# CHAPTER 10: EVALUATION OF ALTERNATIVES

This chapter provides an assessment of how well the alternatives considered in this EIS satisfy project Purpose and Need based on local evaluation criteria. The evaluation is intended to provide the public, interested agencies and decision-making organizations key summary information by which to compare the overall performance of alternatives. The evaluation is presented in two parts. The first describes how both the BEP Alternative and the SVRTP Alternative perform relative to 25 criteria in five categories: mobility improvements, environmental impacts, operating efficiencies, land use, and local financial commitment/support. The second part focuses solely on the performance of the BEP Alternative with respect to certain criteria that the Federal Transit Administration (FTA) considers in evaluating projects for federal funding participation.

VTA has proposed to FTA that the BEP Alternative be approved for federal New Starts capital funding (49 USC Section 5309 [Capital Investment Grants]). Certain actions must be completed before FTA will make a determination on this proposal. In September 2009, VTA submitted a combined New Starts report and request to enter preliminary engineering (PE) supporting the New Starts funding proposal. FTA is in the process of evaluating the merits of the submittal. In accordance with provisions of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU, 2005) and related federal guidelines, FTA issues a rating of the project with respect to various New Starts criteria and recommends to Congress whether or not the project should advance to the next phase of project development (PE) and be eligible for Section 5309 funds. The performance measures of the BEP Alternative in Part 2 are representative of FTA's New Starts criteria.

In consultation with FTA, adjustments were made to the travel demand model (subsequent to the Draft EIS) to reflect changes to the project scope and definition, in part for the purpose of improving the project's "cost effectiveness" rating under New Starts criteria. These adjustments refined the definition of the BEP Alternative.

Values for the BEP Alternative in Part 1 of this chapter have not been updated to reflect the refined definition of the BEP Alternative. Part 2 of this chapter provides a summary of New Starts changes to the project and a discussion of related impacts. The Locally Preferred Alternative presented in Volume II Chapter 2 of the Final EIS represents a fully-updated description of the Berryessa Extension Project, including the project scope and definition assumed for the New Starts Locally Preferred Alternative Silicon Valley Berryessa Extension submitted to FTA in September 2009.

# PART 1

## 10.1 OVERVIEW OF EVALUATION METHODOLOGY FOR EVALUATING BEP AND SVRTP PERFORMANCE

Alternatives are compared both qualitatively and quantitatively when possible using an evaluation methodology that has been applied throughout the project development process. An initial screening of a wide range of alternatives was performed as part of the major investment study process, using a set of evaluation criteria that are listed in Chapter 2. Many of the proposed alternatives were eliminated from further consideration as a result of that process.

This chapter presents a more detailed evaluation of a limited subset of alternatives, based on a similar set of criteria as described below. The evaluation examines how each of the three alternatives considered in this EIS performs in terms of meeting the project Purpose and Need statement presented in Chapter 1. Most criteria included in this evaluation chapter were derived from the Silicon Valley Rapid Transit Corridor MIS/EIS/EIR Major Investment Study (MIS) Final Report (November, 2001). The MIS criteria are listed in Section 2.1.1 of Chapter 2, Alternatives. In certain instances their definitions were modified to better correspond with current project information made available through the EIS process. The final criteria provide an objective means of determining each alternative's consistency with locally defined goals and objectives. These criteria, grouped within five categories, include:

**Mobility Improvements**

- Ridership

  Total transit boardings in the Silicon Valley Rapid Transit Corridor (SVRTC), average weekday (2030) VTA total boardings including BART extension, average weekday (2030) New transit riders, weekday average (2030)

- Travel time savings

  Change in transit user travel times, average weekday (hours)
  Point-to-point auto versus transit total travel time, AM peak hour (minutes)

- Travel speeds

  Average freeway peak hour speed at county screenline (AM/PM)

- Congestion relief

  Change in annual vehicle miles of travel (VMT)
  PM peak period (3 hours) auto trips removed

- Regional connectivity and mobility

- Environmental justice

  Low income households within ½- and one mile of stations
  Zero-auto households within ½- and one mile of stations
  Job opportunities within ½- and one mile of stations

**Environmental Benefits/Adverse Effects**

- Air quality: Change in annual National Ambient Air Quality(NAAQ) pollutant emissions

- Air quality: Change in greenhouse gas emissions in tons of CO2 equivalents

- Mobile (vehicle) energy consumption: Change in annual gallons of gasoline equivalents

- Displacements: Number of residences

- Displacements: Number of businesses

- Historic properties: Number of parcels and structures affected

- Acres of wetlands/habitat affected

- Adverse traffic effects: Number intersections adversely affected before and after mitigation of level of service (LOS)

- Adverse construction effects

**Operating Efficiencies**

- Passenger boardings per vehicle mile (VTA bus, VTA LRT, BART Extension)

- Change in total VTA bus, VTA LRT and BART extension operating costs

- Operating cost per passenger boarding (VTA bus, VTA LRT, BART Extension)

- Operating cost per passenger-mile (VTA bus, VTA LRT, BART Extension)

**Land Use**

- Transit supportive land use policies and zoning regulations
- Potential for transit-oriented development
- Other land use considerations
- Economic development effects

**Local Financial Commitment and Public Acceptance**

- Percent capital funds from local sources
- Community and stakeholder acceptance

## 10.2 SUMMARY OF BEP AND SVRTP PERFORMANCE: LOCALLY ESTABLISHED EVALUATION CRITERIA

This section summarizes performance of the No Build Alternative, BEP Alternative, and the SVRTP Alternative in five areas, applying the previously described evaluation criteria.

### 10.2.1 MOBILITY IMPROVEMENTS

Evaluation criteria have been established to measure the outcomes of proposed major transit investments. The outcomes are the ridership on the project and overall transit system, the faster and therefore shorter travel times that are possible, the benefits that extend to other modes, and the populations that benefit from the improved service. In most cases, these outcomes are quantifiable. An alternative performs better if it generates more riders than other alternatives, reduces travel times, and serves populations with limited or no other travel options (e.g., transit dependent/mobility disadvantaged individuals). Table 10-1 lists the measures that have been identified for capturing mobility benefits of EIS Build Alternatives.

**Table 10-1: Mobility Evaluation**

| Objective/ Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Total Transit Boardings in Study Area, Average Weekday (2030) | ○ | ◐ | ● |
| | 1,181,700 | 1,234,400 | 1,254,800 |
| VTA Total Boardings including BART Extension, Average Weekday (2030) [BART Extension Riders] | ○ | ◐ | ● |
| | 433,800 [0] | 508,000 [46,458] | 538,100 [98,751] |
| New Transit Riders, Average Weekday (2030) | ○ | ◐ | ● |
| | 0 | 27,135 | 48,597 |
| Travel Time Savings: Change in Transit User Travel Times, Average Weekday (hours) | ○ | ◐ | ● |
| | 0 | -43,608 | -57,349 |
| Travel Time Savings: Point-to-Point Auto versus Transit Total Travel Time, AM Peak Hour (minutes) | ○ Auto vs. Transit | ◐ Auto vs. Transit | ● Auto vs. Transit |
| -Pleasanton to downtown San Jose | 81 vs. 85 | 80 vs. 83 | 80 vs. 69 |
| -Union City to downtown San Jose | 49 vs. 62 | 48 vs. 48 | 48 vs. 35 |
| -Alum Rock to downtown San Fran. | 127 vs. 113 | 125 vs. 88 | 124 vs. 76 |
| -Alum Rock to downtown Oakland | 80 vs. 118 | 79 vs. 80 | 78 vs. 68 |
| Travel Speeds: Average Freeway Peak Hour Speed in MPH at County Screenline (AM/PM) | ○ | ◐ | ◐ |
| | 17.6 / 11.7 | 18.5 / 13.1 | 19.3 / 13.9 |
| Congestion Relief: Change in Annual Vehicle Miles of Travel | ○ | ◐ | ● |
| | 0 | -83,200,000 | -146,400,000 |
| Congestion Relief: PM Peak Period (3 Hours) Auto Trips Removed and [Average Daily] Trips Removed | ○ | ◐ | ● |
| | 0 | 5,600 [18,300] | 10,000 [32,500] |
| Regional Connectivity and Mobility | ○ | ◐ | ● |
| Environmental Justice: Low Income Population within ½ Mile [1 Mile] of Stations (2000 Census) | NA | ◐ | ● |
| | | 744 [7,450] | 7,128 [37,746] |

**Table 10-1: Mobility Evaluation Cont'd.**

| Objective/ Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Environmental Justice: Zero Auto Households within ½ Mile [1 Mile] of Stations (Census, 2000) | NA | ○ | ◐ |
| | | 125 [1,329] | 1,819 [7,941] |
| Environmental Justice: Job Opportunities within ½ Mile [1 Mile] of Stations (2030 Forecast) | NA | ◐ | ● |
| | | 17,183 [46,130] | 89,336 [160,178] |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | | |

Source: VTA, 2009

## Ridership

Total ridership, measured in terms of weekday boardings on BART and other transit services serving Santa Clara County and the SVRTC[1], would increase by almost 130 percent between 2007 and 2030, from 515,000 to 1,182,000, under the No Build Alternative conditions. The BEP Alternative would increase 2030 boardings by an additional 4 percent and the SVRTP Alternative by 6 percent. Total weekday boardings on VTA bus and LRT and boardings on BART generated by the BEP and SVRTP alternatives would increase more, by 13 percent and 22 percent, respectively. This higher ridership is a result of riders attracted from auto travel to a high-frequency, high-speed transit alternative, and shifting services accordingly. The number of BART riders using the SVRTP Alternative is forecast to be approximately 98,800, or over two times the riders on the BEP Alternative. Total new transit riders (linked trips) generated by the SVRTP Alternative are just under twice the new riders on the BEP Alternative. The ridership measures support the conclusion that the SVRTP Alternative offers substantially more benefits than the BEP and No Build alternatives.

## Travel Times and Speeds

Savings are measured relative to the 2030 No Build Alternative. The SVRTP Alternative is projected to save SVRTC transit users 57,300 hours of total travel time every weekday, approximately 32 percent more hours than are saved under the BEP Alternative.

[1] Transit operators and services include BART, ACE commuter rail, Caltrain commuter rail, Capitol Corridor intercity rail, Dumbarton Rail Corridor service (proposed), VTA local and express bus, and VTA light rail.

For point-to-point travel during congested peak periods, the SVRTP Alternative would allow faster transit travel compared to the BEP Alternative for trips to/from downtown San Jose. For commuters and other travelers into Santa Clara County traveling to (and from) the major activity centers represented by downtown San Jose and the heart of Silicon Valley, a major purpose and need for high-speed transit improvements in the area, the SVRTP Alternative provides greater access and therefore greater overall benefits. Similarly, the SVRTP Alternative is superior to the BEP Alternative for trips from east San Jose/Alum Rock to/from downtown San Francisco and downtown Oakland. By 2030, with few exceptions, transit travel times to/from downtown activity centers would be substantially less than single-occupant auto travel times.

Both the BEP and SVRTP alternatives will divert auto travel to transit in two of the San Francisco Bay region's more heavily congested freeway corridors, I-880, and I-680. The benefits in terms of improved auto speeds were measured near the Santa Clara County boundary with Alameda County. The weighted average speed for p.m. peak hour traffic (2030) under the No Build Alternative is estimated to be 11.7 mph, improving moderately under the BEP Alternative to 13.1 mph and slightly more under the SVRTP Alternative to 13.9 mph. Although noticeable, the benefits tend to be limited because any freeway capacity that becomes available during peak periods due to mode shifts tends to be readily filled by auto trips diverted from other facilities or other periods. Unfortunately, the future freeway system in the study corridor is likely to always be congested during peak periods although the proposed transit improvements will increase overall corridor capacity and expand modal options. For these reasons the benefits of both the BEP and SVRTP alternatives are considered to be moderately favorable in terms of improving average auto speeds.

## Congestion Relief

Both the BEP and SVRTP alternatives will reduce total vehicle miles of travel (all modes combined) in the region, mainly by reducing the number of auto trips. By 2030 the SVRTP Alternative is expected to reduce VMT compared to the No Build condition by 146 million miles annually. The BEP Alternative reduces VMT by approximately 83 million miles annually (equivalent to 57 percent of the VMT reduction projected under the SVRTP Alternative).

Another perspective on the congestion reduction benefits associated with proposed transit improvements is the reduction in auto trips during peak periods. By 2030 the commute period will likely span three hours during the afternoon. The SVRTP Alternative is projected to eliminate 10,000 trips from the regional roadway network by prompting a mode shift from auto to transit, and the BEP Alternative will eliminate approximately 5,600 trips during the PM peak three hours of travel.

## Mobility Improvements and Environmental Justice

The extension of BART service, as opposed to other transit modes, provides Santa Clara County a direct connection to the San Francisco Bay Area's main regional rail network. The existing BART network, including the in-progress extension to Warm Springs in Alameda County connects three out of four of region's largest cities—San Francisco, Oakland, and Fremont. The BART network also serves the residential and commercial growth areas of Alameda and Contra Costa counties, many of whose residents, at least in Alameda County, are employed in Santa Clara County. The SVRTP Alternative will directly connect the region's largest city, San Jose, and portions of the region's most dynamic employment corridor, Silicon Valley, to BART regional rail. It is superior to the BEP Alternative, which does not offer direct rail connections to San Jose and the south core of Silicon Valley. The higher number of new transit riders generated by the SVRTP Alternative is another indicator of its favorable effect on mobility.

Santa Clara County is quite affluent yet includes sizeable low income and limited mobility populations. Low income populations (defined as individuals in families with incomes less than twice the federal poverty level[2]) served by the BEP and SVRTP alternatives increase considerably as the station catchment areas are enlarged from ½-mile to one mile, reflecting the fact that initially the BART alignment and stations, with the exception of downtown San Jose, will be in existing railroad and industrial corridors. Ongoing infill and industrial-to-residential conversions will expand the population base closer to proposed stations. A ½-mile distance to stations is convenient for walk and non-motorized access. A 1-mile distance is less convenient for walk but can be well served by shuttle/circulator services.

The vast majority of households in the county have at least one auto available. Therefore, the number of zero-auto households served by proposed BART stations is low under both the BEP and SVRTP alternatives. As with low income populations, the number of zero-auto households increases substantially when expanding the catchment area around stations to one mile, although on an absolute scale the number of zero-auto households is not that large.

Transit dependent populations, as indicated by low income and/or low auto ownership, tend to be more heavily concentrated in eastern Santa Clara County, including east San Jose. Many will be provided improved transit access to the

[2] In the San Francisco Bay Area, due to the high cost of living, individuals in poverty are defined as those whose family incomes are less than two times the national average family incomes used to establish poverty thresholds. In 1999, the basis of the 2000 Census, this was $17,029 for a family of four. Twice this level is $34,058.

region's main employment centers under both BART extension alternatives. The SVRTP Alternative offers more mobility benefits to these disadvantaged populations in the project corridor due to its greater accessibility (six BART stations as opposed to two) and rapid rail connections to major employment centers in Oakland and San Francisco. Alternatively, Bay Area transit dependent populations will have increased mobility to Silicon Valley's major employment centers in downtown San Jose and Santa Clara. By 2030, approximately 90,000 jobs are projected to be within ½-mile and 160,000 would be within one mile of proposed BART stations under the SVRTP Alternative. Approximately 17,000 and 46,000 jobs would be within ½-mile and 1-mile, respectively, of BEP Alternative stations. To access jobs in downtown San Jose and Santa Clara, riders on the BEP Alternative will need to transfer to express buses and shuttle/feeder services.

## 10.2.2 ENVIRONMENTAL BENEFITS/ADVERSE EFFECTS

The Build Alternatives could generate both environmental benefits and adverse environmental effects. Adverse effects may be temporary (e.g., limited to the construction of a project) or long term (e.g., cause a permanent change in conditions). Adverse effects once identified can often be mitigated, and it is therefore reasonable to assess effects with proposed, practicable mitigation measures in place.

Table 10-2 lists the various environmental factors included in the evaluation.

### Air Quality and Energy

Relative to the No Build Alternative conditions, the BEP and SVRTP alternatives will reduce annual emissions of key National Ambient Air Quality (NAAQ) pollutants, including reactive organic gases, oxides of nitrogen, and carbon monoxide. These pollutants are associated with auto and truck travel, which are both reduced by a mode shift to transit. Relative to the total emissions of these pollutants from SVRTC traffic, the tonnage reduction is considered moderately favorable under the BEP Alternative and most favorable for the SVRTP Alternative.

The reduction in greenhouse gas emissions, measured in terms of tons of CO2 equivalents, will be more substantial. The benefits from the SVRTP Alternative are a reduction of approximately 16,000 tons annually compared to a reduction of approximately 4,000 tons for the BEP Alternative.

Similar to air quality emissions, the reduction in SVRTC VMT associated with the Build Alternatives will lead to a reduction in transportation energy consumption. The SVRTP Alternative generates a higher reduction in VMT and therefore higher fuel savings. Relative to regional travel, however, the benefits are considered most favorable for the SVRTP Alternative and moderate for the BEP Alternative.

**Table 10-2: Adverse Environmental Effects Evaluation**

| Objective/ Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Air Quality: Change in Annual NAAQ Emissions, in Tons | ○ | ◐ | ● |
| -Reactive Organic Gases (ROG) | 0 | -10 | -21 |
| -Nitrogen Oxides (NOX) | 0 | 9 | -4 |
| -Carbon Monoxide (CO) | 0 | -76 | -160 |
| Air Quality: Change in Greenhouse Gas Emissions in Tons of $CO_2$ Equivalents | ○ | ◐ | ● |
| | 0 | -4,138 | -16,153 |
| Mobile (Vehicle) Energy Consumption: Change in Annual Gallons of Gasoline Equivalents[a] | ○ | ◐ | ● |
| | 0 | -3,125,000 | -6,017,000 |
| Displacements: Number of Residences | ● | ● | ◐ |
| | 0 | 2 | 3-15 |
| Displacements: Number of Businesses | ● | ◐ | ○ |
| | 0 | 47-58 | 78-103 |
| Historic Properties: Number of Parcels [Structures] Affected | ● | ● | ◐ |
| | 0 | 0 | 2-3 [4-8] |
| Acres of Wetlands/Habitat Affected | ● | ◐ | ◐ |
| | 0 | 0.56 | 0.56 |
| Adverse Traffic Effects: Number of Intersections Adversely Affected Before [After] Mitigation of LOS | ● | ◐ | ○ |
| | 0 | 14 [9] | 32 [26] |
| Adverse Construction Effects | ● | ◐ | ○ |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | | |

Notes:

[a] Change in annual gallons of gasoline equivalents based on bus/auto/truck Direct BTUs (110,400 Direct BTUs equivalent per gallon of gasoline)

Source: VTA, 2008

## Displacements and Historic Structures

The No Build Alternative does not result in the displacement of any residences or businesses or affect historic structures in the SVRTC.

The BEP Alternative will displace two residential units, a limited adverse effect given the size and complexity of this alternative. Depending on the alignment option, the SVRTP Alternative will require the removal of from three to 15 residential units, with the high end of the range considered a moderately adverse effect. Under both Build Alternatives, adverse effects on business are more substantial, with the BEP Alternative having a moderately adverse effect and the SVRTP Alternative having the least favorable effect on business activity. The SVRTP Alternative would displace from 66 to 78 percent more business units than the BEP Alternative.

With respect to adverse effects on historic properties (either their removal or causing a permanent change in their setting or character), the BEP Alternative has no adverse effects and the SVRTP Alternative only a moderately adverse effect.

## Habitat

Because the proposed BEP Alternative and SVRTP Alternative improvements are proposed within an already heavily urbanized area, adverse effects on wetlands and other natural habitats will be very minor under both the BEP and SVRTP alternatives.

## Traffic

Both the BEP and SVRTP alternatives divert travel from autos to transit and thereby reduce the number of auto trips relative to the No Build Alternative. There will be a small reduction in peak hour trips on study corridor freeways. (Any available freeway capacity tends to fill readily due to a roadway system that will be over capacity on many links in 2030.) However, approximately three freeway segments in the vicinity of the Berryessa Station under the BEP Alternative will experience peak hour degradation in level of service that exceeds the Santa Clara County Congestion Management Program impact threshold. Depending upon whether the AM or PM peak is considered, approximately four to five segments near the Berryessa and Alum Rock stations under the SVRTP Alternative will experience peak hour degradation in service exceeding thresholds. The adverse effects result from the concentration of traffic proceeding to/from each BART station.

Both alternatives alter arterial and local street circulation in the vicinity of proposed BART stations and increase congestion at intersections used by park-and-ride and kiss-and-ride traffic and, to a limited extent, feeder, and express buses. The potential adverse effects of increased station area traffic were

measured relative to a 2030 No Build Alternative under "With Improvements" conditions, wherein it was assumed intersections will be improved to a reasonable level through retiming, restriping, and lane additions that are possible within the available right-of-way (ROW), before considering the effects of BART station traffic.

The number of intersections that experience substantial adverse effects in 2030 under either of the build alternatives was determined to be a small percentage of the total intersections analyzed. Of the 66 intersections evaluated under the BEP Alternative for both AM and PM levels of service (LOS),[3] both "with" and "without" BEP Alternative improvements, 14 will be adversely affected, or 21 percent. When considering reasonable mitigation, the number of intersections experiencing adverse effects decreases to nine, or 14 percent.

The SVRTP Alternative will result in a higher number of substantial adverse effects. Of the 127 intersections analyzed under this alternative, 32 (or 25 percent) will be adversely affected in terms of LOS by 2030 before consideration of feasible mitigation measures. Following the implementation of reasonable mitigation, 26 intersections (20 percent) will be adversely affected. For these reasons, the SVRTP Alternative was determined to have the least favorable effects relative to local traffic while the BEP Alternative has moderately adverse effects on local traffic.

## Construction

Both the BEP and SVRTP alternatives involve major construction activity. Most of the improvements for the BEP Alternative, except improvements surrounding the Milpitas and Berryessa stations, will be alongside and/or within a former railroad corridor, therefore limiting spillover effects to surrounding uses. The BART guideway will be a combination of at-grade, retained cut, and aerial or retained fill segments. Eight grade separations of the guideway at east-west arterials are proposed. Station structures will be constructed largely within the ROW of the former railroad alignment although improvements for parking, auto, and feeder bus access, including intermodal transfer facilities, will extend into surrounding areas.

At the Berryessa Station, under the BEP Alternative, a storage yard and moderately sized maintenance facility could be constructed as an option to the preferred tailtrack design. This facility, called the Las Plumas Yard Option, would

[3] The Berryessa Station is a line terminus under the BEP Alternative and will generate more auto access traffic than as an intermediate station for the SVRTP Alternative. As a result, 18 additional intersections (compared to the SVRTP Alternative) were evaluated for LOS under 2030 traffic conditions. The intersections were evaluated for LOS during the a.m. and p.m. peak hours.

be built if proposed improvements to existing BART facilities, such as the Hayward Yard for operations and maintenance on the Fremont line, cannot be implemented. The Las Plumas Yard Option is located southeast of the Berryessa Station in an existing industrial area on the east of the Union Pacific Railroad (UPRR) alignment.

The construction period for the BEP Alternative, including testing and pre-revenue service start-up, will last approximately four to five years. Because most improvements will be within the existing railroad corridor, overall adverse construction effects of the BEP Alternative are considered moderate.

The SVRTP Alternative will have the same types of adverse effects for the segment from Warm Springs to Berryessa Station, absent the Las Plumas Yard Option. The alignment south of Berryessa transitions from aerial/retained fill to a tunnel through central San Jose before returning to an at-grade configuration north of I-880 through the Santa Clara Station. Under the SVRTP Alternative, a yard and shops facility will be constructed at the line terminus within the former UPRR Newhall Yard and extend into former industrial sites now owned by the City of San Jose. The underground alignment through San Jose will be a combination of cut-and-cover tunnel (at the two portals, the three underground stations, and where vent shafts and track crossovers are proposed) and bored tunnel (between stations) for approximately 5.5 miles.

The underground portions of the SVRTP Alternative have the potential to cause substantial adverse construction effects due to street closures, truck traffic for the haul and delivery of materials, equipment generated noise, and other activities. VTA will work closely with business and residential communities to limit disruptions whenever possible to an acceptable level. (See Chapter 6, Construction, Section 6.1 of Construction, for discussion of the Construction Education and Outreach Plan established by VTA to minimize the adverse effects of the SVRTP Alternative; Section 6.3, of the Construction chapter identifies other construction mitigation measures for the corridor.) The SVRTP Alternative beyond Berryessa Station will be implemented in phases following completion of the BEP Alternative.

Because of the considerably greater extent of proposed improvements, the potential for disruption of adjacent businesses and residences when the BART alignment is outside the former freight rail corridor and rail yard, and the long duration of construction, the potential construction impacts of the SVRTP Alternative are considered least favorable.

## 10.2.3 OPERATING EFFICIENCIES

Major transit investments should improve operating efficiency—carry more passengers per unit of service provided and carry passengers at a lower unit cost. The change in total operating costs should be reasonable relative to the benefits of greater ridership and increased capacity. Four measures of operating efficiency have been established by which to compare performance of build alternatives, as shown in Table 10-3.

**Table 10-3: Operating Efficiencies Evaluation**

| Objective/ Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Passenger Boardings per Vehicle Mile (VTA bus, VTA LRT, BART Extension; 2030) | ○ | ◐ | ◐ |
| | 1.01 | 1.09 (+8%) | 1.13 (+12%) |
| Change in Total VTA Bus, BRT, LRT and BART Extension Operating Costs ($2008 in millions) | NA | ◐ | ○ |
| | | $119 (+22%) | $166 (+31%) |
| Operating Cost per Passenger Boarding (VTA bus, VTA LRT, BART Extension; $2008) | ○ | ○ | ○ |
| | $4.13 | $4.31 (+4%) | $4.35 (+5%) |
| Operating Cost per Passenger-Mile (VTA bus, VTA LRT, BART Extension; $2008) | ○ | ◐ | ● |
| | $0.97 | $0.78 (-20%) | $0.69 (-29%) |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | | |

Source: VTA, 2008

### Passenger Boardings per Vehicle Mile

Passenger boardings per transit vehicle mile of service (all VTA modes combined) for the No Build Alternative are projected to average 1.01 in 2030. Boardings per vehicle mile (including boardings generated by the extension of BART service) will improve by 9 percent under the BEP Alternative and by 12 percent under the SVRTP Alternative. Increases in this performance measure are desirable, indicating each mile of transit service either operated by VTA to provide its bus and LRT services or by BART for the extension of service into Santa Clara County (which would be financially supported by VTA), is generating more ridership. The overall benefits are considered moderate under both alternatives.

**Operating Costs**

Total annual operating costs for VTA bus, BRT, and LRT service and annual operating costs due to a BART extension into Santa Clara County will be approximately $656.2 million in 2030 under the BEP Alternative and $702.9 million under the SVRTP Alternative (all figures in constant 2008 dollars). Compared to the No Build Alterative, estimated to cost $537.2 million in 2030, the increase in operating costs is $119 million, or approximately 22 percent, under the BEP Alternative and $166 million, or 31 percent, under the SVRTP Alternative.

On a per passenger boarding or per passenger-mile basis, the unit costs of service under the SVRTP Alternative will improve relative to the No Build Alternative and actually be lower. Although the improvement is modest per passenger boarding, it is substantial per passenger-mile (decreasing by 29 percent) and considered a favorable effect. Under the BEP Alternative, Operating Cost per Passenger Mile also decreases relative to the No Build by 20 percent, and is considered a moderately beneficial effect. However, Operating Cost per Passenger Boarding will likely increase moderately under both of the Build Alternatives compared to the No Build Alternative.

The substantial improvement in unit operating costs when comparing Operating Cost per Passenger-Mile to Operating Cost per Passenger results from the long trips served by each of the Build Alternatives. A typical BART rider on the BEP or SVRTP alternative will make a longer trip, on the order of 22 or 17 miles, respectively, than the typical VTA bus or light rail transit rider. BART service is more cost-effective in serving longer person-trips.

## 10.2.4 LAND USE

The evaluation of land use, summarized in Table 10-4, considers an alternative's capacity to support existing and proposed land use plans and policies and to facilitate future growth that encourages increased transit use (e.g., transit oriented development). Transit ridership tends to increase when transit facilities are well integrated into residential and commercial developments, thereby becoming more attractive to users. Development potential is often enhanced when direct access is possible via high capacity, high frequency transit.

**Table 10-4: Land Use Evaluation**

| Objective/ Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Transit Supportive Land Use Policies and Zoning Regulations | ◐ | ● | ● |
| Potential for Transit-Oriented Development | ◐ | ● | ● |
| Other Land Use Considerations | ○ | ◐ | ● |
| Economic Development Effects | ○ | ◐ | ● |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | | |

Source: VTA, 2008

## Transit Supportive Land Use

Communities in the SVRTC are undertaking efforts to better integrate land use and transit. Transit supportive zoning and land use plans, including transit area specific plans, and general plan elements, are in progress and will occur in many locations whether or not the proposed BART extension improvements are implemented. The policies and regulations apply equally as well to light rail and Caltrain station area development and planned BRT corridor and station improvements. Therefore, even under the No Build condition, benefits will be realized from these efforts.

However, local policies and regulation have greater potential benefits when coordinated with station area planning for the BEP and SVRTP alternatives. In fact, communities have undertaken land use planning to provide regional transit-supportive density targets around, and provide improved multimodal access to, proposed BART stations.

The Milpitas BART Station and the Montague and Great Mall LRT stations are both within an area targeted for densification. The Milpitas Transit Area Specific Plan 2008 covers 437 acres and proposes 7,109 new housing units and approximately one million square feet of office, commercial/retail and hotel space. The Milpitas Midtown Specific Plan 2002 also covers the proposed BART station and calls for a high density, transit-oriented development “overlay zone.” A convenient pedestrian connection between BART and the Montague LRT Station will be provided.

The Berryessa Station in northeast San Jose is also in an area targeted for redevelopment and densification. The overall guiding policy is the city's General Plan, which was recently amended to allow higher densities and mixed-uses in support of transit, along transit oriented development (TOD) corridors, and at BART station nodes. Station areas are seen as special strategy areas suitable for high density housing.

The BEP Alternative will be the catalyst to bring these plans to fruition. Although TOD is occurring and gaining broader acceptance around LRT stations, experience shows that BART stations increase TOD potential in surrounding areas considerably. The existing, often underutilized, industrial and other light commercial uses can be developed to higher density residential and commercial/retail without adversely affecting existing residents or eliminating viable industrial enterprises. Market forces have made many of these uses no longer suitable, at least on a large scale, in Santa Clara County. They are prime locations for conversion.

The SVRTP Alternative will have the same potential to reinforce transit supportive land use plans in the areas surrounding the Milpitas and Berryessa stations and become a catalyst for new planning efforts. The alternative will also reinforce transit supportive land use plans and policies in the City of San Jose for the Alum Rock, Downtown San Jose, and Diridon/Arena stations and in the City of Santa Clara for the Santa Clara Station. The Downtown San Jose and Diridon/Arena stations will benefit from the city's Strategy 2000 policies, which call for major growth supportive of transit as part of a vision for downtown. The Diridon/Arena Strategic Development Plan promotes that station area as a critical transit hub and future extension of downtown San Jose. The city was awarded a grant from the Metropolitan Transportation Commission (MTC) to develop a multimodal area plan with higher densities around the Diridon/Arena Station, and began this effort in mid 2009.

In Santa Clara, the General Plan supports LRT and Capitol Corridor connections to BART and calls for an extension of BART to Santa Clara. The Santa Clara Station Area Plan (for Caltrain, ACE, VTA bus, and future BART) proposes a mixed-use "urban center" around this expanding transit center and a people mover connector (APM) to Mineta San Jose International Airport. The 432-acre site plan would include just less than 2,500 housing units and 5 million square feet of office/commercial/hotel space.

Regional programs complement these community planning initiates. For instance, the Transportation for Livable Communities and Housing Incentive Program administered by the MTC provides grants to San Francisco Bay Area cities that plan and build high density housing within one-third mile of transit stations.

## Transit Oriented Development

The potential for TOD similarly exists under the No Build Alternative but will increase substantially with extension of BART service under both the BEP and SVRTP alternatives. BART stations will offer individuals access to a high capacity and fast transit service that connects directly to many other major activity centers in the San Francisco Bay Area, including downtown San Francisco and downtown Oakland. TOD planning is actively underway in the Milpitas and Berryessa station areas (BEP and SVRTP alternatives) and the Santa Clara Station area (SVRTP Alternative). The City of San Jose is updating the local strategic development plan for the Diridon/Arena Station into a multimodal transportation and land use plan for existing bus, light rail, Caltrain, ACE, Amtrak, and proposed BART and future high-speed rail. A visioning exercise was conducted for the Alum Rock Station, with the assistance of resources from San Jose State University, and a more detailed local area planning process focused on transit oriented development will begin soon. These activities demonstrate the appeal of mixed-use TOD in the vicinity of proposed BART stations.

## Other Land Use Considerations

The BEP and SVRTP alternatives will expand intermodal connections with VTA's LRT and bus transit network at key locations. For example, the Milpitas BART Station will include a transit center for VTA bus-to-rail connections and is to be located adjacent to the Capitol LRT Station. The Berryessa Station will include a bus/rail transfer center. The Alum Rock, Downtown/San Jose, Diridon/Arena, and Santa Clara stations under the SVRTP Alternative will also include multimodal transit connections, as listed below.

| Station | Alternative | Transit Modes |
|---|---|---|
| Milpitas | BEP and SVRTP | LRT, Bus |
| Berryessa | BEP and SVRTP | Bus |
| Alum Rock | SVRTP | Bus, BRT |
| Downtown San Jose | SVRTP | LRT, Bus, BRT |
| Diridon/Arena | SVRTP | Caltrain, ACE, Bus, BRT, Capitol Corridor, Amtrak |
| Santa Clara | SVRTP | Caltrain, ACE, Bus, APM |

The topography and scarcity of developable land in the SVRTC require that alternative transportation modes to the auto, and access to housing in other areas, be available. Santa Clara County has a jobs-housing imbalance (more jobs relative to local households) that cannot be addressed simply by providing more housing in the county. Sustaining job growth requires accommodating commuters from Alameda County and other communities. The linear nature of development along the eastern side of San Francisco Bay, resulting from the

geographic constraints of wetlands and bay on the west and undevelopable hills on the east, limits options for new north-south transportation facilities. A new freeway or major expansion of existing freeways is not feasible—without major disruption of existing land uses. The proposed BEP and SVRTP alternatives follow an underutilized and, in segments, vacated freight railroad corridor. The corridor offers a unique opportunity for providing new transportation capacity in a constrained, heavily developed area.

## Economic Development

The economic development effects of the BEP and SVRTP alternatives are largely proportional to the number of stations proposed—with stations being an indicator of transit access to jobs that will be possible under either alternative. Two stations are proposed under the BEP Alternative in areas still largely characterized by low density development. Jobs densities are light. Both the Milpitas and Berryessa stations offer considerable potential in conjunction with TOD initiatives to generate more employment opportunities in the eastern portion of Santa Clara County. The SVRTP Alternative will offer the same economic development opportunities as the BEP Alternative and, with four more stations, expand opportunities into east San Jose, downtown San Jose and, through redevelopment of former railroad and industrial sites, in Santa Clara. Downtown San Jose continues to be targeted for major employment and residential expansion. The SVRTP Alternative can be a catalyst and facilitate these planning efforts. The SVRTP Alternative will offer high benefits relative to economic development in the study corridor while the BEP Alternative will have moderate benefits.

Economic effects associated with construction and ongoing operations of a BART extension were evaluated in a regional economic simulation model. The impacts/benefits were analyzed for a 15-year period, 2016 to 2030. A full extension of BART service, associated with the SVRTP Alternative, was determined to generate $6.0 billion in gross regional product, $2.3 billion in additional personal income, and $4.6 billion in travel time savings to commuters (all figures in 2005$). Construction jobs are temporary, but the improved accessibility to job centers in Silicon Valley and Santa Clara County, including by residents of adjacent counties where housing is more affordable, will allow the local economy to grow more than if no SVRTP Alternative improvements were made. The economic impacts analysis determined that approximately 2,400 more permanent jobs will be created every year due to the travel efficiency gains—the improved access to employment centers—that result from the SVRTP Alternative.

The No Build Alternative offers no comparable impetus for TOD and job growth in Santa Clara County.

## 10.2.5 LOCAL FINANCIAL COMMITMENT AND PUBLIC ACCEPTANCE

Two measures of financial commitment to the project were established: Local Funding Commitment, and Community and Stakeholder Acceptance, as shown in Table 10-5. The criteria indicate if the proposed project is fundable, that is, there is a reliable source of capital and operating dollars and the project sponsor has a sound financial plan covering at least a 20-year time horizon. As a related concern, the public must support the proposed transit investment, as indicated by voter approved funding initiatives, for example.

**Table 10-5: Local Financial Commitment Evaluation**

| Objective/Performance Measure | No Build Alternative | BEP Alternative | SVRTP Alternative |
|---|---|---|---|
| Local Funding Commitment: Percent Capital Funds from Local and State Sources | NA | ● | ● |
| | | 65% | 85% |
| Community and Stakeholder Acceptance | ○ | ◐ | ● |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | | |

Source: VTA, 2009

### Local Funding Commitment

Santa Clara County voters have repeatedly approved special funding initiatives for local transportation improvements. In additional to general sales tax levies approved at the state level and allocated back to counties for primarily public transit (e.g., the Transportation Development Act of 1971, which created the Local Transportation Fund based on a statewide ¼-cent sales tax), Santa Clara County voters approved a permanent ½-cent sales tax for transit operations and capital in 1976. In 1996, voters approved the Santa Clara County Measure B Transportation Improvement Program, which authorized the collection of an additional ½-cent sales tax for local transportation projects through 2006. In 2000, VTA sponsored a ½-cent sales tax measure, Measure A, that extends for

30 more years, from 2006 through 2036. The measure is dedicated to transit improvements and passed with 72 percent of the vote.[4]

On November 4, 2008, Santa Clara County voters were given the opportunity to approve Measure B, adding a ⅛-cent increment to the local sales tax and dedicated solely to operate the BART extension to Santa Clara County. The tax would go into effect contingent upon VTA executing an FFGA with FTA for at least $750 million in federal participation towards a project and the state committing at least $216 million in additional TCRP or other funds, the tax would be in effect for 30 years. Measure B was approved by the required two-thirds margin (66.7 percent of voters in favor). Thus, Santa Clara County will have a combined local/state sales tax rate of 1.375 percent for transit when Measure B takes effect.[5]

Local sources of funds have ensured that numerous county transportation improvements are and will continue to be implemented despite uncertainty in state and federal funding. To construct the BEP Alternative, VTA is requesting federal New Starts funding of $900 million to augment the program, The percentage of BEP Alternative capital costs proposed to be covered by local funds is 65 percent (federal New Starts funds will cover 35 percent).

The proposed $900 million in New Starts funds for the BEP Alternative is also included as a funding source for the SVRTP Alternative, which incorporates the improvements under the BEP Alternative. Additional local funds and other federal funds would be required to fund the larger SVRTP alternative, the non-New Starts share increasing to approximately 87 percent of total costs. Because of the high percentage of local funds going to the BEP and SVRTP alternatives, both of these alternatives are rated most favorable.

## Community and Stakeholder Acceptance

The public and business communities strongly support the extension of BART services into Santa Clara County. The 2000 Measure A, approved by almost three-quarters of county voters, included as its first major proposal to "(e)xtend BART from Fremont through Milpitas to Downtown San Jose and the Santa Clara Caltrain Station…" (2000 Measure A). Continued community and stakeholder

[4] In 2006 a separate Santa Clara County initiative to increase the sales tax by ½ cent failed voter approval. It was not a transportation measure per se. VTA was not a sponsor of the initiative, which was a general tax increase.

[5] Local sales taxes for transit would include the ¼-cent TDA, ½-cent 1976 permanent sales tax, ½- cent Measure A, and ⅛-cent Measure B.

acceptance of a BART extension is supported by the super-majority voter-approved Measure B in November 2008.

### 10.2.6 SUMMARY

Relative to the No Build Alternative, the BEP and SVRTP alternatives generate substantial benefits in terms of increased ridership and expanded mobility for corridor residents, improved air quality, lower growth in congestion in critical travel corridors, and enhanced economic development potential, among other benefits. For the majority of evaluation criteria in these areas, the SVRTP Alternative performs more favorably than the BEP Alternative in the level of benefits produced. For criteria established to capture adverse effects, including environmental, traffic, capital and operating costs, and adverse construction effects, the reverse is typically the case. The No Build Alternative has limited or no adverse effects in these areas, the BEP Alternative will have minor to moderate adverse effects in a number of areas, and the SVRTP Alternative will have the most severe adverse effects. This is understandable given that the SVRTP Alternative involves substantial construction activity at considerable cost. The increased adverse effects of higher levels of transit must be weighed against the increased benefits.

# PART 2

## 10.3 NEW STARTS EVALUATION CRITERIA

### 10.3.1 NEW STARTS CHANGES TO PROJECT DEFINITION

VTA requested re-entry into the New Starts Program in September 2009 as part of a federal funding request to the FTA for the BEP Alternative. In consultation with FTA, adjustments were made to the travel demand model (subsequent to the Draft EIS) to reflect changes to the project scope and definition, in part for the purpose of improving the project's "cost effectiveness" rating under New Starts criteria. These adjustments refined the definition of the BEP Alternative. Revised project data include the VTA operating plan, VTA bus and BART fleet size, ridership projections, vehicle miles traveled, capital cost estimates, and related project elements.

These new data have reduced some of the impacts previously discussed in the Draft EIS. However, some benefits of the BEP Alternative are slightly less than stated previously. Values in Volume I of the Final EIS have not been updated, except where noted in Chapter 9 Financial Considerations to reflect capital and operating/maintenance costs, and in this section of Chapter 10 Evaluation of Alternatives. By maintaining higher values as previously presented the Draft EIS, the document maintains a conservative analysis and disclosure of environmental impacts. This section of Chapter 10, Evaluation of Alternatives provides a

summary of New Starts changes to the project and a discussion of related impacts.

The Locally Preferred Alternative presented in Volume II Chapter 2 of the Final EIS represents a fully-updated description of the Berryessa Extension Project, including the project scope and definition assumed for the New Starts Locally Preferred Alternative Silicon Valley Berryessa Extension submitted to FTA in September 2009.

The following section summarizes changes to the BEP Alternative project definition as part of the September 2009 New Starts submittal, and includes a discussion of how related impacts have changed.

## VTA Operations

Changes were made to the VTA bus operating plan under No Build Alternative and BEP Alternative conditions as part of New Starts. The VTA bus operating plan was revised for the No Build and BEP alternatives to reflect implementation of VTA's January 2008 Comprehensive Operations Analysis (COA).

The travel demand model was updated (subsequent to the Draft EIS) to reflect this current background condition. Additional adjustments were made to the travel demand model as part of ongoing refinements being made in consultation with FTA. More recent travel demand model runs also reflect changes to the project scope and definition, which were made for the purpose of improving the project's "cost effectiveness" rating under New Starts criteria.

The following new transit services and capital projects previously identified as planned and funded under the Measure A Program in Volume I, Table 2-2 are not assumed under 2030 No Build and BEP conditions.

- Downtown East Valley – Capitol Expressway Light Rail Phase II LRT to Eastridge
- Caltrain Commuter Rail Service Upgrades
- Caltrain Electrification Program
- ACE Commuter Rail Service Upgrades
- Mineta San Jose International Airport People Mover to BART, Caltrain, and LRT

Summary of other BEP Alternative VTA operational changes:

- Removal of proposed BART express feeder bus routes: SV-1, SV-3, SV-5, SV-6, SV-7, SV-8
- Removal of requirement for bus park-and-ride lots at VTA Evelyn LRT Station (49 spaces), BART Warm Springs Station (303 spaces), and downtown Sunnyvale (91 spaces)
- Addition of projected demand for bus park-and-ride at Milpitas Station (130 spaces), and increased demand for bus park-and-ride at Berryessa Station (1330 total spaces)
- Addition of new Line 302 from Berryessa BART Station via Hedding-Taylor to North 1st Street, San Fernando to Diridon: 15 minute headway, peak-only service

Fleet requirements for VTA buses and BART cars changed as part of the New Starts process. Demand for VTA buses for 2030 was reduced significantly from 85 40-foot standard vehicles, presented as the high end of a range in the Draft EIS, to eight articulated and two standard buses. The reduction in VTA buses is a result of the elimination of six BART express feeder bus routes, and replacement of 40-foot standard buses, with higher capacity articulated buses.

Demand for BART revenue vehicles is reduced, from 74 BART cars assumed in the Draft EIS capital cost to 40 BART cars to serve the BEP Alternative. VTA and BART continue to discuss the BART revenue vehicle fleet requirements and vehicle procurement schedule, including demand and needs for ready reserve train cars and spares.

## Ridership

Ridership projections from the travel demand model will be continually updated as part of the New Starts process Average daily ridership for the BEP Alternative submitted for New Starts is ten percent less than previously presented in the Draft and Final EIS (from 46,457 to 41,800). Additionally, BEP Alternative station park-and-ride parking charges have been applied to the travel demand model, further reducing parking demand. As a result of ridership changes and parking charges, station park-and-ride parking demand is less than previously presented in the Draft EIS (from 7,095 to 5,795); reducing traffic impacts on study area intersections and freeway segments.

Regional transit trips do not change, but riders no longer taking BART shift to other modes, primarily auto. An increase in regional auto trips would be referred to as additional background traffic, and would not impact previously analyzed freeway segments or intersections. BART Core parking needs are projected to go up from 617 to 845, however the impacts are not significant and VTA will fund necessary BART Core replacement parking.

**Energy, Air Quality, and Emissions**

The projected reduction in BART ridership results in 55 million less VMT savings and associated benefits, when compared to the Draft EIS. This reduced benefit results in 0.05 percent increase in VMT compared to the Draft EIS and is not a significant impact. VMT is directly associated with energy use, air quality and emissions impacts. Auto/truck VMT goes up, reducing benefits; however there is an increase in benefits due to the removal of six VTA express feeder bus routes and associated emissions.

Changes to the No Build Alternative VMT have also occurred. Relative to the new No Build Alternative conditions, the BEP Alternative will still reduce annual emissions of key National Ambient Air Quality (NAAQ) pollutants, including a reduction to reactive organic gases (ROG), oxides of nitrogen (NOX), and carbon monoxide (CO). The BEP Alternative would reduce the tons per year (tpy) emissions output of all modes by 6 tpy for ROG, 5 tpy for NOX, and 45 tpy for CO. The projected reduction of NOX compared to a projected increase of NOX in the Draft EIS, is a result of a reduction of approximately 3 million bus VMT. Emissions of CO are projected to be reduced at a lesser rate than Draft EIS values, due to an increase of approximately 55 million auto/truck VMT. Overall air quality is improved.

The reduction in greenhouse gas emissions, measured in terms of tons of CO2 equivalents for the BEP Alternative, are similar to the reductions projected in the Draft EIS. Carbon dioxide emission rates per mile for buses are five times greater than auto/truck emission rates. When compared to a previously projected reduction of 4,138 tons of CO2 annually presented in the Draft EIS, VMT for buses is now reduced and VMT for auto/truck is now increased, offsetting CO2 emissions overall, for a savings of 3,464 tons annually compared to No Build conditions.

The BART vehicles, stations and related facilities built as part of the BEP Alternative would use electric power as the main form of energy. Direct energy use is projected for all modes for No Build and BEP Alternative conditions. The BEP Alternative is estimated to reduce energy demand by 63,000 British thermal unit (BTU) equivalents or an estimated 570 million gallons of gasoline annually. The Draft EIS projected more bus energy use and less auto/truck energy use, however, there remains a projected net energy savings overall, compared to the No Build Alternative.

## 10.4 NEW STARTS EVALUATION CRITERIA

As previously stated, VTA has requested New Starts funding for the BEP Alternative under Section 5309 of SAFETEA-LU and/or successor legislation. In order to be eligible for program funds, the proposed project must by law address specific project justification and local financial commitment criteria. The

proposed project must be rated at an acceptable level[6] before FTA will advance the project into advanced planning, design and ultimately construction and agree to fund a portion of the associated costs. The federal New Starts review process is intended to place all projects proposed for New Starts funding on a comparable footing, with the objective of funding, from the limited resources available, those projects that are likely to be successful.

For the purpose of evaluating New Starts candidate projects, FTA uses a hypothetical low-cost project, referred to as a "Baseline" Alternative, as a point of comparison. VTA has developed a description of a Baseline Alternative in consultation with FTA. The Baseline Alternative represents a higher level of improvements than the No Build Alternative. According to FTA guidance, the "Baseline must be defined so that comparisons with the New Starts project isolate the costs and benefits of the major transit investment…. At a minimum, the Baseline Alternative must include in the project corridor all reasonable cost-effective transit improvements short of investment in the new starts project" (Title 49, Volume 6, Code of Federal Regulations/49 CFR611.3). This summary compares the proposed BEP Alternative to the Baseline Alternative in seven areas that encompass the New Starts evaluation and rating framework used by FTA to determine federal funding eligibility.

The Baseline Alternative has not been previously described in the Draft EIS in detail. An initial Baseline Plus Expanded Bus Service on I-880 and I-680 HOV Lanes was evaluated in the 2001 MIS. The Baseline Alternative was refined and included among the alternatives evaluated in the Silicon Valley Rapid Transit Corridor Draft EIS/EIR (circulated in March 2004) along with a No-Action Alternative and a BART Extension Alternative. Prior to preparing this document, the Baseline Alternative was withdrawn from further consideration as a possible improvement in the SVRTC because it did not meet the project purpose and need. Nevertheless, it warrants discussion to understand what level of improvements is assumed relative to the improvements proposed under the BEP Alternative. From FTA's perspective, the Baseline Alternative provides a basis for assessing the incremental—or extra— benefits that would result from the additional expenditures required to implement a build alternative like the BEP Alternative. The comparison of incremental costs and benefits relative to the Baseline Alternative helps to document the project's merits.

[6] Projects must receive a "Medium" or higher overall rating from FTA. A project receives ratings with respect to project justification and local financial commitment that enter into the overall rating.

## 10.4.1 BASELINE ALTERNATIVE

The Baseline Alternative builds upon the planned and programmed transportation improvements in the SVRTC through 2030 by substantially supplementing bus service connecting the BART Warm Springs terminus with northern Santa Clara County.

**Service Concepts**

Two VTA express bus services, Routes 180 and 181, currently connect the BART Fremont Station to the Santa Clara Valley. Route 180 proceeds from the BART Fremont station via I-680, then exits on Montague Expressway to terminate at the Great Mall/Main Transit Center, allowing bus and rail connections. Route 180 currently offers 30 minute all-day service.

Route 181 proceeds from the BART Fremont station and operates via I-880 to North First Street, serving downtown San Jose and terminating at the San Jose Diridon Transfer Center. Route 181 currently offers 15 minute service in the peak period, and 30 minute service in the off-peak period.

Upon completion of the BART extension to Warm Springs, the northern terminus of these routes will be shifted to the Warm Springs BART station. In addition, these express bus routes would be able to operate mainly on existing and planned I-880 and I-680 HOV lanes between Warm Springs and San Jose. These future operating conditions are reflected in the No Build Alternative, which also incorporates improved service frequencies for Route 181 at 5-minute peak period headways and 10-minute off-peak period headways. The service frequency for Route 180 remains adequate at existing service levels.

Figure 10-1 shows the alignments for key bus services in the project corridor under the Baseline Alternative.

The Baseline Alternative concept improves upon the No Build Alternative by improving corridor express services, including the following elements:

- The northern terminus of Route 180 and 181 would continue to be the new Warm Springs BART Station, as under the No Build Alternative.
- Route 180, which currently terminates at Great Mall, would be extended to downtown San Jose via a route using Lundy Avenue, King Road, and Alum Rock – Santa Clara Streets.
- A short pattern of Route 180 would terminate at the San Jose Diridon Transit Center and a long pattern would continue along The Alameda to the Santa Clara Caltrain Station. Each pattern would operate at five-minute peak period headways and 10-minute off-peak period headways. These two

patterns combined would offer substantially improved peak and off-peak service frequencies.

- Bus priority improvements would be provided along Lundy Avenue – King Road, and some service would be able to take advantage of assumed BRT transit priority treatments expected to be implemented along Santa Clara Street – Alum Rock Avenue as part of the Santa Clara-Alum Rock-Eastridge BRT project (an already-programmed project which is assumed as part of the No Build condition).

- A bus HOV connector would be provided under the Baseline Alternative at I-680 and Montague Expressway in Milpitas to improve bus travel times. Route 180 would use the high occupancy vehicle/high occupancy toll (HOV/HOT) lane currently under construction along I-680 from north of Fremont to approximately Calaveras Road (and which is assumed to be extended south as necessary) to a bus HOV connector at Montague Expressway.

- Route 181 would also originate at Warm Springs BART and proceed via I-880 to its interchange with North First Street in north San Jose, continue south to San Fernando Street in downtown San Jose and then west to a terminus at the Diridon Transit Center.

- To accommodate park and rider demand in the corridor, transit parking would be provided in the vicinity of Montague Expressway at Capitol Expressway (approximate location of the proposed BART Milpitas Station) and Mabury Road at King Road (approximate location of the proposed BART Berryessa Station).

Baseline bus service from Silicon Valley to the BART Warm Springs Station would begin following the completion of the Warm Springs BART Extension. While the alignment for Route 181 would not change significantly from the No Build, Route 180 would be modified to provide expanded coverage in east San Jose, downtown San Jose, and Santa Clara. The route would depart Warm Springs BART and follow I-680 to the Great Mall/Main Transit Center (as under the future No Build condition) but then would travel southward using Trade Zone Boulevard and Lundy Avenue, which transitions to North King Road. The route would turn west at Alum Rock Avenue and East Santa Clara Street in the final approach to downtown San Jose. A short pattern of the route would terminate at the San Jose Diridon Transit Center while a long pattern would continue along The Alameda to the Santa Clara Caltrain Station.

Table 10-6 summarizes the service frequencies of Route 180 and Route 181 corridor bus service under the Baseline Alternative.

**Table 10-6: Service Headways for Baseline Alternative Bus Routes**

| Route | Description | Peak Headway | Off-Peak Headway |
|---|---|---|---|
| ***Corridor Bus Routes*** | | | |
| VTA 180 short pattern<br>Warm Springs to Diridon | Warm Springs BART via I-680, Great Mall, Tradezone, Lundy – King, Alum Rock – Santa Clara to Diridon | 5 minutes | 10 minutes |
| VTA 180 long pattern<br>Warm Springs to Santa Clara Caltrain | Follows routing of short pattern, extending from Diridon to Santa Clara Caltrain via The Alameda | 5 minutes | 10 minutes |
| VTA 181<br>Warm Springs to Diridon | Warm Springs BART via I-880 to N. 1st Street, San Fernando to Diridon | 5 minutes | 10 minutes |

Source: Connetics Transportation Group, 2009

In addition to improving corridor bus services, as under any of the alternatives considered in this document, VTA would work with employers to expand shuttle bus and van services connecting Santa Clara County bus/rail stations with Silicon Valley employment destinations. Also, VTA would coordinate with other agencies to implement bus and commuter rail service enhancements. Ultimately, the levels of service and origin points for other bus services would be determined by the respective transit agencies operating each service and not by VTA.

Funding to operate these other buses would be the responsibility of the respective local agencies, not VTA.

### BART Service Under the Baseline Alternative

BART service would remain the same as under the No Build Alternative. Route patterns and train frequencies are not expected to change although train lengths might be adjusted to accommodate somewhat higher or time-shifted loads resulting from enhanced bus-BART connections. Figure 10-2 illustrates the BART operating plan under the Baseline Alternative.

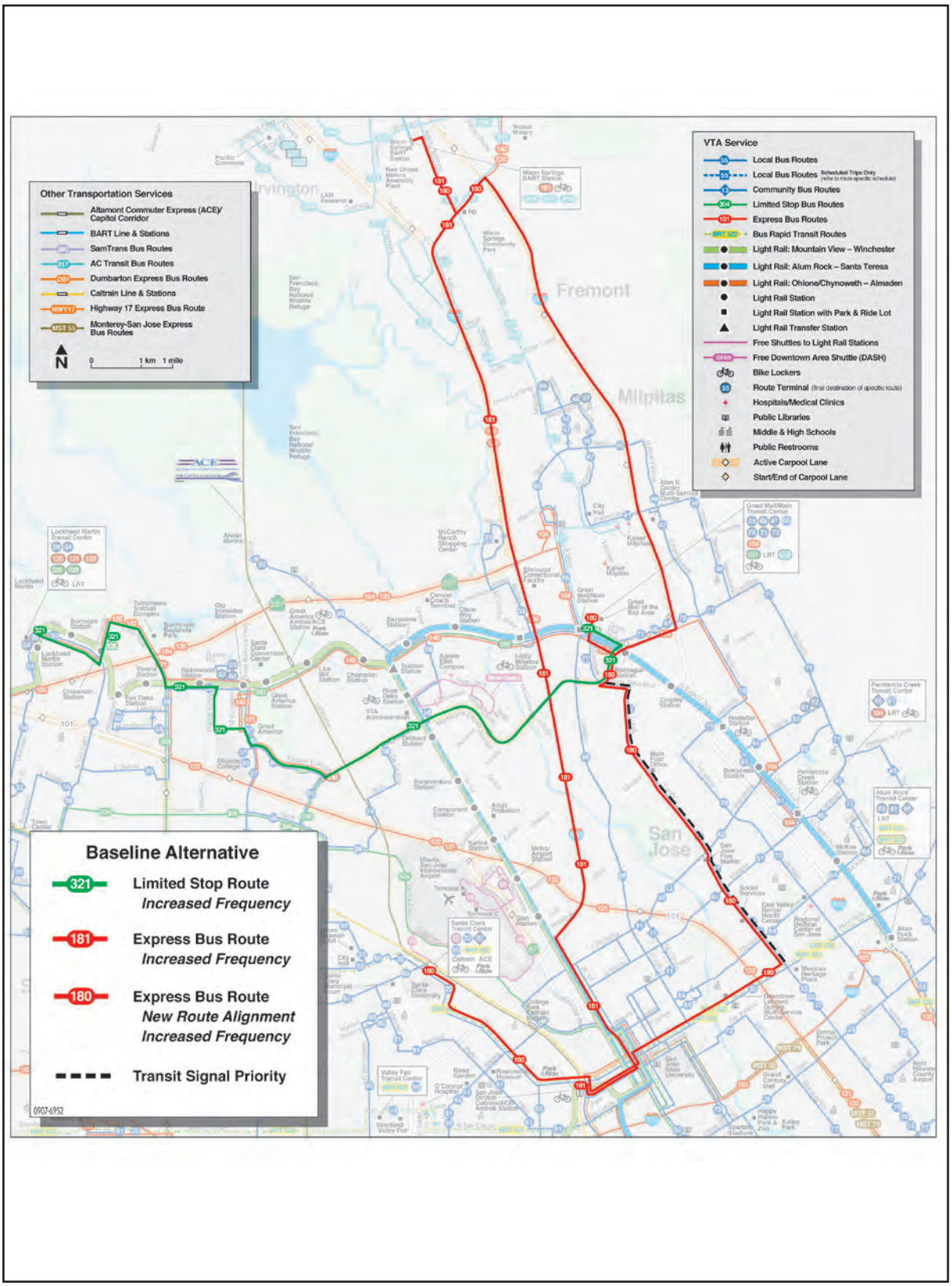


Figure 10-1: Baseline Alternative - Corridor Bus Routes

## Capital Improvements

Expanded bus service under the Baseline Alternative would increase the peak bus requirement. To improve the speed and reliability of bus service between BART Warm Springs and Silicon Valley, VTA would construct certain facilities. These include a busway connector between HOV lanes on I-680 and Montague Expressway, new or expanded park and ride lots, and along key arterials, bus rapid transit improvements.

### Year 2030 Baseline Fleet Requirements

To meet 2030 service levels, an estimated 78 additional VTA buses would be required for the Baseline Alternative compared to the No Build Alternative. All additional buses would be articulated buses. The total VTA bus fleet would consist of approximately 500 vehicles. VTA's light rail fleet is not anticipated to change from the No Build Alternative, with the total number of vehicles remaining at 100. The total BART fleet would be the same for the Baseline Alternative as for the No Build Alternative. Table 10-7 summarizes this information.

**Table 10-7: Fleet Requirement for the Baseline Alternative in Year 2030**

| Service | No-Build Alternative | Baseline Alternative |
|---|---|---|
| *VTA Operated Services*[a] | | |
| Buses | 422 | 500 |
| Light Rail Vehicles | 100 | 100 |
| *Services Operated by Other Agencies* | | |
| BART Cars (entire BART system) | 1,000 | 1,000 |

Notes:
[a] Capital and operating costs are included in the Baseline Alternative cost estimate.
Source: Connetics Transportation Group, 2009

### I-680-to-Montague Expressway Aerial Busway Connector

One new busway connector is proposed in the Baseline Alternative to facilitate bus connections from I-680 to the Montague Expressway and vice versa. This connector would begin in a widened median of I-680 several hundred feet north of the Montague Expressway (just after the SR 237/Calaveras Road interchange), become elevated on structure and fly over the southbound lanes of I-680 and the northwest and southwest quadrants of the I-680/Montague Expressway interchange, and then land in the median of Montague Expressway. ROW would be required alongside the freeway and Montague Expressway where the connector would join each roadway. The aerial busway connector would be approximately 50 feet wide and 2,750 feet (0.52 miles) long.

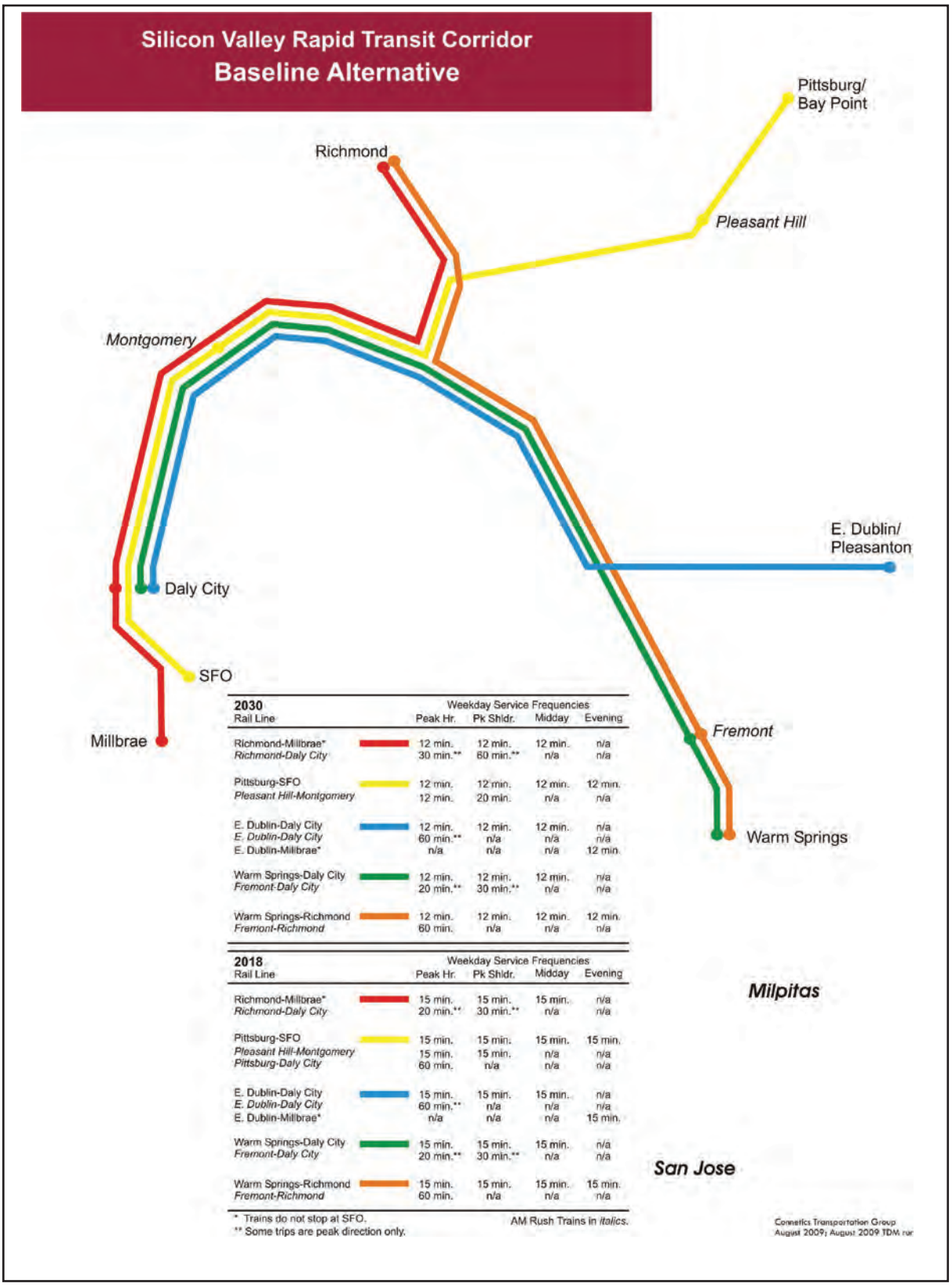


Figure 10-2: Baseline Alternative - BART Operating Plan

The Montague flyover would serve approximately 430 daily buses and nearly 13,000 daily passengers. The estimated cost of the flyover ramp is approximately $74 million.

### Transit Signal Priority and Queue Jump Improvements along Bus Arterials

Under FTA project evaluation guidelines, a Baseline Alternative should typically employ technological measures, referred to as "transportation system management" techniques, to expedite the movement of buses. The intent of these measures is to provide the best possible travel times along the corridor while stopping short of building a separated guideway. The Baseline Alternative would include a variety of transit priority measures along the proposed running way:

- Transit Signal Priority (TSP) – Buses would be specially equipped to transmit a signal to traffic signals along the alignment. This would allow the signals to grant a few seconds of additional green time when buses are about to enter the intersection, reducing the number of times the bus is stopped by red signals.

- Queue jump lanes – Localized bypass lanes would be constructed approaching intersections to allow buses to move to the front of traffic signal queues during red signal phases. Just prior to the green phase, the bus would receive a special signal allowing it to advance ahead of other traffic.

- Bus-only lanes – In locations of greatest traffic congestion, dedicated bus lanes would be provided.

- Stations – South of Berryessa Road, several bus stations would be provided to allow boarding and alighting of passengers along the corridor. These stations would be developed with a higher level of passenger amenities than standard bus stops, similar to the standard provided in bus rapid transit (BRT) systems.

These enhancements would be provided along the street-running portions of Route 180. Transit priority measures would be installed along a short segment of streets between Warm Springs Station and I-680 as well as along Trade Zone Boulevard, Lundy Avenue, and King Road.

### Park and Ride Lots

The Baseline Alternative would mostly use existing or planned lots at key locations to accommodate projected parking demand generated by new bus riders. By providing convenient points of connection to the regional transit network at locations within Santa Clara County, the Baseline Alternative would be expected to reduce parking demand somewhat at the planned Warm Springs

terminus of the BART system. Therefore the Baseline Alternative does not include any expansion of parking at that station. However, two new facilities would be provided in the vicinity of each BART station under the Baseline Alternative:

- Montague/Capital (City of Milpitas): A surface parking lot would be provided in the vicinity of Montague Expressway to provide 140 parking spaces.
- Mabury/King (City of San Jose): A new parking facility would include 1,160 parking spaces to accommodate express bus-related demand.

Park and ride demand estimates are summarized in Table 10-8. Costs for these parking areas are included in the Baseline Alternative capital cost estimate.

**Table 10-8: Baseline Alternative Bus-Related Parking Demand**

| Locations | City | Parking Spaces |
|---|---|---|
| Montague/Capitol | Milpitas | 140 |
| Mabury/King | San Jose | 1,160 |
| Total | | 1,300 |

Source: VTA 2009

### VTA Bus Maintenance and Storage Facilities

Buses operated by VTA under the Baseline Alternative would be stored and maintained at existing bus operating and maintenance facilities, as provided under the No Build Alternative. Because the Baseline Alternative would require a significant increase in fleet size and particularly because of the large increase in the number of articulated buses in the fleet, it is expected that some expansion of the existing maintenance facilities would be necessary. For cost estimating purposes, the expansion is assumed as equivalent to one-half the cost of a single new maintenance facility. The existing facilities have sufficient land area to enable expansion as necessary to accommodate the year 2030 fleet, therefore no cost is assumed for additional real estate. As the LRT fleet size is not anticipated to change by 2030, LRT vehicles would be stored and maintained at the existing Guadalupe Light Rail Maintenance facility north of downtown San Jose.

## Baseline Alternative Costs

Total capital costs are estimated to be $358 million in 2009 base year dollars for the purchase of buses and construction of roadway and parking improvements proposed under the Baseline Alternative. Annual operating and maintenance costs for the Baseline Alternative, assuming 2030 service levels, are projected to be approximately $28.1 million more than the costs of the No Build Alternative

(2009 base year dollars). BART annual operating and maintenance costs for the Baseline Alternative are projected to be approximately $0.7 million more than the costs of the No Build Alternative (2009 base year dollars).

Table 10-9 summarizes Baseline capital costs by FTA's standard cost categories. The No Build Alternative is assumed to have zero capital costs although VTA will be making continual improvements to its bus and rail systems over time. For comparison, capital costs of the BEP Alternative are also shown. Table 10-10 summarizes the Baseline Alternative operating and maintenance costs compared to the No Build and the BEP alternatives.

**Table 10-9: Capital Costs of the Baseline Alternative Compared ($2009 in millions)**

| Principal Components Category | Principal Components Description | Baseline Alternative | BEP Alternative [a] |
|---|---|---|---|
| 10 | Guideway & Track | $64 | $374 |
| 20 | Stations | $37 | $207 |
| 30 | Support Facilities | $30 | $47 |
| 40 | Sitework & Special Conditions | $47 | $189 |
| 50 | Systems | $4 | $194 |
| 60 | Right-of-Way | $53 | $213 |
| 70 | Revenue Vehicles | $59 | $142 |
| 80 | Professional Services | $49 | $369 |
| 90 | Unallocated Contingency | $15 | $79 |
| 100 | Finance Charges | N/A | $294 |
| | **TOTAL :** | **$358** | **$2,108** |

Notes:
[a] See Chapter 9 Financial Considerations, Table 9-2 for BEP Alternative capital cost assumptions
Source: VTA 2009

**Table 10-10: Annual Direct O&M Costs VTA Operated and Assisted Services and BART Extension Service: 2030 Operating Plans ($2009 in millions)[a]**

| Item | No Build Alternative | Baseline Alternative | BEP Alternative |
|---|---|---|---|
| VTA Bus, BRT, Light Rail Direct O&M Costs[b] | $376.7 | $404.4 | $379.3 |
| BART Extension Service O&M Costs (VTA costs)[c] | $0 | $0 | $43.6 |
| **Total VTA Costs** | **$376.7** | **$404.4** | **$423.8** |
| BART Extension Service O&M Costs (BART costs) [d] | $0 | $0.7 | $0 |
| **Total BART Costs** | **$0** | **$0.7** | **$0** |

Notes:
[a] Excludes farebox revenues and advertising income
[b] Includes operating assistance for Santa Clara County paratransit services, ACE, Caltrain, and Highway 17 express bus services funded from the 1976 permanent and 2000 Measure A sales taxes.
[c] Includes allocation of fixed overhead O&M costs, and excludes capital reserve contribution
[d] The BART operating plans (including fleet) is the same for both the No Build and Baseline. However, BART will carry more passengers in the Baseline, so there will be a slight increase in costs associated with passengers, such as customer service, cash handling, station operations, security, maintenance of fare collection equipment, etc..
Source: VTA 2009

## 10.4.2 RESULTS OF NEW STARTS EVALUATION

Alongside its costs, the ridership, travel time and other benefits of the Baseline Alternative were estimated by VTA. This allowed for quantification of Baseline Alternative costs and benefits similar to those established for the New Starts BEP Alternative.

The New Starts evaluation differs from the evaluation in Section 10.2 in two respects: (1) it compares the BEP Alternative against the Baseline Alternative (instead of the SVRTP and No Build alternatives) and (2) it uses a similar, but not identical, set of criteria. The FTA evaluation criteria are grouped in two major categories. One, collectively called “project justification”, assesses overall mobility benefits, cost effectiveness, and environmental benefits of the project. These criteria are discussed in Sections 10.3.3 through 10.3.9. The other major category is Local Financial Commitment, which addresses the strength of the local community’s financial support of the project. This is discussed in Section 10.3.10.

## 10.4.3 MOBILITY IMPROVEMENTS

New Starts mobility is evaluated in terms of five measures, shown in Table 10-11. Unlike cost effectiveness, mobility improvement evaluation criteria are absolute values in which the BEP Alternative is compared against the Baseline Alternative. Criteria are calculated only for the BEP Alternative.

Travel time savings represent mobility benefits for all riders of the BEP Alternative. Total daily System User Benefits for the BEP Alternative are approximately 12,800 hours and project passenger miles total nearly 1.3 million[7]. There is one-half minute of user benefits for every passenger mile traveled on the BEP Alternative. Due to a high-frequency, high-speed transit alternative within an exclusive ROW, on average, a BEP Alternative rider will experience 15 minutes of travel time savings per trip. This mobility benefit significantly increases the ability of the regional workforce to access employment and visitors to access other attractions in the project corridor, and saves over 75 hours of travel time per rider annually, boosting the region's economic vitality. BEP Alternative station area population is projected to increase by nearly 300 percent, and employment to increase by nearly 50 percent in the forecast year. The BEP Alternative provides a transit alternative in the highly congested SVRT corridor, critical for regional workforce mobility.

Transit dependency is defined as the lowest income quartile for home-based work trips. Transit dependents are estimated to make up 11 percent of all project trips; they receive a similar share of system user benefits (over ten percent). The BEP Alternative would improve the transit options and related mobility of a substantial number of low-income residents in the project corridor.

[7] A passenger-mile is one passenger traveling one mile in a transit (BART) vehicle.

**Table 10-11: New Starts Mobility Evaluation**

| Objective/Performance Measure | Baseline Alternative[b] | BEP Alternative |
|---|---|---|
| Number of Transit Trips Using the Project (daily) | N/A | ● 41,881 |
| System User Benefits per Project Passenger Mile | N/A | ● 0.5 min. |
| Number of Trips by Transit Dependents[a] Using the Project (daily) | N/A | ◐ 4,600 |
| Transit Dependent User Benefits per Passenger Mile | N/A | ● 0.6 min. |
| Share of User Benefits Received by Transit Dependents Compared to Share of Transit Dependent Project Trips | N/A | ● 99% |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Notes:
[a] New Starts Template presents this metric only for the Build Alternative.
[b] Defined to be those riders in the lowest of four income categories included in travel forecasts
Source: VTA 2009

## 10.4.4 ENVIRONMENTAL BENEFITS

FTA considers the air quality status of the region in which the major transit investment is proposed. Projects that are in areas not in attainment with federal air quality standards are rated highly. The quantitative values represented in the Table 10-12 are representative of air quality benefits of the alternatives, however are not part of FTA's evaluation criteria.

The project is located within the San Francisco Bay Area Air Basin, which is a federal and state of California nonattainment area for the 8-hour ozone standard as of 2006. The basin is also a nonattainment area with respect to the state of California 1-hour ozone standard, the 24-hour and annual PM10 standard, and annual PM2.5 standard.

**Table 10-12: New Starts Environmental Benefits Evaluation**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| EPA Air Quality Designation for Region (2006) | Non-attainment for Ozone (federal & state)<br>Non-attainment for $PM_{2.5}$ (federal & state)<br>Non-attainment for $PM_{10}$ (state) | |
| Change in Regional Pollutants Emissions | ○ | ● |
| | +14 tons/yr | -56 tons/yr |
| Change in Greenhouse Gas Emissions | ○ | ● |
| | -347 tons/yr. | -3,500 tons/yr |
| Change in Regional Energy Consumption (gasoline equivalents) | ○ | ● |
| | -60,000 gallons/yr | -573,000 gallons/yr |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

Although the Baseline Alternative would generate an increase in transit use, in part through a shift in travel from automobiles to express bus, it is not anticipated to have a marked beneficial impact on regional pollutant emissions and greenhouse gas emissions, due to the impact buses have on air quality. By attracting more trips on rail transit than the bus-based Baseline Alternative, the BEP Alternative will have a greater beneficial impact in both of these areas. Nearly ten times the greenhouse gas equivalent of CO2 will be saved with the BEP Alternative when compared to the Baseline.

Similarly, with respect to energy use, the reduction in vehicle miles of travel in the study area would be substantially higher under the BEP Alternative compared to the Baseline Alternative, thereby resulting in lower transportation energy consumption. Relative to regional travel and energy use, the benefit, measured in terms of potential gallons of gasoline saved, is over nine times the savings of the Baseline Alternative. The BEP Alternative is therefore assigned a high benefit.

## 10.4.5 OPERATING EFFICIENCIES

The New Starts criterion for evaluating the effect of the proposed New Starts project on operating costs is the Operating Cost per Passenger Mile presented in Table 10-13.

**Table 10-13: New Starts Operating Efficiencies Evaluation**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| Operating Cost per Passenger Mile (Systemwide) | $0.36 | $0.35 |
| | ◐ | ◐ |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

The BEP Alternative provides a higher-frequency, higher-capacity, higher-speed transit service than the bus-based Baseline Alternative. Higher ridership is projected for the BEP Alternative compared to the Baseline Alternative, which helps to improve operating efficiencies. Additionally, the operating cost per passenger mile for VTA bus and LRT service is nearly three times that of BART, and because of the longer trip length of BART riders, operating costs are less for the BART-based BEP Alternative when compared to the bus-based Baseline Alternative. These numbers show there is not a large variant in operating efficiencies, because the metrics include the entire BART system (systemwide operating cost per passenger mile).

## 10.4.6 COST EFFECTIVENESS

Cost effectiveness is measured in terms of the incremental cost per hour of transportation system user benefits in the forecast year (2030). User benefits "…reflect the improvements in regional mobility—as measured by the weighted in-vehicle and out-of-vehicle changes in travel-time to users of the regional transit system—as caused by the implementation of the New Starts project" (FTA New Starts and Small Starts Evaluation and Rating Process).

The first measure is a composite of two calculations: (1)the change in VTA's annual operating costs and annualized capital costs when implementing the BEP Alternative, relative to similar costs for the Baseline Alternative, and (2) the estimated hours of user benefits that would be realized by BEP Alternative transit users compared to user benefits on the Baseline Alternative. The ratio of these two calculations is the Incremental Cost per Hour of User Benefits. As shown in Table 10-14, the BEP Alternative has an estimated "cost effectiveness" of $30.88 and an Annualized Cost per New Rider of $43.98.

**Table 10-14: New Starts Cost Effectiveness Evaluation**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| Incremental Cost per Hour of User Benefits | N/A | ◐ |
| | | $30.88 |
| Annualized Cost Per New Rider | N/A | ◐ |
| | | $43.98 |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

## Land Use

This measure indicates how well the BEP and Baseline alternatives achieve and reinforce local land use policies. FTA directs project sponsors to consider whether alternatives are consistent with existing land use policies and how they would affect those policies. Also, project sponsor should indicate if transit-supportive plans and policies are in place or in planning to improve the performance of alternatives, including how alternatives would reinforce and/or facilitate the implementation of those plans and policies.

Transit supportive plans and policies can include growth management strategies, transit supportive corridor policies, supportive zoning regulations (near stations), and the various tools local governments and the project sponsor can use to implement land use policies. The likely effects of the proposed transit project on regional land uses should be assessed. Project sponsors can also identify and indicate project performance relative to other land use considerations. Table 10-15 presents performance measures for the land use evaluation.

Existing land use in the SVRTC reflects the corridor's historic purpose of freight train goods movement. VTA, working with local cities, has had considerable success in establishing transit oriented development around a number of light rail stations and approving transit oriented specific plans in the vicinity of the proposed BART stations. Older properties along the BEP Alternative alignment are increasingly being converted to higher intensity uses, such as infill multifamily housing and light industrial and office/commercial development.

The City of Milpitas recently approved the Milpitas Transit Area Specific Plan which establishes specific guidance for development of 437 acres surrounding the proposed BART Milpitas Station and VTA Capitol Light Rail Station. The plan proposed redevelopment for over 7,000 dwelling units and 1.5 million square feet

**Table 10-15: New Starts Land Use Evaluation**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| Existing Land Use | ◐ | ◐ |
| Transit Supportive Plans and Policies | ◐ | ● |
| Performance and Impacts of Policies | ○ | ● |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

of commercial uses. In support of the city's BART Station Area Node policy, San Jose approved the Flea Market North and South Village Planned Development project, providing for 2,800 residential units and mixed commercial uses on 120 acres surrounding the proposed BART Berryessa Station site.

Significant economic benefits are associated with the planned land use intensification surrounding the proposed BART stations. Near the proposed Milpitas and Berryessa BART stations, a number of TOD projects have been constructed in anticipation of BART, and implementation of local land use policies would result in extensive, high-density mixed-use developments, which have either been adopted or are well advanced through the approval process. Completed and pipeline TOD projects within a half-mile of the proposed BART stations illustrate the impact transit supportive land use policies have had on intensifying station area urban redevelopment within the project corridor.

## 10.4.7 OTHER FACTORS

Other factors that are considered by FTA when evaluating projects for New Starts funding include the effect of the project on economic development; nature and extent of the transportation problem the project is intended to address; whether the project is a "principal element" of a local or regional congestion management program or auto pricing strategy; and any other factor that the "project sponsor believes articulates the benefits of the proposed major capital investment" but are not captured elsewhere in the New Starts evaluation.

Four factors in this evaluation category have been identified as especially relevant to the proposed BEP Alternative. The Other Factors for consideration in the New Starts evaluation are listed in Table 10-16.

**Table 10-16: New Starts Other Factors Evaluation**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| Effect on Economic Development in SVRT Corridor | ○ | ◑ |
| Provides Needed Capacity In Congested Travel Corridors | ○ | ◑ |
| Consistent with Voter Initiatives; Supported by Public and Local, Regional and State Agencies | ○ | ● |
| Supports Congestion Pricing Initiatives in Santa Clara County and Bay Area | ◑ | ● |
| ● - Most Favorable ◑ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

Economically, Silicon Valley has emerged as the economic engine of the San Francisco Bay Area. It is the high technology capital of the United States and arguably the world.

VTA conducted a study to assess the economic benefits of the proposed BART extension and the general magnitude of regional benefits ensuing from the project. [8] Transit increases access to jobs and services for low-income individuals, the elderly and disabled, students, and people with no private means of transportation, thus contributing to the economic well-being of these population groups. Improved transit in Santa Clara County has the potential to expand employment opportunities for the county's workforce to locations outside of the county where wages are higher. This would result in the creation of 3,900 jobs and generate up to $90 million in personal income during the study period.

It is estimated that the overall regional economic benefits of the proposed BART extension would generate up to $11.4 billion in GRP, $3.27 billion in personal income, and $8.6 billion in commute travel time savings during the study period of 2008 to 2030 due to transportation efficiency gains, construction, operations and maintenance expenditures, new land development and improved worker mobility and accessibility of the proposed BART extension.

[8] The scope of this study evaluated the full six station extension to Milpitas, San Jose and Santa Clara

Geographically, the project provides a fundamental transit link within a highly constrained freeway corridor in the San Francisco Bay Area. Other transportation solutions would present unacceptable quality of life, environmental, and economic costs to study area residents. Due to physical limitations created by the San Francisco Bay to the west of the corridor and the Diablo Mountain Range to the east, right-of-way constraints from localized infill development adjacent to the freeways, and public sentiment associated with freeway widening, the I-880 and I-680 freeway corridors cannot be expanded without significant financial cost, loss of sensitive habitat, increasing greenhouse gas emissions, and air quality compromises.

The BEP Alternative will serve three critical special circumstances that define the transportation problem in the project corridor. Despite rapid housing growth, Santa Clara County (particularly Silicon Valley) has a significant jobs-housing imbalance currently, with employment opportunities about 1.5 times the number of housing units. The imbalance will continue well into the future, actually increasing to 1.6 times.

The BEP Alternative will improve mobility for longer-distance commuter and other trip purposes. The project will enhance connectivity by integrating Santa Clara County into the BART regional rail system, connecting the region's three key employment centers (San Jose, San Francisco, and Oakland), and closing the gap in the regional rail network that is intended to someday circle San Francisco Bay. A BART extension also offers the more promising mode for focusing and accelerating transit oriented development growth patterns in Santa Clara County.

Santa Clara County voters have strongly supported transit funding programs. Beginning in 1976 with passage of a permanent ½ cent local sales and use tax for transit capital projects and operations, County residents have, with one exception, approved all measures placed before them. In 2000 voters approved sales tax Measure A, primarily a BART extension measure, for transit projects in Santa Clara County. Despite the recent economic downturn, in November 2008, Santa Clara voters approved (with a super-majority vote) an additional 1/8 cent sales tax to cover operations and maintenance for a BART extension to Santa Clara County. The BART extension is included in the Regional Transportation Plan.

In April 2009 MTC adopted the long-range Transportation 2035 Plan, which commits to developing an 800-mile HOT Network throughout the region. MTC has adopted the long-range Transportation 2035 Plan and identifies anticipated revenues from Santa Clara County express lane corridors to be committed to the Measure A program. The BART extension project is the largest project in the Measure A program. Santa Clara County toll revenues are anticipated to be $2 billion over the next 25 years.

## 10.4.8 LOCAL FINANCIAL COMMITMENT

SAFETEA-LU Section 3011(a) (49 USC 5309(d)) requires that New Starts projects have strong local financial commitments for capital and operating costs. Sponsoring agencies should demonstrate that there are "stable and dependable financing sources to construct, maintain and operate the transit system. Projects that propose a local funding share of project capital cost larger than the required non-federal share (at least 20 percent) and have a sound financial plan are desired. FTA's goal is to implement projects that use limited federal (and local) resources efficiently. Three measures are considered as part of the financial evaluation, as listed in Table 10-17.

The evaluation of the project capital financing plan considers the sponsoring agency's current capital condition; commitments of capital funds; and, the reasonableness of capital planning assumptions and cost estimates in conjunction with the funding capacity of the agency. Similar considerations are included in the evaluation of the operating finance plan.

**Table 10-17: New Starts Local Financial Commitment**

| Objective/Performance Measure | Baseline Alternative | BEP Alternative |
|---|---|---|
| Stability and Reliability of Capital Financing Plan | ○ | ● |
| Stability and Reliability of Operating Financing Plan | ○ | ● |
| Local Share of Project Costs | ○ | ● |
| | N/A | 65% |
| ● - Most Favorable ◐ - Moderately Favorable ○ - Least Favorable | | |

Source: VTA 2009

Two local tax measures specifically provide capital and operating funding for a BART extension to Silicon Valley, however do not provide funding for the Baseline alternative. The Measure A sales tax primarily provides capital funding for transit projects. A BART extension is included in Measure A, however the Baseline Alternative is not included.

The recently approved Measure B sales tax, for operations and maintenance of a BART extension only, will not take effect, and that source of operating funds will not exist, unless FTA approves an Full Funding Grant Agreement (FFGA) for the BEP Alternative. Therefore the design and construction, and operations and

maintenance of the Baseline Alternative would need to be entirely from VTA's current funding sources and would be less assured than the Measure A/Measure B funds which directly support BEP Alternative.

Section 5309 requires local funding share to be at least 20 percent of project capital costs. The 65 percent local share proposed by VTA for the BEP Alternative is far in excess of the federal requirement.