound and I-280 exit to Foothill Boulevard – braided ramp
- SR 152 safety improvements between US 101 and SR 156 (westbound SR 152 to westbound SR 156)
- Trimble Road/De La Cruz Boulevard/US 101 Interchange improvements
- SR 17/85 improvements
- Montague Expressway/Trimble Road flyover ramp
- Central Expressway widening for HOV lanes from SR 237 to De La Cruz Boulevard
- Widen US 101 southbound from Story Road to Yerba Buena Road, auxiliary lanes
- Widen US 101 from SR 25 to Santa Clara/San Benito County line
- Widen US 101 between Cochrane Road and Monterey Highway
- US 101/Capitol Expressway interchange improvements
- Widen westbound SR 237 on-ramp from SR 237 to northbound US 101
- SR 85 to SR 237 northbound connector ramp improvements
- SR 237 westbound to SR 85 southbound connector ramp
- SR 237 westbound on-ramp at Middlefield Road
- Widen San Tomas Expressway between SR 82 and Williams Road
- Widen US 101 from I-880 to McKee Road/Julian Street, auxiliary lanes

- SR 85/Fremont Avenue ramp improvements
- Construct SR 237 eastbound to Mathilda Avenue flyover off-ramp

The following list identifies Alameda County roadway improvements under the No Build Alternative assumed by 2030[3]:

- Fremont Boulevard extension; four-lane extension to Dixon Landing Road
- Kato Road widening; add continuous left turn lane between Auburn Street to north of Milmont
- I-880 widening from Mission Boulevard to Santa Clara County line; 10 lanes (eight mixed-flow plus two HOV)
- I-680 southbound HOV lane (SR 84 to Alameda/Santa Clara County line)
- I-680 northbound HOV lane (SR 84 to Alameda/Santa Clara County line)
- SR 84 new roadway (expressway) from SR 238 (Mission Boulevard) to I-880; four-lane new expressway
- I-880/Mission Boulevard/Warren Avenue interchange improvement

2.3.3 PROJECT COSTS

This section summarizes the capital and operating costs associated with the No Build Alternative. Detailed cost information can be found in Chapter 9, Financial Considerations of this document. Costs are shown in constant 2008 dollars and year of expenditure (YOE) dollars.

The No Build Alternative consists of existing roadway and transit networks, as well as programmed improvements to meet forecasted growth in travel demand and service improvements included in Measure A. These planned capital improvements will be funded by VTA and other agencies, as identified in the Metropolitan Transportation Commission Regional Transportation Plan. Therefore, it is assumed that the No Build Alternative has a zero-base capital cost to compare to the Build alternatives.

Total operating and maintenance costs for the No Build Alternative are estimated to be approximately $537 million in 2008 dollars and $1.158 billion in YOE dollars when including forecast cost inflation to 2030. The net operating costs assume fare and related operating revenues, and would offset a portion of the total operating costs. The net cost of service under the No Build Alternative would be $391.1 million in 2008 dollars and $886.2 million in YOE dollars.

[3] This list was generated from the Transportation 2030 Plan (MTC) and VTP 2030 (VTA).

2.4 BERRYESSA EXTENSION PROJECT ALTERNATIVE

The Berryessa Extension Project Alternative (BEP Alternative) would consist of the design, construction, and future operation of a 9.9 mile extension of the San Francisco Bay Area Rapid Transit (BART) heavy rail line. The BEP Alternative would begin south of the planned BART Warm Springs Station in Fremont (to be implemented by 2014) and proceed on the former Union Pacific Railroad (UPRR) right-of-way (ROW) through Milpitas to near Las Plumas Avenue in San Jose (Figure 2-3). Two stations are proposed, one in Milpitas and one in San Jose. Passenger service for the BEP Alternative would start in 2018, assuming funding is available.

2.4.1 ALIGNMENT AND STATION FEATURES BY CITY

The alignment and station design features for the BEP Alternative discussed in this section are presented from north to south and by city (Fremont, Milpitas, and San Jose). These features are presented graphically in Appendices B and D for the alignment and stations, respectively. Engineering stationing numbers are provided to assist the reader in locating design features on the plans included in Appendix B.[4] Several options for the BEP Alternative alignment, station configurations, and other features are presented.

Other features associated with this alternative include construction staging areas, a maintenance and storage facility (referred to as "yard and shops") for BART vehicles, and BART core system improvements. Fleet requirements, operating plan, and station boardings for the BEP Alternative are also discussed in this section.

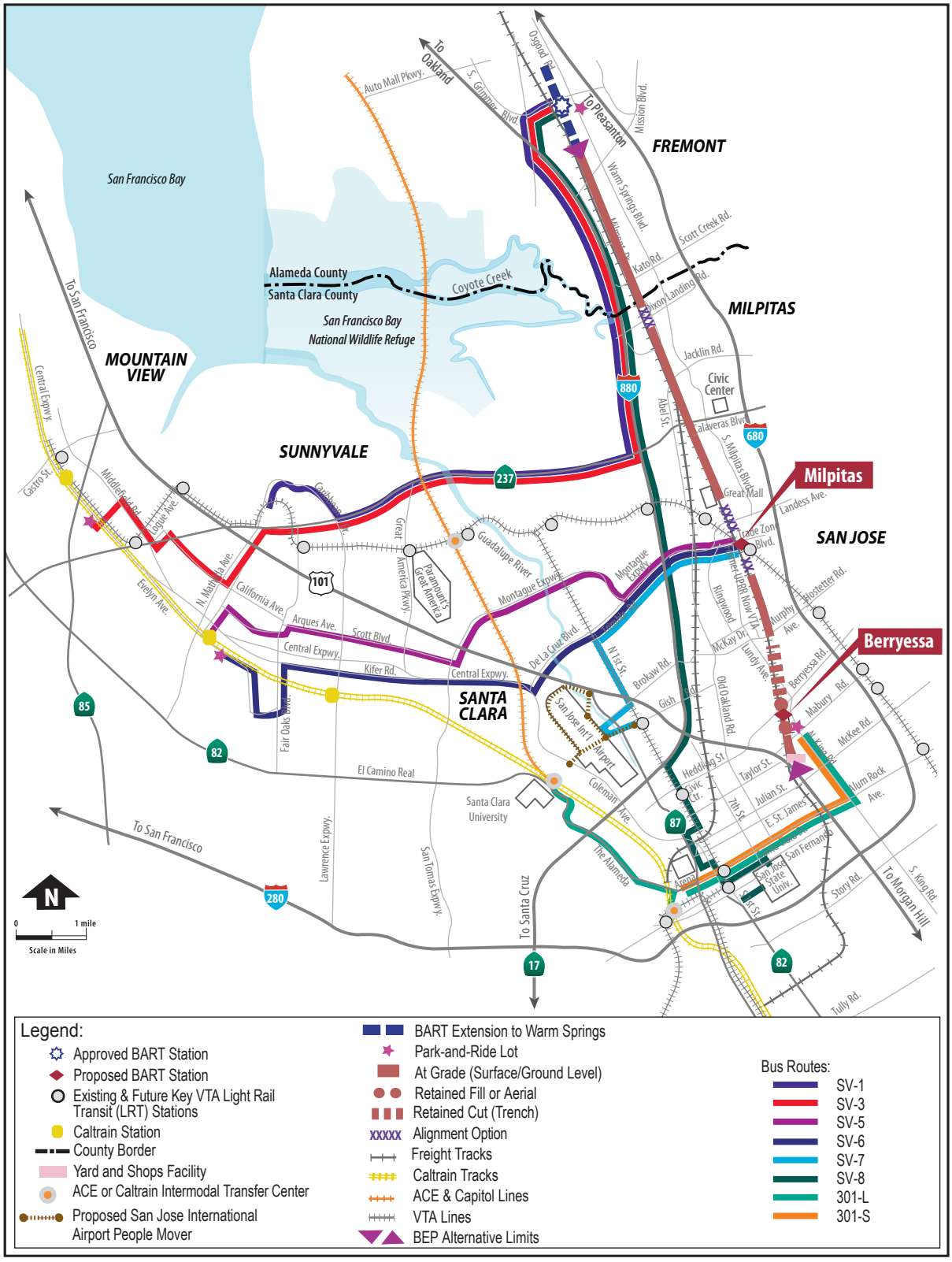
"BART core system improvements" refers to upgrades and improvements to the existing BART system to accommodate the increased passenger loads anticipated within the existing BART facilities as a result of the BEP Alternative. These improvements are further described later in this section.

City of Fremont

The BEP Alternative in Fremont would extend from the planned BART Warm Springs Station to south of Scott Creek as shown on Figure 2-4.

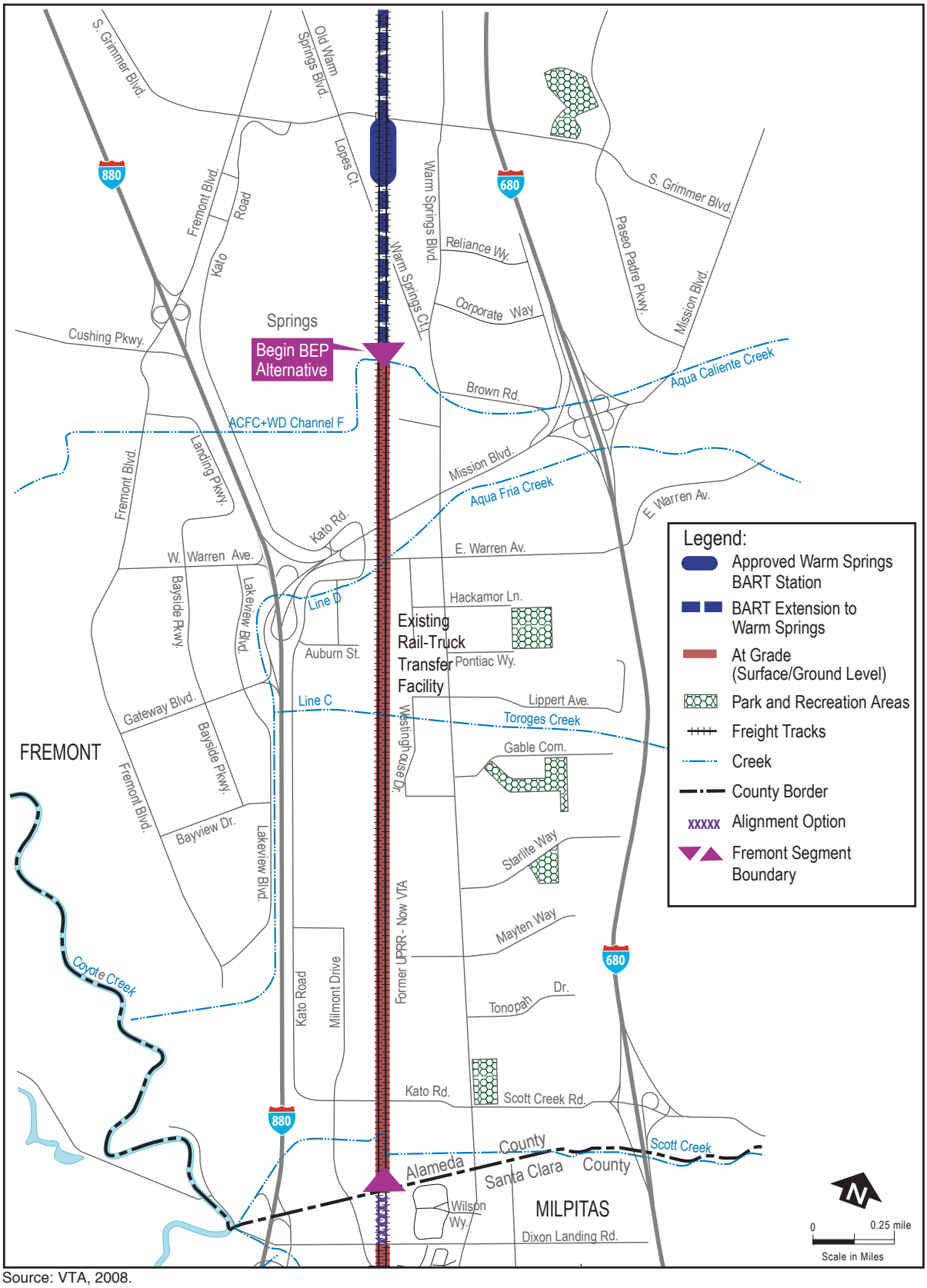
The alignment would begin south of the planned BART Warm Springs Station in Fremont, at the southerly terminus of the BART Warm Springs Extension guideway, with a new, at grade, two-track BART rail line near the UPRR Warm Springs Yard and east of the existing railroad ROW (STA 35+50) but within VTA's ownership. The alignment would continue south and cross over Agua Caliente Creek/Line F, where a

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



Source: VTA, 2008.

Figure 2-3: BEP Alternative



Source: VTA, 2008.

Figure 2-4: BEP and SVRTP Alternatives – City of Fremont

new double box culvert would be constructed by VTA (STA 45+50).[5] BART would remain at grade from Mission Boulevard to East Warren Avenue. Other agencies would widen Mission Boulevard and reconstruct East Warren Avenue, which is currently at grade, as a new roadway underpass. BART would therefore cross both Mission Boulevard and East Warren Avenue on new bridge structures that pass over these below-grade roadways. Other agencies would also construct drainage improvements at Agua Fria Creek/Line D, which is slightly south of Mission Boulevard (STA 71+00).[6] South of East Warren Avenue, Traction Power Substation SWA and Train Control Building S24 would be located on the east side of the railroad ROW (STA 78+50), with access provided to Mission Falls Court.

The alignment would continue at grade and cross over Toroges Creek/Line C, where a new box culvert would be constructed by others (STA 101+50). The alignment would continue past two additional culverts: Line B-1 (STA 122+00), where there are no planned improvements, and Line B (STA 146+00), where a new box culvert would be constructed by others.

BART 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). VTA would also construct a new bridge for the UPRR to cross over Kato Road. The slope of the Kato Road underpass would be a 5 percent grade to accommodate safe stopping distances for a design speed limit of 40 miles per hour. Crossover tracks, which allow the passage of a train from one track to the other through the use of switches, would be constructed both north and south of Kato Road (STA 157+00 and STA 170+00). These crossovers would provide for 10-car train storage and allow single-track operations around an occasional stored train. South of Kato Road, BART would continue at-grade and cross over Scott Creek/Line A, where a new box culvert would be constructed by others (STA 173+00). Traction Power Substation SKR and Train Control Building S26 would be located south of the creek on the west side of the railroad ROW (STA 175+00), with access provided to Milmont Drive.

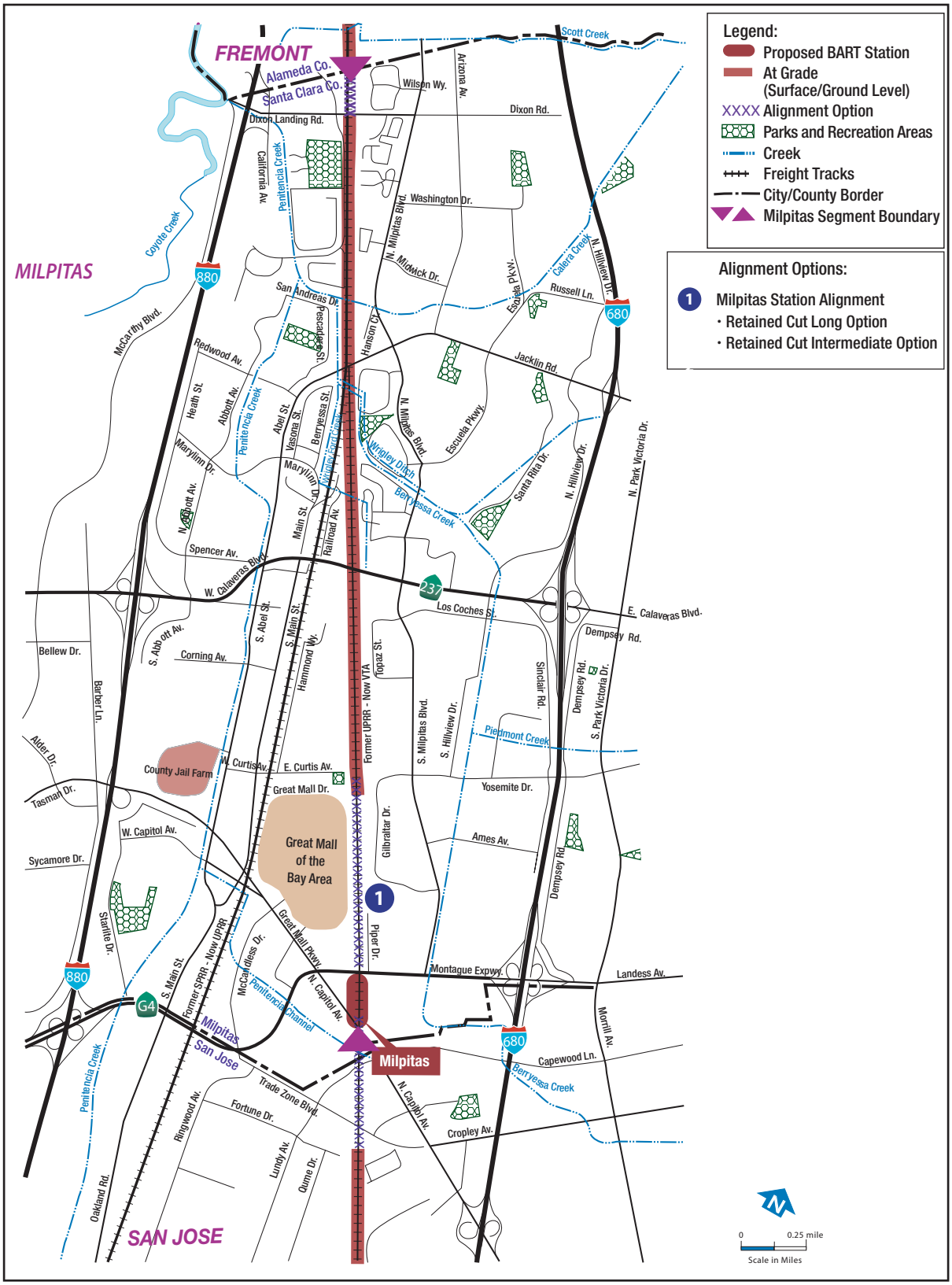
City of Milpitas

Fremont to the Retained Cut

The BEP Alternative in Milpitas would begin at the County/City line and extend south of Montague Expressway to the Milpitas Station as shown on Figure 2-5.

[5] The Alameda County Flood Control and Water Conservation District) refers to creeks in Alameda County as “Drainage Lines”, e.g., Agua Caliente Creek as Drainage Line F. Therefore, the creeks in Alameda County within the project study area are also referred to as “Lines.”

[6] 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.



Source: VTA, 2007.

Figure 2-5: BEP and SVRTP Alternatives – City of Milpitas

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 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. The UPRR crossing would also remain at grade.

- At Grade Option. Under this option, BART would continue at grade and cross on a new bridge structure over Dixon Landing Road (STA 191+50), which would be reconstructed as a roadway underpass by VTA. VTA would also construct a new bridge for the UPRR to cross over the roadway. An adjacent cross street to the west of the railroad ROW, Milmont Drive, would also be lowered due to the new slope of Dixon Landing Road.

Approaching Abel Street, the alignment would continue at grade, cross over an existing underground culvert containing Calera Creek (STA 231+00), where no culvert improvements are planned but new drainage outfalls would be installed by others. BART would then pass under the existing Abel Street overcrossing (STA 244+00). BART would continue over Berryessa Creek on a new multi-cell box culvert constructed by others to accommodate the widening and realigning of the creek by the Santa Clara Valley Water District (STA 246+00). Crossover tracks would be located south of this box culvert (STA 258+00).

Continuing south, High Voltage Substation SRC, Traction Power Substation SRR, Switching Station SRR, and Train Control Building S28 would be located west of the railroad ROW, with access provided from Railroad Court (STA 259+00). The high voltage substation would require installation of high voltage (115 kilovolt [kV]) power feed lines that connect to nearby existing PG&E towers/lines and/or PG&E substations. 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 steel tower/pole would be constructed within PG&E's existing easement.

The alignment would continue at grade over Wrigley Creek, where a new box culvert would be constructed by others (STA 274+00), and pass under the Calaveras Boulevard/SR 237 overpass (STA 287+00). A high rail vehicle access point would be located just south of Calaveras Boulevard/SR 237, with access provided from Railroad Avenue (STA 289+00). BART would continue past the UPRR Milpitas Yard located to the west of the ROW and cross over the Hetch-Hetchy underground aqueduct pipeline (STA 315+00). Beginning just south of Curtis Avenue (STA 330+00) to a point south of Trade Zone Boulevard, there are two alignment options: Retained Cut Long and Retained Cut Intermediate. The decision for the alignment option is dependent on a decision as to whether a locomotive wye is needed at this location. VTA is discussing the status of the wye with UPRR, and depending on the outcome of that discussion, would either relocate the existing wye, which is located immediately north of Montague Expressway, to an area north of Piper Drive, or would eliminate the existing wye in

exchange for payment of compensation to the railroad. In either case, a spur track serving local industries east of the BART alignment, also located north of Montague Expressway, would remain in service. The relocated UPRR tracks at this location, whether for the new locomotive wye or to reconnect to the existing spur track, would encroach into Piper Drive. The City of Milpitas currently has an easement for this roadway; however, UPRR owns the property.

Retained Cut Long Option

Under this option, BART would transition into a retained cut from south of Curtis Avenue (approximately 3,000 feet north of Montague Expressway), continue past the Milpitas/San Jose city lines, and return to an at grade configuration south of Trade Zone Boulevard (STA 337+00 to 411+00). This option would be chosen if the existing locomotive wye in Milpitas were relocated to the north (STA 355+00). The length and depth of the long retained cut enables the freight track on the west side of the railroad ROW to cross over the BART retained cut, to access the relocated locomotive wye on the east side of the ROW.

To accommodate the retained cut for the BART tracks, the freight track would be relocated 22 feet farther to the west than its existing location; consequently, up to 20 feet of ROW would be acquired from: 1) the easternmost portion of the Parc Metropolitan Condominiums, including both Parc Metro East Park and a detention basin/private park in the City of Milpitas, and 2) the Great Mall. This approximate 20-foot-wide strip of land acquired to accommodate the freight track and construction of the retained cut would continue for approximately 2,200 feet along Great Mall Drive. Then, the freight track would cross over the BART retained cut on a new bridge structure near the mid-way point along the Great Mall parking lot. On the east side of the railroad ROW, additional ROW would be acquired to accommodate this freight track as it continues to the new locomotive wye location. The new wye location 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 could potentially be connected to an existing UPRR Milpitas Yard industry lead track to provide a shorter connection to the existing freight spur.

Also under this option, crossover tracks would be located within the retained cut near the existing locomotive wye location (STA 363+00 and 368+00). Traction Power Substation SME would be located just north of Montague Expressway either within the railroad ROW above the BART retained cut or within the existing locomotive wye area (STA 366+50). Montague Expressway, Capitol Avenue, and Trade Zone Boulevard would be supported above the BART retained cut on new roadway bridge structures (STA 369+00, 380+00, and 402+00, respectively).

Retained Cut Intermediate Option

Under this option, BART would transition into a retained cut farther south than under the Retained Cut Long Option (approximately 2,000 feet north of Montague Expressway), continue past the Milpitas/San Jose city lines, and return to an at grade configuration

south of Trade Zone Boulevard (STA 354+00 to 411+00). This option is possible if it is determined that the locomotive wye in Milpitas can be eliminated under an agreement with UPRR. In this option, the length of the retained cut would be reduced to the minimum necessary to enable the freight track on the west side of the railroad ROW to cross over the BART retained cut further south to access the existing spur track, thereby continuing service to the industries on the east side of the railroad ROW.

Like the Retained Cut Long Option, the freight track would be relocated 22 feet farther to the west than its existing location; consequently, up to 20 feet of ROW would be acquired from: 1) the easternmost portion of the Parc Metropolitan Condominiums, including part of Parc Metro East Park and a detention basin/private park in the City of Milpitas, and 2) the Great Mall. However, under the Retained Cut Intermediate Option, this approximate 20-foot-wide strip of land would continue for approximately 3,100 feet along Great Mall Drive (ending at approximately STA 360+50), as the freight track would cross farther south to access the spur track near the southeast corner of the Great Mall parking lot.

Under this option, the crossover tracks and alternate locations for Traction Power Substation SME would be the same as under the Retained Cut Long Option. Likewise, Montague Expressway, Capitol Avenue, and Trade Zone Boulevard would be supported above the BART retained cut on new roadway bridge structures (STA 369+00, 380+00, and 402+00, respectively).

Under both the above options, UPRR freight service would be discontinued near Montague Expressway if VTA has not already arranged to discontinue freight service in this area, and BART would no longer share the railroad ROW with freight trains as the alignment continues south,.

Milpitas Station[7]

The Milpitas Station area would be located between Montague Expressway and Capitol Avenue and on the east and west side of the railroad ROW (starting at approximately STA 371+00), encompassing up to 27 acres of land. The station would consist of two 700-foot-long, 16-foot-wide (minimum) side platforms in a retained cut. 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. Train Control Room S40 would be located near the north end of the 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. Figures 2-6A and 2-6B provide site plans of the station.

[7] The Milpitas Station was formerly referred to as the Montague/Capitol Station in earlier documents for this Project.

A two- to eight-level parking structure would be constructed on 2 acres at the north side of the station area, to the east of the station, and along Montague Expressway to accommodate park-and-ride parking demand. Additional surface parking and/or future transit facilities would be located as needed within the station area.[8]

Due to the location of the Milpitas Station area, an existing PG&E 115 kV overhead line located along the south side of Montague Expressway between Capitol Avenue and South Milpitas Boulevard would be relocated. The line would remain on the south side of the expressway and within the station area, but would be relocated to avoid conflict with the station frontage road and raised in height to provide adequate clearance from the top level of the parking garage. The existing wooden poles would be replaced with approximately 14 steel poles, which would be installed at a maximum height of 130 feet. An existing 115 kV overhead line that crosses Montague Expressway near the railroad crossing, which ties into the line along Montague Expressway as a "Tee" interconnection, would also be relocated.

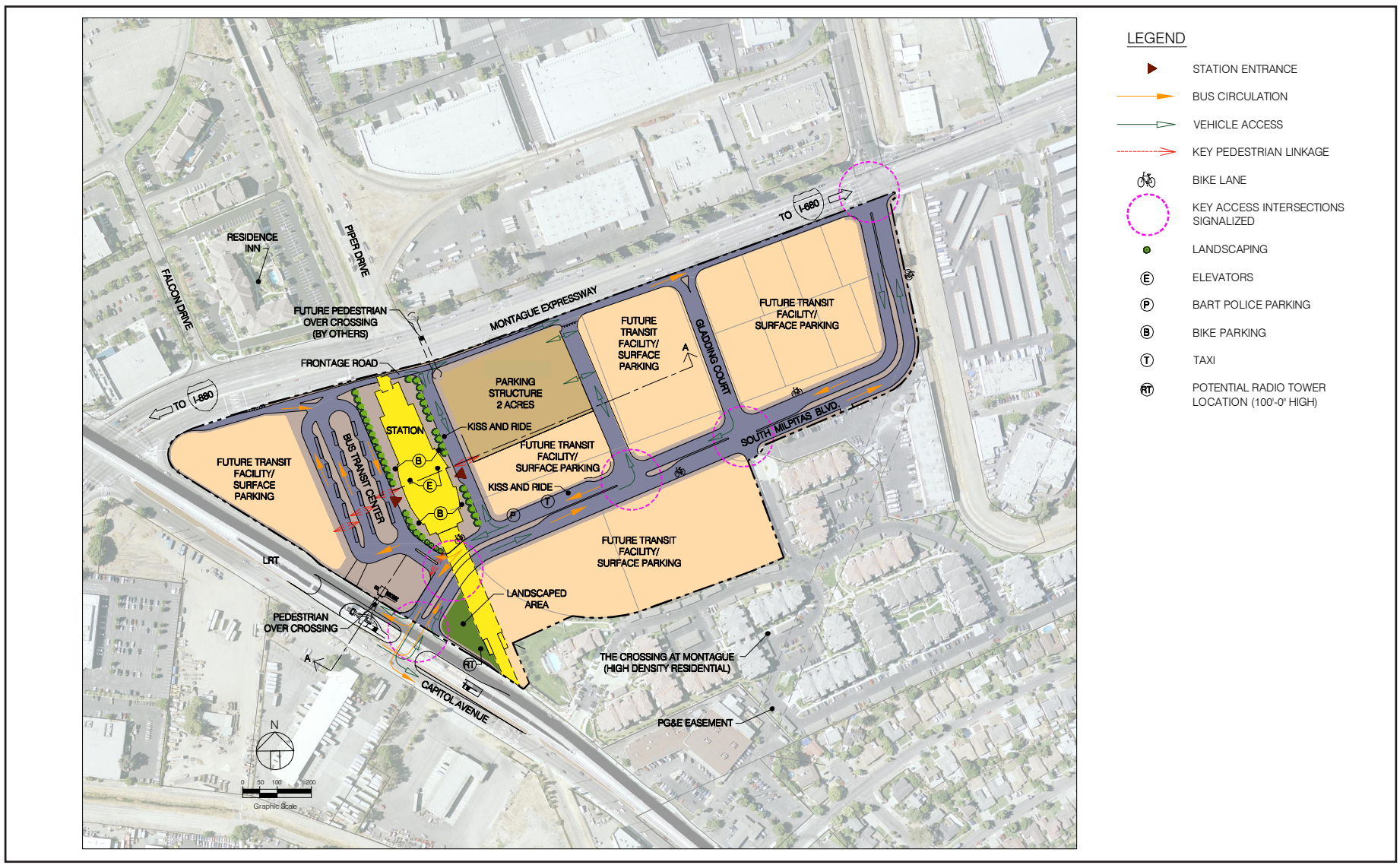
The Milpitas Station includes two options for the bus transit center:

East Bus Transit Center Option

Under this option, a 16-bay bus transit center with kiss-and-ride facilities would be located east of the station and south of the parking structure. Bus access to the transit center would be from either an eastbound frontage road on Montague Expressway or an extension of South Milpitas Boulevard.

Vehicular access to the Milpitas 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 provided at the new intersections of South Milpitas Boulevard and Capitol Avenue, South Milpitas Boulevard and Gladding Court, and at South Milpitas Boulevard for parking structure access.

[8] The range in parking levels at the station reflects a combination of surface and structured parking options to meet projected parking demand.



Source: VTA, 2008.

Figure 2-6A: Milpitas Station West Bus Transit Center Option Conceptual Site Plan

Source: VTA, 2008.

Figure 2-6B: Milpitas Station East Bus Transit Center Option Conceptual Site Plan

West Bus Transit Center Option

Under this option, a 15-bay bus transit center with kiss-and-ride facilities would be located west of the station and adjacent to surface parking and/or future transit facilities. Bus access to the transit center would also be from an eastbound frontage road on Montague Expressway, and an extension of South Milpitas Boulevard. An additional signalized intersection would be provided in the vicinity of Capital Avenue for this option to accommodate bus circulation to and from the transit center.

City of San Jose

The BEP Alternative alignment located in San Jose would begin after the Milpitas Station and extend into San Jose terminating past the Berryessa Station east of US 101 as shown on Figure 2-7.

Milpitas to Berryessa Station

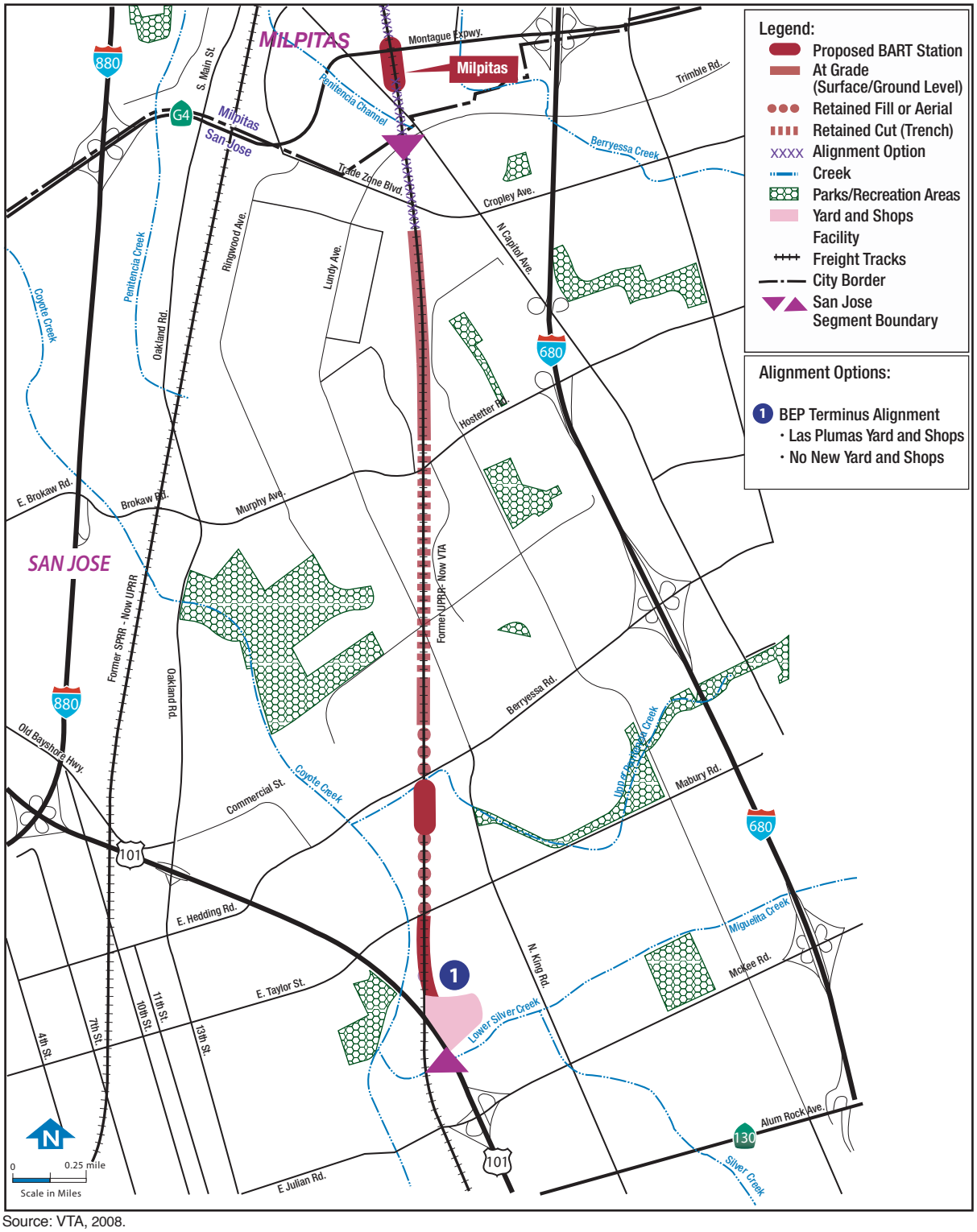
BART would continue past the Milpitas/San Jose city lines in a retained cut, pass over East Penitencia Channel (STA 390+00) where VTA would construct drainage improvements, and transition to an at grade configuration south of Trade Zone Boulevard. Trade Zone Boulevard would be supported above the retained cut on a new roadway bridge structure (STA 402+00). Slightly south, Traction Power Substation SMB would be located on the west side of the railroad ROW (STA 416+00), with access provided to Qume Drive.

South of Trade Zone Blvd., the BART alignment would return to an at-grade configuration for a distance of approximately 4,100 feet. Approaching Hostetter Road, BART would transition back into a retained cut. Hostetter Road would be supported above the retained cut on a new roadway bridge structure. Train Control Building S44 would be located immediately south of Hostetter Road on the east side of the railroad ROW (STA 458+00). BART would continue in a retained cut to south of Lundy Avenue and Sierra Road (STA 450+00 to 498+00). The Sierra Road/Lundy Avenue intersection, which is located at the BART crossing, would remain at grade, but be supported over the BART retained cut on a new bridge structure.

South of Sierra Road/Lundy Avenue, BART would transition to an at-grade configuration and then to an aerial configuration. The location of the beginning of the aerial structure would vary depending on whether the BEP Alternative alignment terminates with tail tracks only or a yard and shops facility (see below). The aerial structure would pass over Berryessa Road (STA 521+00) and Upper Penitencia Creek and lead into the Berryessa Station. No improvements would be required to Berryessa Road.

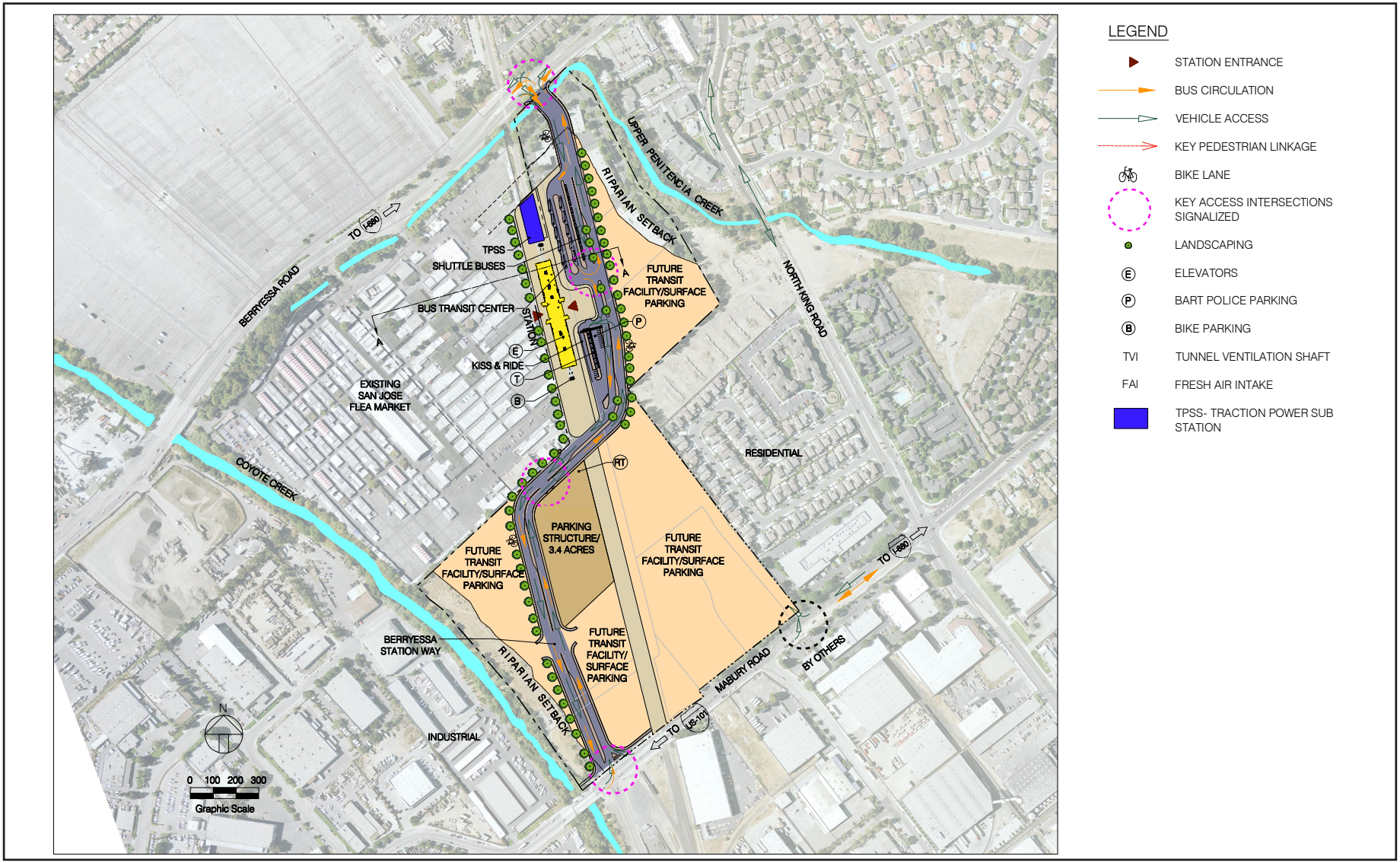
Berryessa Station

The Berryessa Station area would be located between Berryessa Road and Mabury Road (starting at approximately STA 525+50), and would encompass approximately 55 acres (Figure 2-8). The station would be located at the north end of the site, and would contain a 700-foot-long, 29-foot-wide center platform on the aerial structure. Pedestrian



Source: VTA, 2008.

Figure 2-7: BEP Alternative – City of San Jose



Source: VTA, 2008.

Figure 2-8: Berryessa Station Conceptual Site Plan

access to the station platform would be from a mezzanine situated at street level. A 10-bay bus transit center and kiss-and-ride area would be located to the east of the station. Portions of the Berryessa Station area are adjacent to Upper Penitencia Creek and Coyote Creek. The station area includes either a 150-foot setback from the near banks of these creeks or a 100-foot setback from the riparian tree dripline (outer edges of the tree canopy), whichever is greater. This conforms to the San Jose Riparian Corridor Policy Study guidelines (1999), which require "a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater)." The two exceptions to this setback occur at the following locations: 1) where a new street on the east side of the railroad ROW, Berryessa Station Way, crosses over Upper Penitencia Creek to/from Berryessa Road and 2) where Berryessa Station Way intersects with Mabury Road to approximately 200 feet north. Encroachment into the riparian setback near Mabury Road has been approved by the city. Documentation of this approval is provided in Appendix H.

A four- to eight-level parking structure on 3.4 acres would be constructed at the south end of the site and to the west of the ROW. An approximately 100-foot-high radio tower and associated equipment shelter would be located at the northeast corner of the multi-story parking structure. Additional surface parking and/or future transit facilities would be located as needed within the station area.[9]

Access to the station area from the north would be from Berryessa Road via a new street, Berryessa Station Way, on the east side of the railroad ROW. Access to the parking areas at the south end of the station area would be from Mabury Road.

Intersection improvements, including traffic signals, would be provided at Berryessa Road, Mabury Road, and at the parking structure entrance on Berryessa Station Way. At the southeastern end of the station area, a new roadway connecting to a new signalized intersection at Mabury Road is planned by others.

South of Berryessa Station, two crossover tracks and a pocket track, which allows storage of a train adjacent to the mainline(s), would be located on the aerial structure. Gap Breaker Station SXB and Train Control Building S56 would be located south of Mabury Road on the west side of the ROW (STA 551+00), with access provided to DOT Way (a private street that leads to the San Jose Mabury Yard). There are two alternate locations for High Voltage Substation SMR and Switching Station SSM. The first location would be west of the railroad ROW at the southern end of the San Jose Mabury Yard near US 101. The second location would be east of the railroad ROW and north of Las Plumas Avenue. For both locations, a new high voltage line would begin at the high voltage substation and 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.

[9] The range in parking levels at the station reflects a combination of surface and structured parking options to meet projected parking demand.

BEP Terminus

The configuration for the terminus of the BEP Alternative varies depending on whether the alignment terminates with tail tracks only, which can store some BART train cars temporarily, or a yard and shops facility, which can store and service many BART train cars (No New Yard Option and Las Plumas Yard Option, respectively). The variation between the options occurs at two locations: 1) north of Berryessa Road where the alignment transitions from an at grade configuration to retained fill, and then to an aerial structure and 2) south of the aerial structure after the alignment transitions back to an at-grade configuration. In between, the alignment passes through the Berryessa Station area, continues over Mabury Road on a bridge, transitions to retained fill, then returns to an at grade configuration. All facilities along this portion of the alignment remain the same under both options, as described above.

No New Yard Option

Under this option, the BART alignment would transition from an at grade configuration to retained fill north of Berryessa Road near STA 506+50, and then to an aerial structure near STA 519+50. The rise of the BART trackway along this distance would allow for an approximate 0 percent slope beginning north of the aerial structure (on the retained fill portion), which in turn allows room for BART crossover tracks on the structure to provide for train storage and single-track operations around an occasionally stored train.

South of Mabury Road, a maintenance of way siding track, which allows for the storage of track and wayside maintenance vehicles (such as ballast tampers, rail-grinders, track and tunnel vacuum, work train), high rail vehicles, and other miscellaneous vehicles would be located to the east of the ROW and north of Las Plumas Avenue (STA 566+00). A high rail vehicle access point would be located in the same general location.

Additional storage and the maintenance of BART trains would be necessary at existing BART facilities, most likely the Hayward Yard. Existing BART maintenance facilities would be modified or improved to accommodate the additional maintenance and storage activities required for servicing the BART trains needed for the BEP Alternative. Such improvements to existing BART facilities specifically needed to accommodate the BEP Alternative would be in addition to and independent of improvements needed by BART to serve projected growth in the BART system.

In an effort to manage the existing and future maintenance and storage needs of revenue vehicles, BART has recently initiated a comprehensive Strategic Maintenance Program (SMP) for the BART system. The SMP is a change in BART maintenance scheduling and activities. It will also have an effect on how the BART yard and shop facilities are designed, operated, and expanded in the future.

BART will soon begin an analysis of the expansion and use of BART yard and shop facilities as it relates to the recently initiated SMP. The analysis will address the

additional vehicle maintenance and storage needs for anticipated growth in the core BART system as well for planned expansion of the BART system, including growth generated by the BEP Alternative.

This study will identify where, how, and how long the maintenance and storage requirements of the BEP Alternative could be satisfied by expanding facilities at existing yard and shops. However, such improvements must be accommodated within available space at and/or in the vicinity of existing BART facilities. Accordingly, the No New Yard Option would be a temporary solution, which could accommodate the BEP Alternative until the full, six-station SVRTP Alternative is constructed with its own maintenance and storage facility. At this stage in development of the SMP analysis and planning, it appears that construction of a 6-lift facility adjacent to Hayward Yard could accommodate running repairs to the revenue vehicles required by the BEP Alternative. It is anticipated that such shop improvements would eventually be converted for use as scheduled overhaul facilities, and comprise a VTA contribution to the SMP infrastructure that would support the entire, combined fleet.

The extent and cost of maintenance and storage needed for the BEP Alternative would be determined during the SMP study and evaluation process. Once an appropriate site and proposed improvements are identified, BART would carry out environmental review, design and construction of the necessary improvements to existing facilities to accommodate the BEP Alternative. If the Hayward site is selected for expansion, it is anticipated that any substantial adverse environmental impacts could be mitigated since it is located in an industrial area. In any case, additional environmental studies would be required depending on the outcome of the SMP study.

The BEP Alternative cost projection includes a base capital cost allowance for a Las Plumas Yard Option, discussed below. If instead the No New Yard Option is selected, VTA and BART would establish a capital contribution to be made by VTA for improvements to existing BART maintenance facilities needed to address BEP Alternative BART train maintenance and storage demand. Given the constraints on available space at existing BART maintenance and storage facilities such as the Hayward Yard, it is possible that acquisition of adjacent private property would be required for expansion to accommodate the BEP Alternative. VTA anticipates that the capital contribution necessary to implement the No New Yard Option, including environmental review, design, property acquisition and construction costs, would not exceed the cost allowance for the Las Plumas Yard Option.

Las Plumas Yard Option

Under this option, the BART alignment would transition from an at grade configuration to retained fill north of Berryessa Road near STA 509+00, and then to an aerial structure near STA 519+50. Unlike the No New Yard Option, there would be no BART crossover tracks located on the north end of the aerial structure.

The yard and shops facility would begin near Nicora Avenue and extend to Lower Silver Creek, east of US 101. The facility would encompass approximately 26 acres. The

facility would be set back approximately 100 feet from the top of the north bank or tree drip line of Lower Silver Creek, whichever is applicable along the property line. Two transfer tracks would lead into the facility. A single tail track would be located parallel to the two transfer tracks. The main entrance to the facility would be from Las Plumas Avenue. Other 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 200 parking spaces for employees, authorized visitors, and delivery and service vehicles. A conceptual site plan of the Las Plumas Yard is shown in Figure 2-9.

The facility would serve two general purposes: 1) cleaning, maintenance, and storage of BART train cars; and 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). In order to provide for these functions, several buildings and numerous transfer and storage tracks would be constructed. Notable buildings and facilities would include a car wash building, control tower, inspection pit, blowdown facility, wheel truer, revenue vehicle maintenance facility, vehicle turntable, non-revenue vehicle maintenance facility, and a material storage area. 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.

Train Car Washer. The train car washer would be an open-ended building with an automated vehicle washing machine. As each train returns to the yard for storage, it would be driven through the car wash where the exterior would be cleaned.

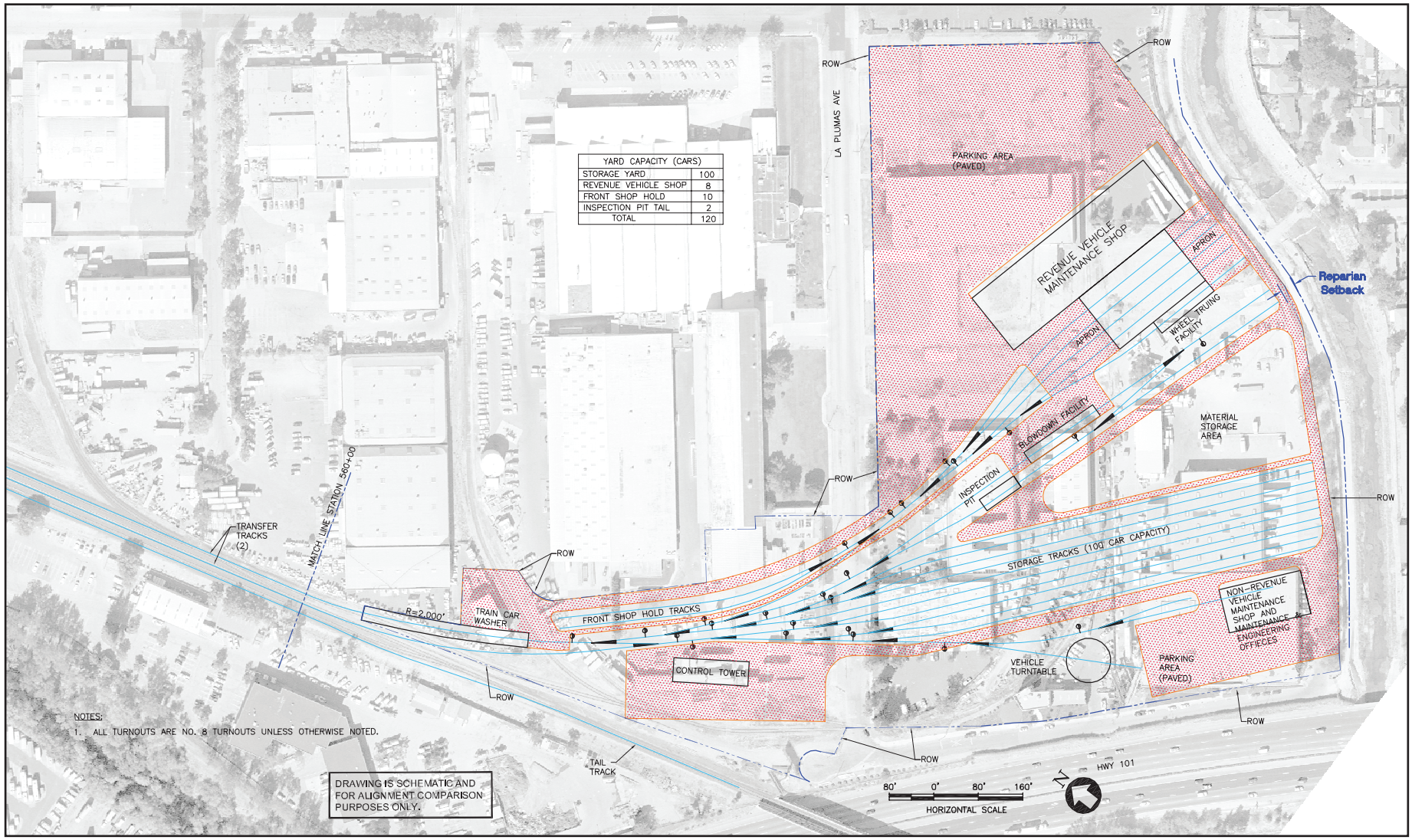
Yard Control Tower. The yard control tower would be approximately three stories in height. The tower would be situated to have a proper view of train operations in the yard and shops area. Employees staffing the tower would control the majority of train movements within the yard area while shop area movements are made under local control.

Inspection Pit. The inspection pit would be enclosed in a shed and open at each end to allow trains to travel over a depressed pit so that the underside of trains could be inspected.

Blowdown Facility. The blowdown facility would be primarily for cleaning the underside of trains in a combined wet and dry process in preparation for scheduled inspections. The cleaning operation would be performed within a service pit.

Wheel Truing Facility. The wheel truing facility would be located next to the revenue vehicle maintenance facility. The primary function of this facility would be to enclose the wheel truing pit and equipment to facilitate the maintenance and repair of BART vehicle wheel sets.

Revenue Vehicle Maintenance Shop. The revenue vehicle maintenance shop would be a large building of approximately 70,000 square feet. Tracks would lead to and



Source: VTA and CirclePoint, 2008.

Figure 2-9: Las Plumas Yard and Shops Facility Conceptual Site Plan

through the building. 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.

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.

Non-revenue Vehicle Maintenance Shop and Maintenance and Engineering Offices. The non-revenue vehicle maintenance facility 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 facility 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. It would also contain an overhead crane, vehicle hoists, and diagnostic repair equipment.

Material Storage Area. The material storage area is utilized to store maintenance equipment and stockpile supplies.

2.4.2 BART AND VTA OPERATIONS

Fleet Requirements

Based on 2006 fleet size and anticipated 2030 service levels the projected fleet requirements with and without the BEP Alternative are shown below in Table 2-5.

Table 2-5: BEP Alternative Fleet Size

Service	2007 Existing	2030 Projected (No Build Alternative)	2030 Projected (BEP Alternative)
VTA Buses	525	509	509 – 594
VTA Light Rail Vehicles	100	100	100
BART Cars	669	956	1,030 – 1,041

Source: Connetics Transportation Group and VTA, 2008.

With the BEP Alternative, a total VTA bus fleet of 509 to 594 vehicles is estimated to meet year 2030 service levels. The low end of the range represents no net change in the bus fleet compared to the No Build Alternative, achieved through improved efficiency of operations and the substitution of high capacity (articulated) buses for standard buses where demand warrants. The high end of the range represents the worst case scenario where 85 additional 40-foot standard buses are needed to meet future demand and service levels. The total light rail fleet is not anticipated to change

between now and 2030, with the total number of vehicles estimated at 100. VTA can accommodate the 2030 demand and still have a sufficient number of spare vehicles to accommodate breakdowns. An estimated 74 to 85 additional BART vehicles would be required compared to 2030 No Build Alternative conditions. The BART fleet for the entire system with the BEP Alternative would consist of 1,030 to 1,041 vehicles.

Operating Plan

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. Monday – Saturday. After 7:30 p.m. Monday – Saturday and all day Sunday, the average headway would be 10 minutes.[10]

Six new VTA bus routes would provide service to several major employment destinations, activity centers, and transit facilities in the Silicon Valley. The BEP Alternative would include an expansion of bus service from the planned BART Warm Springs Station or the Milpitas 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), San Jose International Airport (SJIA), and San Jose Civic Center/SJSU/Downtown San Jose. Three of the routes (serving Oakmead and SJIA) would originate at their northern ends at the BART Milpitas Station. The other three routes would originate at Warm Springs Station. Some of VTA's local bus routes within the SVRTC also would be rerouted to serve BART stations. The new 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 and in the midday at 20- to 60-minute headways. In addition to the routes described above, a high-frequency bus would be operated from the Berryessa station to downtown San Jose via King Street and Santa Clara Street. This bus line would have a short and long service, with the short service terminating at Diridon Station and the long service extending along The Alameda to Santa Clara. This service would operate at 5 minute peak headways for both the short and long service (combined headway of 2.5 minutes to downtown) and 10 minute headways off-peak.

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

[10] BART is in the process of updating its operating plan. To be consistent with the updated operating plan, the Year 2030 BEP Project operating plan would also change. After 7:30 p.m. Monday - Saturday and all day Sunday, the average headway would be 7.5 minutes instead of 10 minutes. There would be no other changes that would directly affect the BEP Project.

Park-and-Ride Lots

The BEP Alternative would require four park-and-ride parking lots for the additional bus service. The number of parking spaces required at each lot is based on projected parking demand for new VTA bus service. Demand for three of the four park-and-ride lots would be met within existing facilities located at the approved Warm Springs BART Station (303 spaces), the Berryessa BART Station (753 spaces in the parking garage), and the existing Evelyn LRT Station in Mountain View (49 spaces). The fourth parking facility would be constructed in downtown Sunnyvale to accommodate 91 spaces. Figures 2-10 to 2-13 show the locations of the park-and-ride lots.

Ridership

The BEP Alternative segment will serve a projected total of 46,457 riders per day in 2030. Further discussion of ridership projections and station parking demand is provided in Chapter 3, Transportation and Transit Analysis.

2.4.3 DESCRIPTION OF PROJECT FEATURES

This section describes various features of the BEP Alternative to assist the reader's understanding of the electrical, communication, and other facilities required to operate this alternative. Definitions for the terms used in this chapter and throughout the EIS are included in Chapter 13, Definitions and Abbreviations.

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 the BART third rail (also called the contact rail). Switching and sectionalizing stations control power on the 34.5 kV sub-transmission system. The switching stations are co-located with the high voltage substations and the sectionalizing stations are between these locations and co-located with traction power substations.

Traction Power Substations and Sectionalizing Stations

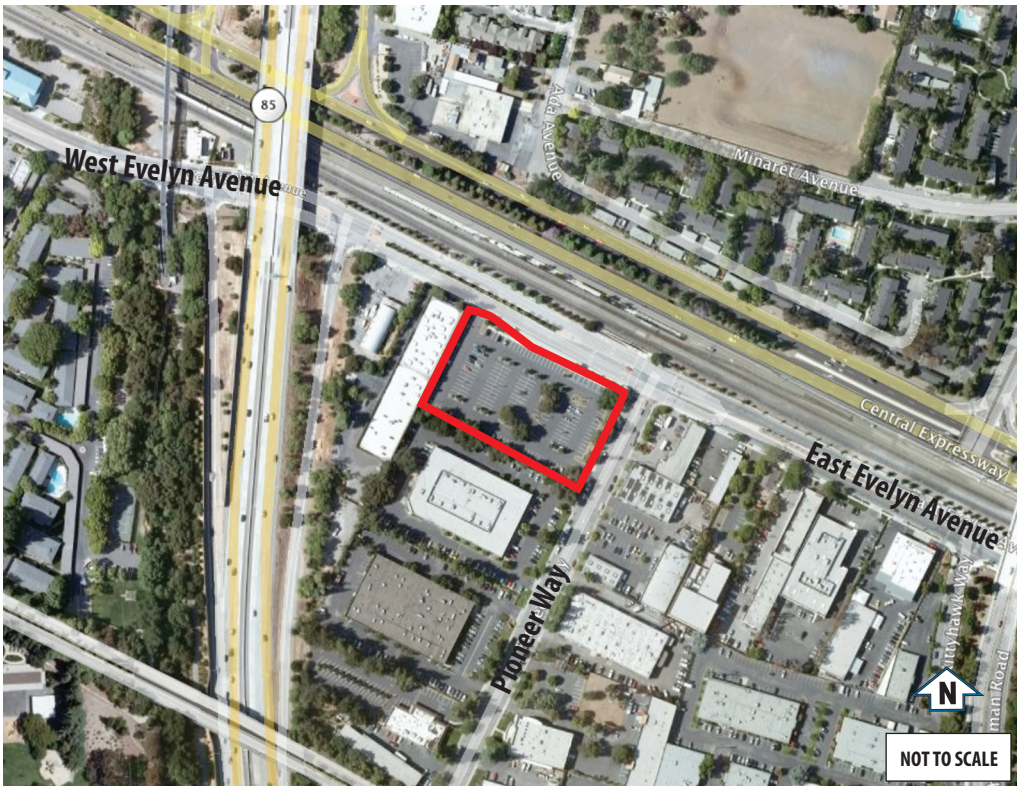
Traction power substations provide the power required to run BART trains on the mainlines, storage tracks, yard and shops tracks, and so forth. These substations transform 34.5 kV AC to 1,000 V DC for distribution through BART's electrified third rail (also called the contact rail). Traction power substations 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 equipment, protection relays,

Source: Google Earth, CirclePoint, 2008.

Figure 2-10: Location of Warm Springs BART Station Park-and-Ride Lot

Source: Google Earth, CirclePoint, 2008.

Figure 2-11: Location of Berryessa Station Park-and-Ride Lot



Source: Google Earth, CirclePoint, 2008.

Figure 2-12: Location of Evelyn LRT Station Park-and-Ride Lot

Source: Google Earth, CirclePoint, 2008.

Figure 2-13: Location of downtown Sunnyvale Park-and-Ride Lot

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.

Site dimensional requirements would vary based on site-specific requirements and where sites would be combined with other facilities such as train control buildings. Some sites would require an access easement or construction of an access road. Minimum approximate dimensional requirements for traction power substations are 60 by 200 feet and 15 feet in height. Approximate dimensional requirements of sectionalizing stations are 30 by 20 feet, and the equipment would be combined with the traction power 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 34.5 kV sub-transmission cable system. High voltage substations include outdoor type equipment consisting of power utility interface equipment such as a disconnect switch, metering potential and current transformers, a revenue metering facility, 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, telemetering 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.

High voltage substations 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 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 distribution lines. Short (typically less than 1,000 feet) sections of overhead and underground power lines would

be constructed from existing distribution facilities to the new facilities. Transformers and switching equipment would be located within ancillary areas at stations. In addition, each station and the yard and shops would have a standby diesel-electric generator located aboveground. Additional standby diesel-electric generators would be located at pump stations 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. Approximate dimensional requirements for gap breaker stations are 30 by 40 feet and 15 feet high.

Train Control and Communication Equipment

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

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

Railroad Intrusion Detection System

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 incidence 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 from approximately 1,500 feet south of Grimmer Boulevard to just north of Montague Expressway at approximately 500- to 1,000- foot intervals under both the BEP and SVRTP alternatives and from the west tunnel portal to the end of the tail track near De La Cruz Boulevard under the SVRTP Alternative. Only in these locations would BART

operate adjacent to an active freight railroad. The poles would be approximately 15 to 25 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 right-of-way 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.

Pump Stations

Pump stations collect groundwater seepage and/or rainwater at the lowest elevation points of the alignment, i.e., 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. Access to pump stations would be from within the retained cuts or from an at grade location. 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 at or near the following locations along the alignment:

- Kato Road.
- Dixon Landing Road.
- South of Curtis Avenue with both retained cut options (Long, Intermediate), near the UPRR at grade bridge over BART.
- Trade Zone Boulevard with both retained cut options.
- Hostetter Road.
- Sierra Road/Lundy Avenue intersection.

Maintenance and Emergency Access

From the planned BART Warm Springs Station to just south of Berryessa Station for both the BEP and SVRTP alternatives, a maintenance road would be constructed to the east of the alignment and within the railroad ROW. Access to the maintenance road would be from station areas, BART facility sites, public streets, or parking lots. At some locations along the maintenance road, vehicle turnarounds would be provided where there is no egress available, such as where there are grade separations between street crossings and the railroad ROW, where maintenance or emergency vehicles would need to turn around to go back. Vehicle turnaround areas would be at the following locations:

- South of the Mission Boulevard crossing (north of East Warren Avenue, access would be by way of an easement through an existing parking area).
- South of the East Warren Avenue crossing (north of East Warren Avenue, access would be by way of an easement through an existing parking area).
- South of the Kato Road crossing (north of Kato Road, access would be by way of an easement through an existing parking area).
- North and south of the Dixon Landing Road crossing under the At Grade Option.
- North and south of Berryessa Creek, as there may not be room for vehicles to cross over the multi-cell box culvert that is being constructed by others.

Vehicular and on-foot maintenance access to the BART ROW would be provided through locked gates or doors (in soundwalls) and located at approximate ½-mile intervals along the at-grade sections of the alignment. 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 BEP Alternative.

"Green" Building Strategies

To the maximum extent practicable, the design and operations of the BEP Alternative would incorporate green strategies through project features that reduce energy, water, and solid resource consumption and improve indoor environmental quality. Some project features to be included or considered include:

- **Daylighting and lighting controls.** Daylight can be successfully used to reduce electric power consumption when controls for artificial lighting can reduce the lighting level when daylight is available. Photosensor-driven lighting control and dimming control is a well-established technology that could be applied to station platforms and interiors, the Las Plumas Yard, and also on train cars. Controls should also allow low-power settings for after-hours settings at stations.
- **Escalators.** Since many passengers arrive at BART stations during at peak hours, running escalators at full speed at other times uses energy needlessly. To reduce energy, escalators that can stop and re-start or escalators with a low speed mode (which may have less maintenance problems that the start/stop type) could be installed.
- **Renewable power.** Photovoltaic solar panels are typically used to generate on-site power for transportation facilities. One cost-saving strategy is to use

PV panels for roofing or canopy areas where their cost can offset the use of other materials that would otherwise be required.

- **Station and system access modes.** Strategies to encourage people to arrive at BART stations by means other than single-occupancy-vehicles include: enhancing pedestrian and bicycle infrastructure at and within a convenient walking/biking radius of stations (better crosswalks, bike parking, bike lanes, etc.); encouraging mixed-use design at station areas; supplementing shuttle service to stations; and reducing the subsidy for parking garages. These strategies would require coordination with the communities and local agencies in station areas.

- **Water.** There are numerous well-established ways to save water, reduce stormwater flooding, and improve water quality in landscape design that are directly applicable to station areas and the Las Plumas Yard and potentially to BART trackways. These include planting native, drought-resistant plants; using low-flow fixtures; increasing pervious surface with porous paving, unit pavers, etc.; capturing surface flow with bioswales and raingardens; and using soil-water separators and other filters. For the Las Plumas Yard, the train car washing process could use recycled grey water and save up to 90 percent of the water used.[11] If access to the San Jose and Santa Clara recycled water networks is available, then recycled water could be used for station landscaping.

- **Plant-Based Lubricants/Coolants.** The use of soy-based oil is being considered in the design of the Build Alternatives for use with large transformers and potentially other systems machinery.

- **Materials & Resources.** Green strategies in this category include: the management of construction and demolition waste to keep waste out of landfills to the maximum extent practicable; the use of recycled and regionally or locally available materials when available and appropriate; the reuse of soils on-site or elsewhere in the project area when possible. Excavated soils could also be made available for use at other project sites.

- **Indoor Environmental Quality.** Given that most of the BEP Alternative is not composed of indoor space, only a few measures are being considered to address indoor environmental quality. These include the use of low-VOC materials (paints, coatings, carpet, and other materials) and green cleaning products.

- **LEED Certification.** The LEED (Leadership in Energy and Environmental Design) Green Building Rating System is a voluntary, third-party certification program using a point system for the incorporation of green building strategies

[11] Gray water is waste water without human waste such as from showers, sinks, dishwaters, etc.

in five general categories: sustainable sites; water efficiency; energy and atmosphere; materials and resources; and indoor environmental quality. LEED is used by many government agencies at the federal, state, and local levels as the benchmark for green building. For the BEP Alternative, LEED can be most directly applied to individual building components including the stations and Las Plumas Yard.

In general, the BEP Alternative (and SVRTP Alternative) is a far more environmentally sustainable mode of transportation as compared to the single-occupancy vehicle mode, and as such is a significant environmental improvement.

2.4.4 PROJECT COSTS

This section summarizes the capital and operating costs associated with the BEP Alternative. Detailed cost information can be found in Chapter 9, Financial Considerations of this document. Costs are shown in constant 2008 dollars and year of expenditure (YOE) dollars.

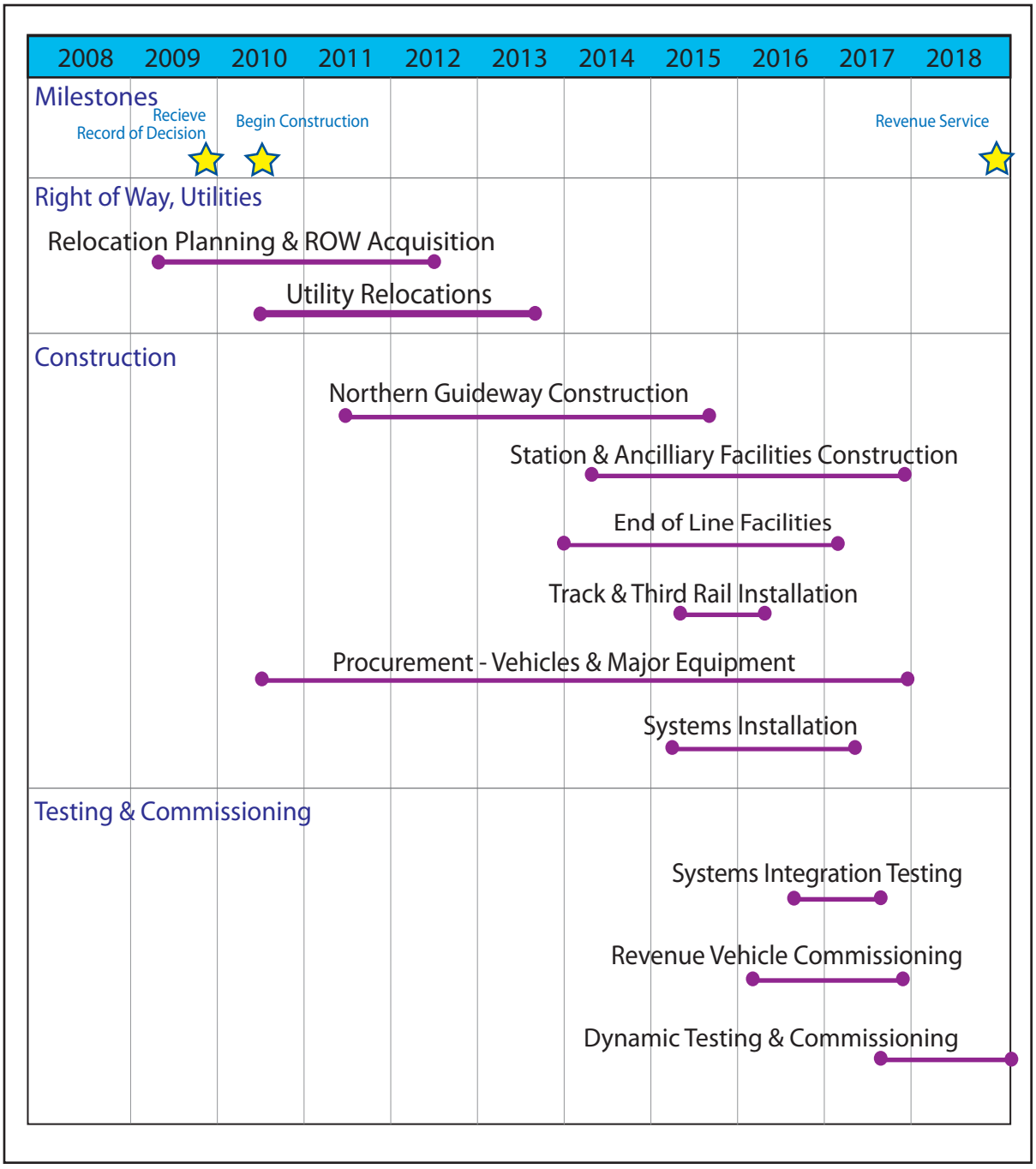
Capital costs are estimated at $2.026 billion in 2008 dollars and $2.487 billion in YOE dollars for the BEP Alternative. These are the costs of improvements proposed for federal funding participation and include vehicles, right-of-way, design, administration, and construction.

Operating and maintenance costs for the BEP Alternative include both VTA's costs for bus, bus rapid transit (BRT), light rail (LRT) and other assisted services, plus the costs for BART extension service. VTA's non-BART operating costs for the BEP Alternative total $572.3 million in 2008 dollars and $1.232 billion in YOE dollars. The net operating costs assume fare and related operating revenues would offset a portion of the operating costs. The net cost of VTA's non-BART service would be $415.8 million in 2008 dollars and $941.1 in YOE dollars.

The total incremental operating cost of BART service under the BEP Alternative would be approximately $83.9 million in 2008 dollars and $156 million in YOE dollars. BART operating and maintenance costs include the maximum capital reserve contribution, and direct and fixed cost contributions VTA would make annually to BART. The net total annual operating cost for the BEP Alternative would be $47.2 million in 2008 dollars and $87.7 in YOE dollars.

2.4.5 PROJECT SCHEDULE

The BEP Alternative would take approximately eight years to construct and perform start-up and testing activities, as shown in Figure 2-14. Passenger service for the BEP Alternative would start in 2018, assuming funding is available.



Source: VTA, 2008.

Figure 2-14: BEP Alternative Proposed Construction Schedule

2.5 SILICON VALLEY RAPID TRANSIT PROJECT ALTERNATIVE

The Silicon Valley Rapid Transit Project Alternative (SVRTP Alternative) would consist of a 16.1-mile extension of the BART system as shown in Figure 2-15. The alignment would begin at the planned BART Warm Springs Station in Fremont (to be implemented by 2014) and proceed on the former Union Pacific Railroad right-of-way through the City of Milpitas to south of Mabury Road in the City of San Jose. The extension would then descend into a 5.1 mile-long subway tunnel, continue through downtown San Jose, and terminate at grade in the City of Santa Clara near the Caltrain Station. Six stations are proposed: Milpitas, Berryessa, Alum Rock, Downtown San Jose, Diridon/Arena, and Santa Clara. Passenger service for the SVRTP Alternative would start in 2018, assuming funding is available.

2.5.1 ALIGNMENT AND STATION FEATURES BY CITY

Cities of Fremont and Milpitas

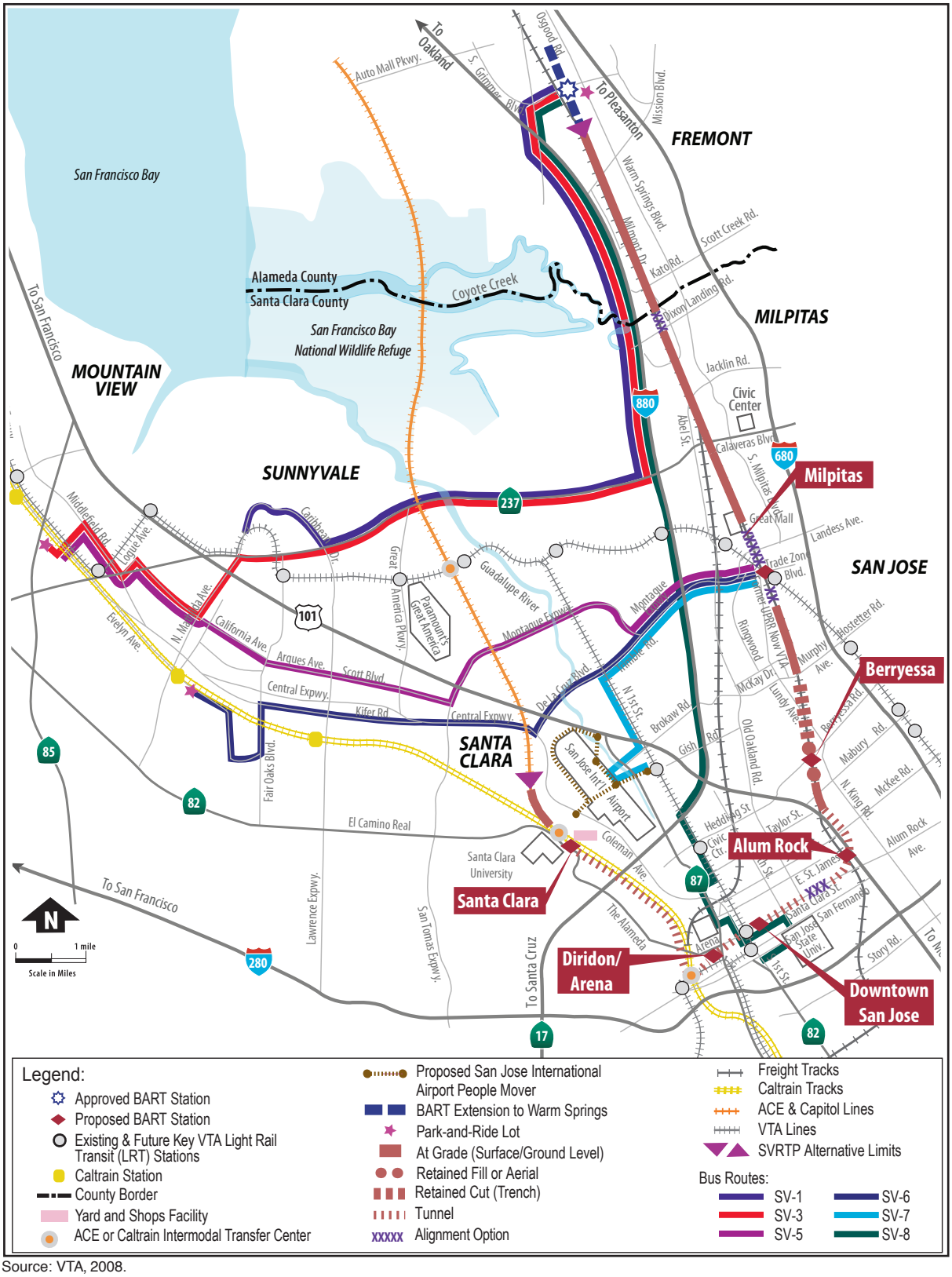
The SVRTP Alternative would consist of the same design features and options as described under the BEP Alternative in Fremont and Milpitas. However, the parking demand at the Milpitas Station would increase based on additional projected ridership for this alternative resulting in a six- to eight-level parking structure at the station (the BEP Alternative would include a two- to eight-level parking structure).[12] The reader should refer to Section 2.4.1 of this chapter for the design features from the planned BART Warm Springs Station to the Milpitas/San Jose city lines.

City of San Jose

Milpitas to Alum Rock Station

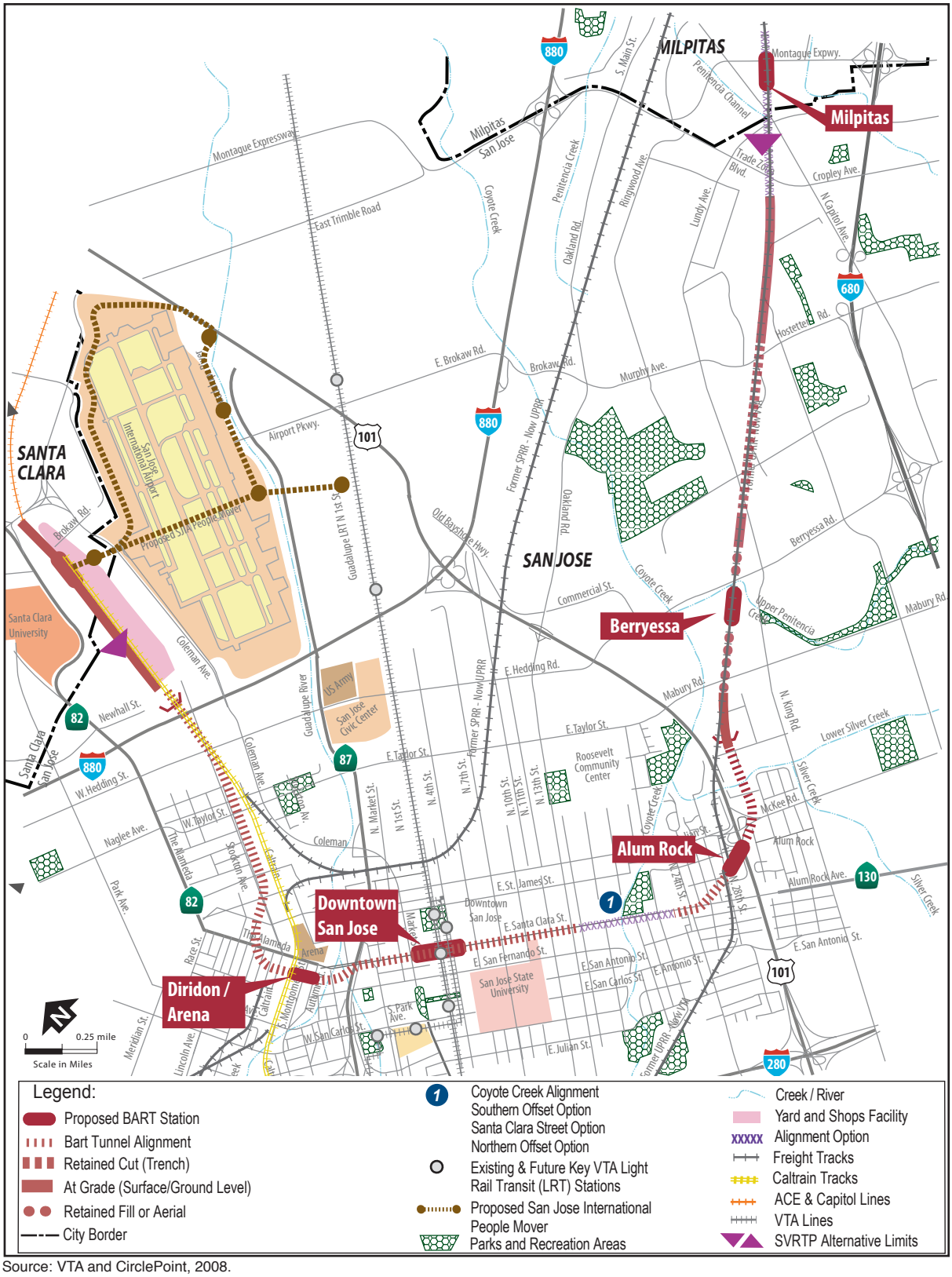
The SVRTP Alternative alignment in San Jose is shown on Figure 2-16 and would consist of the same design features and options as described under the BEP Alternative from the Milpitas/San Jose city lines to just north of the Berryessa Road. North of Berryessa Road, the alignment would transition from an at grade configuration, to retained fill near STA 509+00, and then to the aerial structure near STA 519+50 (the same configuration as the Las Plumas Yard Option under the BEP Alternative). The parking demand at the Berryessa Station would increase under the SVRTP Alternative based on additional projected ridership under this alternative resulting in an eight-level parking structure at the station (the BEP Alternative would include a four- to eight-level parking structure). South of the Berryessa Station, the alignment includes crossover tracks, a pocket track, and electrical and communication facilities, also as described

[12] The range in parking levels at the stations reflects a combination of surface and structured parking options to meet projected parking demand.



Source: VTA, 2008.

Figure 2-15: SVRTP Alternative



Source: VTA and CirclePoint, 2008.

Figure 2-16: SVRTP Alternative - City of San Jose

under the BEP Alternative. South of the electrical and communication facilities, a high rail vehicle access point would be located west of Nicora Avenue, with access to the facility provided from this roadway (STA 558+50). A maintenance of way siding track, which allows for the storage of track and wayside maintenance vehicles, high rail vehicles, and other miscellaneous vehicles would be constructed to the west of the high rail vehicle access point (STA 558+50 to 570+00).

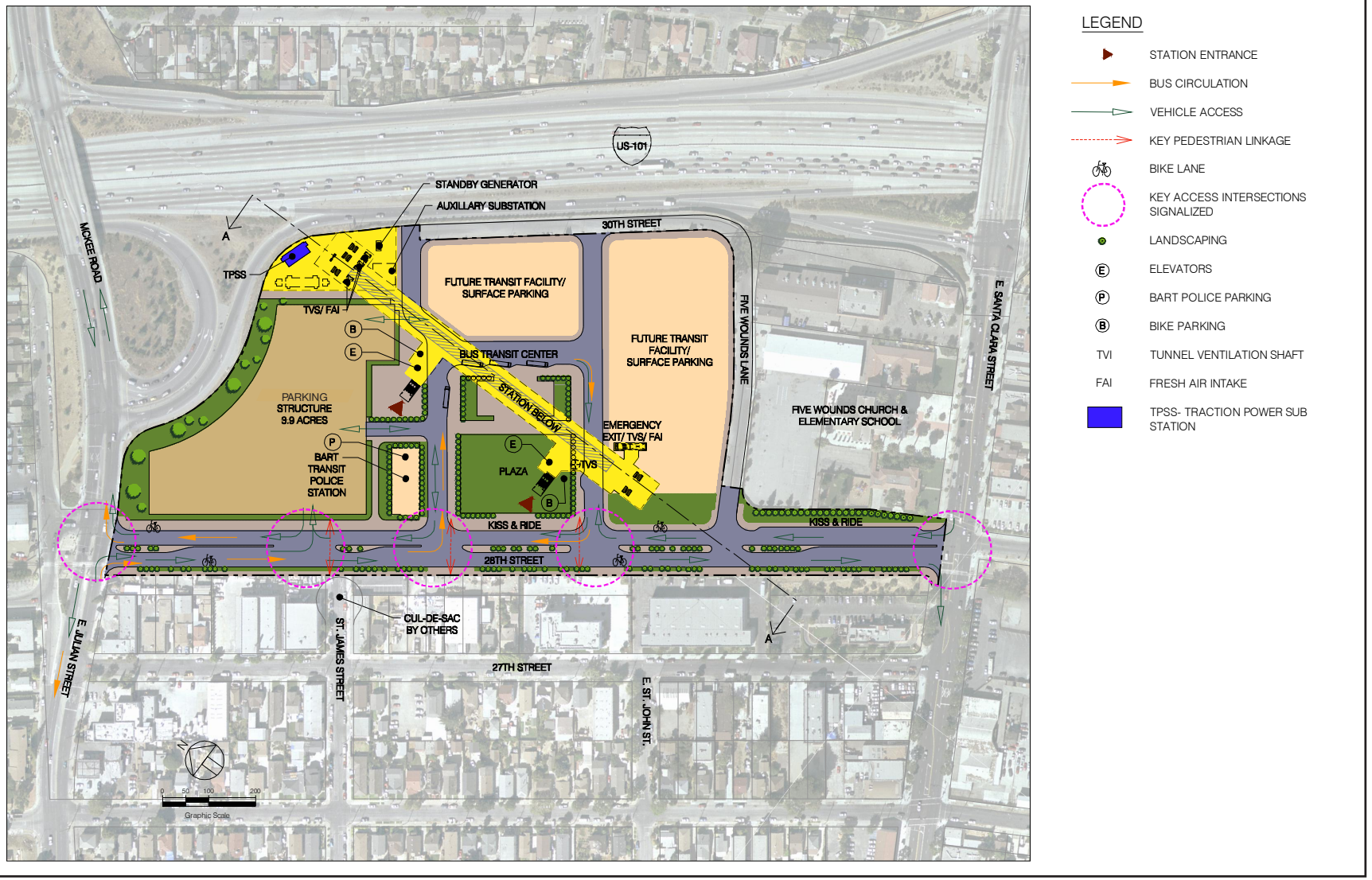
The alignment would transition from an aerial configuration to a retained cut configuration and then enter the east tunnel portal near Las Plumas Avenue (STA 569+50). At the portal, an aboveground structure (approximately 21 by 11 feet, and 10 feet high) would provide access down to an equipment room. A fire department connection would also be provided at the portal. High Voltage Substation SMR and Switching Station SSM would be located within the railroad ROW and adjacent to the portal.

South of the portal, the tunnel would pass beneath Lower Silver Creek (STA 581+00), curve under the US 101 freeway south of the McKee Road/East Julian Street interchange, and enter Alum Rock Station.

Alum Rock Station

The Alum Rock Station area would be located between US 101 and 28th Street (starting at approximately STA 600+00) (Figure 2-17). The station area would encompass approximately 19 acres. 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, staff breakroom, and Train Control Communications Room (TCCR). 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 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 an outdoor plaza.

At the north end, pedestrian access would connect the mezzanine level with the parking structure. Kiss-and-ride facilities would be located along 28th Street and the west side of the plaza. 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 opening up at the north end near the vent shafts and the other at the south end near the plaza area. A four- to five-level parking structure would be located on 3.9 acres at the north end of the Alum Rock Station area to accommodate park-and-ride parking demand. Additional surface parking and/or future transit facilities would be located as needed within the station area. The station area would include a BART Police Zone Facility. Plans and elevations of the proposed station are provided in Appendix D.



Source: VTA, 2008.

Figure 2-17: Alum Rock Station Conceptual Site Plan

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 TCCR 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 provided at the intersections of 28th /East Julian streets and 28th /East Santa Clara streets. Three new traffic signals would be provided in the station area on 28th Street between East Julian and Santa Clara for access to the parking structure and transit center. 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 or Bus Rapid Transit (BRT) operating on East Santa Clara Street/Alum Rock Avenue.

Tunnel Alignment Options near Coyote Creek

From Alum Rock Station, the tunnel would curve under 28th Street, 27th Street, and 26th Street before aligning under East Santa Clara Street (STA 620+00). The tunnel would continue under the 100-foot-wide East/West Santa Clara Street ROW, consisting of a 68-foot-wide street and 16-foot wide sidewalks, as it approaches Coyote Creek (STA 644+00). Near Coyote Creek, there are three options for the tunnel alignment. Each of these options includes additional options for the location of a tunnel ventilation structure and auxiliary power substation. Additional information on these alignment options is provided in Appendix E.

Southern Offset Option

Under this option, the tunnel alignment would begin to transition south from the East Santa Clara Street ROW near 22nd Street. The tunnel would pass Coyote Creek to the south and avoid the Coyote Creek/East Santa Clara Street bridge foundations. The alignment would transition back into the street ROW near 13th Street. West of Coyote Creek, there are alternate locations for Tunnel Ventilation Structure FSS, an aboveground structure with an associated vent shaft, Auxiliary Power Substation SFF, and Gap Breaker Station SXC. One potential location is on the south side of East Santa Clara Street between 15th and 16th streets. Another location is also on the south side of East Santa Clara Street between 14th and 15th streets. On the north side of East Santa Clara Street, one potential location includes a site on the former San Jose Medical Center property just west of 17th Street. The last locations are also on the north

side of East Santa Clara Street between 13th and 14th streets and between 12th and 13th streets.

Northern Offset Option

Under this option, the tunnel alignment would begin to transition north from the East Santa Clara Street ROW near 22nd Street. The tunnel would pass Coyote Creek to the north and avoid the Coyote Creek/East Santa Clara Street bridge foundations. The alignment would transition back into the street ROW near 13th Street. The Northern Offset Option includes the same alternate locations for Tunnel Ventilation Structure FSS Auxiliary Power Substation SFF, and Gap Breaker Station SXC as described above under the Southern Offset Option.

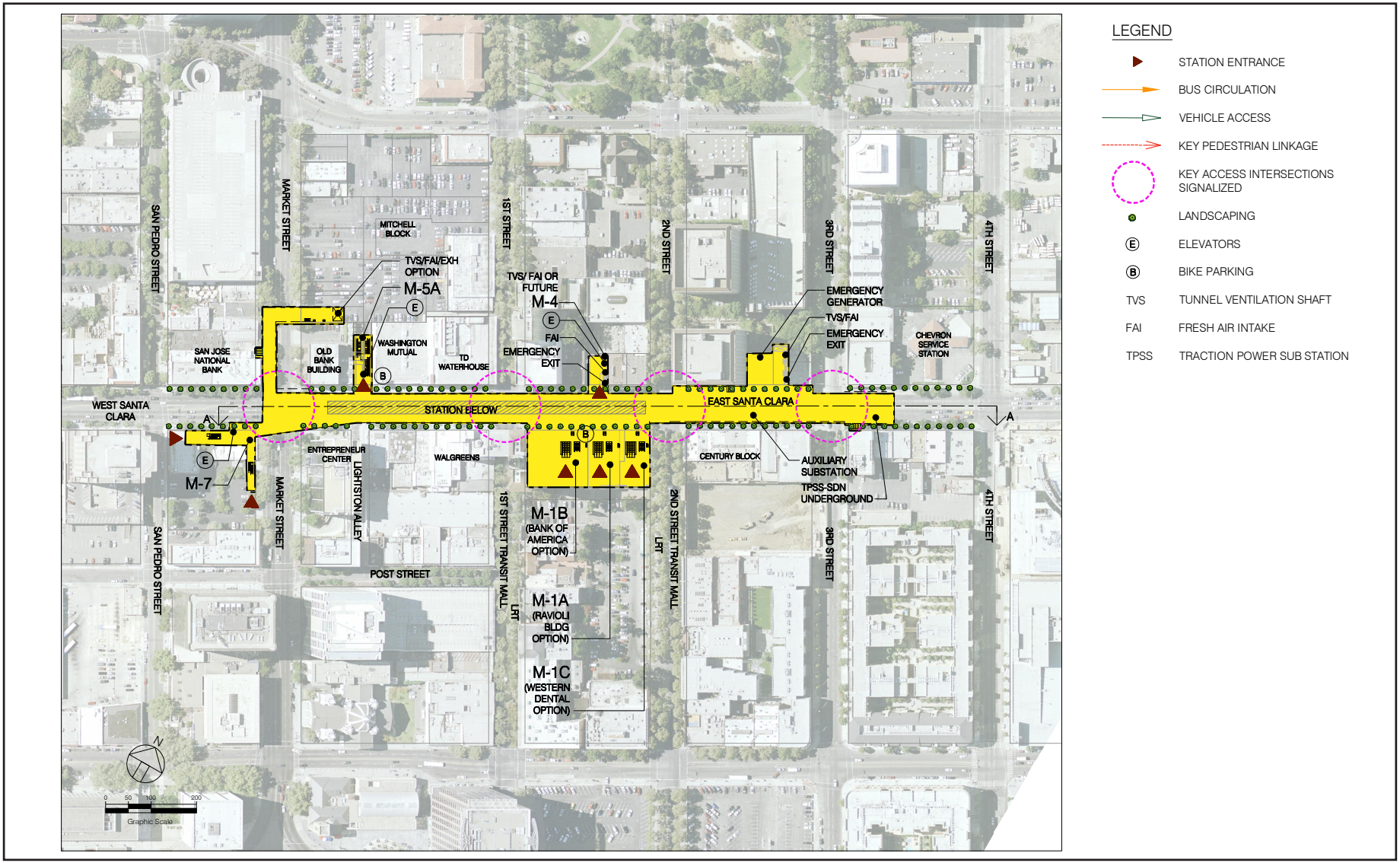
Santa Clara Street Option

Under this option, the tunnel alignment would remain under the East Santa Clara Street ROW. The tunnel would need to be deeper than the two offset options, as it must pass directly under the Coyote Creek/East Santa Clara Street bridge foundations. The Santa Clara Street Option includes the same alternate locations for Tunnel Ventilation Structure FSS, Auxiliary Power Substation SFF, and Gap Breaker Station SXC as described above under both offset options.

Downtown San Jose Station

BART would continue beneath East Santa Clara Street to the Downtown San Jose Station (Figure 2-18). Crossover tracks would be located east of the Downtown San Jose Station between 2nd and 3rd streets (within the station box).

The Downtown San Jose Station box would be located underground from near 3rd Street to San Pedro Street. The box would be approximately 1,400 feet long and 65 feet wide, and would consist of a platform area, a mezzanine one level above, and the downtown crossover at the east end of the box. Ancillary areas would be located at the ends of the station box and in areas connecting to the station box. 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 700 feet long and 28 feet wide. Pedestrian access (elevators and escalators) to the mezzanine would be from several station entrances between 2nd and Market streets. One entrance would be located at the southwest corner of West Santa Clara and Market streets (Figure 2-18, M-7). A second entrance would be located on the south side of East Santa Clara Street between 1st and 2nd streets. There are three alternate locations for this entrance: 1) the Ravioli/Firato Delicatessen building (M-1A), 2) the Bank of America/Bank of Italy building (M-1B), or 3) the Western Dental/Moderne Drug building (M-1C). A third entrance would be located on the north side of East Santa Clara Street mid-block between Market and 1st streets (M-5A). A fourth potential future entrance would be located on the north side of East Santa Clara Street mid-block between 1st and 2nd streets (M-4). 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



Source: VTA, 2008.

Figure 2-18: Downtown San Jose Station Conceptual Site Plan

Street/Alum Rock Avenue. The station area would not include a multi-level parking structure or surface parking.

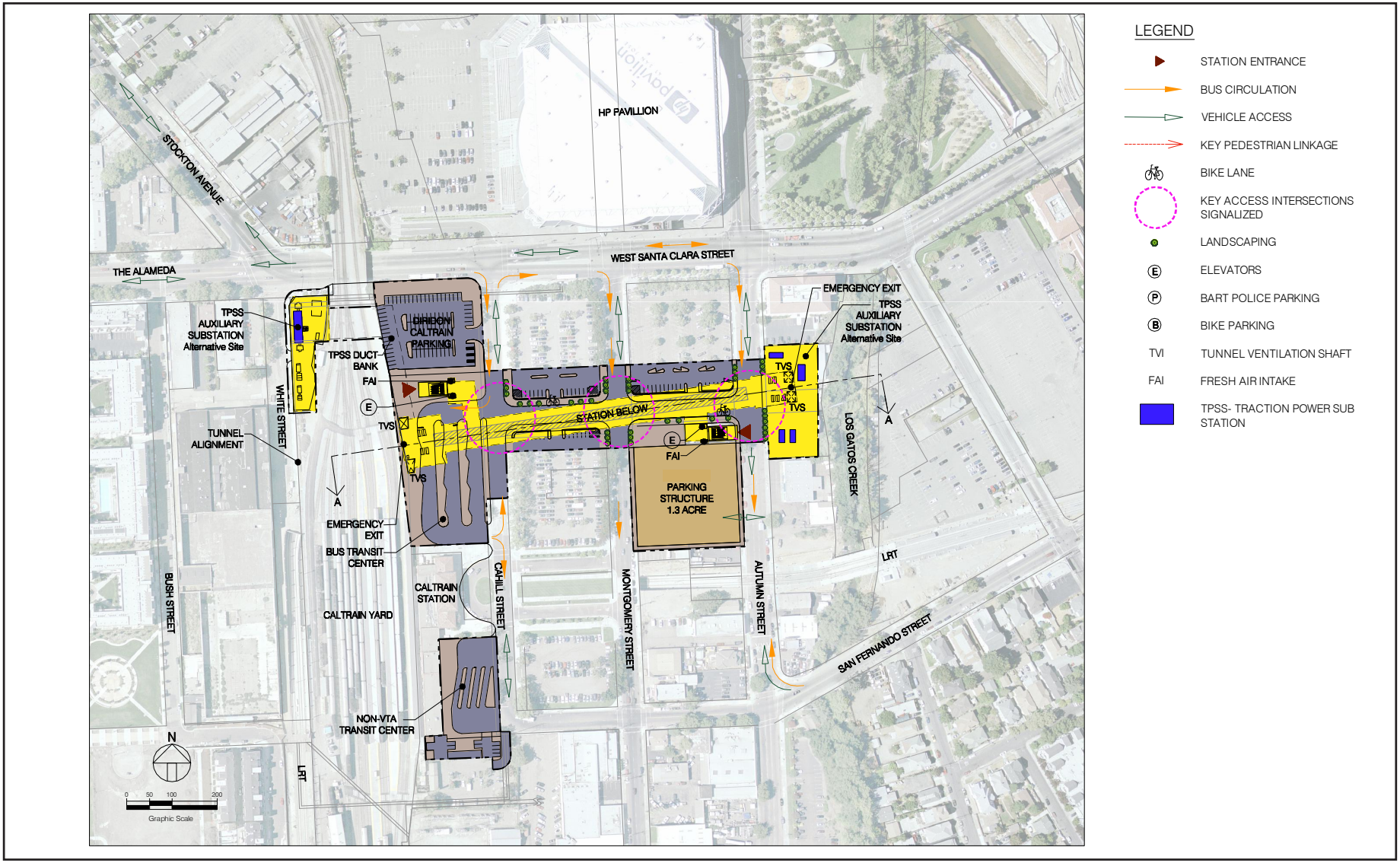
The ancillary areas would include ventilation facilities and associated vent shafts, a traction power substation, an auxiliary power substation, and a train control room. An emergency generator would be located near the east end of the station in an on the second or third floor of a new building to be constructed on the "Mexico Bakery" site. 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, the vent shaft would be located on the north side of East Santa Clara Street and on the west side of Market Street. 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. 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 would be guided by the City of San Jose's Master Streetscape Plan.

Diridon/Arena Station

BART would continue beneath West Santa Clara Street, shifting to the south to pass between the State Route 87 bridge foundations, and continuing below the Guadalupe River, a retaining wall, and Los Gatos Creek to the Diridon/Arena Station (Figure 2-19).

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. 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 700 feet long and 28 feet wide, with the mezzanine one level above. Pedestrian access to the mezzanine would be from both the east and west ends of the station. Street level pedestrian connections would be provided from the station to the San Jose Diridon Caltrain Station and San Fernando LRT station. The San Jose Diridon LRT station is located to the west, and connecting passengers could reach it by walking through the Caltrain station.



Source: VTA, 2008.

Figure 2-19: Diridon/Arena Station Conceptual Site Plan

An existing bus transit center located south of West Santa Clara Street between the Caltrain railroad tracks and Cahill Street would be expanded. A parking lot south of the existing Diridon Caltrain Station would be replaced by a new Bus Transit Center for non-VTA buses. Portions of other existing Caltrain parking lots located adjacent to the station area would be reconfigured. An eight-level parking structure would be located south of the station between Montgomery and Autumn streets. Access to the Diridon Station area would be from West Santa Clara Street at Cahill, Montgomery, and Autumn Streets from the north. Access to the station area from south would be from San Fernando Street. A new street would be constructed approximately above the alignment of the station box. Three new signalized intersections would be provided along this street at Cahill, Montgomery, and Autumn Streets.

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 fresh air intake/exhaust facility at each end of the station. The station area would also include Train Control Room S80.

There are two alternate locations for Traction Power Substation SDS and Auxiliary Power Substation SDA. The first location would be aboveground at the east end of the Diridon/Arena Station between Autumn Street and Los Gatos Creek. The substations would be co-located with two ventilation shafts east of Autumn Street. This location would also include an emergency generator. The site would be setback from the creek as appropriate to achieve basic riparian habitat protection objectives in accordance with the city's Riparian Corridor Policy Study guidelines. The second location would be aboveground at the southeast corner of White and West Santa Clara streets. If this location were chosen, then the emergency generator would be located aboveground at the west end of the Diridon/Arena Station, near the two ventilation shafts located west of Cahill Street.

Continuation of Tunnel Alignment

West of the Diridon/Arena Station, BART would continue beneath the San Jose Diridon Caltrain Station train tracks and White Street. The tunnel would then turn towards the north, crossing under The Alameda at Cleaves Avenue and West Julian Street at Morrison Avenue before aligning under the 80-foot-wide Stockton Avenue ROW, consisting of a 56-foot wide street and 12-foot wide sidewalks (STA 780+00).

On the east side of Stockton Street between approximately Schiele Avenue and Taylor Street, there are four alternate locations for Tunnel Ventilation Structure STS, an aboveground facility with an associated vent shaft, Auxiliary Power Substation SST, and Gap Breaker SXD (STA 786+00 to STA 791+00). The first potential location is near Schiele Avenue, the second and third are near Villa Avenue, and the fourth is between Villa Avenue and Taylor Street.

The tunnel would continue north, cross under the Caltrain train tracks, and divert from the Stockton Avenue ROW near Hedding Street (STA 812+00). The tunnel would continue on the east side of the Caltrain ROW and cross under I-880 before ascending and then exiting the west tunnel portal near Newhall Street (STA 833+00).

Several electrical and communication facilities would be located near the west tunnel portal and PG&E's FMC Substation. These facilities include High Voltage Substation SNH, Traction Power Substation SNS, and Train Control Building S82. The high voltage substation would be served from PG&E's FMC substation by a 115 kV line. There are two alternate routes for this 115 kV line connection. The first alternate route would begin at the high voltage substation, run north to Newhall Street, then run east on upgraded poles along Newhall Street, then south on an existing line along Stockton Avenue. A second alternate route would also run north to Newhall Street and then run east on upgraded poles along Newhall Street, but a new line would be constructed to traverse the PG&E substation site. The 115 kV line would require approximately 80-100 foot-high tapered tubular steel towers and/or wood poles spaced approximately every 150 to 300 feet.

Crossover tracks would be located in the retained cut just outside the tunnel portal (STA 833+00 to 839+00). BART would be at grade as it enters the yard and shops facility and the Santa Clara Station.

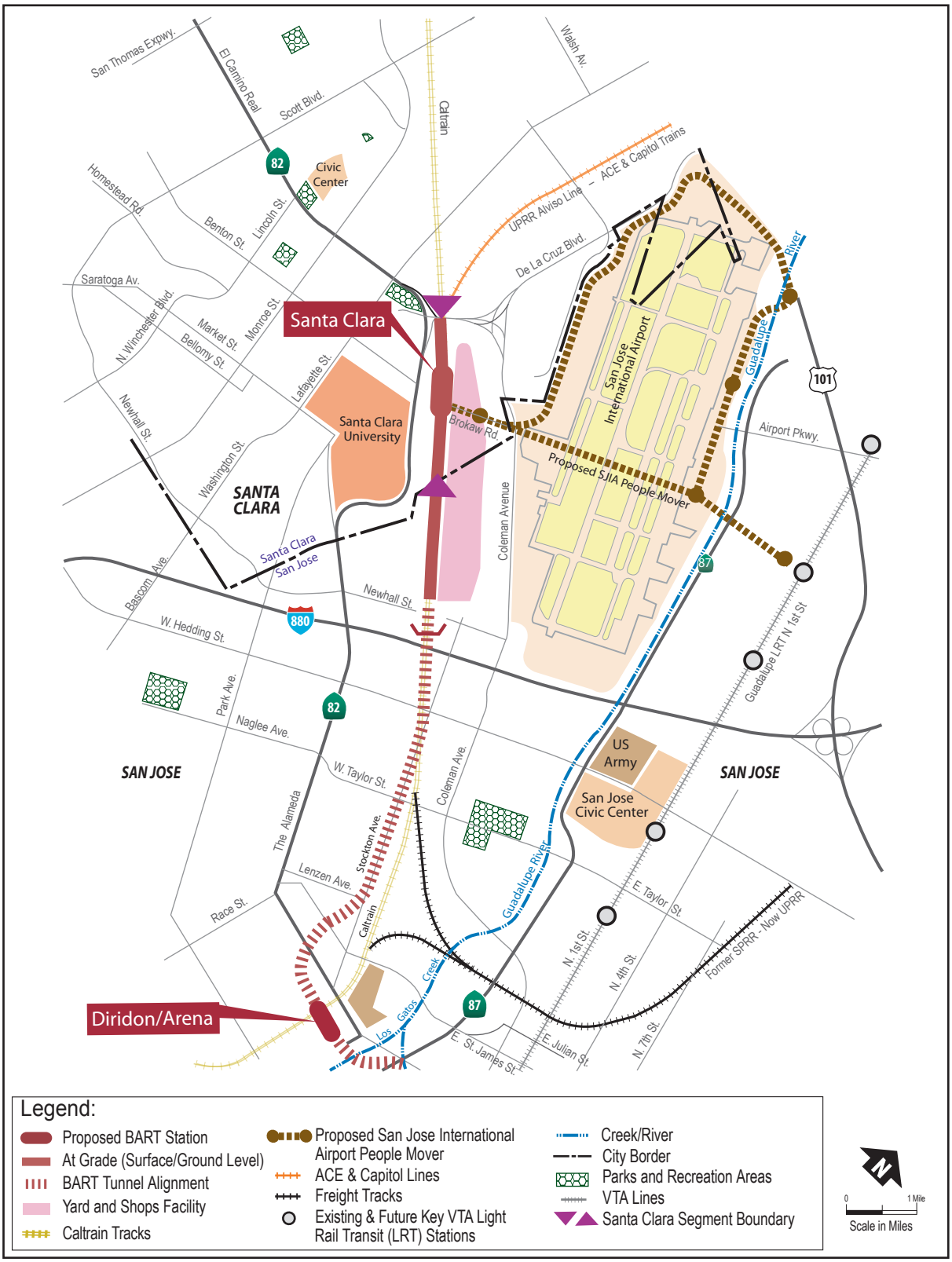
City of Santa Clara

The SVRTP Alternative alignment in Santa Clara is shown on Figure 2-20 and primarily consists of a yard and shops facility and the Santa Clara Station.

Newhall Yard and Shops Facility

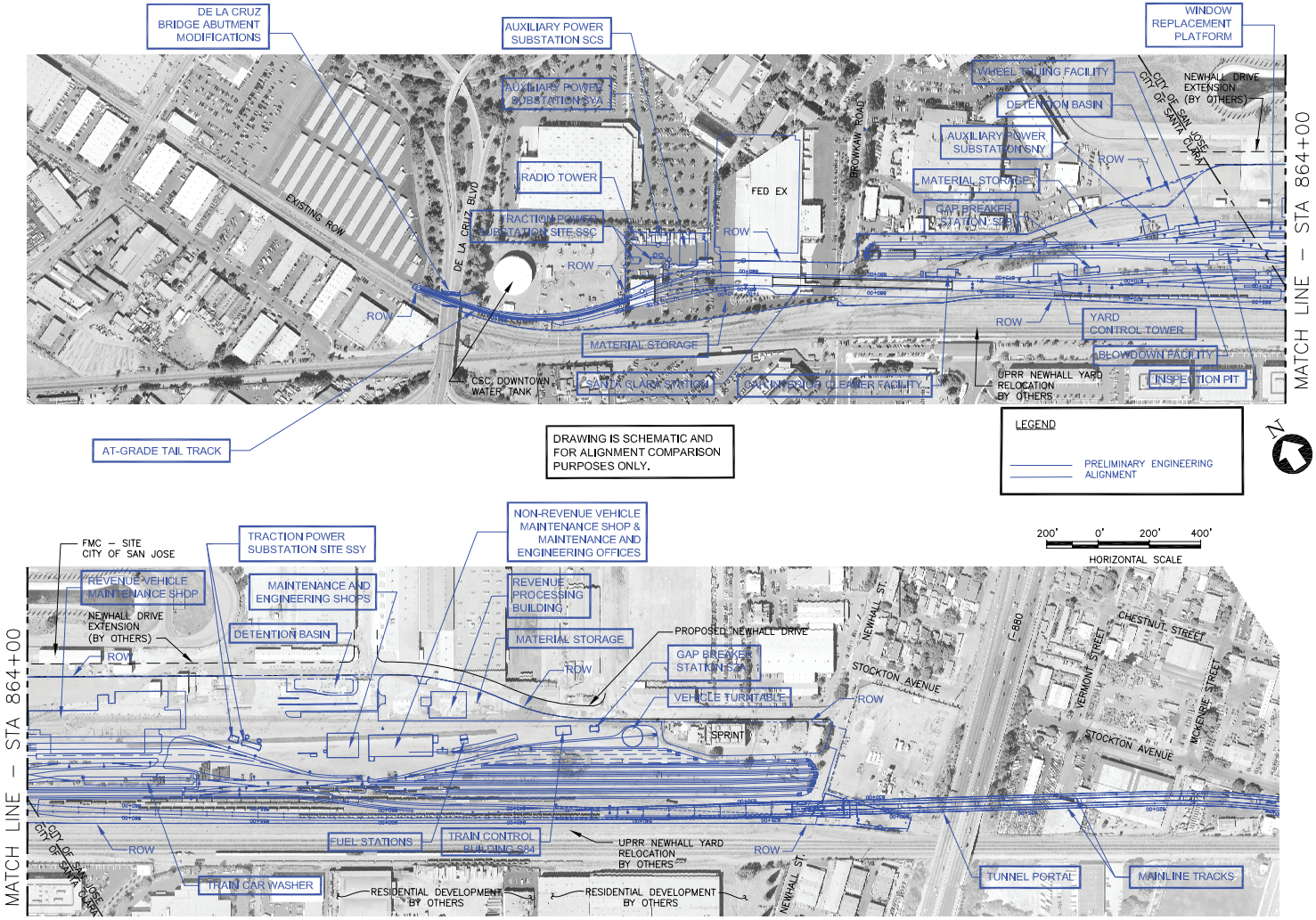
The Newhall Yard and Shops facility would begin north of the west tunnel portal at Newhall Street in San Jose and extend to De La Cruz Boulevard in Santa Clara, where a single tail track would cross under the De La Cruz Boulevard overpass and terminate on the other side of the overpass. The facility 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 main entrance to the facility would be from Newhall Drive. Other secured entrances would be provided at various locations for employees and emergency personnel. The site would include service roads to all buildings on site along with provisions for approximately 470 parking spaces for employees, authorized visitors, and delivery and service vehicles. A conceptual site plan of the Newhall Yard and Shops facility is shown in Figure 2-21.

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



Source: VTA, 2008.

Figure 2-20: SVRTP Alternative - City of Santa Clara



Source: VTA and CirclePoint, 2008.

Figure 2-21: Newhall Yard and Shops Facility Conceptual Site Plan

facilities would include a revenue processing building, vehicle turntable, non-revenue vehicle maintenance shop and maintenance and engineering offices, maintenance and engineering shops, 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 (a specially constructed, stand-alone building) would be located across from the main entrance along Newhall Drive. The site would require approximately 1.5 acres for the building, parking, and tractor/trailer turnaround operations. 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 another car to make up the train.

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 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.

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 shop would contain maintenance bays for mechanical and power components, as well as hoists, diagnostic repair equipment, and a storage area for replacement parts.

Fuel Stations

The diesel fuel stations would be located southeast of the non-revenue vehicle maintenance shop building. The facility allows maintenance vehicles such as rail mounted maintenance equipment to fuel up within the yard.

Revenue Vehicle Maintenance Shop

The revenue vehicle maintenance shop would be large building of 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 would be 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 include storage areas for cleaning carts and tools (cleaning chemicals, mops, brooms, squeegees, vacuum cleaners, etc.). The configuration of the building would support cleaning of the interior of BART cars in the Santa Clara Station platform area or in the yard storage tracks.

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 enclosed in a shed and open at each end to allow trains to travel over a depressed pit so that the underside of trains could be inspected.

Blowdown Facility

The blowdown facility would be 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 Truing Facility

The wheel truing facility would be located near the revenue vehicle maintenance shop. The primary function of this facility would be to enclose the wheel truing pit and equipment to facilitate the maintenance and repair of BART vehicle wheel sets.

Yard Control Tower

The yard control tower would be three stories in height. 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 within the yard and shops area.

Electrical and Communication Facilities

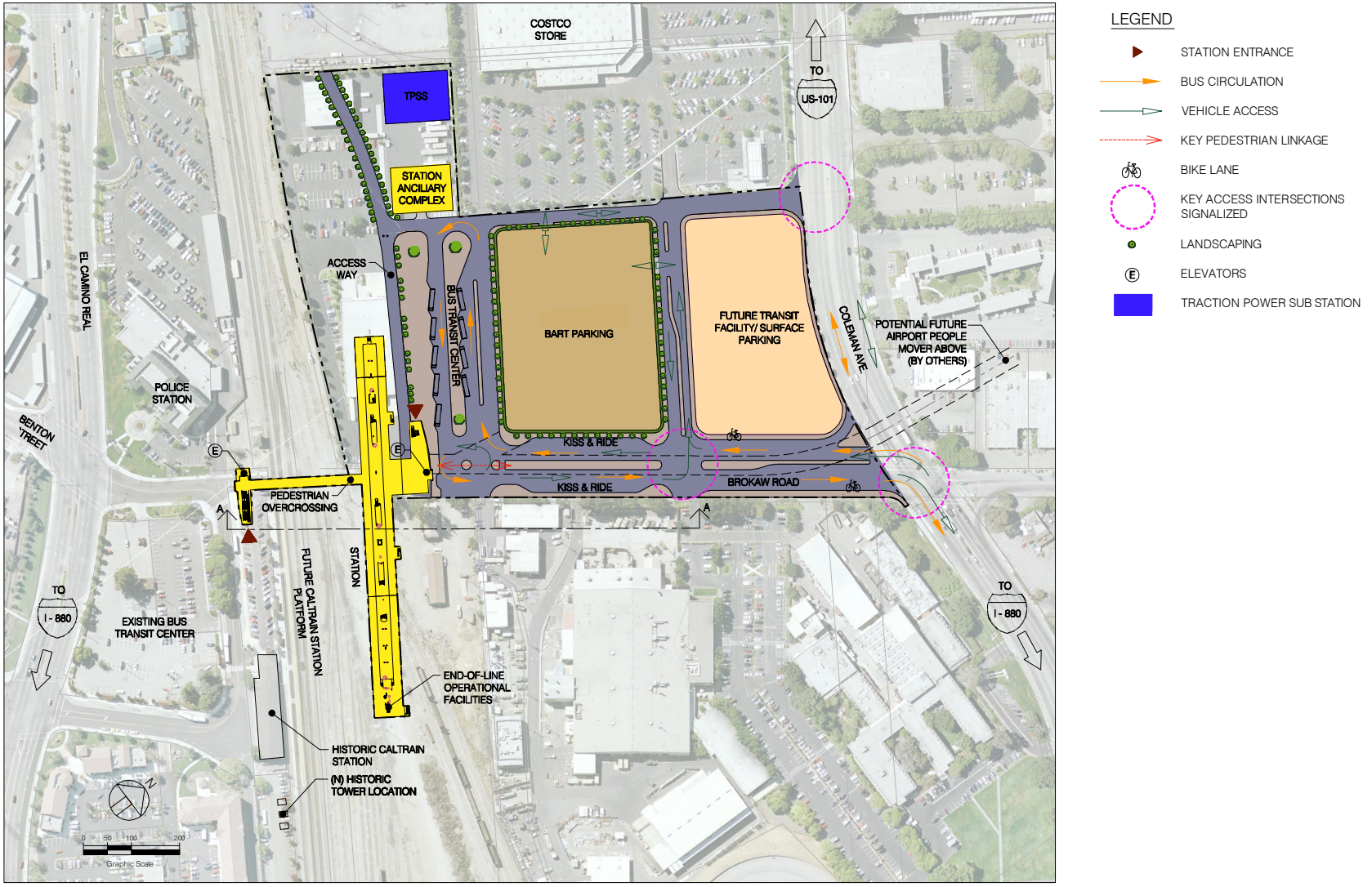
Traction Power Substation SSY, Auxiliary Power Substation SNY, Gap Breaker Station SZA, and Gap Breaker Station SZB, and Train Control Building S84 would be located in the Newhall Yard area. Traction Power Substation SSC and Auxiliary Power Substation SCS/SYA would be located north of the Santa Clara Station. 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. 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 19,000 square feet and located near the main entrance in San Jose. The other detention basin would be approximately 26,000 square feet. 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.

Santa Clara Station

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 (Figure 2-22). The station area would encompass approximately 12 acres. The station would be at grade, centered at the end of Brokaw Road, and would contain a 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 a 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, to be constructed as a separate project, 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. A five- to six-level parking structure would be constructed on 3.2 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. Access to the Santa Clara Station area would



Source: VTA, 2008.

Figure 2-22: Santa Clara Station Conceptual Site Plan

be from Brokaw Road off Coleman Avenue. Brokaw Road would be widened to four lanes. Signalized intersections would be provided off Coleman Avenue to Costco and within the station area on Brokaw Road for access to the parking structure.

2.5.2 BART AND VTA OPERATIONS

Fleet Requirements

Anticipated 2030 projected fleet requirements with and without the SVRTP Alternative are shown below in Table 2-6.

Table 2-6: SVRTP Alternative Fleet Size

Service	2007 Existing	2030 Projected (No Build Alternative)	2030 Projected (SVRTP Alternative)
VTA Buses	525	509	509 – 550
VTA Light Rail	100	100	100
BART Cars	669	956	1,083 – 1,090

Source: Connetics Transportation Group and VTA, 2008.

With the SVRTP Alternative, a total VTA bus fleet of 509 to 550 vehicles is estimated to meet 2030 service levels. The low figure represents no net change in the bus fleet compared to the No Build Alternative, achieved through improved efficiency of operations and the substitution of high capacity (articulated) buses for standard 40-foot buses where demand warrants. The high end of the range represents a worst case scenario where 41 additional standard 40-foot buses are needed to meet future demand and service levels. The total light rail fleet is not anticipated to change between now and 2030, with the total number of vehicles estimated at 100. VTA can accommodate the 2030 demand and still have a sufficient number of spare vehicles to accommodate breakdowns. An estimated 127 to 134 additional BART vehicles would be required compared to the 2030 No Build Alternative conditions. The BART fleet for the entire system with the SVRTP Alternative would consist of 1,083 to 1,090 vehicles. BART is in the process of updating its operating plan. It is anticipated that the new operating plan will have minimal impact on fleet requirements.

Operating Plan

The SVRTP Alternative 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. Seven new routes would serve Lockheed/Martin, Sunnyvale/Mountain View Industrial Parks, Oakmead (two routes), SJIA, and San Jose Civic Center/SJSU/Downtown San Jose and Santa Clara station to Great America LRT station. Three of the routes (serving Oakmead and SJIA) would

terminate at the BART Milpitas Station. Five of the six bus routes would also operate in the reverse-peak commute direction and in the midday at 15- to 60-minute headways. Some of VTA's local bus routes also would be rerouted to serve BART stations. VTA bus routes would operate at 2- 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.

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

Park-and-Ride Lots

The SVRTP Alternative would require three park-and-ride parking lots for the additional bus service. The number of parking spaces required at each lot is based on projected parking demand for new VTA bus service. Demand for two of the three park-and-ride lots would be met within existing facilities located at the approved Warm Springs BART Station (291 spaces) and the existing Evelyn LRT Station in Mountain View (47 spaces). The third site at the southeast corner of Carroll Street and Evelyn Avenue in downtown Sunnyvale is an existing parking lot that would be double-decked to add 61 spaces. The Berryessa Station would not require any additional park-and-ride parking to support the bus service for this alternative.

Ridership

The SVRTP Alternative is projected to serve a total of 98,751 riders per day in 2030. Further discussion of ridership projections and station parking demand is provided in Chapter 3, Transportation and Transit Analysis.

2.5.3 DESCRIPTION OF PROJECT FEATURES

Refer to Section 2.2.2 of this chapter for the descriptions for electrical facilities, train control and communication equipment, railroad intrusion detection systems, pumps stations, maintenance and emergency access, and "green" strategies.

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.

Tunnel and Underground Station Ventilation Facilities

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

Emergency Ventilation Facilities

Emergency ventilation facilities would be located along the tunnel alignment between the underground stations (called mid-tunnel ventilation structures) and within the underground stations. The facilities include fans, dampers, vent shafts, and associated facilities and operate primarily to remove smoke in cases of emergency in either the tunnels or the stations. In addition, the facilities limit air velocities 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 200 feet (including a small paved area which would be used for maintenance activities or parking for maintenance personnel and an area for electrical transformers) with most of the equipment housed in a structure approximately 90 by 140 feet and 25 feet in height. A 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, or fresh air being drawn into, a protective grate.

There would be several underground ventilation facilities at the Alum Rock, Downtown San Jose, and Diridon/Arena stations, with all of the equipment located in the ancillary areas at both ends of the station boxes. The surface feature would be one or more vent shafts at each end of the station. Each shaft would be approximately 15 by 20 feet and 10 to 15 feet in height above ground level. An opening would be located at the top of each 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.

Pump Stations

Pump stations are generally described in Section 2.4.3 of this chapter. All the equipment for pump stations along the SVRTP Alternative tunnel alignment or in underground stations would be located underground. Access to these facilities for maintenance purposes would be from the nearest underground station or another facility. Access to pump stations located elsewhere along the alignment would be from within the retained cuts or from an at grade location.

Under the SVRTP Alternative, pump station would be located as described in Section 2.4.3 of this chapter, plus the following additional locations:

- In the east and west 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 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 near Stockton Avenue).

2.5.4 PROJECT COSTS

This section summarizes the capital and operating costs associated with the SVRTP Alternative. Detailed cost information can be found in Chapter 9, Financial Considerations of this document. Costs are shown in constant 2008 dollars and year of expenditure (YOE) dollars.

Capital costs are estimated at $5.207 billion in 2008 dollars and $6.423 billion in YOE dollars for the SVRTP Alternative. These are the costs of improvements proposed for federal funding participation and include vehicles, right-of-way, design, administration, and construction.

Operating and maintenance costs for the SVRTP Alternative include both VTA's costs for bus, bus rapid transit (BRT), light rail (LRT) and other assisted services, plus the costs for BART extension service. VTA's non-BART operating costs for the SVRTP Alternative total $555.5 million in 2008 dollars and $1.196 billion in YOE dollars. The net operating costs assume fare and related operating revenues would offset a portion of the operating costs. The net cost of VTA's non-BART service would be $405.5 million in 2008 dollars and $916.9 in YOE dollars.

Under the SVRTP Alternative, the total incremental cost of BART service would be approximately $147.4 million in 2008 dollars and $273.8 million in YOE dollars. BART operating and maintenance costs include the maximum capital reserve contribution, and

direct and fixed cost contributions VTA would make annually to BART. The net operating cost for the SVRTP Alternative would be $63.2 million in 2008 dollars and $117.4 million in YOE dollars.

2.5.5 PROJECT SCHEDULE

The SVRTP Alternative would take approximately eight years to construct and perform start-up and testing activities, as shown in Figure 2-23. Passenger service for the SVRTP Alternative would start in late 2018, assuming funding is available.

2.6 RELATED PROJECTS

The projects discussed in this section are planned or proposed projects that are within or close to the right-of-way of the build alternatives (Figure 2-24). VTA has coordinated and will continue to coordinate its planning and conceptual design for the proposed transit alternatives with the possible development of these related projects. This section includes transit projects, other transportation projects, water resource related projects, and development projects with an environmental document completed or currently underway. Descriptions of these projects were obtained in consultation with the cities of San Jose, Milpitas, and Santa Clara.

Except as noted below, implementation of the BEP or SVRTP alternatives is not dependent on any of the related projects, and each related project has its own independent utility, i.e., could be built with or without implementation of either Build Alternative. The extension of BART to Warm Springs is a prerequisite for the BEP and SVRTP alternatives because both of these alternatives connect to the BART Warm Springs Station. In several cases, however, design of the related projects will need to be coordinated with the design of the proposed BEP and SVRTP alternatives. Such coordination is currently underway between VTA and the various planning and implementing agencies identified below.

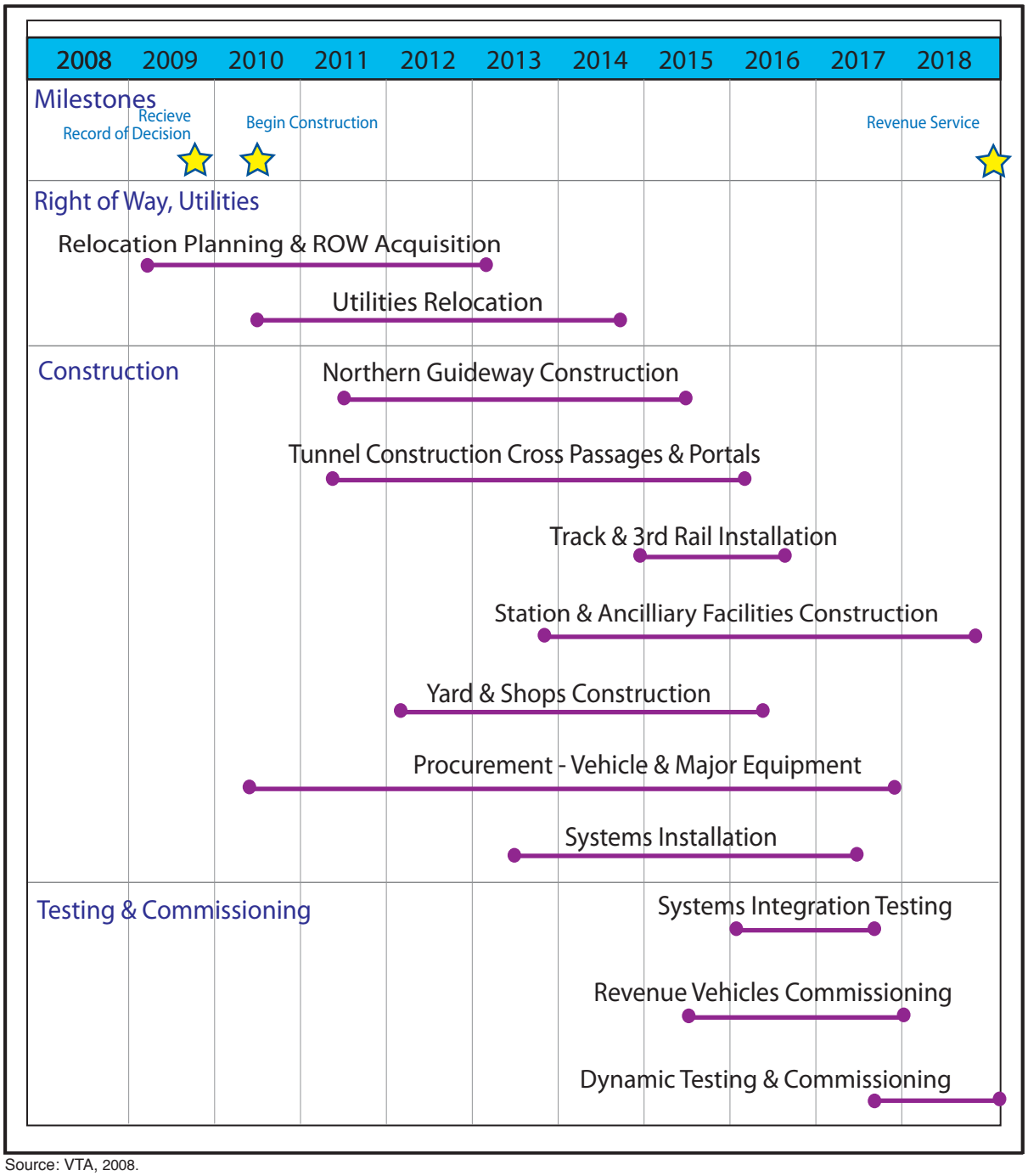
2.6.1 DEVELOPMENT RELATED PROJECTS

Berryessa General Plan Amendment

The City of San Jose is currently reviewing a proposed General Plan Amendment from Light Industrial to Transit Corridor Residential on a 13.64-acre site located south of Berryessa Road between King Road and the UPRR tracks (Figure 2-24, #12).

Mixed-Use Downtown San Jose Development Project

The San Jose Redevelopment Agency is proposing the development of 1.5 million square feet of mixed use development (Figure 2-24, #21). The development would



Source: VTA, 2008.

Figure 2-23: SVRTP Alternative Proposed Construction Schedule

Source: VTA, 2008.

Figure 2-24: Related Projects

include residential and commercial uses on an approximately 23.1-acre site located between West San Fernando Street and West San Carlos Street, and between Los Gatos Creek and the railroad tracks.

Pulte Homes Development Project

The Pulte Homes Development Project, located to the south of the Santa Clara Station at Newhall Street and Campbell Avenue within the City of San Jose, was approved in 2007 and is currently under construction (Figure 2-24, #22). The project involves the construction of 220 homes situated on a 10.2-acre site and is anticipated to be completed in June 2009.

2.6.2 RELATED TRANSIT PROJECTS

BART Extension to Warm Springs

An extension of BART to Warm Springs (Figure 2-24, #1) is a prerequisite to the BEP and SVRTP alternatives because the BEP and SVRTP alternatives would be a continuation of BART facilities and service south from the planned BART Warm Springs Station. It is also included within the No Build Alternative. An EIR was prepared and approved by BART in 1991 for the Warm Springs Extension Project. A Supplemental EIR was subsequently prepared to address changes proposed to the project, including the BART Irvington Station. On June 26, 2003, the BART Board of Directors certified the Supplemental EIR and adopted modifications to and updates of the Warm Springs Extension Project. The Federal Transit Administration (FTA), as the lead federal agency, and BART released a Final Environmental Impact Statement (FEIS) for the Warm Springs Extension Project in July 2006, followed by a Record of Decision (ROD) on October 24, 2006.

Santa Clara – Alum Rock Transit Improvement Project

The Santa Clara – Alum Rock Transit Improvement Project (SCAR Project) proposes Single-Car LRT or Bus Rapid Transit service along East/West Santa Clara Street east of Almaden Boulevard to the Capitol Line on Capitol Avenue (Figure 2-24, #17). This project does not directly impact the BEP Alternative but is related to the SVRTP Alternative because the proposed BRT/LRT would have a station stop on East Santa Clara Street at 28th Street approximately two blocks from the Alum Rock BART station. As a programmed improvement within the *VTP 2030* (see Table 2-1), it is also a component of the No Build Alternative.

Capitol Expressway Capitol Expressway Light Rail Transit Project

The Capitol Expressway Light Rail Project is a 3.1 mile extension of light rail along Capitol Expressway in the City of San Jose from the existing Alum Rock Station to Eastridge Transit Center in its first phase and to Nieman Boulevard in a future phase (Figure 2-24, #16). On August 2, 2007, the VTA Board of Directors' certified the Final Supplemental EIR and amended the project description. This project is located

approximately 2 miles from either the Berryessa or Alum Rock BART stations and therefore does not directly impact either of the two Build Alternatives. However, as a programmed improvement within the *VTP 2030* (see Table 2-1), it is a component of the No Build Alternative.

New BART Operational Control Center

BART operates an existing Operation Control Center (OCC) in the City of Oakland to provide real-time supervisory monitoring and control capability. The facility provides automatic train supervision functions and manages train schedules, train dispatches, and train tracking. In addition, the facility provides control, indication, and alarm functions to enable OCC operators to manage the traction power and support plant control functions. With the exception of the approved Warm Springs Extension, it is not feasible to support additional extensions using the existing OCC facility. The facility is limited by the available space for controller workstations and by the area of the projection display board. BART is currently evaluating alternatives to both support BART expansion plans and a Build Alternative. Subsequent, environmental studies will be required prior to approval of a project.

Caltrain Electrification Program

The Peninsula Corridor Joint Powers Board Caltrain Electrification Program would provide for the conversion from diesel-hauled to electric-hauled trains along the approximately 80 mile long Caltrain corridor from San Francisco to the north through San Mateo County terminating in the City of Gilroy in southern Santa Clara County (Figure 2-24, #20 along the existing Caltrain corridor). Caltrain plans to complete electrification between 2012 and 2014. The SVRTP Alternative would provide transfers to Caltrain at the Diridon/Arena and the Santa Clara stations. In addition, some of the electric substations for the electrification project may be located within the SVRTP Alternative right-of-way at Newhall Yard. As a programmed improvement within the *VTP 2030* (see Table 2-1), it is a component of the No Build Alternative. This project does not directly impact the BEP Alternative.

Norman Y. Mineta San Jose International Airport Connector

An airport people mover (APM) connector is included in VTA's Measure A Program, which was approved by Santa Clara County voters in November 2000. The connector would be constructed east from the Santa Clara Caltrain Station on an elevated alignment and then descend to either an at-grade or underground configuration extending to the airport terminals and continuing to a connection point with the existing VTA light rail system in First Street (Figure 2-24, #23). The SVRTP Alternative conceptual station designs allow for a link between the proposed APM and the proposed Santa Clara Station described in this chapter. The APM project has no direct impact to the BEP Alternative.

2.6.3 OTHER RELATED TRANSPORTATION PROJECTS

Freight Railroad Relocation and Lower Berryessa Creek Project

In 2003, VTA acquired the Union Pacific Railroad Corporation's (UPRR's) Western Pacific Milpitas/Fremont Line, from north of Mission Boulevard in Fremont to San Jose, a distance of approximately 10 miles. The line runs parallel to a second UPRR line (acquired by the UPRR from the former Southern Pacific) and together they define the northern portion of the alignment for the proposed BEP and SVRTP alternatives. The portion of the former Western Pacific line from approximately Mission Boulevard and the Warm Springs BART Station south is the designated right-of-way for the Build Alternatives. The portion of the Western Pacific line north of Mission Boulevard was sold to BART in August 2007 to provide the alignment for the programmed Warm Springs Extension Project, to begin construction in 2009.

As part of the Western Pacific line acquisition, VTA agreed to allow UPRR to continue freight operations until all freight service could be relocated to the former Southern Pacific line. As part of this relocation and abandonment, the Southern Pacific line will also be relocated to facilitate UPRR freight handling services in the corridor. Utilities in the UPRR corridor will also be relocated and minor real estate acquisitions made. When completed, the Western Pacific line would be abandoned. Designs for the relocation and abandonment of UPRR freight service are almost complete and will soon proceed independent from the BEP and SVRTP alternatives.

Another element of the relocation project is the abandonment of freight railroad service to existing shippers south of Montague Expressway in order to make the corridor there available for VTA's use. VTA is evaluating current needs of existing shippers and proposes to assist in converting railroad freight shipping to trucks or in relocating businesses, as necessary.

The existing rail lines to be relocated are partially within the proposed project right-of-way for both the BEP and SVRTP alternatives, and therefore the completion of the relocation work would be a prerequisite to construction of the Build Alternatives.

I-880/Mission Boulevard (Route 262)/Warren Avenue Interchange Reconstruction and I-880 Widening Project

The California Department of Transportation (Caltrans) and the Alameda County Transportation Improvement Agency (ACTIA) have programmed the widening of Mission Boulevard to six lanes, three in each direction (Figure 2-24, #4). Included are retaining and sound walls, street lighting, raised medians, and the replacement of the UPRR railroad bridge. Utility relocation is scheduled to begin in spring of 2009. This project would affect the length of the BART bridge structure to be constructed over the widened Mission Boulevard underpass. VTA is coordinating with Caltrans and ACTIA regarding the relocation of existing freight railroad facilities and other impacts to VTA property at this location. This project occurs within the alignment of both the BEP and

SVRTP alternatives. Because it is already under construction, this project is also included within the definition of the No Build Alternative.

Warren Avenue/Union Pacific Railroad Grade Separation Project

The City of Fremont has programmed construction of an East Warren Avenue underpass of the railroad ROW (Figure 2-24, #5). The grade separation project is included in a Statutory Exemption (Title 14, Section 15282(h) of the California Code of Federal Regulations and Section 21080.13 of the Public Resource Code) filed in July 2002 by the City of Fremont. The grade separation also includes reconfiguration of existing access to a truck-rail transfer facility at Warren Avenue. Utility Relocation is tentatively scheduled to begin in spring of 2009. Funding and construction of this project would enable the BART alignment to be constructed at-grade over the East Warren Avenue underpass for both the BEP and SVRTP alternatives as described earlier in this chapter. Because it is already programmed for construction, this project is also included within the definition of the No Build Alternative. VTA is coordinating with the City of Fremont regarding the relocation of existing freight railroad facilities and other impacts to VTA property at this location.

US 101/Taylor-Mabury Interchange

VTA and the City of San Jose are working in partnership with Caltrans to develop the 101 Implementation Plan, a conceptual planning and engineering study for the segment of 101 between Taylor-Mabury and SR 87. The Plan is evaluating a range of projects including a new interchange at the Taylor-Mabury crossing of US 101 (Figure 2-24, #15). Once the Implementation Plan is completed and projects are prioritized, work would begin on a Project Study Report. Implementation of this project would provide improved vehicular access to the Berryessa Station for both Build Alternatives.

Calaveras Boulevard Widening Project

VTA is currently evaluating this project as one option in an I-680/I-880 cross connector study (Figure 2-24, #7). This project includes widening the bridge at SR 237 over the alignment of the BEP and SVRTP alternatives. Because the widening project would pass over the BART alignment on an aerial structure, there is no direct impact, but the design and construction of the widening project would need to be coordinated with either Build Alternative to avoid construction impacts and maintain required vertical clearances.

Montague Expressway Widening Project

The proposed project consists of widening Montague Expressway from six lanes to eight lanes and Landess Avenue from four lanes to six lanes between I-680 and Park Victoria Drive (Figure 2-24, #11). Commuter lanes would be continuous between Pecten Court in Milpitas and Mission College Boulevard in Santa Clara.

2.6.4 RELATED WATER RESOURCES PROJECTS

The BEP and SVRTP alternatives would not construct all the drainage improvements required along the railroad corridor to address flooding, as several projects by others are planned and/or programmed (funded) to address existing design flow and flooding conditions. The objective of these projects is to upgrade the creek channels to increase their capacities. Once completed, these projects will reduce the risk of flooding in the areas of improvements, which include portions of the BART alignment. These projects include:

Freight Railroad Relocation and Lower Berryessa Creek Project

The transportation aspects of the Freight Rail Relocation project have been described above. In addition, this project includes drainage improvements on Toroges Creek, Line B-1, Line B, Scott Creek, Calera Creek, Berryessa Creek, and Wrigley Creek to accommodate anticipated stormwater flows from a 100-year flood event (Figure 2-24, #2). These improvements are planned and programmed for construction in 2009 and 2010, prior to construction of either the BEP or the SVRTP alternatives. These improvements are discussed in the *Freight Railroad Relocation and Lower Berryessa Creek Project – Initial Study with Mitigated Negative Declaration* (September 2007) and an Addendum to this document (March 2008). Both the BEP and SVRTP alternatives will benefit from the proposed drainage improvements.

Berryessa Creek Flood Protection Project

The Santa Clara Valley Water District is planning the Berryessa Creek Flood Protection Project within the project area to increase the conveyance capacity of the creek to convey the 100-year design flow and to remove areas in Milpitas and San Jose from the 100-year floodplain (Figure 2-24, #8). The project is divided into the joint Santa Clara Valley Water District/U.S. Army Corp of Engineers Berryessa Creek Project and the Lower Berryessa Creek Project (AKA Berryessa Creek Levees Project). The joint Santa Clara Valley Water District/U.S. Army Corp of Engineers Berryessa Creek Project begins at Calaveras Boulevard in Milpitas and ends at Old Piedmont Road in San Jose. The Lower Berryessa Creek Project begins at the confluence with Lower Penitencia Creek in Milpitas and ends at Calaveras Boulevard. This project includes improvements on Calera Creek to prevent flooding upstream of the railroad corridor. The Lower Berryessa Creek Project includes construction of a multi-cell box culvert along Berryessa Creek which will ultimately support a segment of the BART alignment for either the BEP or SVRTP alternatives. As a result, completion of the box culvert would need to occur prior to construction of the BART project for either build alternative. Upon completion of these projects, flooding from overflow of Berryessa Creek within the project area would be eliminated, including along the alignment, at the Milpitas Station area, and around East Penitencia Channel. VTA is coordinating with the Santa Clara Valley Water District regarding the construction of these drainage facilities.

Upper Penitencia Creek Flood Protection Project

The Santa Clara Valley Water District and Army Corp of Engineers are studying various alternatives to reduce the flooding potential along Upper Penitencia Creek from Coyote Creek to Dorel Road in San Jose (Figure 2-24, #13). Among the alternatives being studied are widening of the existing channel and constructing an underground bypass channel box structure on Upper Penitencia Creek to convey high creek flows directly to Coyote Creek. With implementation of the project, Upper Penitencia Creek would be able to convey the design flows without overtopping the banks near the Berryessa Station area. The project also would eliminate the floodplains around the railroad corridor. This project provides benefits to both build alternatives.

Lower Silver Creek Flood Protection Project

The Santa Clara Valley Water District's Lower Silver Creek Flood Protection Project, currently under construction, provides flood protection along an approximately 4.4 mile long channel reach between Cunningham Avenue and Coyote Creek (Figure 2-24, #14). Reaches 1 and 2 are located at the confluence with Coyote Creek and McKee Avenue. Reach 3 is located between McKee Avenue and Cunningham Avenue. The construction of Reaches 1 and 2 is complete, near the Las Plumas Yard Option site, and the channel in the vicinity of US 101 is wide and the banks are protected with gabions where necessary. This project eliminates the 100-year floodplains along the railroad corridor in this area, at the Las Plumas Yard site under the BEP Alternative, and at the east tunnel portal and Alum Rock Station area under the SVRTP Alternative. The project eliminates the 500-year floodplain for both the critical facilities at the Las Plumas Yard site (BEP Alternative) and the east tunnel portal (SVRTP Alternative).

Mid-Coyote Creek Flood Protection Project

The Santa Clara Valley Water District's Mid-Coyote Creek Flood Protection Project is located in the central portion of the Coyote Watershed. Its limits extend approximately 6.1 miles in San Jose between Montague Expressway and I-280 (Figure 2-24, #19). The purpose of the project is to increase the conveyance capacity of Coyote Creek to provide flood protection to homes, schools, businesses, and highways from a 100-year flood event, and would reduce the likelihood of flooding issues associated with Berryessa Station, resulting in benefits for both build alternatives.

VTA will coordinate with appropriate agencies to obtain updated information on the progress of these projects. In the event that any of these flood protection projects, which eliminate the 100-year floodplains within the BEP and SVRTP alternatives areas, is not implemented on schedule, additional hydrologic and hydraulic studies will be prepared during subsequent engineering phases.

2.7 ALTERNATIVES CONSIDERED AND WITHDRAWN

A total of 11 alternatives were originally developed and assessed in the Major Investment Study. The process by which these alternatives were determined and ranked is described in Section 2.1, Alternatives Development Process. The eleven alternatives were:

- **Alternative 1:** The **Baseline Alternative** combined existing and programmed highway, bus, rail transit, and commuter rail services in the corridor with greatly expanded regional (inter-county) express bus services using I-880, I-680 and SR 237 freeway and Montague Expressway HOV lanes to Silicon Valley employment centers connecting at the planned BART Warm Springs station.

- **Alternative 2:** The **Busway Alternative** used an exclusive grade-separated busway along the former UPRR alignment for expanded express bus services traveling between the planned BART Warm Springs station and Silicon Valley employment centers.

- **Alternative 3:** The **Commuter Rail Alternative on the Alviso Alignment** included increased commuter rail service on the ACE and Capitol Corridor intercity train alignments from Stockton, Tracy, and Livermore and from Union City BART.

- **Alternative 4:** The **Commuter Rail Alternative on the former Southern Pacific Railroad (SPRR) Alignment** included commuter rail service between the planned BART Warm Springs and San Jose Diridon Caltrain Station via the former SPRR ROW.

- **Alternative 5:** The **Commuter Rail Alternative on the former UPRR Alignment** included commuter rail service between the planned BART Warm Springs Station and 28th and Santa Clara Streets in San Jose via the former UPRR ROW.

- **Alternative 6:** The **Diesel Light Rail Alternative on the former SPRR Alignment** included diesel light rail service on two routes, one between the planned BART Warm Springs Station and Mountain View Caltrain Station and the other between the planned BART Warm Springs Station and San Jose Diridon Station via the former SPRR ROW and Tasman East and West LRT lines.

- **Alternative 7:** The **Diesel Light Rail Alternative on the former UPRR Alignment** included diesel light rail service on two routes, one between the planned BART Warm Springs Station and Mountain View Caltrain Station and the other between the planned BART Warm Springs Station and San Jose Diridon Station via the former UPRR ROW and Tasman East and West LRT lines.

- **Alternative 8:** The **Light Rail (electric-powered) Alterative on the former SPRR Alignment** included light rail service on two routes, one between the planned BART Warm Springs Station and Mountain View Caltrain Station and the other between the planned BART Warm Springs Station and San Jose Diridon Station via the former SPRR ROW and Tasman East and West LRT lines.

- **Alternative 9:** The **Light Rail (electric-powered) Alterative on the former UPRR Alignment** included light rail service on two routes, one between the planned BART Warm Springs Station and Mountain View Caltrain Station and the other between the planned BART Warm Springs Station and San Jose Diridon Station via the former UPRR ROW and Tasman East and West LRT lines, and existing street ROW.

- **Alternative 10:** The **BART Extension Alternative on the SPRR Alignment** included an extension of BART services from the planned BART Warm Springs Station to the Santa Clara Caltrain Station via the former SPRR ROW, downtown streets (subway alignment) and Caltrain ROW.

- **Alternative 11:** The **BART Extension Alternative on the former UPRR Alignment** included an extension of BART services from the planned BART Warm Springs Station to the Santa Clara Caltrain Station via the former UPRR ROW, downtown streets (subway alignment), and Caltrain ROW.

The screening process that was used in the MIS to evaluate these 11 alternatives is described in Section 2.1, Alternatives Development Process. The initial screening eliminated alternatives 4, 6, 7, 8, and 10 for the following reasons:

- Alternatives 6 and 7 (both diesel powered light rail alternatives) received a “low” rating in terms of conformity with project goals, including incompatibility with existing LRT operation, lack of community acceptance, and increased generation of air pollutants and noise; and

- Alternatives 4, 6, 8 and 10 could not co-exist at grade with freight railroad service in the severely constrained SPRR right-of-way without being placed on aerial structures or underground.

As discussed in Section 2.1, Alternatives Development Process, the remaining six alternatives were refined and subjected to additional technical analysis and evaluation. A composite ranking of the six alternatives was developed, with Alternative 11 (BART Extension on the former UPRR Alignment) emerging as the highest-ranked alternative. On November 9, 2001, the VTA Board unanimously selected the BART Extension on the former UPRR Alignment as the Preferred Investment Strategy/Locally Preferred Alternative for the project corridor, and directed that it be carried forward into the environmental compliance phase, along with the Baseline Alternative. The Baseline Alternative was carried forward in the 2004 Draft EIS/EIR to comply with FTA project development guidelines.