

SANTA CLARA
VALLEY TRANSPORTATION AUTHORITY (VTA)
SILICON VALLEY RAPID TRANSIT CORRIDOR MIS/EIS/EIR

MAJOR INVESTMENT STUDY (MIS)
Final Report

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MIS FINAL REPORT

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S.0 EXECUTIVE SUMMARY

Beginning in March 2001, the Santa Clara Valley Transportation Authority (VTA) initiated a Major Investment Study (MIS) for the Silicon Valley Rapid Transit Corridor (SVRTC). The purpose was to address the potential benefits and impacts of alternative transportation investment strategies, leading to the selection of a Preferred Investment Strategy for the corridor. The MIS will be followed by the preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR), which will involve the appropriate technical and environmental analysis for the approved Preferred Investment Strategy. The entire MIS/EIS/EIR process will result in a transportation solution for the corridor through extensive analysis and public outreach.

Based on the results of the MIS, the VTA Board of Directors approved a BART Extension to the cities of Milpitas, San Jose and Santa Clara on the Union Pacific Railroad (UPRR) Alignment as the Preferred Investment Strategy for the corridor on November 9, 2001. The recommended Preferred Investment Strategy, Alternative 11, includes the following elements: 1) mode; 2) general alignment; 3) station locations; and 4) maintenance and storage facility site. The project elements are summarized in **Table S-1** and delineated on **Figure S-1**.

Table S-1

Preferred Investment Strategy -- Alternative 11

Mode	<ul style="list-style-type: none">• BART – A fully grade separated and automated rail rapid transit technology system
Alignment	<ul style="list-style-type: none">• Union Pacific Railroad (UPRR) with tunnel under Downtown San Jose to Santa Clara (~16.3 route miles)
Stations	<ul style="list-style-type: none">• Montague/Capitol• Berryessa• Alum Rock• Civic Plaza/San Jose State University• Market Street• Diridon/Arena• Santa Clara
Maintenance & Storage Facility	Union Pacific Railroad Newhall Yard in San Jose/Santa Clara
Project Costs (2001 dollars in millions)	<ul style="list-style-type: none">• Annual Operating and Maintenance = \$63 M• Total Capital Costs = \$3,710M
Ridership (Year 2025)	<ul style="list-style-type: none">• Average Weekday = 87,200• New Riders = 60,600



**Figure S-1 Alternative 11: Preferred Investment Strategy BART on UPRR (Former WPRR)
Alignment**

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SILICON VALLEY RAPID TRANSIT CORRIDOR MIS FINAL REPORT

1.0 INTRODUCTION

This document summarizes the Major Investment Study (MIS) planning process for the Silicon Valley Rapid Transit Corridor (SVRTC). The MIS is the first step under Federal Transit Administration (FTA) project development guidelines that may ultimately lead to an application for federal funds to implement major capital transportation improvements in the corridor.

The document is divided into four chapters followed by six appendices, which provide more detailed information about the public involvement process, the project alternatives, and the screening and evaluation processes. The first chapter provides the project description and location, the project background, the purpose and need for the project, and the project goals. The second chapter identifies the preliminary list of 11 alternatives and describes the screening of these alternatives. It also provides the rationale for selecting six of the 11 alternatives to be carried forward for further refinement and evaluation, as well as a summary of the physical and operating characteristics of the six remaining alternatives. The six alternatives are:

- Alternative 1: Baseline with Expanded Express Bus on I-880 and I-680
- Alternative 2: Busway on the Union Pacific Railroad (UPRR) Alignment
- Alternative 3: Commuter Rail on the UPRR's "Alviso" Alignment
- Alternative 5: Commuter Rail on the UPRR Alignment
- Alternative 9: Light Rail (LRT) on the UPRR Alignment
- Alternative 11: Bay Area Rapid Transit (BART) on the UPRR Alignment

In addition, a VTA-operated BART-compatible alternative was subsequently formulated as a "fall-back" option pending the negotiations with the Bay Area Rapid Transit District.

The third chapter describes the evaluation of the six alternatives compared with a No Project Alternative. The fourth chapter summarizes the recommendation of the SVRTC Policy Advisory Board and the rationale and selection of the Santa Clara Valley Transportation Authority (VTA) to carry forward the BART alternative as well as the FTA-required "New Starts" Baseline Alternative into the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) phase of the project. It also provides the cost estimates and funding sources for the selected alternatives, the key issues yet to be resolved, and the steps in project development and implementation following the MIS.

1.1 PROJECT DESCRIPTION AND LOCATION

VTA is the local lead agency in conducting the Silicon Valley Rapid Transit Corridor MIS and EIS/EIR. This heavily traveled north-south corridor extends over 20-miles from the cities of Union City, Newark and Fremont through Milpitas, northeast and downtown San Jose, terminating in Santa Clara (**Figure 1-1**).

Figure 1-1 – Silicon Valley Rapid Transit Corridor Study Area

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1.2 PROJECT BACKGROUND

The MIS for this corridor is the most recent in a series of transportation improvement studies that have occurred over the last 25 years. The transportation studies have attempted to identify transportation solutions for one of the most congested and rapidly growing travel corridors in the San Francisco Bay Area region. From these studies, specific transit capital and operations improvements, such as the Tasman light rail line and improved bus connections between the Fremont BART Station and Santa Clara County, have been planned and implemented. However, more extensive transit service improvements are required to provide needed additional capacity to address an anticipated 52 percent growth in corridor travel over the next 20 years. In addition, the transit service improvements are needed to close the approximately 20-mile gap in the regional rail system between the BART system, which now terminates in central Fremont, and the Caltrain system in Downtown San Jose as well as to relieve congestion on the regional roadway system.

While substantial state and local funding for transportation improvements in this corridor has been identified through the approval of Santa Clara County Measure A in November 2000, it is likely that federal funding would be required to implement a major transit capital improvement project that can address projected congestion in the corridor and provide a link between existing rail services in the corridor, a long-standing goal in the Bay Area. FTA guidelines require the local lead agency to follow a step-by-step process to compete and qualify for federal Section 5309 (New Starts) discretionary funding for major transit capital improvement projects.

1.3 PURPOSE OF THE MAJOR INVESTMENT STUDY

The MIS represents the first step in the FTA project development process, which may ultimately lead to an application for federal funds to implement major capital transportation improvements in the corridor. The MIS process (indicated in **Figure 1-2**) enables communities to focus on the issues and potential solutions to address corridor transportation problems. The process also provides decision-makers with technical information (such as mode and alignment options, capital and operating cost estimates, engineering and environmental constraints) and alternative strategies to alleviate existing and future transportation problems in the corridor. As part of this process, a proactive community involvement program allows decision-makers the chance to understand the concerns and interests of the general public in resolving the transportation problems identified in their communities a summary of the SVRTC public involvement program is presented in **Appendix A**.

Decision-makers use the community input as well as technical information and input from the SVRTC Policy Advisory Board (PAB) and Technical Advisory Committee (TAC) to determine the Preferred Investment Strategy, the comprehensive package of transportation improvements selected by the VTA Board for the corridor.

1.4 KEY ISSUES IN THE CORRIDOR

1.4.1 POPULATION AND EMPLOYMENT GROWTH

The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) developed population and employment growth projections for 2025. For this MIS, the projections have been disaggregated by MTC "Superdistrict"¹ (**Figure 1-3**) to indicate the increase in jobs and

¹ ABAG and MTC have defined a set of 34 "superdistricts" that are used to aggregate traffic zones and travel demand data so that information can be tabulated and displayed in a summary fashion. The primary market area for the major transit capital investments being considered in this study includes five superdistricts: Superdistrict 9 - The greater north Santa Clara County area; Superdistrict 11 - Central San Jose including the downtown area; Superdistrict 12 -The City of Milpitas and northeast San Jose; Superdistrict 15 - Eastern Alameda County; and Superdistrict 16 -Greater Fremont (southern Alameda County) area.

Figure 1-2 – Basic Steps in the MIS Planning Process

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Figure 1-3 – MTC Superdistricts in the SVRTC

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households within the corridor. **Table 1-1** presents the estimated increase in households and employment between 2000 and 2025 for the Superdistricts that are relevant for the corridor analysis. As illustrated in **Table 1-1**, the increase in number of households range from 14,425 in Superdistrict 16 (Greater Fremont) to 36,259 in Superdistrict 15 (eastern Alameda County), an increase of 14.6 percent and 58.7 percent, respectively. Household growth will, however, be outpaced by the increase in the number of jobs throughout the corridor. Superdistricts 15 (eastern Alameda County) and 9 (Santa Clara/Silicon Valley) are expected to add 106,225 jobs (an increase of 108.1 percent) and 83,790 jobs (an increase of 21.2 percent), respectively.

Table 1-1
Projected Population and Employment Growth in the SVRT Corridor between 2000
and 2025 (by MTC Superdistrict)

Superdistrict	Household Growth	Percent Increase	Employment Growth	Percent Increase
9 (Northern Santa Clara County)	24,967	28.9%	83,790	21.2%
11 (Central San Jose)	22,647	23.2%	49,787	32.7%
12 (The City of Milpitas and Northeast San Jose)	28,972	21.6%	30,855	31.4%
15 (Eastern Alameda County)	36,259	58.7%	106,225	108.1%
16 (Southern Alameda County)	14,425	14.6%	65,912	53.7%

Overall, the corridor will add 119,270 households and 226,569 jobs between 2000 and 2025. Because 2.8 jobs are being created for every new household, most employees must seek housing outside area. The imbalance of jobs and housing is a regional issue that aggravates highway congestion, as described below.

1.4.2 JOBS/HOUSING IMBALANCE

The northeastern part of Santa Clara County contains a majority of the Silicon Valley's current employment. Office and research/development land uses have expanded rapidly in this area over the past few years. Travel in this area is expected to grow dramatically as northern San Jose, Santa Clara, and Milpitas continue to develop vacant land and intensify development on currently developed sites. This area contains two of the county's greatest citywide jobs-housing imbalances, with Milpitas at 2.88 and Santa Clara at 3.41.² While overall the County has 1.16 jobs per employed resident, the jobs-housing imbalance is projected to worsen in Milpitas by 2025, with a projected ratio of 3.15. Milpitas is also expected to have a large percentage increase in both jobs (33.5 percent) and housing (22.1 percent).

Housing in San Jose is forecast to increase 17.4 percent by 2025 while jobs are expected to increase 24.2 percent. An aggressive redevelopment program of the City of San Jose for its downtown area could increase housing units by more than 68,000, and employment by 141,000. Improved transit is fully consistent with Greater Downtown Strategic Plan and with the new redevelopment strategy for downtown. The completion of improved transit to Downtown San Jose would increase transit ridership for trips originating outside the subarea and the county to reach these new jobs. Planned redevelopment of

² Expressed as the number of jobs in a geographic area divided by number of residential units in the same area.

Downtown San Jose is supportive of increased transit use, with higher densities of housing, office/ research and development, and retail. Improved transit in the corridor would allow further increases in land use density, enhancing both transit ridership and land use efficiency.

1.4.3 SAN JOSE INTERNATIONAL AIRPORT PASSENGER GROWTH

The San Jose International Airport (SJIA), a major regional trip generator in the area, is expected to increase its number of daily flights by 22 percent between 2000 and 2010, with the annual volume of passengers growing from 12 million to 17.6 million in 2010, reaching 25 million in 2020.

1.4.4 TRAFFIC GROWTH AND CONGESTION

The SVRT corridor is one of the most congested in Northern California. Over the last 10 years, it has experienced very high and increasing levels of traffic congestion due to the growth of jobs throughout the Silicon Valley area, including Downtown San Jose and the cities of Fremont, Milpitas, and Santa Clara. Congestion is also spreading from the peak period into the off peak. Average daily work trips from Alameda County to Superdistricts 9, 11 and 12 in northern Santa Clara County will increase from 105,000 in 2000 to 132,000 in 2025, an increase of 25.7 percent. Northbound work trips from northern Santa Clara County to Alameda County are expected to grow by 48.5 percent (17,800 trips) over the 25-year period.

Tables 1-2 and 1-3 illustrate the increase in commute trips between Alameda County and Superdistricts 9, 11 and 12 in northern Santa Clara County, including Downtown San Jose. The tables indicate that:

- From Alameda County, the greatest number of trips (82,000) and the largest rate of increase (23 percent) will occur between Alameda County and Superdistrict 9, the heart of the Silicon Valley. An additional 50,000 trips are expected from Alameda County to Superdistricts 11 (Central San Jose) and 12 (Milpitas/Northeast San Jose).
- In the reverse direction, 29,500 trips are projected from Superdistrict 12 to Alameda County, an increase of 41 percent. An additional 25,900 trips will occur from Superdistricts 9 and 11 to Alameda County.

The increase in travel demand will further strain the current level of congestion on regional roadways.

Table 1-2

**Growth in Home-Based Work Trips
From Alameda County to Northern Santa Clara County**

Superdistrict	Work Trips 2000	Work Trips 2025	Percent Increase
9 (Northern Santa Clara County)	66,619	82,037	23%
11 (Central San Jose)	17,259	23,310	35%
12 (The City of Milpitas and North-eastern San Jose)	20,999	27,673	31%

Table 1-3

**Growth in Home-Based Work Trips
From Northern Santa Clara County to Alameda County**

Superdistrict	Work Trips 2000	Work Trips 2025	Percent Increase
9 (Northern Santa Clara County)	7,176	11,750	64%
11 (Central San Jose)	9,420	14,116	49%
12 (The City of Milpitas and Northeastern San Jose)	20,970	29,522	41%

1.4.5 AIR QUALITY CONSIDERATIONS

Increasing congestion and slowing travel times for auto and transit will potentially lead to worsening air quality in the region, which already has been designated “nonattainment” for ozone by the US Environmental Protection Agency. In 1999, monitoring stations within the corridor reported that the federal ozone standard was exceeded once and the state ozone standard was exceeded twelve times. During the same period, the state standard for particulate matter (PM₁₀) was exceeded seven times, although the federal standard for PM₁₀ was maintained.

1.5 PROJECT GOALS

Project goals provide direction for developing alternatives that address the transportation deficiencies identified for the corridor. They are also used to guide the evaluation of alternatives. In the evaluation process, goals attainment is a critical element in determining whether transportation alternatives have merit for being considered as part of the Preferred Investment Strategy. The following goals were adopted to guide the development and evaluation of alternatives:

- **Goal 1: Congestion Relief** - to reduce the level and extent of travel delay that is occurring on the corridor and regional highway system.
- **Goal 2: Mobility Improvements and Regional Connectivity** – to improve transit service to, from, and within the corridor by enhancing service quality (comfort, safety, and reliability) and quantity (improved service frequencies, travel times, operating speeds, and capacity); to improve regional connections that ease transferring between systems, by developing multi-modal centers, and by utilizing multiple-agency tickets and fares.
- **Goal 3: Environmental Benefits** - to provide transit improvements that enhance and preserve the social and physical environment and minimize potential negative impacts resulting from implementation of the transit alternatives.
- **Goal 4: Transit Supportive Land Use** - to ensure the compatibility of transportation improvements with local jurisdiction land use plans and policies so that transit ridership can be maximized and the number of auto trips reduced.
- **Goal 5: Operating Efficiencies** - to produce future resource savings for VTA relative to existing and planned transit service improvements.

- **Goal 6: Cost Effectiveness** – to provide benefits from transportation improvements in relation to the costs.
- **Goal 7: Local Financial Commitment** – to maintain VTA’s contribution to the cost of constructing, operating, and maintaining the Preferred Investment Strategy and the stability and reliability of its capital and operating funding sources for implementing the strategy.
- **Goal 8: Community and Stakeholder Acceptance** – to provide a transportation system that reflects the needs and desires of the residents and businesses in the corridor, is compatible with local planning initiatives, and generates widespread political support.
- **Goal 9: Environmental Justice** – to provide an equitable amount of transit service and mobility benefits to transit dependent residents, who are generally from low income or minority communities or households not having access to a private automobile.
- **Goal 10: Safety and Security** –to implement transit improvements without creating undue safety and security risks that cannot be mitigated.
- **Goal 11: Construction Impacts** – to minimize the extent and the duration of construction impacts on the surrounding community resulting from implementing transportation improvements.

Criteria to measure goals attainment were based on FTA’s New Starts Final Rule and previous FTA guidance. In addition, local performance measures were formulated to serve as an important adjunct to the FTA New Starts criteria. The local performance measures were derived from previous transportation studies, such as the recent VTA BART Extension Study, as well as input from agencies, policy-makers, and the general public. The complete list of project goals, objectives, and evaluation criteria is presented in **Appendix B**.

2.0 ALTERNATIVES CONSIDERED

2.1 PRELIMINARY LIST OF ALTERNATIVES

At the beginning of the MIS planning process, a broad range of transportation alternatives was considered for the corridor, including the possible use of:

- Express bus,
- Busway,
- Commuter rail,
- Diesel light rail,
- Light rail, and
- BART

Eleven preliminary alternatives were identified, including the Baseline Alternative and 10 “build” alternatives. The Baseline Alternative, which would expand existing service, is used as a basis for comparison with the proposed “build” alternatives, which would implement a variety of major transit capital and operating improvements in the corridor. The 10 “build” alternatives were derived from recommendations from previous corridor transportation studies; an assessment of existing and projected transportation deficiencies in the corridor and the surrounding regional subarea; VTA and regional transportation planning priorities for the corridor; community advocacy and support, including approved voter initiatives; and local jurisdiction planning policy.

The preliminary alternatives, listed below, were approved by the project TAC and PAB and presented to the general public at a series of community meetings. A summary of the physical and operating characterization of the preliminary alternatives is presented in **Appendix C**.

- **Alternative 1: Baseline**—combines existing and programmed (expected improvements through 2025) highway, bus, rail transit and commuter rail services in the corridor with expanded regional (intercounty) express bus services utilizing I-880 and I-680 freeway High Occupancy Vehicle (HOV) lanes to Silicon Valley employment centers connecting at the planned Warm Springs BART Station (refer to **Appendix D: Tables D-1 and D-2**)
- **Alternative 2: Busway**—uses an exclusive busway along the Union Pacific Railroad (UPRR) alignment for expanded express bus services traveling between Warm Springs BART and Silicon Valley employment centers
- **Alternative 3: Commuter Rail (CRT) on the Alviso Alignment**—increases commuter rail service on the Altamont Commuter Express (ACE) and Capitol train alignments from Stockton, Tracy and Livermore; and from Union City BART
- **Alternative 4: Commuter Rail (CRT) on the Former Southern Pacific Railroad (SPRR) Alignment**—implements commuter rail service between Warm Springs BART and San Jose Diridon Station via the former SPRR right-of-way
- **Alternative 5: Commuter Rail (CRT) on the UPRR Alignment**—implements commuter rail service between Warm Springs BART and 28th and Santa Clara Streets via the UPRR right-of-way
- **Alternative 6: Diesel Light Rail on Former SPRR Alignment**—implements diesel light rail service on two routes between Warm Springs BART and the Mountain View Caltrain Station and between Warm Springs BART and San Jose Diridon Station via the former SPRR right-of-way and Tasman East and West LRT lines
- **Alternative 7: Diesel Light Rail on UPRR Alignment**—implements diesel light rail service on two routes between Warm Springs BART and the Mountain View Caltrain Station and between Warm Springs BART and San Jose Diridon Station via the UPRR right-of-way and Tasman East and West LRT lines
- **Alternative 8: Light Rail (LRT) (electric-powered) on Former SPRR Alignment**—implements diesel light rail service on two routes between Warm Springs BART and the Mountain View Caltrain Station and between Warm Springs BART and San Jose Diridon Station via the former SPRR right-of-way and Tasman East and West LRT lines
- **Alternative 9: Light Rail (LRT) (electric-powered) on UPRR Alignment**—implements diesel light rail service on two routes between Warm Springs BART and the Mountain View Caltrain Station and between Warm Springs BART and San Jose Diridon Station via the UPRR right-of-way and Tasman East and West LRT lines
- **Alternative 10: BART**—extended from Warm Springs BART to Santa Clara Caltrain Station via the former SPRR right-of-way and Caltrain right-of-way
- **Alternative 11: BART**—extended from Warm Springs BART to Santa Clara Caltrain Station via the UPRR right-of-way and Caltrain right-of-way

2.2 SCREENING THE PRELIMINARY LIST OF ALTERNATIVES

During June 2001, the preliminary alternatives were screened according to the project goals, objectives, and evaluation criteria, as well as input from policymakers, local agencies, and the general public. The screening results are in **Table 2-1**. Of the 11 alternatives, the project TAC and PAB agreed to carry forward Alternatives 1, 2, 3, 5, 9, and 11 for the following reasons:

Table 2-1

Screening of the Preliminary List of Alternatives

Alt.	Description	Goal ¹ / Level of Achievement ²											Overall Goal Achievement	Further Evaluation (Yes / No)
		1	2	3	4	5	6	7	8	9	10	11		
1	Baseline Plus Expanded Express Bus	M	H	M	L	H	H	M	M	M	L	H	Medium	Yes
2	Busway on Union Pacific	M	H	M	L	H	M	M	M	H	H	M	Medium/High	Yes
3	Commuter Rail on "Alviso" Line	M	M	L	M	M	M	L	M	M	M	L	Medium	Yes
4	Commuter Rail on Former Southern Pacific	M	L	L	M	L/ SF	M	M	NA	M	M	L	Medium/Low/ Significant Flaw ³	No
5	Commuter Rail on Union Pacific	M	L	M	M	L	M	M	L	H	M	M	Medium	Yes
6	Diesel Light Rail on Former Southern Pacific	M	M	L	M	L/ SF	M	M	L	M	M	L	Medium/Low/ Significant Flaw ^{3,4}	No
7	Diesel Light Rail on Union Pacific	M	M	M	H	L/ SF	M	M	L	H	M	M	Medium/ Significant Flaw ⁴	No
8	Light Rail on Former Southern Pacific	M	M	L	M	L SF	M	H	H	M	M	L	Medium/ Significant Flaw ³	No
9	Light Rail on Union Pacific	M	M	M	H	H	M	H	H	H	M	M	High	Yes
10	BART on Former Southern Pacific	H	H	L	H	L/ SF	L	H	H	M	H	L	Medium/ Significant Flaw ³	No
11	BART on Union Pacific	H	H	M	H	M	L	H	H	H	H	M	High	Yes

¹Goal:

- 1) Congestion Relief
- 2) Mobility Improvements and Regional Connectivity
- 3) Environmental Benefits
- 4) Transit Supportive Land Uses
- 5) Operating Efficiencies
- 6) Cost Effectiveness
- 7) Local Financial Commitment
- 8) Community and Stakeholder Acceptance
- 9) Environmental Justice
- 10) Safety and Security
- 11) Construction Impacts

²Level of Achievement:

H = High
M = Medium
L = Low
SF = Significant Flaw
NA = Not Available

³Significant Flaw on Former Southern Pacific right of way, which would require continued freight operations in a constrained right-of-way.

⁴Significant Flaw with diesel light rail vehicles because they are not compatible with VTA's existing system.

- Alternatives 9 (LRT on the UPRR Alignment) and Alternative 11 (BART on the UPRR Alignment) had a “high” degree of conformity with the project goals and no significant flaws.
- Alternative 1 (Baseline), Alternative 2 (Busway), Alternative 3 (CRT on the Alviso Alignment), and Alternative 5 (CRT on the UPRR Alignment) received a “medium” rating for conformance with project goals and had no significant flaws.

Alternatives 4, 6, 7, and 10 were eliminated for the following reasons:

- Alternative 6 (Diesel LRT on the SPRR Alignment) and Alternative 7 (Diesel LRT on the UPRR Alignment) 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
- Alternative 4 (CRT on the SPRR Alignment), Alternative 6 (Diesel LRT on the SPRR Alignment), Alternative 8 (LRT on the SPRR Alignment), and Alternative 10 (BART on the SPRR Alignment) could not coexist at grade with freight railroad service in the severely constrained SPRR right-of-way without being placed on aerial structures or underground.

More information regarding the methodology and the results for screening the preliminary list of alternatives is presented in **Appendix C**.

2.3 ALTERNATIVES CARRIED FORWARD

Following the screening of the preliminary list of alternatives, six remaining alternatives, listed below and summarized in **Table 2-2**, were carried forward. The alternatives were refined to provide a more detailed definition of the alignments (including developing typical cross sections) and station locations. The refinement included preparation of initial operating plans and re-examination of station stop locations and maintenance and storage facility sites. This information was used to estimate preliminary capital and operating and maintenance (O&M) costs for the alternatives.

- Alternative 1: Baseline with Expanded Bus Alternative
- Alternative 2: Busway Alternative
- Alternative 3: CRT on Alviso Alignment Alternative
- Alternative 5: CRT on UPRR Alignment Alternative
- Alternative 9: LRT on UPRR Alignment Alternative
- Alternative 11: BART on UPRR Alignment Alternative

A description of the alignment, station locations/access points, potential intermodal transfer locations, and possible maintenance and storage facility sites for the six alternatives follows. **Appendix D** includes a list of 2025 highway and transit projects incorporated into the Baseline Alternative.

In addition, a No Project Alternative was established to serve as the basis of comparison in the evaluation of the six alternatives. The No Project Alternative, like the Baseline Alternative, consists of today’s transit system, including transit improvements planned by other agencies (e.g., BART to Warm Springs) and some projects already programmed for funding by VTA. However, the No Project Alternative does not include the enhanced bus service incorporated into the Baseline Alternative. The comparison is useful for local decision-makers to determine which, if any, transportation alternatives have merit and should be included in the Preferred Investment Strategy for the corridor.

Table 2-2

Silicon Valley Rapid Transit Corridor Alternatives Physical and Operational Characteristics

Alternatives	Number of Routes	Route Miles	Headways	Number of Stations (existing, new, optional)	Change in Fleet Size over Baseline (for VTA and non-VTA fleets)																
Alternative 1 Baseline Plus Expanded Express Bus Service on I- 880 and I-680 HOV Lanes	<ul style="list-style-type: none">• 11 VTA Express Bus routes to Silicon Valley, all originating from Warm Springs BART Station;• 10 Express Bus routes originating in central CC County, Tri-Valley and San Joaquin Valley communities funded by the local operating agencies	3.33 miles of exclusive busway facility; ~ 60 miles Stockton to Warm Springs; ~12 miles Warm Springs to San Jose Diridon via I-880	<ul style="list-style-type: none">• 3-30 minute peak- period headways• 3 all-day Express Bus routes at 15 – 30 minute headways	Not Applicable	<table><thead><tr><th>Operator</th><th>Fleet Size</th></tr></thead><tbody><tr><td>VTA Base Bus System</td><td>560</td></tr><tr><td>“SVRTC” Express Bus</td><td>114</td></tr><tr><td>VTA Light Rail</td><td>113</td></tr><tr><td>ACE Commuter Rail Cars</td><td>58</td></tr><tr><td>ACE Locomotives</td><td>9</td></tr><tr><td>BART</td><td>859</td></tr><tr><td>“Valley” Express Bus (by others)</td><td>106</td></tr></tbody></table>	Operator	Fleet Size	VTA Base Bus System	560	“SVRTC” Express Bus	114	VTA Light Rail	113	ACE Commuter Rail Cars	58	ACE Locomotives	9	BART	859	“Valley” Express Bus (by others)	106
Operator	Fleet Size																				
VTA Base Bus System	560																				
“SVRTC” Express Bus	114																				
VTA Light Rail	113																				
ACE Commuter Rail Cars	58																				
ACE Locomotives	9																				
BART	859																				
“Valley” Express Bus (by others)	106																				
Alternative 2 Busway on UPRR (Former WPRR) Alignment	Same as Alternative 1	11.74 miles exclusive busway facility	<ul style="list-style-type: none">• 3-15 minute peak- period headways• 3 all-day Express Bus routes at 15 – 30 minute headways	4 new 3 optional	-4 VTA “SVRTC” Express Buses +1 “Valley” Express Bus -2 Commuter Rail Cars																
Alternative 3 Expanded Commuter Rail on UPRR’s “Alviso” (ACE Train) Alignment	<ul style="list-style-type: none">• 3 Commuter Rail routes:<ul style="list-style-type: none">A) Stockton, Tracy, Livermore to SJ Diridon;B) Livermore to San Jose Diridon;C) Union City BART to San Jose Diridon	85 miles (Stockton to SJ Diridon); 43.5 miles (E. Livermore to SJ Diridon Station); 24.4 miles (Union City BART to SJ Diridon)	<ul style="list-style-type: none">• 30-minute peak service from Stockton, East Livermore, and Union City BART for 10-minute combined headway south of Niles Junction• 60-minute service off –peak, from East Livermore and Union City BART only for 30-minute combined headway south of Niles Junction	10 existing 1 new 2 by others	-3 VTA “SVRTC” Express Buses +74 VTA Commuter Rail Cars +12 Diesel Locomotives -91 “Valley” Express Buses																

¹. O&M = Operating and Maintenance

Table 2-2 (Cont.)

Silicon Valley Rapid Transit Corridor Alternatives Physical and Operational Characteristics; Ridership; and Costs

Alternatives	Number of Routes	Route Miles	Headways	Number of Stations (existing, new, optional)	Change in Fleet Size over Baseline (for VTA and non-VTA fleets)
Alternative 5 Commuter Rail on UPRR Alignment	<ul style="list-style-type: none"> 1 Commuter Rail route; transfer at 28th/Santa Clara to Downtown/East Valley LRT line or Bus Rapid Transit Route 22 	11.3 miles, Warm Springs BART to 28 th /Santa Clara Streets	<ul style="list-style-type: none"> 15-minute headways during peak periods; 30 minutes, off-peak periods 	4 new, 2 optional	-8 Light Rail Cars +24 VTA Commuter Rail Cars -14 “ACE” Commuter Rail Cars + 5 Diesel Locomotives -3 “Valley” Buses
Alternative 9 Light Rail on UPRR Alignment	<ul style="list-style-type: none"> 2 Light Rail routes: <ul style="list-style-type: none"> A) Warm Springs to Tasman line to Lockheed/ Martin B) Warm Springs to Downtown/East Valley line to SJ Diridon 	~24 miles total, 11.36 miles in UPRR right-of-way, ~10 miles on Tasman LRT line, and ~2.5 miles on Santa Clara Street (shared with planned Downtown/East Valley LRT line)	<ul style="list-style-type: none"> 10 minute headways each route, for 5 minute combined headways, peak; 20 minute headways each route, for 10 minute combined headways, off-peak 	1 existing (SJ Diridon) plus all Tasman Stations west of Montague/ Capitol and all East Valley Light Rail Stations (7) from 28 th Street to SJ Diridon; 4 new, 3 optional	-67 VTA “SVRTC” Express Buses +61 VTA Light Rail Vehicles +2 ACE Commuter Rail Cars -2 Valley Buses
Alternative 11 BART on UPRR Alignment	2 BART routes: <ul style="list-style-type: none"> S.F. to Fremont to San Jose Richmond to Fremont to San Jose 	16.3 miles, Warm Springs to Santa Clara Caltrain	12 minute headways each route, for 6-minute combined headways all day; 20-minute headways each route for 10-minute combined headways evenings and weekends	7 new, 1 optional	-69 VTA “SVRTC” Express Buses +6 VTA Light Rail Vehicles -17 ACE Commuter Rail Cars +18 BART Cars +1 “Valley” Express Buses

ALTERNATIVE 1: BASELINE (Figure 2-1)

EXPANDED EXPRESS BUS SERVICE

The Baseline Alternative adds express bus service above the existing and programmed level identified in VTP 2020, which programs 40 buses for operating express bus service to Silicon Valley destinations over a 20-year planning horizon (refer to **Tables D-1 and D-2** in **Appendix D**). In addition, the Baseline Alternative includes VTA light rail extensions, VTA bus fleet expansion to 650 vehicles, commuter rail service upgrades, High Occupancy Vehicle (HOV) lane and other highway improvements and the BART extension to Warm Springs. VTA also will continue to work with employers to expand the shuttle bus and van services connecting Santa Clara County bus/rail stations with Silicon Valley employment destinations.

New VTA BART-Silicon Valley Service

From the Warm Springs BART Station and express bus terminal, 11 VTA “Silicon Valley” express bus routes would take riders to most of the large Silicon Valley employment centers, as follows:

- Lockheed/Martin and the Moffett Industrial Park in Sunnyvale;
- NASA/Ames and the Shoreline Industrial Park in Mountain View;
- Sunnyvale and Mountain View Industrial Parks along Mathilda, Maude, and Middlefield;
- Tasman Drive to Baypointe LRT Station in San Jose;
- Montague Expressway to the Mission College area, and then along Scott and Arques in Santa Clara and Sunnyvale (Oakmead Industrial Parks);
- Montague to Trimble Road and then to Central Expressway and Kifer Road (Oakmead Industrial Parks);
- Brokaw Road and Airport Drive to the San Jose International Airport and the surrounding office parks;
- Milpitas industrial parks along Milpitas Boulevard to the Great Mall area;
- San Jose Trade Zone industrial parks south of Milpitas;
- Dixon Landing-McCarthy Road; and
- San Jose Civic Center and Downtown San Jose.

These VTA express routes would operate mainly on the planned I-880 HOV lanes between Fremont Boulevard in Fremont and North First Street in San Jose. A few express routes would operate on the planned I-680 HOV lanes between Mission Boulevard and Montague Expressway. Leaving the Warm Springs bus terminal, a bus-only, aerial roadway (busway) would be constructed along the south side of South Grimmer Boulevard and along the east side of Fremont Boulevard between the bus terminal and I-880. Upon reaching I-880, this busway would continue on aerial structure to take the express buses directly to and from the planned I-880 median HOV lanes. Traveling south in the planned I-880 median HOV lanes, express buses would have direct connector HOV flyover ramps to take them directly to HOV lanes at SR 237 and at Montague Expressway. Express buses would also be able to leave the planned I-880 HOV lanes at Tasman Drive, Brokaw Road and North First Street. The express bus routes using the planned I-680 HOV lanes would access these HOV lanes at Mission Boulevard. Traveling south on the planned I-680 HOV lanes, these express bus routes would have the ability to exit at State Route (SR) 237/Calaveras Boulevard and at Montague Expressway.

New Central Valley, Tri-Valley, and Central Contra Costa County Service to BART Warm Springs

Existing and planned express bus service between the Central Valley, Tri-Valley, and central Contra Costa County and Silicon Valley is provided by Stockton Metropolitan Area Rapid Transit (SMART), Modesto Area Express (MAX), Livermore-Amador Valley Transit Authority (LAVTA) and the (Contra Costa) County Connection. With the inauguration of BART service to Warm Springs, it is expected that the “Valley” express bus service would be rerouted and terminate at the Warm Springs BART Station as follows:

Figure 2-1 – Alternative 1: Baseline Plus Expanded Express Bus Service on I-880 & I-680 HOV Lanes

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

- The express bus service would operate on I-5, I-205, SR 132, I-580, SR 84 and I-680;
- All of the express bus routes would utilize the planned I-680 HOV lanes over the Sunol Grade between SR 84 and Grimmer Road in south Fremont;
- Just south of Grimmer Road, a new interchange for buses and HOV's would be constructed to allow these express buses to directly access the Warm Springs BART Station located at Grimmer Road and Warm Springs Boulevards;
- Just east of the Warm Springs BART Station, a large bus transfer facility with a large central island passenger terminal would be constructed, permitting these "Valley" express buses to quickly and efficiently exchange their passengers with VTA's "Silicon Valley" express buses; and
- The "Valley" buses would then return to their point of origin in order to make additional peak-hour trips.

The level of service and origin points for the "Valley" express bus service would be determined by the respective transit agencies operating the express bus service and not by VTA. Similarly, funding to operate "Valley" express bus service would be the responsibility of the local operating agencies, not VTA.

OPERATING PLAN ASSUMPTIONS AND ISSUES

The VTA "Silicon Valley" express bus routes would operate at 3-30 minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the AM peak, and from 3:00 PM to 7:00 PM in the PM peak. Five of these express bus routes would also operate in the reverse peak direction for bi-directional service. Three express routes (Oakmead, San Jose Airport and Downtown San Jose) would operate all day long at 15-30 minute intervals in both directions.

At the discretion and funding responsibility of SMART, MAX, LAVTA, and County Connection, "Valley" express bus routes could operate at 10-60-minute peak-direction and reverse direction headways from 4:00 AM to 8:00 AM in the AM peak and from 3:30 PM to 7:30 PM in the PM peak. In addition, to ensure that employees using peak-period express bus service would have a way to return home in case of emergency, limited, all-day service between the major Silicon Valley employment centers, BART Warm Springs and Stockton would be available on 60-minute service frequencies.

ALTERNATIVE 2: BUSWAY ON UPRR ALIGNMENT (Figure 2-2)

PHYSICAL DESCRIPTION

Alternative 2 includes all elements of the Baseline Alternative, except that the VTA "Silicon Valley" express bus routes would operate in an 11.5-mile grade-separated, exclusive busway constructed in the UPRR (former Western Pacific Railroad-WPRR) right-of-way between the Warm Springs BART Station and 28th/Santa Clara Streets in central San Jose instead of in the planned I-880 and I-680 freeway HOV lanes. Upon reaching Santa Clara Street, the express buses destined for Downtown San Jose would exit the busway at 28th Street and turn west onto Santa Clara Street, operating in a Bus Rapid Transit configuration 2.4-miles to a terminal at the San Jose Diridon Station. The total length of the busway/bus rapid transit from the Warm Springs BART Station to the San Jose Diridon Station would be 13.8-miles. Since the UPRR has indicated that railroad freight service could be discontinued on this alignment, the rail freight line would be removed in its entirety in order to make room for a two-lane busway. The busway would be approximately 54-feet wide in cross section and consist of two 14-foot bus lanes, two 10-foot outside shoulders, two 2-foot inside shoulders, and a 2-foot median concrete barrier. Where the right-of-way narrows north of the Montague Expressway, a depressed alignment (retained cut 16-feet deep) is proposed to mitigate impacts on cross street traffic, particularly at Montague Expressway and Capitol Avenue. After returning to grade south of Trade Zone Boulevard, the busway would again

Figure 2-2 – Alternative 2: Busway on UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

descend into a retained cut, passing under Hostetter Road and remaining below grade until immediately north of Berryessa Road. The below grade alignment would mitigate noise and visual impacts on the adjacent single-family residences. To avoid impacts to Berryessa Road, Lower Penitencia Creek, Mabury Road, Highway 101, and Miguelita Creek, the busway would ascend on an aerial structure 10 to 25 feet above grade from Berryessa Road to south of Miguelita Creek. The busway would continue at grade until its terminus at Diridon Station.

The busway would be completely grade-separated from cross-street traffic and railroads. Security gates would prevent busway access by unauthorized vehicles. Top speed on the dedicated busway would be approximately 65 miles per hour (mph).

Access/egress ramps would connect the busway with major roads at the following key locations:

- Warm Springs BART
- SR 237/Calaveras Boulevard
- Montague Expressway
- Hostetter Road (optional)
- Berryessa Road
- 28th/Santa Clara Streets

“Valley” express buses, identified in the Baseline Alternative, would continue to terminate at Warm Springs BART and would be the responsibility of the respective local operating agencies.

OPERATING PLAN ASSUMPTIONS AND ISSUES

For the Busway Alternative, operating times and service frequencies for the express buses traveling on a dedicated busway would remain the same as described in the Baseline Alternative. The VTA “Silicon Valley” express bus routes would operate at 3-15 minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the AM peak, and from 3:00 PM to 7:00 PM in the PM peak. Five of these express bus routes would also operate in the reverse peak direction for bi-directional service. Three express routes (Oakmead, San Jose Airport and Downtown San Jose) would operate all day long at 15-30 minute intervals in both directions.

ALTERNATIVE 3: EXPANDED COMMUTER RAIL (CRT) ON UPRR’s “ALVISO” ALIGNMENT (Figure 2-3)

PHYSICAL DESCRIPTION

Alternative 3 includes a significant expansion and upgrading of the ACE commuter rail service on the UPRR’s “Alviso” line. Service levels would be comparable to that now offered on the Caltrain line between San Jose and San Francisco – i.e., 60-80 trains per weekday. Expanded commuter train services would operate along two routes north of Niles Junction. One branch would originate from a new commuter rail station, which would be constructed approximately 800 feet east of the Union City BART Station, permitting transfers between BART and the new commuter rail line. A second branch would operate from the existing ACE commuter rail station near I-580 and Vasco Road in Livermore. Both branches would converge south of Niles Junction and traverse the same UPRR “Alviso” route that the Capitol and ACE trains now utilize through Fremont, Newark, north San Jose and north Santa Clara to San Jose Diridon Station. The total route length is approximately 43.5-miles from Vasco Road in east Livermore to Diridon Station, and approximately 22.5-miles from the Union City BART Station to Diridon Station. The two routes would complement the existing ACE service between Stockton and San Jose Diridon Station and the Capitol Corridor intercity service between Oakland and San Jose.

Figure 2-3 – Alternative 3: Expanded Commuter Rail on UPRR “Alviso” (ACE Train) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

From Union City, the commuter trains would travel southeast on the UPRR's (former SPRR) Hayward Branch track approximately three miles to the Niles Junction area (the same route as the Capitol and Amtrak intercity trains now take). They would then turn sharply onto the Alviso line and merge with the ACE train route coming through Niles Canyon from Stockton and Livermore. Along the Union City branch, the existing single-track alignment would be upgraded to a triple-track section, allowing bi-directional dedicated passenger service on two of the tracks (commuter and intercity rail), as well as a dedicated single-track freight line. In addition, accommodations would be made for a potential second freight track. In general, freight tracks would occupy the western portion of the alignment. Curve revisions would be included with the work where possible, to allow passenger speeds of up to 90 mph. All grade crossings would be upgraded, and bridges would be widened for three tracks. Culverts would be extended or rehabilitated. On the approach to Alameda Creek/Niles Junction, passenger trains would ascend on a double-track "flyover" structure over the creek and freight junction. On the flyover structure, the alignment would converge with the East Livermore branch via high-speed turnouts.

Along the East Livermore branch, the existing single-track alignment would be upgraded to two tracks where possible (i.e. outside of tunnels and where existing roadbed widths permit), to permit bi-directional passenger operations shared with freight service. Curve revisions would be included where possible (i.e. where sufficient roadbed widths are present, and where adequate tangent length exists between reversing curves), to allow passenger speeds of up to 60 mph. All grade crossings would be upgraded, and bridges would be widened for two tracks, or replaced where necessary. Culverts would be extended or rehabilitated. Approaching Niles Junction from the east, passenger trains would diverge from the main alignment and ascend on a double-track "flyover" structure over the freight junction. On the flyover structure, the alignment would converge with the Union City branch via high-speed turnouts.

South of Niles Junction, the alignment would follow the UPRR Centerville Branch westward to Newark Junction and continue across the San Francisco Bay National Wildlife Refuge on a low-level aerial structure (approximately 3.4-miles crossing of protected marshes and wetlands). The existing double-track corridor would be upgraded to three tracks, consisting of two dedicated passenger tracks along the east, and one freight track along the west side of the alignment. The right-of-way could also accommodate a second freight track, except in the vicinity and just west of the existing Centerville Station, where the narrow right-of-way west of Fremont Boulevard would permit two tracks. At Newark Junction, the curve would be revised to the extent practical to improve operating speeds as passenger trains converge on the former SP "Alviso" line.

South of Newark Junction, the existing single-track alignment would be upgraded to three tracks, consisting of two dedicated passenger tracks along the east, and one dedicated freight track along the west side of the alignment. The two passenger tracks would cross over the single freight track to the west side of the right-of-way before approaching the low-level aerial structure across the San Francisco Bay National Wildlife Refuge. Along Lafayette Street, some street right-of-way would be required to accommodate the three-track section. In addition, the existing platforms at Great America Station, the Tasman Drive overcrossing, and the junction at the "Alviso Wye" may require modification to accommodate three tracks.

In general, track construction and upgrades would allow passenger speeds of up to 90 mph. All grade crossings would be upgraded, bridges would be widened for three tracks, and culverts would be extended or rehabilitated. Commuter rail stations would be located at:

- Stockton (existing)
- Lathrop/Manteca ACE Train Station (existing)
- Tracy ACE Train Station (existing)
- Greenville Road/I-580 (new)

- East Livermore ACE Train Station (existing)
- Livermore ACE Train Station (existing)
- Pleasanton ACE Train Station (existing)
- Union City BART Station (new, to be constructed by others)
- Fremont Centerville (existing)
- Auto Mall Parkway (new, to be constructed by others)
- Great America (existing)
- Santa Clara Caltrain Station (existing)
- San Jose Diridon Station (existing)

To accommodate the increased commuter rail fleet size, a new rail maintenance and storage facility would be constructed in East Livermore on BART-owned property in the vicinity of I-580 and Greenfield Road.

In addition, Alternative 3 incorporates all routes of the “Silicon Valley” express bus service identified in the Baseline Alternative since many of the express bus routes serve Silicon Valley employment destinations not served by commuter rail along the Alviso alignment. Express bus service from the Central Valley, Tri-Valley, and central Contra Costa County would be rerouted to terminate at the Pleasanton Train Station or a new East Livermore Train Station instead of the Warm Springs BART Station and would be the responsibility of the local operating agencies.

OPERATING PLAN ASSUMPTIONS AND ISSUES

Commuter train service would be expanded to provide all-day service operating between 4:30 AM and 1:00 AM. Service frequencies would be increased as well. During peak periods, the existing service originating/terminating in Stockton would be increased to 30-minute service frequencies. New service from both the east Livermore and Union City BART terminals would operate every 30 minutes, resulting in combined 10-minute service frequencies south of Niles Junction. During the off-peak, service would operate at 60-minute intervals from East Livermore and Union City BART only, resulting in 30-minute combined frequencies south of Niles Junction.

The VTA “Silicon Valley” express bus routes would operate at 3-30 minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the AM peak, and from 3:00 PM to 7:00 PM in the PM peak. Five of these express bus routes would also operate in the reverse peak direction. Three express routes (Oakmead, San Jose Airport and Downtown San Jose) would operate all day long at 15-30 minute intervals in both directions.

ALTERNATIVE 5: COMMUTER RAIL (CRT) ON UPRR ALIGNMENT (Figure 2-4)

PHYSICAL DESCRIPTION

Alternative 5 includes a new commuter rail line constructed on the UPRR’s (former WPRR) San Jose Branch right-of-way between the planned Warm Springs BART Station and 28th/Santa Clara Streets, a distance of approximately 11-miles. The new commuter rail line would proceed south from the Warm Springs BART Station to Abel Street in Milpitas in a combined 120-200-foot wide railroad right-of-way containing two separate freight railroad corridors, each a minimum of 60-feet wide. South of Abel Street, the two freight railroad corridors diverge, and their rights-of-way narrow considerably to approximately 60-feet each. Because the UPRR has indicated that railroad freight service could be discontinued on this alignment, a new double track for commuter trains only would replace or coexist with the existing single, freight rail track.

Figure 2-4 – Alternative 5: Commuter Rail on UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

Where the right-of-way narrows north of the Montague Expressway, a depressed alignment (retained cut 16-feet deep) is proposed to mitigate impacts on cross street traffic, particularly at Montague Expressway and Capitol Avenue. After returning to grade south of Trade Zone Boulevard, the commuter rail line would again descend into a retained cut, passing under Hostetter Road and remaining below grade until immediately north of Berryessa Road. The below grade alignment would mitigate noise and visual impacts on the adjacent single-family residences. To avoid impacts to Berryessa Road, Lower Penitencia Creek, Mabury Road, Highway 101, and Miguelita Creek, the commuter rail line would ascend on an aerial structure 10 to 25 feet above grade from Berryessa Road to south of Miguelita Creek. The rail line would continue at grade until its terminus at 28th/Santa Clara Streets.

Potential station sites are:

- Warm Springs BART
- Dixon Landing Road (optional)
- Abel Street or Calaveras Boulevard (optional)
- Montague Expressway
- Berryessa Road
- 28th/Santa Clara Streets

A new commuter rail maintenance and storage facility would be located in the UPRR NUMMI Yard in Fremont, the UPRR Milpitas Yard in Milpitas, or along the UPRR right-of-way north of I-280 in San Jose.

VTa's expanded express bus service between Warm Springs BART and Silicon Valley in the Baseline Alternative would be reduced to eight routes (Lockheed Martin/Moffett; NASA/Shoreline Industrial Parks; Sunnyvale-Mountain View Industrial Parks; Oakmead Industrial Parks (two routes); San Jose Airport; northeast San Jose Industrial Parks; and Dixon Landing-McCarthy Road). Seven of these routes would be truncated at the northern end at Capitol/Montague. Two of the seven express routes (San Jose Airport and northeast San Jose Industrial Parks) would be converted to feeder service. Express bus service from the Central Valley, Tri-Valley, or Central Contra Costa County, which would be operated by the respective local transit agencies, would terminate at Warm Springs BART.

OPERATING PLAN ASSUMPTIONS AND ISSUES

Commuter train service would operate every day, generally from 4:30 AM to 1:00 AM. During the AM and PM peak periods, service would be provided at 15-minute intervals, and during the off-peak, at 30 minute service levels. Thus, service would be comparable to that currently offered on the Caltrain line between San Jose and San Francisco, i.e., 60-80 trains per weekday. The VTA "Silicon Valley" express bus routes would operate at 10-60-minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the AM peak, and from 3:00 PM to 7:00 PM in the PM peak. Three of the express bus routes would also operate in the reverse peak direction. The two converted feeder routes would operate all day long at 30-minute intervals in both directions.

ALTERNATIVE 9: LIGHT RAIL (LRT) ON UPRR ALIGNMENT (Figure 2-5)

PHYSICAL DESCRIPTION

Alternative 9 includes a new electric light rail line constructed on the UPRR's (former WPRR's) San Jose Branch right-of-way between the planned Warm Springs BART station and 28th and Santa Clara Streets. One of two proposed LRT routes would turn west onto the Tasman East LRT line between the West lines to the Lockheed/Martin Station. A second LRT route would continue from Montague/Capitol south in the UPRR (former WPRR) right-of-way to 28th Street/Santa Clara Street, a distance of approximately 11.4-miles. It would then turn onto the planned Downtown/East Valley LRT line on Santa Clara or San Fernando Streets and travel west 2.4-miles to the San Jose Diridon Station, for a total distance of approximately 13.8-miles from the Warm Springs BART Station.

The new light rail line would proceed south from the Warm Springs BART Station in the 120-200-foot wide railroad right-of-way that combines two separate freight railroad corridors – each a minimum of 60-feet wide – through south Fremont and north Milpitas to approximately Abel Street. Here, the two freight railroad corridors diverge, and their rights-of-way narrow considerably to approximately 60-feet each. The UPRR has indicated that freight railroad service could be discontinued in this alignment. Therefore, two new light rail tracks would replace the existing freight track in the right-of-way between the Warm Springs BART Station and the 28th Street/Santa Clara Street connection with the planned Downtown/East Valley LRT line.

Where the right-of-way narrows north of the Montague Expressway, a depressed alignment (retained cut 16-feet deep) is proposed to mitigate impacts on cross street traffic, particularly at Montague Expressway and Capitol Avenue. After returning to grade south of Trade Zone Boulevard, the light rail line would again descend into a retained cut, passing under Hostetter Road and remaining below grade until immediately north of Berryessa Road. The below grade alignment would mitigate noise and visual impacts on the adjacent single-family residences. To avoid impacts to Berryessa Road, Lower Penitencia Creek, Mabury Road, Highway 101, and Miguelita Creek, the light rail line would ascend on an aerial structure 10 to 25 feet above grade from Berryessa Road to south of Miguelita Creek. The light rail line would continue at grade, connecting with the Downtown/East Valley LRT line at Santa Clara Street.

In addition to the light rail stations along the Downtown/East Valley LRT line, potential station sites are:

- Warm Springs BART
- Dixon Landing Road (optional)
- Abel Street or Calaveras Boulevard (optional)
- Montague Expressway
- Hostetter Road (optional)
- Berryessa Road
- 28th/Santa Clara Streets

A new light rail maintenance and storage facility would be located in the UPRR NUMMI Yard in Fremont, the UPRR Milpitas Yard in Milpitas, or along the UPRR right-of-way north of I-280. Possible sites for traction power substations are:

- On vacant land adjacent to the UPRR right-of-way north of Kato Road in Fremont
- On a triangular piece of vacant land adjacent to the UPRR right-of-way, Highway 101 and Miguelita Creek in San Jose
- At station locations (undetermined number)

Figure 2-5 – Alternative 9: Light Rail on UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

Eight “Silicon Valley” express bus routes (Lockheed/Martin, NASA/Shoreline Industrial Parks, Sunnyvale/Mountain View Industrial Parks, Oakmead (2 routes), San Jose Airport, northeast San Jose, and Dixon Landing) would be retained from the Baseline Alternative, but seven routes would be truncated at the northern end in Milpitas (Montague/Capitol LRT Station). Two of the seven express routes (San Jose Airport and northeast San Jose Industrial Parks) would be converted to feeder service. Express bus service from the Central Valley, Tri-Valley, or Central Contra Costa County, which would be operated by the respective local transit agencies, would terminate at Warm Springs BART.

OPERATING PLAN ASSUMPTIONS AND ISSUES

Light rail service would operate every day between 4:30 AM and 1:00 AM. During peak periods, service frequencies would be every 5-minutes, with one route operating at 10-minute intervals between the Warm Springs BART Station and Lockheed/Martin, and a second route operating at 10-minute intervals between the Warm Springs BART Station and the San Jose Diridon Station (subject to equilibration with modeled transit ridership demand). During the off-peak, each route would offer 20-minute light rail service. The service levels would thus be comparable to that currently offered on VTA’s existing Guadalupe and Tasman LRT lines. The VTA “Silicon Valley” express bus routes would operate at 10-60-minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the morning peak and from 3:00 PM to 7:00 PM in the evening peak. Three of the express bus routes would also operate in the reverse peak direction. The two converted feeder routes would operate all-day long at 30-minute intervals in both directions.

ALTERNATIVE 11: BART ON UPRR ALIGNMENT (Figure 2-6)

PHYSICAL DESCRIPTION

Alternative 11 includes a new BART rail transit line constructed on the UPRR’s (former WPRR) San Jose Branch right-of-way between the planned Warm Springs BART Station, Downtown San Jose and the Santa Clara Caltrain station, a distance of approximately 16.3-miles. The new BART rail line would proceed south from the Warm Springs BART Station in the 120-200-foot wide railroad right-of-way that combines two separate freight railroad corridors – each a minimum of 60-feet wide – through south Fremont and north Milpitas to approximately Abel Street. Here, the two freight railroad corridors diverge, and their rights-of-way narrow considerably to approximately 60-feet each. Since the UPRR has indicated that freight railroad service could be discontinued on this alignment, the rail freight line would be removed in its entirety in order to make room for a two-track BART line approximately 40-feet wide.

Where the right-of-way narrows north of the Montague Expressway, a depressed alignment (retained cut 16-feet deep) is proposed to mitigate impacts on cross street traffic, particularly at Montague Expressway and Capitol Avenue. After returning to grade south of Trade Zone Boulevard, the BART line would again descend into a retained cut, passing under Hostetter Road and remaining below grade until immediately north of Berryessa Road. The below grade alignment would mitigate noise and visual impacts on the adjacent single-family residences. To avoid impacts to Berryessa Road, Lower Penitencia Creek, Mabury Road, Highway 101, and Miguelita Creek, the BART line would ascend on an aerial structure 10 to 25 feet above grade from Berryessa Road to south of Miguelita Creek. From Miguelita Creek, the BART line would descend into a twin-bore tunnel underneath the railroad right-of-way to 28th/Santa Clara Streets. At 28th Street, the alignment would leave the railroad right-of-way and proceed west under either Santa Clara Street (100’ wide), or alternately, under San Fernando Street (60’-90’ wide) for about 2.4-miles to the vicinity of the San Jose Arena and the San Jose Diridon Station. The BART line would then turn northwest and proceed underneath Stockton Street and the Caltrain right-of-way to the I-880 freeway overcrossing, where it would surface on the northeast side of the Caltrain and UPRR rights-of-way. From I-880, the BART line would continue in at-grade and above-grade configuration to the vicinity of the Santa Clara Caltrain Station, where it would terminate.

Figure 2-6 – Alternative 11: BART on UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

Potential station sites are:

- Abel Street or Calaveras Boulevard (optional)
- Montague Expressway
- Berryessa Road
- 28th/Santa Clara Streets
- Civic Plaza/SJSU
- Market Street
- Diridon Station
- Santa Clara Caltrain Station

A new BART maintenance and storage facility would be located in the eastern section of the UPRR Newhall Yard in Santa Clara or in the UPRR Milpitas Yard in Milpitas. Possible sites for traction power substations are:

- On vacant land adjacent to the UPRR right-of-way north of Kato Road in Fremont
- On a triangular piece of vacant land adjacent to the UPRR right-of-way, Highway 101 and Miguelita Creek in San Jose
- At station locations (undetermined number)

Eight “Silicon Valley” express bus routes (Lockheed/Martin, NASA/Shoreline Industrial Parks, Sunnyvale/Mountain View Industrial Parks, Oakmead (2 routes), San Jose Airport, northeast San Jose, and Dixon Landing) would be retained from the Baseline Alternative, but seven routes would be truncated at the northern end at Montague/Capitol BART Station. Two of the seven express routes (San Jose Airport and northeast San Jose Industrial Parks) would be converted to feeder service. Express bus service from the Central Valley, Tri-Valley, or Central Contra Costa County, which would be operated at the sole discretion of the respective local transit agencies, would terminate at Warm Springs BART.

OPERATING PLAN ASSUMPTIONS AND ISSUES

BART train service would operate every day from 4:00 AM to 1:00 AM. From 4:00 AM to 7:30 PM, service frequencies would be at 6-minute intervals (12 minutes on the Richmond-Fremont-San Jose line, and 12 minutes on the San Francisco-Fremont-San Jose line) between the Warm Springs BART Station and Downtown San Jose/Santa Clara. This represents a reduction of three minutes from current BART service frequencies. After 7:30 PM, 10-minute service would be offered (20-minute service frequencies on each BART line). The VTA “Silicon Valley” express bus routes would operate at 10-60-minute service frequencies in the peak direction from 4:30 AM to 8:30 AM in the morning peak and from 3:00 PM to 7:00 PM in the evening peak. Three of the express bus routes would also operate in the reverse peak direction. The two converted feeder routes would operate all-day long at 30-minute intervals in both directions.

ALTERNATIVE 11B: VTA – OPERATED BART – COMPATIBLE ALTERNATIVE

In October 2001, the PAB requested that “fall-back” alternatives to Alternative 11 be considered in case an agreement between BART and VTA could not be negotiated. Alternative 11B, which would use the same technology and alignment as Alternative 11 but would require a cross-platform transfer to the BART system at Warm Springs and be operated by VTA, was considered the most viable alternative. **Appendix E** contains a description and comparison of the BART-Compatible Alternative 11B with Alternative 11.

3.0 EVALUATION OF THE ALTERNATIVES CARRIED FORWARD

Once the refinement of the six alternatives carried forward was completed, additional technical analysis was conducted to facilitate a more comprehensive evaluation than was possible during the initial screening of alternatives. The additional technical information allowed the criteria to be measured, in large part, quantitatively in contrast to the primarily qualitative analysis used for the initial screening. As in the initial screening of alternatives, the evaluation was conducted in accordance with the project goals (identified in Section 1.5), using the FTA criteria and the local criteria listed in **Appendix B**. The table also indicates the performance measures associated with the FTA and local criteria. The technical analysis was supplemented with input received through public and agency meetings, including community/agency reaction to the concepts proposed and the design details considered.

3.1 EVALUATION RESULTS

Table 3-1 summarizes the key results of the evaluation. Where applicable, the data is compared to the No Project Alternative. The quantitative values indicated in **Table 3-1** compare the alternatives for each performance measure. They are used to assign a composite rating of goals achievement for each criterion as a way to easily compare the alternatives to the No Project Alternative. The ratings, ranging from best/most favorable to worst/least favorable, are as follows:

- High
- Medium-High
- Medium
- Low-Medium
- Low

The complete set of evaluation criteria and technical results are presented in **Table 3-2**.

3.2 PROS AND CONS OF THE SIX ALTERNATIVES

From the evaluation results presented in Section 3.1, trade-offs for each alternative were identified. The pros and cons for each alternative are listed below.

Alternative 1 – Baseline with Expanded Express Bus

Pros:

- High amount of point-to-point service, with many different routes and destinations
- Fastest and easiest to implement, with revenue service possible in 3 to 5 years
- Greatest amount of flexibility since express buses can be re-routed and headways can be modified to match changing ridership demands
- Lowest capital costs
- Most cost effective
- Fewest construction impacts on the community and environment
- No displacement of residences or businesses
- Funding is included in the 2000 Measure A program for bus expansion.

Table 3-1**Key Evaluation Criteria¹**

Evaluation Criteria	No Project	Alt. 1 Bus	Alt. 2 BRT	Alt. 3 CRT	Alt. 5 CRT	Alt. 9 LRT	Alt. 11 BART
Ridership (Year 2025)							
Average Weekday	9,700	31,800	49,100	27,500	26,000	56,600	87,200
New Trips	--	22,100	35,600	24,400	21,200	37,700	60,600
Costs (2001 dollars in millions)							
Capital	--	\$333	\$1,155	\$1,521 ²	\$998 ³	\$1,514 ⁴	\$3,710 ⁵
Annual Operating & Maintenance	--	\$17.4	\$19.5	\$37.7	\$16.1	\$41.8	\$63.0 ⁵
Cost Efficiency							
Farebox Recovery	--	20.1%	21.8%	68.6%	46.1%	20.8%	64.4%
Cost per New Rider	--	\$9.69	\$11.40	\$23.47	\$20.22	\$14.75	\$19.36
Service Effectiveness							
Daily Trips Removed from Roadways	--	18,973	30,791	17,887	19,617	29,006	51,747
Daily Travel Time Savings (Hours Saved)	--	63,315	74,931	49,958	54,402	71,117	153,913

¹Does not include optional stations²Electrification from Livermore/Union City to San Jose adds \$355M; ³Electrification adds \$75M⁴Tunneling under Downtown San Jose adds \$774M⁵Costs could change depending on outcome of VTA/BART Cooperative Agreement**Cons:**

- Modest ridership potential
- Insignificant traffic relief in the corridor
- Increases the number of buses on already congested highways and local streets
- Modest speed and reliability because express buses would share the roadways with carpools and general traffic
- No transit oriented development opportunities with bus routes because they do not establish a stable station environment for development
- Alameda County's Measure B funding would not be eligible for the BART Warm Springs Extension, which specifies that a rail connection must be implemented.

Alternative 2 – Bus Rapid Transit on Union Pacific Alignment**Pros:**

- High amount of point-to-point service, with many different routes and destinations
- Uses UPRR right of way, which is excess to the railroad's needs
- Exclusive guideway, with an 11.5-mile grade separated Busway on UPRR right of way
- Grade separation projects already underway on the UPRR line in Alameda County
- Removes express buses from very congested I-880 and I-680 HOV lanes, providing more room for carpools and vanpools
- High levels of speed (65 mph maximum) and reliability on Busway
- Flexibility to re-route buses once they have left the Busway
- Third highest number of new transit riders
- Significant transit oriented development opportunities at Warm Springs, Montague/Capitol, Berryessa and Alum Rock station areas
- Serves large number of residents along the line, with good service to transit dependents.

Table 3-2

Evaluation of Alternatives Compared with the No Project Alternative

Goals and Evaluation Criteria	Baseline	Busway on UPRR	CRT On Alviso	CRT on UPRR	LRT On UPRR	BART on UPRR
Goal 1: Congestion Relief						
Peak Trips Removed from Roadways	18,973	30,791	17,887	19,617	29,006	51,747
Equivalent Capacity of Freeway Lanes	2	3	5	4	4	7
Highly Congested Corridors Served	4	4	2	4	4	4
Goal 2: Mobility Improvements and Regional Connectivity						
Average Weekday Riders in Corridor	31,800	49,100	27,500	26,000	56,600	87,200
New Transit Riders	22,068	35,559	24,354	21,155	37,661	60,646
Daily Travel Time for All Users (Hours)	63,315	74,931	49,958	54,402	71,117	153,913
Intermodal Connections	5	5	4	3	4	5
Jobs within 1/2-Mile of Boarding Points	N/A	74,302	31,198	20,325	74,302	75,978
Low Income Households and Other Transit Dependents within 1/2-Mile of Boarding	N/A	3,905	760	667	3,905	3,227
Goal 3: Environmental Benefits, Impacts and Equity						
Historic and Archaeological Sites Affected	2	78	98	78	79	80
Level of Noise/Vibration Impacts (Potential # Residential Impacts)	N/A	254	771	164	707	321
Net Change in Air Pollutant Emissions (Tons)	-661	-773	495	-239	-625	-1,211
Net Change in Greenhouse Gas Emissions (Tons)	-152,471	-175,612	-60,886	-92,207	-121,813	-151,208
Net Change in Regional Energy Consumption (BTUs)	-1,133,726	-1,297,871	-403,531	-625,211	-1,016,665	-1,482,662
Change in Wetlands and Threatened and Endangered Species Habitats (Potential impacts)	0	2	4	2	2	2
Businesses and Households Displaced	0	11	0	30	30	43
Goal 4: Transit Supportive Land Use						
Transit-Supportive Policies and Zoning Regulations (Qualitative Rating)	Low	Med-High	Medium	Med-High	Med-High	High
Acres of Developable/Redevelopable Land within 1/4 Mile of Stations	0	131	378	131	212	245
Goal 5: Operating Efficiencies and Customer/User Benefits						
Operating Cost per Passenger-Mile	\$0.24	\$0.23	\$0.25	\$0.24	\$0.24	\$0.22
Farebox Recovery Ratio	20.1%	21.8%	68.6%	46.1%	20.8%	64.4%
Compatibility with Existing Transit and Freight Services (Qualitative rating)	Med-High	Med-High	Medium	Low	High	Medium
Goal 6: Cost Effectiveness						
Incremental Cost per Travel Time Savings	\$3.66	\$5.86	\$12.38	\$8.51	\$8.46	\$8.26
Incremental Cost per Incremental New Rider	\$9.69	\$11.40	\$23.47	\$20.22	\$14.75	\$19.36
Cost per Total Rider	\$1.45	\$1.55	\$1.65	\$1.58	\$1.63	\$1.95

Table 3-2 (Cont.)

Evaluation of Alternatives Compared with the No Project Alternative

Goals and Evaluation Criteria	Baseline	Busway on UPRR	CRT On Alviso	CRT on UPRR	LRT On UPRR	BART on UPRR
Goal 7: Local Financial Commitment						
Capital Financing Plan has Stable and Reliable Sources for Local Matching Funds (Qualitative rating)	Medium	Medium	Medium	Medium	Medium	Med-High
20-Year Operating Plan has Stable and Reliable Base (Qualitative rating)	High	High	Medium	High	Medium	Medium
Conforms with Voter-Approved Conditions on Funding (Qualitative rating)	Medium	Low	Low	Low	Low	High
Goal 8: Community and Stakeholder Acceptance						
Degree of Community Support (Qualitative rating)	Medium	Medium	Medium	Low	Medium	High
Degree of Public Agency Support	TBD	TBD	TBD	TBD	TBD	TBD
Goal 9: Environmental Justice and Socioeconomic Equity						
Maximize Transit Service and Access to Low-Income, Minority Areas, and Transit Dependents	N/A	3,905	760	667	3,905	3,227
Benefits on Low-Income, Minority Communities and Transit Dependents (Qualitative rating)	Low-Med	High	Medium	Medium	High	High
Impacts on Low-Income, Minority Communities and Transit Dependents (Displacements of low-income)	0	0	0	5	5	10
Goal 10: Safety and Security						
Miles of Exclusive Guideway	3.33	11.74	6.54	11.36	11.36	16.23
At-Grade Crossings with Significant Traffic Volumes	N/A	2	32	1	2	0
Adjacent Schools Near At-Grade Crossings	N/A	2	4	2	2	0
Goal 11: Construction Impacts						
Severity and Duration of Construction Impacts (Qualitative rating)	High	Medium	Low	Medium	Medium	Low
Potential Available Construction Mitigation Measures (Qualitative rating)	High	Medium	Medium	Medium	Medium	Medium

NA = Not Applicable
TBD = To Be Determined
HOV = High Occupancy Vehicle
BRT = Bus Rapid Transit
UPRR = Union Pacific Railroad
CR = Commuter Rail
LRT = Light Rail
BART = Bay Area Rapid Transit

Legend:

High = best/most favorable
Medium = fair/moderately favorable
Low = worst/least favorable

Cons:

- Increases the number of buses on congested streets and arterials, primarily in downtown San Jose
- Significant construction impacts to build the exclusive Busway at-grade, on retained fill (embankment) and in retained cut (trench)
- Right of way acquisition required at station areas, displacing some businesses
- At-grade crossings at E. Julian and E. Santa Clara streets
- Generates some noise impacts in residential areas
- Voter-approval would be required to use VTA's Measure A funding
- Alameda County's Measure B funding would not be eligible for the BART Warm Springs Extension, which specifies that a rail connection must be implemented.

Alternative 3 – Commuter Rail on Alviso Alignment

Pros:

- Longest route length, with greatest amount of transit guideway (47 miles)
- Shortest route to the center and western portion of the Golden Triangle
- Best service to eastern Alameda, central Contra Costa and San Joaquin counties
- Uses existing railroad right-of-way already in use
- Enhances capacity for existing services in the corridor, such as freight, ACE, Capitols and Amtrak.

Cons:

- Alviso is the main freight track for the railroad between the San Francisco Bay Area and Los Angeles, which could cause conflicts with freight services
- Agreement with the railroad would be required, establishing such things as the number of trains allowed, track access fees and needed capital improvements
- Shared right-of-way with existing freight and commuter trains could cause competition for service slots
- Station areas would have conflicts with freight trains
- One-mile tunnel just east of Niles Junction in Niles Canyon presents a potential bottleneck
- Narrow railroad right-of-way would require acquisition of additional land
- Crosses approximately 4 miles of the San Francisco Bay National Wildlife Refuge on a new low-level aerial structure or embankment, potentially causing a significant impact to protected wetlands and a federally-protected wildlife sanctuary
- Significant construction impacts to build double- and triple-tracks, two major railroad flyover structures, and an approximate 4 mile low-level bridge over the wetlands; construction duration could be extended due to environmental permitting process
- Noise impacts due to increased commuter train traffic
- Moderate transit oriented development opportunities
- Significant number of at-grade crossings (41) creates additional safety issues for pedestrians and cars; grade separations would be very expensive to build and disruptive to existing services and neighborhoods
- Low cost-effectiveness
- Voter-approval would be required to use VTA's Measure A funding.

Alternative 5 – Commuter Rail on Union Pacific Alignment

Pros:

- Uses UPRR right-of-way, which is excess to the railroad's needs
- Provides 11.5 miles of grade separated guideway on the UPRR right-of-way
- Grade separation projects already underway on the UPRR line in Alameda County
- High operating speeds (79 to 90 miles per hour maximum)
- Lowest operating and maintenance costs
- Significant transit oriented development opportunities at Warm Springs, Montague/Capitol, Berryessa and Alum Rock station areas
- Serves large number of residents along the line, with good service to transit dependents.

Cons:

- Requires passengers transfer to VTA's bus or light rail services to continue into Downtown San Jose
- Does not connect to any other commuter rail services, such as Caltrain or ACE
- Low ridership
- Significant construction impacts to build an 11.5-mile commuter railroad at grade, on retained fill (embankment) and in retained cut (trench)
- Right-of-way acquisition required at station areas and for new maintenance facility, displacing some businesses
- Noise impacts due to commuter trains running in residential areas
- At-grade crossings will exist at E. Julian and E. Santa Clara streets
- Voter-approval would be required to use VTA's Measure A funding
- Strongly opposed by residents along the corridor.

Alternative 9 – Light Rail on Union Pacific Alignment

Pros:

- Integrates with VTA's Tasman and Downtown East Valley light rail lines, providing direct, no-transfer service
- Uses UPRR right-of-way, which is excess to the railroad's needs
- Provides 11.5 miles of grade separated guideway on the UPRR right-of-way
- Grade separation projects already underway on the UPRR line in Alameda County
- Second highest ridership
- Second highest congestion relief
- High cost-effectiveness
- Significant transit oriented development opportunities at Warm Springs, Montague/Capitol, Berryessa and Alum Rock station areas
- Serves large number of residents along the line, with good service to transit dependents.

Cons:

- Significant construction impacts to build an 11.5 mile light rail guideway at grade, on retained fill (embankment) and in retained cut (trench), taking 4 to 7 years to construct
- Right-of-way acquisition required at station areas and for maintenance facility, displacing some businesses
- Restricted to 2- and 3-car trains due to limitations on Tasman and Downtown East Valley light rail lines
- Slowest guideway speeds (55 mph maximum)

- At-grade crossings will exist at E. Julian and E. Santa Clara streets
- Potential noise impacts due to trains running in residential areas
- Voter-approval would be required to use VTA's Measure A funding.

Alternative 11 – BART on Union Pacific Alignment

Pros:

- Uses UPRR right-of-way, which is excess to the railroad's needs
- Provides 16.3 miles of 100 percent exclusive, grade separated guideway
- Grade separation projects already underway on the UPRR line in Alameda County
- Provides regional connectivity, with no transfers to the BART system
- Fastest travel times to passenger destinations
- Significant carrying capacity on board trains
- Highest ridership
- Greatest congestion relief
- Significant transit oriented development opportunities at Warm Springs, Montague/Capitol, Berryessa and Alum Rock station areas
- Serves large number of residents along the line, with good service to transit dependents
- Voter-approved in November 2000 on VTA's Measure A initiative
- Support for a BART Extension remains high with the voters in Santa Clara County
- Approximately \$2.7 billion is available in funding for a BART Extension.

Cons:

- Most expensive alternative
- Unresolved issues related to BART Cooperative Agreement could impact the costs
- Most significant construction impacts to build 16.3 miles of at grade, retained fill (embankment), retained cut (trench) and tunnel sections, with the longest construction duration
- Right-of-way acquisition required at station areas and for new maintenance facility, displacing some businesses
- Potential noise impacts due to trains running in residential areas
- Significant amount of federal funds will be needed to implement the project.

3.3 COMPOSITE RATINGS FOR THE SIX ALTERNATIVES

As a final step in the evaluation process, the information in the previous sections was used to rate the alternatives from "high" to "low" in achieving each of the project goals. The composite ratings of goals achievement presented in **Table 3-3** indicate that:

- BART on the UPRR Alignment had seven "high" and "medium high" ratings, the highest goals conformity ranking of the six alternatives;
- Busway on the UPRR Alignment placed second with four "high" and "medium high" ratings;
- LRT on the UPRR Alignment had three "medium high" ratings;
- CRT on the Alviso Alignment had one "medium high" rating; and
- CRT on the UPRR Alignment had no "high" or "medium high" ratings, the lowest goals conformity ranking of the alternatives.

Table 3-3

Composite Rating of Alternatives in Achieving Project Goals Compared with No Project Alternative

Goal and Evaluation Criteria	Baseline	Build Alternatives				
		Busway on UPRR ¹	CRT ² on Alviso ³	CRT on UPRR	LRT on UPRR	BART on UPRR
Goal 1: Congestion Relief	Low-Med	Medium	Low-Med	Medium	Medium	High
Goal 2: Regional Connectivity and Mobility Improvements	Low-Med	Medium	Low-Med	Low	Medium	High
Goal 3: Environmental Benefits, Impacts and Equity	Med-High	Med-High	Low	Low-Med	Medium	Medium
Goal 4: Transit Supportive Land Use	Low	Medium	Med-High	Medium	Med-High	Med-High
Goal 5: Operating Efficiencies and Customer/User Benefits	Medium	Med-High	Low-Med	Low	Medium	Med-High
Goal 6: Cost Effectiveness	High	High	Low-Med	Medium	Med-High	Medium
Goal 7: Local Financial Commitment	Med-High	Medium	Low-Med	Medium	Low-Med	Med-High
Goal 8: Community and Stakeholder Acceptance	Medium	Medium	Medium	Low	Medium	High
Goal 9: Environmental Justice and Socioeconomic Equity	Medium	Med-High	Medium	Low-Med	Med-High	Medium
Goal 10: Safety and Security	Low	Medium	Low	Medium	Medium	High
Goal 11: Construction Impacts	High	Medium	Low-Med	Medium	Medium	Low-Med
Overall Ranking	Medium	Med-High	Low-Med	Low-Med	Med-High	High

¹. Union Pacific Railroad

². Commuter Rail Transit

³. Alviso alignment currently used by Altamont Express and Capitol Corridor trains

Legend:

High = best/most favorable

Medium = fair/moderately favorable

Low = worst/least favorable

4.0 SELECTION AND IMPLEMENTATION OF THE PREFERRED INVESTMENT STRATEGY

4.1 POLICY ADVISORY BOARD COMMITTEE RECOMMENDATIONS

On October 31, 2001, the Policy Advisory Board (PAB) voted unanimously to recommend to the VTA Board that Alternative 11: BART on the UPRR Alignment be carried forward into the EIS/EIR phase along with the FTA-required Baseline Alternative (Alternative 1). Since the VTA-BART negotiations were still unresolved at the time, the PAB recommended carrying forward the BART-Compatible Alternative 11B into the next phase along with Alternative 11.

4.2 PUBLIC INPUT

The PAB considered public and agency input gathered in three rounds of public meetings throughout the MIS planning process. A summary of the public involvement process and responses to comments received in the third round of community meetings held in October 2001 are presented in the Summary of Public Comments Document Third Round of Public Meetings (October 2001).

4.3 VTA BOARD DISCUSSION AND ACTION

On November 9, 2001, the VTA Board unanimously selected BART on the UPRR Alignment (Alternative 11) as the Preferred Investment Strategy for the Silicon Valley Rapid Transit Corridor citing its overall ranking of “High” in comparison to the other alternatives (**Figure 4-1**). The Board instructed that, in addition to the BART Alternative, the Baseline (Expanded Bus) Alternative be carried forward into the environmental compliance phase to fulfill FTA project development guidelines. The Board also approved the negotiating agreement with BART that identifies the terms and conditions for implementing the Preferred Investment Strategy in concert with BART. On November 12, 2001, the BART Board also adopted the terms and conditions for the agreement. Copies of the VTA Board resolution selecting BART as the Preferred Investment Strategy and the terms and conditions of the VTA-BART agreement are included in **Appendix F**. In addition, **Appendix F** contains letters in support of the VTA Board action from the cities in the Silicon Valley Rapid Transit Corridor and previous VTA Board actions authorizing the Major Investment Study and the Measure A Sales Tax Initiative (November 2000).

4.4 KEY ELEMENTS OF THE PREFERRED INVESTMENT STRATEGY

Table 4-1 lists the recommended elements of the project. Average weekday ridership for the BART alternative is projected to be 87,200 in 2025. The estimated capital cost is \$3,710 million in 2001 dollars, with annual operating and maintenance costs estimated at \$63.0 million. Revenues from passenger fares will substantially offset the operating and maintenance costs. Sources of funding to cover the capital costs of the Preferred Investment Strategy are presented in **Table 4-2**.

Table 4-1

Preferred Investment Strategy -- Alternative 11

Mode	<ul style="list-style-type: none">• BART
Alignment	<ul style="list-style-type: none">• Union Pacific Railroad with tunnel under Downtown San Jose to Santa Clara (~16.3 route miles)
Stations	<ul style="list-style-type: none">• Montague/Capitol• Berryessa• Alum Rock• Civic Plaza/San Jose State University• Market Street• Diridon/Arena• Santa Clara
Maintenance & Storage Facility	<ul style="list-style-type: none">• Union Pacific Railroad Newhall Yard in San Jose/Santa Clara
Project Costs (2001 dollars in millions)	<ul style="list-style-type: none">• Annual Operating and Maintenance = \$63 M• Total Capital Costs = \$3,710M
Ridership (Year 2025)	<ul style="list-style-type: none">• Average Weekday = 87,200• New Riders = 60,600

Figure 4-1 – Alternative 11 - Preferred Investment Strategy

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

Table 4-2

**Sources to Fund the Capital Costs of the
Preferred Investment Strategy**

Funding Source	Funding Amount (2001 Dollars in Millions)
Local	
2000 Measure A	
• BART to San Jose	\$2,094M
• Contingency	\$118M
1996 Measure B*	\$50M
State	
Traffic Congestion Relief Plan (TCRP)	\$614M
Federal	
Federal Transit Administration's (FTA) New Starts	\$834M
TOTAL:	\$3,710M

*Funding identified to purchase the right of way; also could be supplemented with State TCRP and Federal Revenue Aligned Budget Act (RABA) funds.

4.5 ISSUES REQUIRING FURTHER ANALYSIS AND INPUT

The primary issues which remain unresolved after completing the MIS process and require further study and evaluation in the subsequent EIS/EIR phase are presented below and indicated in **Figure 4-2**. Various station and alignment options for the Preferred Investment Strategy need to be considered in the next phase. More detailed analysis and community input will assist VTA in making decisions about these options, resulting in a project that is further defined for the environmental compliance phase. The following is a summary of the design options that need further input and evaluation:

Station Issues

- Optional Calaveras/Abel Station – continue to evaluate an optional station at either Calaveras Boulevard or Abel Street in Milpitas.
- Combine Downtown San Jose Station – determine if the two downtown San Jose stations at Civic Plaza/SJSU and Market Street can be combined into a single station between Second and Market streets.
- Parking and Station Access from Highway 101 – analyze the parking capabilities and auto access from Highway 101 at both the Berryessa and Alum Rock stations.

Alignment Considerations

- Curtis Avenue to Trade Zone Road Alignment Profiles – consider BART at-grade, above ground or below ground from Curtis Avenue to Trade Zone Road in Milpitas.
- Berryessa Road to Mabury Road Alignment Profiles – determine if BART will be at-grade, above ground or below ground from Berryessa to Mabury roads in San Jose.
- Downtown San Jose Subway Alignment Options – analyze BART tunneling under both Santa Clara and San Fernando streets in Downtown San Jose.

Figure 4-2 – Alternative 11 – Key Issues Requiring Further Analysis and Resolution

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- Direct BART Connection to San Jose International Airport – compare a direct BART connection to the airport with the Airport People Mover project in San Jose/Santa Clara.

Maintenance and Storage Facility Options

- UPRR's Newhall Yard – evaluate options to accommodate both BART and freight needs on the UPRR's Newhall Yard, as well as on adjacent properties.
- UPRR's Milpitas Yard – consider using the UPRR's freight yard tracks in Milpitas as an optional site for the BART maintenance and storage facility.

4.6 NEXT STEPS

As a next step, VTA will conduct detailed station and alignment evaluations to further define the BART Alternative. The appropriate technical and environmental analysis for the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) will follow. The EIS/EIR will identify and evaluate the resources potentially affected by the alternatives along with the appropriate mitigation measures.

APPENDICES

APPENDIX A

SUMMARY OF THE PUBLIC INVOLVEMENT PROCESS

SUMMARY OF THE PUBLIC INVOLVEMENT PROCESS

The Santa Clara Valley Transportation Authority has conducted an extensive public involvement process as part of the Major Investment Study. Three rounds of public outreach and comment gathering have provided valuable information to the Major Investment Study process.

The first round in May 2001 and the second round in July 2001, each consisted of the following events: five meetings with the Community Working Groups (Fremont, Milpitas, Berryessa/Hostetter, Downtown San Jose and Santa Clara), four public open house meetings (Fremont, Milpitas, San Jose and Santa Clara), and stakeholder meetings with the various interest groups.

The third round in October 2001 consisted of the following events: five meetings with the Community Working Groups (Fremont, Milpitas, Berryessa/Hostetter, Downtown San Jose and Santa Clara), four public open house meetings (Fremont, Milpitas, San Jose and Santa Clara), and stakeholder meetings with the various interest groups. Three additional Community Working Group meetings were held to fully address issues during the MIS. The Downtown San Jose Community Working Group participated in a tour of a segment of the Downtown San Jose alignment of the corridor. Two special Community Working Group meetings were scheduled to receive comments on Alternative 11B-BART-Compatible. The Fremont and Milpitas Community Working Group members attended one meeting and the Hostetter/Berryessa, Downtown San Jose and Santa Clara Community Working Group members attended a second meeting.

The Community Working Groups include representatives of neighborhood and business associations, community organizations, advocacy groups, major property owners and planning commissioners. The public meetings were open to the public and announced through a public notice mailed to the study mailing list of nearly 90,000 residents and businesses. Newspaper advertisements were published for each round of meetings in the following papers: The Argus, El Observador, Milpitas Post, Santa Clara Weekly, Mercury News Sunday edition, Thoi Bao, and Sing Thao Daily.

Participants in the stakeholder meetings have included: Bay Area Transportation and Land Use Coalition (BATLUC), Bay Rail Alliance, San Jose State University, Modern Transit Society, Fremont Rotary Club, Train Riders Association of California (TRAC), League of Woman Voters, South Bay Labor Council, Silicon Valley Manufacturing Group, the Sierra Club, Fremont Rotary Club, San Jose's Cathedral Foundation and the San Jose Silicon Valley Chamber of Commerce.

The purpose of the first round of meetings was to provide information on the project and receive input from the public on preliminary alternatives, alignments, transit technologies and stations. The second round of meetings provided information and received public input on the screening process and alternatives recommended for further evaluation. The third round of meetings with the public, Community Working Groups, and key stakeholders provided an opportunity for the public to comment on the remaining alternatives and the Preliminary Recommendation for the Preferred Investment Strategy. The public input received at the third round of meetings was sent to the Policy Advisory Board (PAB) and the VTA Board prior to actions on the MIS in October 2001 and November 2001.

In addition to the verbal and written comments submitted at Community Working Group, public meetings and stakeholder meetings, written comments were also received by fax, e-mail and regular mail through the closing of each comment period. In total, approximately 370 comments were submitted during the first round of meetings, 395 for the second round of meetings and 527 comments for the third round of meetings. The public comments were summarized and documented in the Summary of Public Comments for Round 1 (June 2001), Round 2 (August 2001), and Round 3 (October 2001).

A variety of issues have been raised including comments on alignments, modes, and station options. Project phasing, funding, neighborhood issues, construction impacts, and land use around stations have also been raised as important issues. Ridership, accessibility, frequency of transfers and direct connections to the San Jose Airport are issues that have also been emphasized in the public comments. Staff has fully reviewed all of the comments and made recommendations on which items to consider further and which items to drop from consideration.

VTA developed communication materials to disseminate study information to the public; materials included an overview newsletter, a Frequently Asked Questions document and various fact sheets. A project Web site (www.svrtc-vta.org) was created and it includes full project information and access to the project documents such as Community Working Group status reports and meeting summaries, Summary of Public Comments Reports, the project newsletter and pictures of the project alternatives. VTA is planning an extensive public involvement program during the EIS/EIR phase.

APPENDIX B

PROJECT GOALS, OBJECTIVES AND EVALUATION CRITERIA

Table B-1

**Project Goals, Objectives, and Evaluation Criteria¹
for the Silicon Valley Rapid Transit Corridor MIS/EIS/EIR**

Goal 1. Congestion Relief

Objectives

- Reduce Traffic in Highly Congested Corridors
- Provide Alternative Transportation for Highly Congested Corridors

Evaluation Criteria

- 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

Objectives

- Build Transit Usage in One of the Bay Area's Most Congested Corridors
- 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

Evaluation Criteria

- New Transit Riders
- Average Weekday Riders
- *Travel Time Savings for All Users of Transportation Systems (if available in time)*
- Travel Times for Selected Origin and Destination Pairs
- *Number of Intermodal Connections*
- *Number of Jobs Within One-half Mile of Boarding Points*
- *Number of Low-Income Households and Other Transit Dependents Within One-half Mile of Boarding Points*

Table B-1 (Cont.)

**Project Goals, Objectives, and Evaluation Criteria
for the Silicon Valley Rapid Transit Corridor MIS/EIS/EIR**

Goal 3. Environmental Benefits, Impacts and Equity

Objectives

- 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, including Seniors and Mobility Impaired Community
- Consider Cumulative Environmental Impacts Resulting from Other Private and Public Works Development Projects

Evaluation Criteria

- Number of Historic Properties and Archaeological Sites Affected
- Level of Noise and Vibration Impact of Federal Threshold
- *Net Change in Air Pollutant Emissions (if data available in time)*
- *Net Change in Greenhouse Gas Emissions (if data available in time)*
- *Net Change in Energy Consumption (if data available in time)*
- Change in Wetlands and Threatened and Endangered Species Habitat
- *Current Regional Air Quality Attainment Designation by Environmental Protection Agency (EPA)*
- Number of Households and Businesses Displaced

Goal 4. Transit Supportive Land Use

Objectives

- 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
- Maximize Ridership by Supporting Smart, Efficient and Desirable Growth Patterns
- Address Future Land Uses and Projected Growth
- Minimize Displacement of Low Income and Minority Population

Evaluation Criteria

- *Transit-supportive Land Use Policies and Zoning Regulations in the Corridor and at Station Areas*
- Acres of Land Available for Development/Redevelopment within One-half Mile of Stations

Table B-1 (Cont.)

**Project Goals, Objectives, and Evaluation Criteria
for the Silicon Valley Rapid Transit Corridor MIS/EIS/EIR**

<p>Goal 5. Operating Efficiencies and Customer/User Benefits</p> <p>Objectives</p> <ul style="list-style-type: none"> • 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 • Provide New, Seamless Access to Existing Transit System <p>Evaluation Criteria</p> <ul style="list-style-type: none"> • <i>Operating Cost per Passenger Mile</i> • Farebox Recovery Ratio • Compatibility with Existing Transit and Freight Services
<p>Goal 6. Cost Effectiveness</p> <p>Objectives</p> <ul style="list-style-type: none"> • Provide Transportation Improvements to Make Efficient Use of Constrained Financial Resources • Provide Positive Fiscal Impacts on Local Governments <p>Evaluation Criteria</p> <ul style="list-style-type: none"> • <i>Travel Time Savings per Incremental Cost of Project (if available in time)</i> • <i>Cost per New Rider</i> • Cost per Rider
<p>Goal 7. Local Financial Commitment</p> <p>Objectives</p> <ul style="list-style-type: none"> • Maintain Adequate Funding to Sustain the Existing System while Securing New Funding Sources for System Expansion <p>Evaluation Criteria</p> <ul style="list-style-type: none"> • <i>Capital Financing Plan has Stable and Reliable Sources for Local Matching Funds</i> • <i>20-year Operating Plan has Stable and Reliable Base</i> • Conforms with Voter-approved Conditions on Funding
<p>Goal 8. Community and Stakeholder Acceptance</p> <p>Objectives</p> <ul style="list-style-type: none"> • Provide Opportunity for the General Public, Organized Community Groups, and Stakeholder Agencies to Provide Comments on the Alternatives Considered <p>Evaluation Criteria</p> <ul style="list-style-type: none"> • Degree of Community Support • Degree of Public Agency Support

Table B-1 (Cont.)

**Project Goals, Objectives, and Evaluation Criteria
for the Silicon Valley Rapid Transit Corridor MIS/EIS/EIR**

<p>Goal 9. Environmental Justice / Socioeconomic and Geographic Equity</p> <p>Objectives</p> <ul style="list-style-type: none">• 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 <p>Evaluation Criteria</p> <ul style="list-style-type: none">• Enhanced Transit Service and Access to Low Income and Minority Areas, as well as Other Transit Dependents• Benefits and Impacts on Low Income and Minority Communities, as well as Other Transit Dependents
<p>Goal 10. Safety and Security</p> <p>Objectives</p> <ul style="list-style-type: none">• Ensure Safe and Secure Operation of Transportation Improvements for the Adjacent Communities <p>Evaluation Criteria</p> <ul style="list-style-type: none">• Miles of Exclusive Guideway• Number of At-grade Crossings with Significant Traffic Volumes• Number of Adjacent Schools Near At-grade Crossings
<p>Goal 11. Construction Impacts</p> <p>Objectives</p> <ul style="list-style-type: none">• Minimize Construction Impacts for Transportation Improvements on the Surrounding Communities, including Low Income and Minority Population <p>Evaluation Criteria</p> <ul style="list-style-type: none">• Severity and Duration of Construction Impacts• Potential Available Construction Mitigation Measures

¹ *Italicized text* = evaluation criteria identified in Federal Transit Administration New Starts Program.

APPENDIX C

SILICON VALLEY RAPID TRANSIT CORRIDOR PRELIMINARY DEFINITION OF ALTERNATIVES

Table C-1

Silicon Valley Rapid Transit Corridor Preliminary Definition of Alternatives Physical and Operational Characteristics

Alternatives	Number of Routes	Route Miles	Headways	Hours of Operation	Number of Stations (existing, new, optional)	Fleet Size
Alternative 1 Baseline Plus Expanded Express Bus Service on I-880 and I-680 HOV Lanes	<ul style="list-style-type: none"> 11 Express Bus routes, all originating from Warm Springs BART Station; 10 Express Bus routes originating in central CC County (2 routes), Tri-Valley (3 routes) and San Joaquin Valley (5 routes) funded by the respective local operating agencies 	~ 60 miles Stockton to Warm Springs; ~12 miles Warm Springs to San Jose Diridon via I-880	<ul style="list-style-type: none"> 3-30 minute peak-period headways 3 all-day Express Bus routes at 15-30 minute headways 	4:30 am-8:30 am; 3:00 pm-7:00 pm; 3 all-day Express Bus routes	Not Applicable	74 additional VTA express buses (in addition to the ~40 existing express buses now operated by VTA in this corridor)
Alternative 2 Busway on UPRR (Former WPRR) Alignment	Same as Alternative 1	11.74 miles Warm Springs BART to 28 th / Santa Clara Streets	Same as Alternative 1	Same as Alternative 1	4 new 3 optional	Virtually the same as Alternative 1
Alternative 3 Expanded Commuter Rail on UPRR's "Alviso" (ACE and Capitol Trains) Alignment plus Expanded Express Bus Service as in Alternative 1	<ul style="list-style-type: none"> 3 Commuter Rail routes: A) Stockton, Tracy, Livermore to SJ Diridon; B) Livermore to San Jose Diridon; C) Union City BART to San Jose Diridon 	A) 43.5 miles (Vasco Road to SJ Diridon Station); B) 24.4 miles (Union City BART to SJ Diridon Station)	<ul style="list-style-type: none"> 30-minute peak service from Stockton, 30-minute from East Livermore and 30-minute from Union City BART for 10-minute combined headway south of Niles Junction 60-minute service off-peak, 30-minute combined headway south of Niles Junction 	4:30am to 1:00am	10 existing 1 new 2 by others	12 diesel-electric (or electric) locomotives; 74 bi-level passenger rail cars; and 70 additional "Silicon Valley" VTA express buses
Alternative 4 Commuter Rail on Former SPRR Alignment plus Reduced "Silicon Valley" Express Bus Feeder Service	<ul style="list-style-type: none"> 1 Commuter Rail route 	12.8 miles BART Warm Springs to SJ Diridon	<ul style="list-style-type: none"> 10-minute headways during peak periods 20-30 minutes, off-peak periods 	Same as Alternative 3	1 existing (SJ Diridon) 3 new 3 optional	6 diesel-electric (or electric) locomotives; 10 additional bi-level passenger rail cars; and 74 additional "Silicon Valley" express buses
Alternative 5 Commuter Rail on UPRR Alignment plus Reduced "Silicon Valley" Express Bus Feeder Service	<ul style="list-style-type: none"> 1 Commuter Rail route with transfer at 28th/Santa Clara to Downtown / East Valley LRT line 	11.4 miles, Warm Springs BART to 28 th /Santa Clara Streets	Same as Alternative 4	Same as Alternative 3	4 new 2 optional	5 diesel-electric (or electric) locomotives; 10 additional level passenger rail cars; and 74 additional "Silicon Valley" express buses

Table C-1 (Cont.)

Silicon Valley Rapid Transit Corridor Preliminary Definition of Alternatives Physical and Operational Characteristics

Alternatives	Number of Routes	Route Miles	Headways	Hours of Operation	Number of Stations (existing, new, optional)	Fleet Size
Alternative 6 Diesel Light Rail on Former SPRR Alignment plus Reduced “Silicon Valley” Express Bus Feeder Service	<ul style="list-style-type: none"> • 2 Diesel Light Rail routes: A) Warm Springs to Tasman line to Lockheed/ Martin; B) Warm Springs to SJ Diridon 	12.8 miles, Warm Springs BART to SJ Diridon	<ul style="list-style-type: none"> • 10 minute headways each route, for 5 minute combined headways, peak; 20 minute headways each route, for 10 minute combined headways, off-peak 	4:30am to 1:00 am	1 existing (SJ Diridon) plus all Tasman Stations west of Great Mall Station 4 new 3 optional	61 articulated diesel LRVs and 7 additional “Silicon Valley” express buses
Alternative 7 Diesel Light Rail on UPRR Alignment plus Reduced “Silicon Valley” Express Feeder Bus Service	<ul style="list-style-type: none"> • 2 Diesel Light Rail routes: C) Warm Springs to Tasman line to Lockheed/ Martin D) Warm Springs to East Valley line to SJ Diridon 	13.8 miles, 11.4 miles in WPRR R/W, and 2.4 miles on Santa Clara Street (shared w/planned Downtown / East Valley LRT line)	Same as Alternative 6	Same as Alternative 6	1 existing (SJ Diridon) plus all Tasman Stations west of Montague/ Capitol and all East Valley Light Rail stations (7) from 28 th Street west to SJ Diridon Station 4 new 3 optional	Same as Alternative 6
Alternative 8 Light Rail on Former SPRR Alignment plus Reduced “Silicon Valley” Express Bus Feeder Service	Same as Alternative 6	Same as Alternative 6	Same as Alternative 6	Same as Alternative 6	Same as Alternative 6	Same as Alternative 6
Alternative 9 Light Rail on UPRR Alignment plus Reduced “Silicon Valley” Express Bus Feeder Service	Same as Alternative 7	Same as Alternative 7	Same as Alternative 6	Same as Alternative 6	Same as Alternative 7	Same as Alternative 6
Alternative 10 BART on Former SPRR/8 th Street Alignment plus Reduced “Silicon Valley” Express Bus Feeder Service	2 BART routes: <ul style="list-style-type: none"> • S.F. to Fremont to San Jose • Richmond to Fremont to San Jose 	15.4 miles	12 minute headways each route, for 6-minute combined headways all day; 20-minute headways each route for 10-minute combined headways evenings and weekends	4:00 am to 1:00 am	6 new 2 optional	118 BART cars; 6 additional LRVs; and 5 additional “Silicon Valley” express buses
Alternative 11 BART on UPRR Alignment plus Reduced “Silicon Valley” Express Bus Feeder Service	Same as Alternative 10	16.3 miles	Same as Alternative 10	Same as Alternative 10	7 new 1 optional	Same as Alternative 10

Figure C-1 Alternative 1 - Baseline Plus Expanded Express Bus Service on I-880 & I-680 HOV Lanes

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Figure C-2 Alternative 2 - Busway on UPRR (Former WPRR) Alignment

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Figure C-3 Alternative 3 – Expanded Commuter Rail on UPRR “Alviso” (ACE Train) Alignment

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Figure C-4 Alternative 4 – Commuter Rail on Former SPRR Alignment

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Figure C-5 Alternative 5 – Commuter Rail on UPRR (Former WPRR) Alignment

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Figure C-6 Alternative 6 – Diesel Light Rail on Former SPRR Alignment

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Figure C-7 Alternative 7 – Diesel Light Rail on UPRR (Former WPRR) Alignment

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Figure C-8 Alternative 8 – Light Rail on Former SPRR Alignment

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Figure C-9 Alternative 9 – Light Rail on UPRR (Former WPRR) Alignment

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Figure C-10 Alternative 10 – BART on Former SPRR/8th Street Alignment

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Figure C-11 Alternative 11 – BART on UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

APPENDIX D

SILICON VALLEY RAPID TRANSIT CORRIDOR 2025 NO PROJECT AND BASELINE HIGHWAY AND TRANSIT NETWORK ASSUMPTIONS

Table D-1

**Silicon Valley Rapid Transit Corridor
2025 No Project and Baseline Highway Network Assumptions**

No.	Santa Clara County Highway and Expressway Projects	Source	Actions / Notes
1.	SR 85/US 101 northbound direct HOV connections in Mountain View	VTP 2020 ¹	Completed by 2005
2.	Montague Expressway/San Tomas Expressway/US 101/Mission College Bl. Interchange	VTP 2020	
3.	SR 87/US 101 stem ramp connection to Trimble interchange	VTP 2020	
4.	US 101 Widening to accommodate SR 85 Direct HOV Connectors in San Jose	VTP 2020	
5.	SR 85/US 101 Direct HOV Connectors in San Jose	SCL ² Measure B	
6.	US 101 Widening from Metcalf Road to Cochrane Road	SCL Measure B	(6 mixed-flow + 2 HOV)
7.	Montague Expressway/I-880 interchange reconfiguration improvements	VTP 2020	
8.	Coleman Avenue/I-880 interchange improvements	VTP 2020	
9.	I-680 Southbound HOV lanes: ALA ³ /SCL County Line to Montague Expressway	VTP 2020	
10.	SR 87 improvements at Skyport Drive interchange	SCL Measure B	Under construction
11.	SR 87 widening (HOV Lanes) between Julian Street and SR 85	SCL Measure B	Completed by 2005
12.	Montague Expressway Widening from 6 to 8 lanes; I-680 to US 101	VTP 2020	
13.	Montague Expressway/Commuter Rail/BART grade separation	VTA	
14.	I-880/Route 237 freeway interchange (Stages A, B & C)	SCL Measure B	Stage A under construction
15.	I-880 widening from Montague to US 101	SCL Measure B	6 lanes (all mixed-flow lanes)
16.	Upgrade Guadalupe Freeway to 6 lane freeway from US101 to Julian	SCL Measure B	6 lanes (4 MF + 2 HOV) under construction
17.	US 101/Hellyer Avenue interchange modifications	Local	City of San Jose Project
18.	US 101/Blossom Hill Avenue interchange modifications	Local	City of San Jose Project
19.	US 101 Aux Lane widening; SR 87 to Great America Parkway	VTP 2020	
20.	Fourth Street/Zanker Road/US 101 overcrossing and ramp modifications	VTP 2020	
21.	Tully Road/US 101 interchange modifications	VTP 2020	
22.	Tennant Avenue/US 101 interchange improvements in Morgan Hill	VTP 2020	
23.	Tenth Street (SR 152) extension and US 101 interchange improvements in Gilroy	VTP 2020	
24.	SR 25/Santa Teresa Boulevard/US 101 interchange construction	VTP 2020	
25.	Buena Vista/US 101 interchange construction	VTP 2020	
26.	SR 237 Widening for HOV lanes between SR 85 and US 101	VTP 2020	
27.	SR 237 Westbound auxiliary lanes between Coyote Creek Bridge and North First Street	VTP 2020	
28.	I-880 widening from Route 237 to Alameda County line	MTC RTP ⁴ '98	10 lanes (8 mixed-flow + 2 HOV)
29.	I-680 northbound HOV lane (Montague to ALA/SCL County Line)	VTP 2020	
30.	Improvements to I-880/Stevens Creek Blvd interchanges	VTP 2020	
31.	I-280/I-680 connector to southbound US 101: braided ramp with Tully Road exit ramp	VTP 2020	
32.	Widen SR 85 from I-280 to Fremont Avenue	VTP 2020	
33.	SR 85 Northbound to I-280 Northbound and I-280 exit to Foothill braided ramp	VTP 2020	

Table D-1 (Cont.)

**Silicon Valley Rapid Transit Corridor
2025 No Project and Baseline Highway Network Assumptions**

No.	Santa Clara County Highway and Expressway Projects	Source	Actions / Notes
34.	SR 25 upgrade to expressway standards	VTP 2020	
35.	SR 152 safety improvements between US 101 and SR 156	VTP 2020	
36.	Trimble Road/De la Cruz Bl./US 101 Interchange improvements	VTP 2020	
37.	Route 85/87 interchange completion	SCL Measure B	
38.	Route 17/85 improvements	SCL Measure B	
39.	Montague Expressway/Trimble Road flyover ramp	VTP 2020	
40.	Central Expressway Widening for HOV lanes from SR 237 to De la Cruz Avenue	VTP 2020	
41.	I-880 widening from Mission Blvd. to Santa Clara County line	MTC RTP '98	10 lanes (8 MF + 2 HOV)
42.	I-680 southbound HOV lane (Route 84 to ALA/SCL County Line)	ALA Measure B	
43.	I-680 northbound HOV lane (Route 84 to ALA/SCL County Line)	ALA Measure B	
44.	Route 84 new roadway (expressway) from Route 238 (Mission Blvd) to I-880	ALA Measure B	4 lane new expressway
45.	I-880/Dixon Landing Road interchange improvement	MTC RTP '98	
46.	I-880/Mission Blvd interchange improvement	MTC RTP '98	

¹ Valley Transportation Plan 2020 (VTA)

² Santa Clara County

³ Alameda County

⁴ Metropolitan Transportation Commission Regional Transportation Plan

Table D-2

**Silicon Valley Rapid Transit Corridor
2025 Baseline Transit Network Assumptions**

No.	Santa Clara County Transit Projects	Source	Actions / Notes
1.	Vasona LRT ³ , Winchester to Downtown San Jose	SCL ⁴ Measure B	10-minute headways, interlined with East Valley LRT
2.	Vasona LRT, Vasona Junction to Downtown San Jose	TBD ⁵	10-minute headways, interlined with East Valley LRT
3.	Tasman East/Capitol Expressway LRT, Hostetter to Eastridge Mall	SCL Measure B	10-minute headways
4.	Downtown/East Valley - Santa Clara/Alum Rock LRT line	SCL Measure A	10-minute headways, interline with Vasona, terminate at Alum Rock station
5.	BRT ⁶ - Line 22/Line 300	SCL Measure A	Limited stop (Route 300) at 10 min headways, 15% travel time reduction on El Camino
6.	BRT – Monterey Highway	SCL Measure A	Downtown SJ to Santa Teresa LRT, 10 min headway for limited stops, 10% travel time reduction on Routes 66, 68 on Monterey Highway to San Carlos
7.	Expansion of VTA bus fleet to 650 vehicles	SCL Measure A	650 buses plan from VTP 2020, does not include rail shuttles
8.	Caltrain	SCL Measure A	Increase service to 100 trains SJ to SF, add express trains (SJ, MV, PA, Hillsdal, Millbrae and SF stops, 60 minute travel time), new Coyote Valley station, 20 trains serving Gilroy (6 rt in peak direction, 2-4 rt in reverse peak direction)
9.	Caltrain service upgrades	SCL Measure A, other	Increase service over 2010 to 120 trains SJ to SF, Gilroy service 30 min peak period/peak direction, 60 min reverse peak direction; electrify system; extension to Monterey County (extend 2 round trips)
10.	ACE service upgrade	SCL Measure A	8 peak direction trains weekday service, new Auto Mall Parkway station
11.	Amtrak Capitols	Capitol 2001 Plan	11 round trips per day, Sacramento to San Jose trains, new Coliseum and Union City Intermodal stations
12.	San Jose International Airport rail connector to BART, Caltrain and LRT	SCL Measure A	5 minute headways all day, connection to LRT in 2010, BART and Caltrain by 2025
13.	BART Extension from Fremont to Warm Springs	BART	12-minute peak/mid-day headways each train (6-minute combined frequency)
14.	AC Transit southern Alameda County bus service increases	AC Transit	increase to 15 min peak/30 min off-peak headways from 30 peak/30 off-peak headways
15.	New West Dublin BART station	ALA ⁷ Measure B	

³ Light Rail Transit

⁴ Santa Clara County

⁵ To Be Determined

⁶ Bus Rapid Transit

⁷ Alameda County

APPENDIX E

BART-COMPATIBLE ALTERNATIVE 11B

ALTERNATIVE 11B: BART-COMPATIBLE RAIL ALTERNATIVE ON UPRR ALIGNMENT

PHYSICAL DESCRIPTION

The BART-compatible Alternative would follow the same horizontal and vertical alignment as the BART Alternative described in Section 2.1.1, but would terminate at the Warm Springs BART Station, forcing a transfer to and from the BART system (**Figure E-1**). Potential station locations and a new maintenance and storage facility site also would be the same. However, the maintenance and storage facility would be half as large as in Alternative 11. The BART-Compatible Alternative would be operated exclusively by VTA, terminating at the Warm Springs BART Station (**Figure E-2**). The Warm Springs Station would be redesigned to accommodate cross-platform transfers and to permit the turnback of BART and VTA trains to the north and south, respectively (**Figure E-3**). Turnback operation for the VTA system would require the construction of four 3500-foot long tail tracks extending north of the Warm Springs Station. Similarly, VTA would need to install mainline tracks parallel with the BART tail tracks extending south of Warm Springs. In order to allow possible future BART operation along the alignment south of Warm Springs, the stations and alignment, including track gauge, station platform size, train control system, would be designed to be fully compatible with BART.

OPERATING PLAN ASSUMPTIONS

The operating plan described for Alternative 11 would apply to this alternative as well, except that VTA trains would be timed to meet BART trains heading in the same direction, thus facilitating passenger transfers between systems.

Figure E-1 Alternative 11B – VTA–Operated, BART–Compatible Rail On UPRR (Former WPRR) Alignment

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

Figure E-2 Alternative 11B – VTA/BART Warm Springs Transfer Station Plan View of Station and Tail Tracks

Note: Some of the report figures and the appendices are not available through the website. To request materials or inquire about accessible features, please e-mail vtabart@vta.org or telephone VTA Customer Service at (408) 321-2300 or TDD for the hearing impaired at (408) 321-2330.

**Figure E-3 Alternative 11B – VTA/BART Compatible/BART Warm Springs Transfer Station
Cross Section through Station**

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APPENDIX F

RESOLUTIONS AND LETTERS OF SUPPORT FOR THE BART ALTERNATIVE AS THE PREFERRED INVESTMENT STRATEGY