Chapter 2
Alternatives Analysis

Section 2.1 Introduction

An integral part of the EIS process is the consideration of all reasonable alternatives which would:

- avoid or minimize adverse impacts, or
- enhance the quality of the human environment.

Given the long history of transportation planning in the Capitol Expressway Corridor, many alternatives and design options have been evaluated throughout the planning, environmental, and design phases of the project. This section describes what alternatives were developed, through what process, and with what kind of public and agency input. It also explains why alternatives were eliminated from consideration (through the use of what criteria, at what point in the process, and with what public and agency involvement).

This chapter concludes by describing the alternatives that are considered and evaluated in this Supplemental DEIS. These alternatives include:

- No-Build Alternative
- Light Rail Alternative

Section 2.2 Identification of Alternatives

The Supplemental DEIS evaluates two alternatives: 1) No-Action or No-Build Alternative and 2) Light Rail Alternative. The process for identifying these alternatives began with the Major Investment Study (MIS) in 1999 and continued throughout environmental scoping, conceptual engineering, the Draft EIS/EIR (April 2004), Final EIR (April 2005), and Final Supplemental EIR (April 2007). This process is described in more detail below.

Initial Process for Identifying Alternatives

The MIS process provided the initial framework for making transportation planning decisions in the Downtown East Valley study area, which included the Capitol

Expressway Corridor. The consideration of different alternatives, collaborative decision-making, and proactive public involvement were critical elements of this process and included the following steps:

- Identify transportation needs,
- Establish goals,
- Develop a broad range of alternatives to respond to demonstrated needs,
- Conduct an initial screening process to identify the most promising alternatives,
- Evaluate the alternatives carried forward,
- Select a Preferred Investment Strategy.

Interactive public involvement occurred throughout each step of the MIS process. Varied methods were used to engage the community and solicit comment. These methods included stakeholder interviews, targeted outreach meetings, public meetings, having a presence at prominent locations in the East Valley such as Eastridge Mall and the Berryessa Flea Market, posting information on the VTA website, and mailing project updates, project information, and newsletter articles to a network of neighborhood-based groups. The effectiveness of the public involvement effort was continuously assessed and modified to assure a successful outreach program.

Given the identified transportation needs and input received from the community, the following specific goals were established for the Downtown East Valley MIS:

- improve mobility,
- increase transit ridership,
- target the highest commute corridors, with emphasis on work trips and school trips,
- promote livable neighborhoods,
- community support.

With these goals in mind, a total of 16 conceptual alternatives and a “No-Build” Alternative were developed (see Table 2-1).

Table 2-1. Downtown/East Valley Initial List of Candidate Conceptual Alternatives

Alternative	Mode and Description
1	Light Rail Transit (LRT) on Santa Clara/Alum Rock from Downtown to Capitol (Avenue) LRT
2	LRT on Capitol Expressway from terminus of Capitol (Avenue) LRT to Eastridge Mall
3	LRT on Capitol Expressway from Eastridge Mall to Guadalupe LRT (Capitol Station)
4	LRT on 10th/11th Streets and Senter Road from Downtown to Tully Road. *[Modified by the PAB on December 16, 1999, as follows: LRT on 2nd/3rd, 5th, and 7th or 8th Streets from Downtown to County Fairgrounds.]*
5	LRT on 10th/11th Streets, Senter and Tully Roads from Downtown to Eastridge Mall
6	LRT on 10th/11th Streets and Keyes/Story Road from Downtown to terminus of Capitol (Avenue) LRT
7	LRT on Alum Rock and White/San Felipe Road from Capitol (Avenue) LRT to Evergreen Valley College
8	Busway/HOV lanes on Highway 101 for Express Bus Service from the Alum Rock, Capitol Eastside and Evergreen study area neighborhoods to "Golden Triangle" employment centers
9	Busway/HOV lanes on Capitol Expressway for Express Bus Service from Eastridge Mall to Guadalupe LRT (Capitol Station)
10	Busway/HOV lanes on Capitol Expressway from terminus of Capitol (Avenue) LRT to Eastridge Mall and Bus Rapid Transit (BRT) features on Quimby and White Roads from Eastridge Mall to Evergreen Valley College
11	BRT on Santa Clara/Alum Rock, King, Tully and White/San Felipe Roads from Downtown to Evergreen Valley College. *[Modified by the PAB on December 16, 1999, as follows: BRT on Santa Clara/Alum Rock from Downtown to White Road, and along King, Tully and White/San Felipe Roads to Evergreen Valley College.]*
12	BRT on Santa Clara/Alum Rock and White/San Felipe Road from Downtown to Evergreen Valley College
13	BRT on 10th/11th Streets, Senter Road and Tully Road from Downtown to Eastridge Mall
14	BRT on 10th/11th Streets and Keyes/Story Road from Downtown to terminus of Capitol (Avenue) LRT
15	BRT on Monterey Highway from Downtown to Guadalupe LRT (Santa Teresa Station)
16	Transportation System Management (TSM) improvements throughout study area including more frequent bus services and improved intersection signalization.
17	No Project

An initial screening process in late 1999 by the Downtown East Valley Policy Advisory Board (PAB) eliminated six of the alternatives from further consideration.

The reasons for elimination are described in Table 2-2. Nine alternatives plus No-Build and Transportation System Management, or TSM, Alternatives were then carried forward for more detailed definition to enable the technical analysis to be conducted. The refinement included, for example, further definition of the alignments, access locations, station/stop locations, typical cross-sections and design standards, and initial operating plans and policies. The refined definition also reflected public input obtained during the first phase of the MIS process. Once the alternative refinement process was complete, technical analysis of the alternatives was initiated with respect to established evaluation criteria and performance measures.

Table 2-2. Alternatives Eliminated from Further Detailed Analysis

Alternative	Mode and Location
5	**LRT on 10th/11th Streets, Senter and Tully Roads from Downtown to Eastridge Mall.** This alternative is very similar to Alternative 4, but extends light rail to Eastridge Mall along Tully Road rather than terminating at the County Fairgrounds property. Alternative 5 provides a relatively good degree of connectivity to the existing and planned rapid transit network. Even though existing ridership in the corridor is relatively low among study area corridors, future development and redevelopment could generate moderate ridership. However, there appears to be limited support for this option, and public opposition has been voiced regarding construction of an elevated guideway along Tully Road. Because of the high existing traffic volumes and constrained right-of-way on Tully Road, the elevated guideway on Tully is viewed as a necessary element of this alternative. The elevated guideway would also result in a very high capital cost for this alternative. Therefore, carrying Alternative 5 forward did not appear warranted.
6	**LRT on 10th/11th Streets and Keyes/Story Road from Downtown to terminus of Capitol (Avenue) LRT.** Alternative 6 is similar to Alternative 5 except that the alignment uses Story Road rather than Tully Road as the east/west connection. While this alternative generally meets the goals of the project, concerns have been expressed that Story Road is necessary for automobile traffic without sufficient right-or-way to accommodate LRT. In addition, little community support has been expressed for this alternative. Therefore, carrying Alternative 6 forward did not appear warranted.
7	**LRT on Alum Rock and White/San Felipe Road from Capitol (Avenue) LRT to Evergreen Valley College.** Alternative 7 extends light rail along Alum Rock to White Road, and continues south along White/San Felipe Roads to Evergreen Valley College. It would provide little additional benefit over Alternative 1 in terms of connectivity to the existing and planned light rail network given the additional cost of extending LRT east to White/San Felipe Road. Existing transit ridership along White/San Felipe falls in the low- to mid-range. Future development along the corridor is expected, but not at the densities that would generate sufficient ridership for a light rail investment. In addition, there was little community support for this corridor as a light rail corridor. Therefore, carrying Alternative 7 forward did not appear warranted.

Alternative	Mode and Location
9	**Busway/HOV lanes on Capitol Expressway for Express Bus Service from Eastridge Mall to Guadalupe LRT (Capitol Station).** Alternative 9 would construct HOV lanes on Capitol Expressway from Silver Creek Road to State Route 87. This option provides a high degree of connectivity to the existing and planned rapid transit network. While providing express bus service in this corridor has received support, there was community concern regarding the addition of HOV lanes to Capitol Expressway between US 101 and SR 87. As a result, it was recommended that Alternative 9 be dropped from further consideration, but that express bus service traversing Capitol Expressway be added to Alternative 16 (Transportation System Management).
12	**BRT on Santa Clara/Alum Rock and White/San Felipe Road from Downtown to Evergreen Valley College.** Alternative 12 provides a high degree of connectivity to the existing and planned rapid transit network along the Santa Clara Street/Alum Rock Avenue segment. Existing transit ridership along White/San Felipe falls in the low- to mid-range. Future development along the corridor is expected, but not at the densities that would generate sufficient ridership for major bus rapid transit investments. The Santa Clara Street/Alum Rock Avenue portion of this option has received significant support during public outreach while the White/San Felipe road portion of the alignment has received limited support. The project team did not recommend carrying Alternative 12 forward due to insufficient ridership and community support; however, it was recommended that Alternative 11 be modified to include an extension of BRT investments along Alum Rock Avenue to White Road.
14	**BRT on 10th/11th Streets and Keyes/Story Road from Downtown to terminus of Capitol (Avenue) LRT.** Alternative 14 generally meets the identified goals of the project although it has received very little support during public outreach. Both Alternatives 11 and 13 were considered better choices for serving the study area with bus rapid transit (BRT) improvements since Alternative 11 would serve an existing major transit corridor and Alternative 13 would serve major trip generators, such as Downtown San Jose, the new City Hall, San Jose State University, Kelly Park, the San Jose Municipal Ballpark, and Eastridge Shopping Center; therefore, carrying Alternative 14 forward did not appear warranted.

Source: Downtown/East Valley Major Investment Study, Project Summary Report, December 2000.

The criteria used for the technical evaluation were developed using Federal guidance and input from the community to reflect the goals of the project. The six major evaluation criteria included: Mobility Improvements; Equity Issues; Capital and Operating Expenditures; Cost-Effectiveness; Transit-Oriented Land Use; and Environmental Concerns.

To allow a meaningful comparison of alternatives under consideration, the alternatives were grouped based on the general travel corridors they would serve. Four alternatives were considered in the Capitol Expressway Corridor, which are illustrated in Figure 2-1.

- Alternative 2 would provide LRT service in the median of Capitol Expressway from the terminus of the Capitol LRT Line near Alum Rock Avenue to Eastridge Mall. This Alternative would require the removal of the existing HOV lanes on Capitol Expressway. Under Alternative 2, two options were considered.
  - Option 2(a) is primarily at-grade.
  - Option 2(b) is primarily elevated to reduce traffic impacts.
- Alternative 3 would construct light rail in the median of Capitol Expressway from Eastridge Mall to the Guadalupe LRT Line.
- Alternatives 8 and 10 would both provide Express Bus service in this corridor.
  - Alternative 8 would provide Express Bus service from the study area to the heavily concentrated employment centers in North San Jose, Santa Clara, Sunnyvale, and Mountain View (Golden Triangle).
  - Alternative 10 would provide Express Bus service along Capitol Expressway from Eastridge Mall to the Alum Rock LRT Station, and would include Bus Rapid Transit features on Quimby and White Roads from Eastridge Mall to Evergreen Valley College.

Based on an evaluation of the key performance measures, all four alternatives would serve the Capitol Expressway Corridor and would enhance VTA's Eastridge Transit Center. Alternative 2, 3, and 10 would generate more total riders in the corridor by providing fast, direct service between Eastridge Transit Center and the existing light rail system. However, the capital cost of the light rail options is much higher than the Express Bus alternatives, which would provide improved service at a lower cost due to the ability to make use of existing HOV lanes.

Table 2-3. Capitol Expressway/Evergreen Corridor Key Performance Measures

Alternative	Total Riders	New Riders	Total Households (HH) Served	Low Income HH Served	HH with Autos	Capital Cost
2a (LRT At-Grade to Eastridge)	3,200	2,300	11,400	950	250	$215M
2b (LRT Aerial to Eastridge)	3,200	2,300	11,400	950	250	$302M
3 (LRT from Eastridge to Guadalupe)	6,200	1,500	13,000	1,100	300	$270M
8 (Express Bus to Golden Triangle)	1,800	1,700	43,450	3,600	1,900	$103M
10 (Express Bus to Alum Rock and BRT to Evergreen Valley College)	2,100	250	6,500	1,100	200	$68M

Note: shading indicates best performance for the measure.

Although the express bus alternatives would provide improved service to residents at a lower cost, service would be provided only during commute hours, as compared to

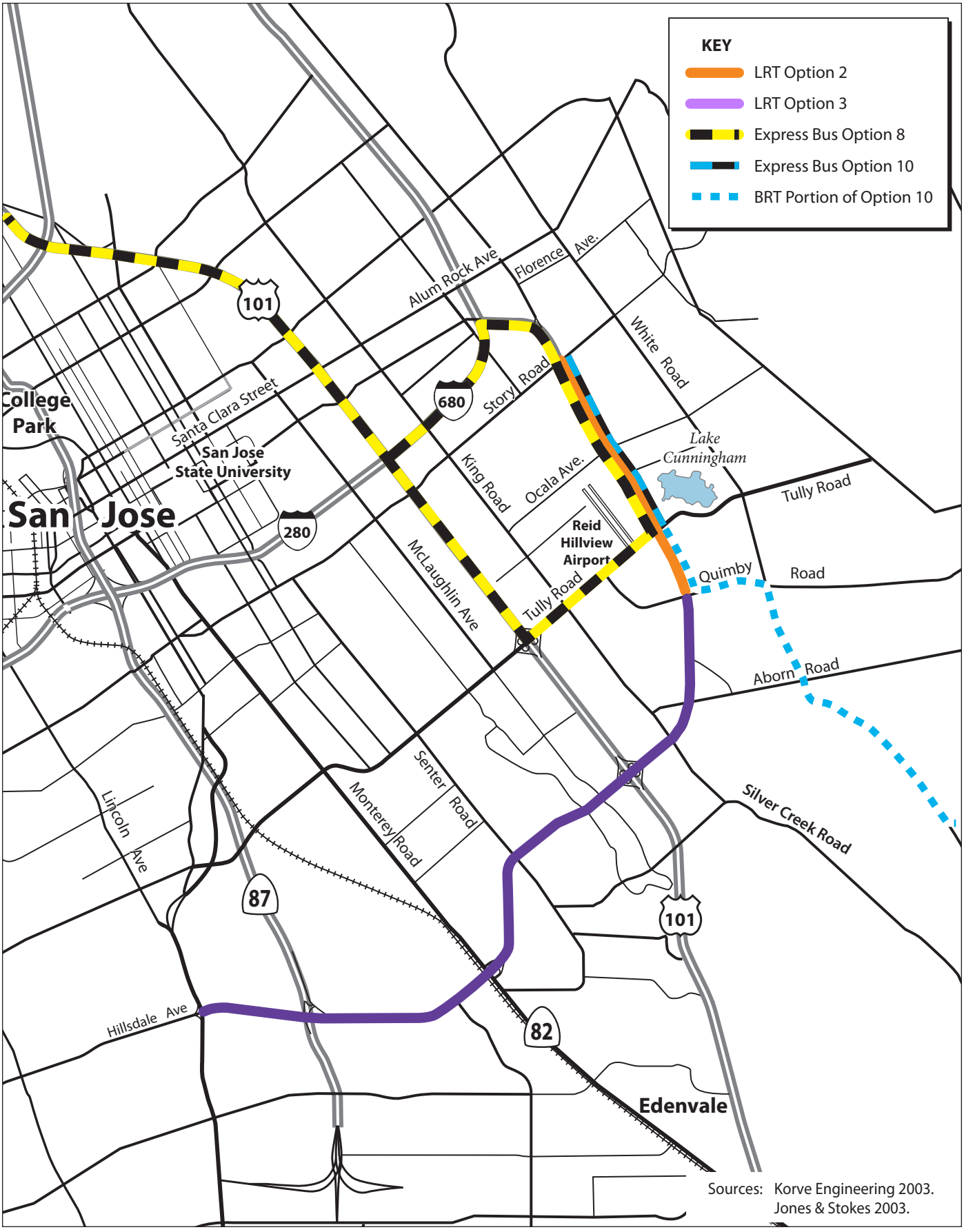

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Figure 2-1
Alternatives Evaluated in the MIS

the light rail alternatives, which would operate during regular service hours. During the public outreach program, the community strongly supported the light rail alternatives for this reason.

The extension of LRT service from the Alum Rock LRT Station to Eastridge Mall (Alternative 2) received the most community support as compared to all other alternatives considered during the MIS process. Although removing HOV lanes on Capitol Expressway was raised as an issue, few individuals viewed this as a critical concern.

Based on public comment and the evaluation of key performance measures, the PAB recommended both Alternatives 2(a) and 3, with supporting bus feeder service from the Evergreen area to Eastridge Mall, on June 21, 2000, to the VTA Board of Directors for inclusion in the Preferred Investment Strategy. In a unanimous decision on August 3, 2000, the VTA Board of Directors adopted the recommendations of the PAB for the Downtown East Valley Preferred Investment Strategy.

Alternatives Evaluated in the Draft EIS/EIR (April 2004)

The alternatives evaluated in the Draft EIS/EIR (April 2004) were identified during the MIS process and further developed during conceptual engineering and environmental scoping. The Draft EIS/EIR included a No-Action Alternative, Baseline Alternative, and Light Rail Alternative.

NO-BUILD ALTERNATIVE

As required by Section 1502.14(d) of NEPA, the alternatives analysis in the EIS shall "include the alternative of no action". The analysis of the "No-Action" Alternative (referred to as No-Build in this document) provides a benchmark for comparing the magnitude of environmental effects of the action alternatives. The No-Build Alternative represents the conditions that would reasonably be expected to occur in the foreseeable future if none of the proposed alternatives were implemented.

BASELINE ALTERNATIVE

Under the requirements of FTA's New Starts and Small Starts program, the proposed project is evaluated against a "baseline alternative", which is defined as the "best that can be done" to address identified transportation needs in the corridor without a major capital investment in new infrastructure. The Baseline Alternative evaluated in the Draft EIS/EIR included enhancements to existing bus service above existing and planned levels. In addition, the Baseline Alternative included a new route that would provide continuous limited-stop bus service along Capitol Expressway between Alum Rock LRT Station and the Capitol LRT Station (modification of Alternative 10 from the MIS) The Baseline Alternative is illustrated in Figure 2-2.

LIGHT RAIL ALTERNATIVE

As a result of the MIS process and environmental scoping, three light rail alternatives were evaluated for inclusion in the Draft EIS/EIR. These light rail alternatives were very similar with the exception of the number and type of lanes proposed on Capitol Expressway.

The Light Rail Alternative would extend 8.2 miles south and west from the Alum Rock Station to the Eastridge Transit Center, and continue to connect with the existing Guadalupe LRT Line at SR 87 (consistent with Alternatives 2 and 3 from the MIS). The Light Rail Alternative would have nine stations, located near Story Road, Ocala/Cunningham Avenue, Eastridge Mall, Nieman Boulevard, McLaughlin Avenue, Senter Road, Monterey Highway, Vista Park Drive, and SR 87. This Light Rail Alternative involved ten design options for the vertical alignment, station locations and design, Park-and-Ride lots, and vehicle storage facility.

Light Rail Alternative with Six Mixed-Flow Lanes on Capitol Expressway

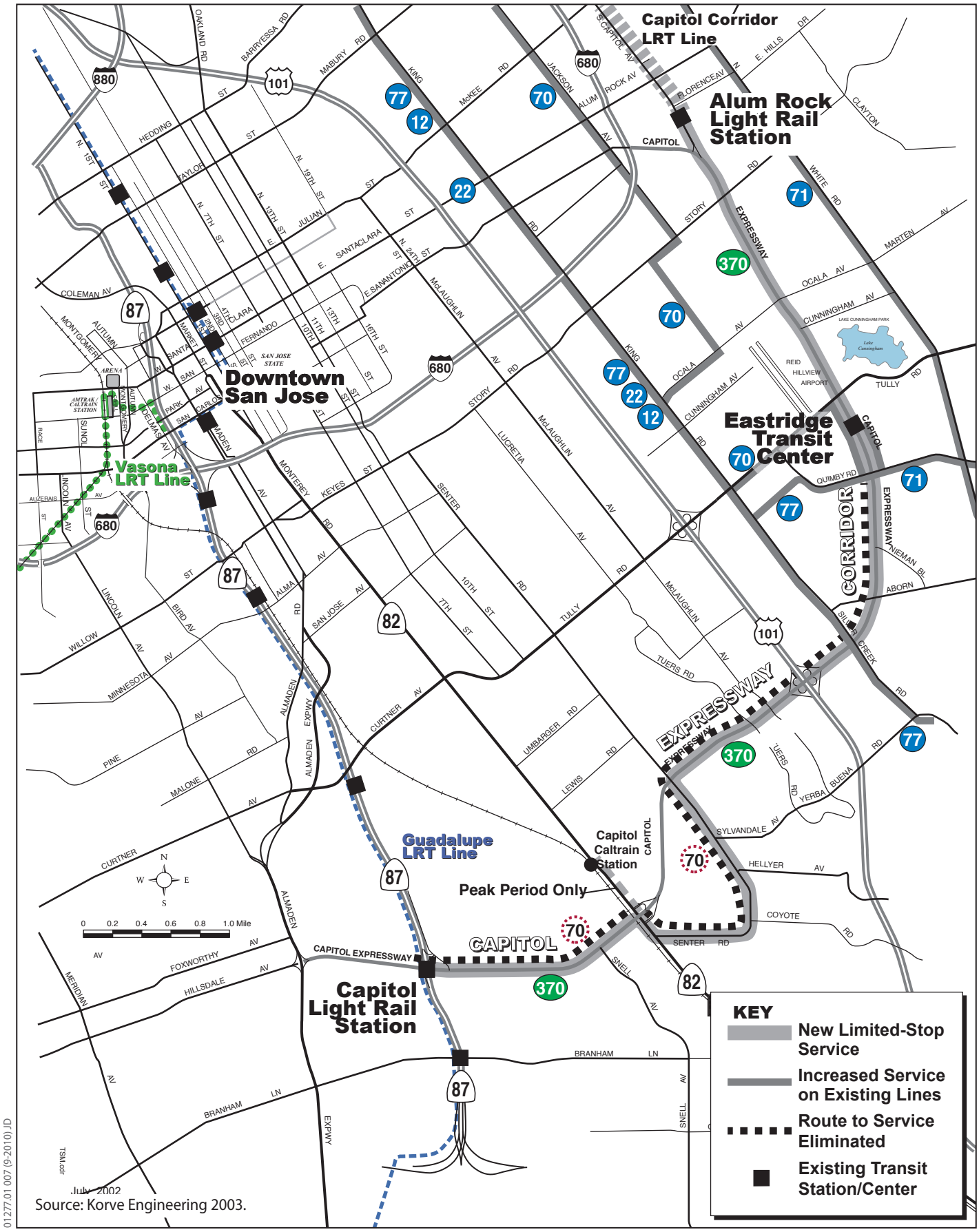
This Alternative was based on the Preferred Investment Strategy that was approved by the VTA Board of Directors on August 3, 2000, at the completion of the MIS. It involved the removal of the two HOV lanes on Capitol Expressway to accommodate the light rail.

Light Rail Alternative with Four Mixed-Flow and Two HOV Lanes on Capitol Expressway

In response to comments from the County of Santa Clara during environmental scoping, an LRT alternative, which involved the removal of two mixed-flow lanes and the retention of the HOV lanes was evaluated. Since traffic and construction-related impacts would be more severe under this alternative, this option was rejected from further consideration in the Draft EIS/EIR.

Light Rail Alternative with Six Mixed-Flow and Two HOV Lanes on Capitol Expressway

Recognizing that removing two mixed-flow lanes could be a major concern to the community, VTA evaluated an alternative to retain all eight traffic lanes (six mixed-flow and two HOV lanes) between U.S. 101 and I-680. Retaining eight traffic lanes would require approximately 11 additional feet of right-of-way on both sides of Capitol Expressway from approximately Story Road to U.S. 101, which would increase the number of full and partial property acquisitions required. Retaining eight lanes would also impact significantly more Section 4(f) (recreational) and biologically sensitive property. In addition, it would also result in more adverse noise impacts because of the relocation of traffic lanes 11 feet closer to existing residential and park areas. Although this alternative would result in fewer traffic impacts as compared to the Light Rail Alternative with Six Mixed-Flow Lanes, it was rejected from further consideration in the Draft EIS/EIR because of the severity of other environmental impacts.



July 2002

Source: Korve Engineering 2003.

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Figure 2-2
Baseline Alternative (2004 EIS/EIR)

Section 2.3 Alternatives Evaluated in the Supplemental DEIS

The alternatives that have been carried forward and that are evaluated in this Supplemental DEIS have undergone substantial modification since the completion of the Draft EIS/EIR in April 2004.

The No-Build Alternative has been modified due to changes in existing services and the introduction of new services. Major changes to existing services have included the addition of limited-stop bus service along Capitol Expressway in July 2005. New services consist of planned BRT service along Santa Clara/Alum Rock Avenue and Capitol Expressway. This new service was recommended in the BRT Strategic Plan, which was finalized in June 2009, and will increase the speed and frequency of bus service along Capitol Expressway. It is currently scheduled to begin construction in mid-2013 and begin revenue service in late 2014.

The Baseline Alternative was eliminated from further evaluation because the major improvements to bus service described in the Draft EIS/EIR have been implemented or are in the process of being implemented. A more detailed explanation of the reasons for eliminating the Baseline Alternative are included later in this section.

The Build Alternative has been modified in response to public comments on the Draft EIS/EIR, pending land use and transportation decisions in the corridor, and value engineering. During the public circulation of the Draft EIS/EIR, VTA received numerous comments from the public expressing concerns about the effects of the project on traffic south of Nieman Boulevard. This led to the decision by VTA's Board of Directors to defer decisions on Phase 2 between Nieman Boulevard and State Route 87 until the transportation improvements associated with the U.S. 101 Central Corridor Study and the Evergreen Smart Growth Strategy have been further developed and approved. Constraints on local and regional transportation funding ultimately led to the decision to remove Phase 2 south of Nieman Boulevard from the project.

The extension to Nieman Boulevard is shown as a separate phase in the Valley Transportation Plan 2035 and funds are considered to be available for this extension over the 25-year period of the plan. However, unless an 81-acre vacant parcel between Quimby Road and Nieman Boulevard is developed with land uses that support a station at this location, the extension will not meet VTA's Transit Sustainability Policy. As a result, the Build Alternative in the Supplemental DEIS has been limited to the Minimum Operating System (MOS) as depicted in Figure 2-3a and Figure 2-3c. Additional federal and state environmental review would be required prior to a decision to proceed with the Nieman Extension.

The Build Alternative in the Draft EIS/EIR contained numerous design options for the alignment, stations, and ancillary facilities. Based on public comments on the Draft EIS/EIR, environmental considerations, and costs, staff made recommendations

on the selection of design options which was contained in *Final Staff Recommendations Report Regarding Project Options Considered in the EIS/EIR* dated July 2004. Subsequent value engineering resulted in further modifications to the design to address agency comments, improve operations, minimize right-of-way acquisitions, reduce environmental effects, and lower costs. The Build Alternative in the Supplemental DEIS has been modified to reflect the results of these analyses.

During the environmental scoping for the Supplemental DEIS, VTA presented the proposed alternatives to be evaluated in the SDEIS. In response, the County commented that the Baseline Alternative is still a very viable alternative and should also be evaluated in the Supplemental DEIS, and the Environmental Protection Agency commented that the range of alternatives analyzed should include both the continued use of HOV lanes and/or additional express bus service.

The reason why the Supplemental DEIS does not evaluate a Light Rail Alternative that retains the HOV lanes is because this alternative was already evaluated in the Draft EIS/EIR (April 2004) as described in Section 2.3. The alternative with Four Mixed-Flow and Two HOV Lanes was rejected because it would have more severe traffic impacts than the alternative with Six Mixed-Flow Lanes. The alternative with Six Mixed-Flow and Two HOV Lanes was rejected because it would require more property acquisition and it would result in more severe noise impacts and impacts to Section 4(f) resources than the alternative with Six Mixed-Flow Lanes.

The reason why VTA is proposing to eliminate the Baseline Alternative and limit the range of alternatives analyzed is described in the following section. The subsequent sections describe the No-Build Alternative and the Light Rail Alternative.

Elimination of the Baseline Alternative from the Supplemental DEIS

Subsequent to the preparation of the Draft EIS/EIR (April 2004), improvements to bus services on Capitol Expressway were implemented or are in the process of being implemented. These improvements are similar to the improvements that were included in the Baseline Alternative that was evaluated in the Draft EIS/EIR. They include the introduction of Rapid 522 bus service in July 2005 and the planned introduction of BRT service in late 2014.

Rapid 522 serves the El Camino/Santa Clara Street/Alum Rock Avenue corridor, which is the backbone of VTA's bus network, providing service along the east-west length of Santa Clara County between Eastridge Transit Center and Palo Alto Transit Center. The corridor is 26 miles long and includes the cities of San Jose, Santa Clara, Sunnyvale, Mountain View, Los Altos and Palo Alto. This service provides faster, more frequent, and more direct service through the use of bus signal priority, reduced stops, and 15-minute headways.

BRT service between the San Jose Diridon Station and Eastridge Transit Center via Capitol Avenue was proposed as part of Phase I of the Santa Clara-Alum Rock

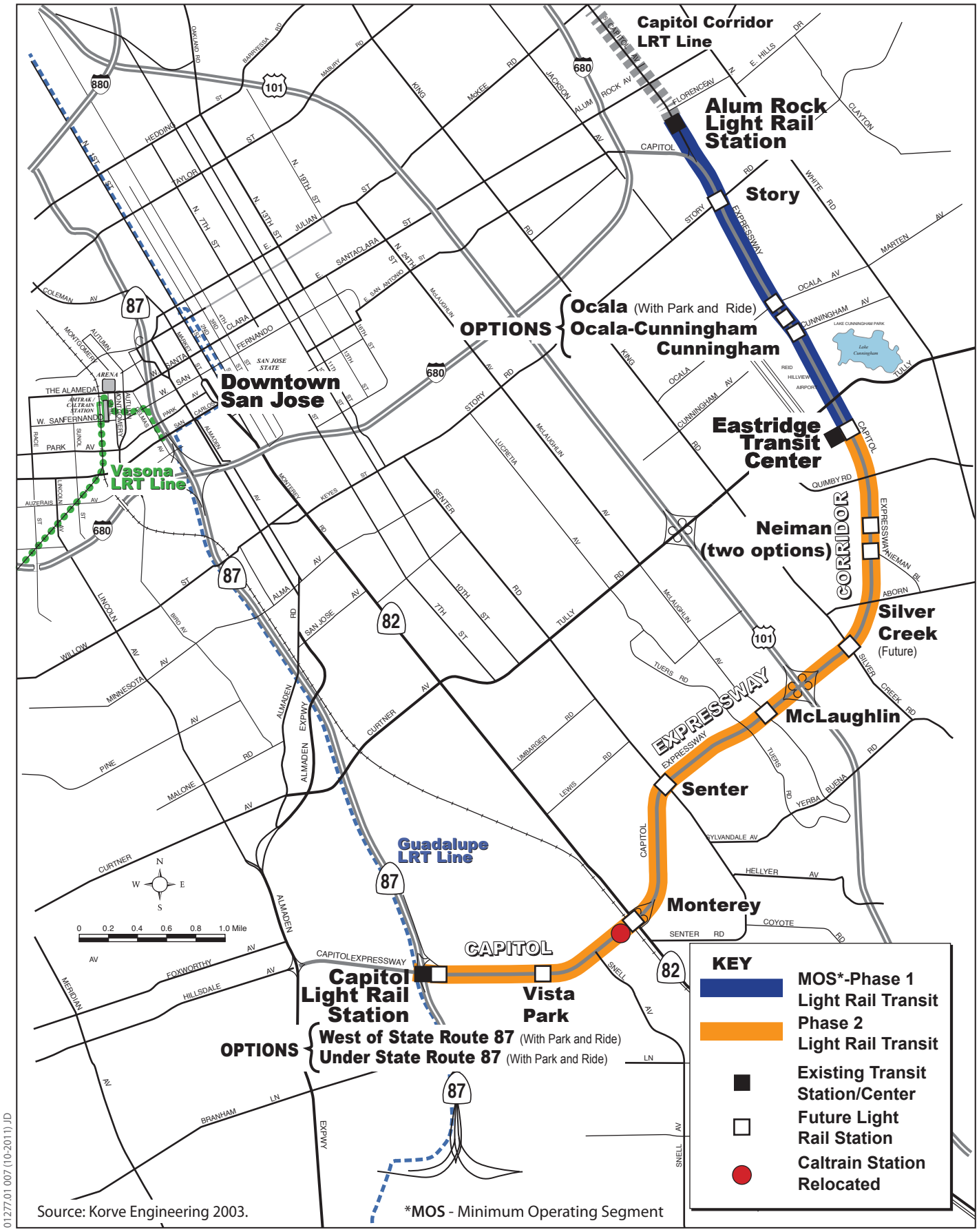
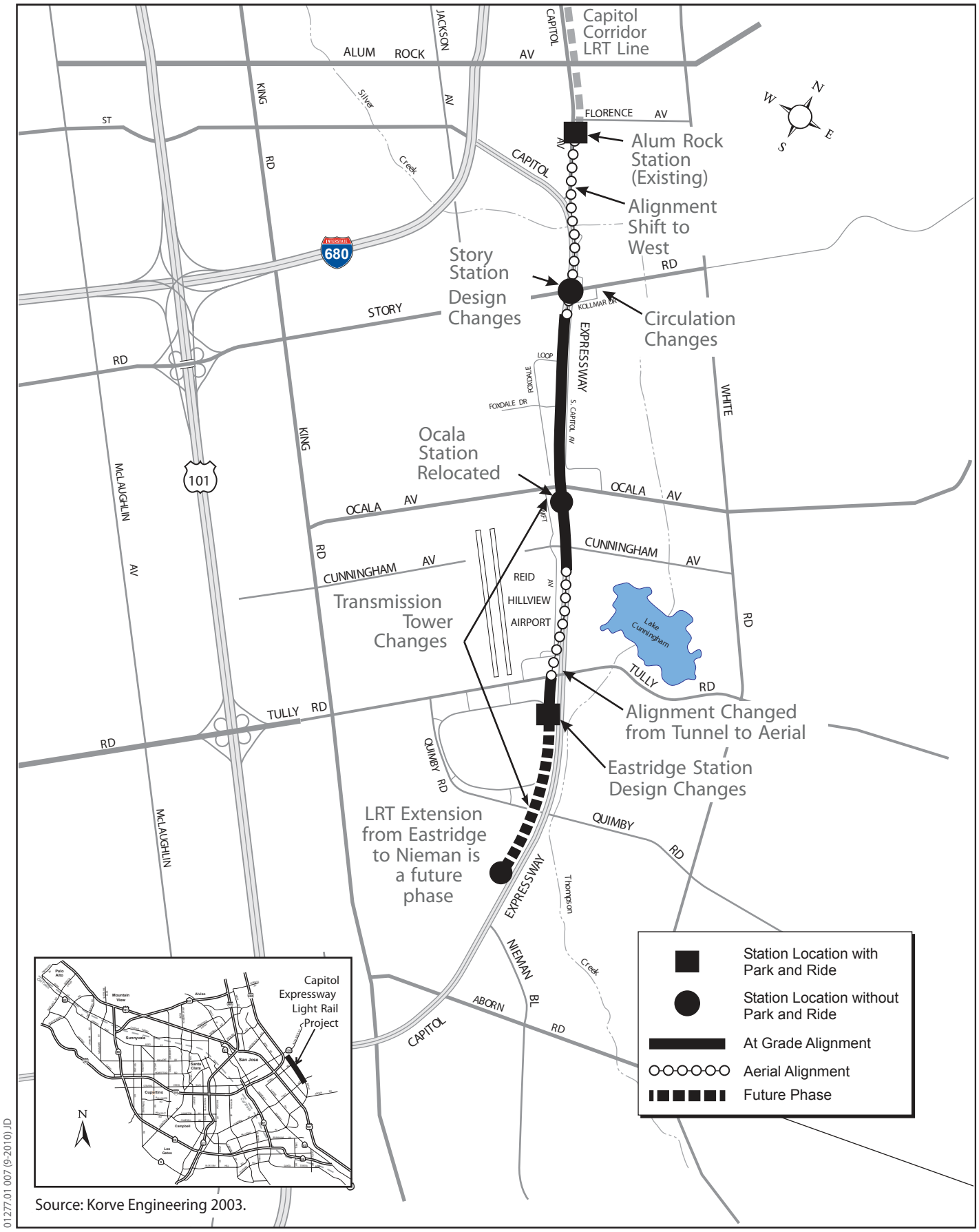


Figure 2-3a
Light Rail Alternative (2004 EIS/EIR)



Source: Korve Engineering 2003.

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Figure 2-3b
Light Rail Alternative (2007 SEIR)

Transit Improvement Project. BRT service would utilize articulated vehicles (approximately 60 feet in length), operate at 6-minute headways during peak periods, and include stops at Story Road, Ocala Avenue, and Eastridge Transit Center. A Final EIR for the Santa Clara-Alum Rock Transit Improvement Project was certified and the project was approved by the VTA Board of Directors on December 11, 2008. Preliminary Engineering for the Santa Clara-Alum Rock BRT began in April 2010. Construction of the BRT project is scheduled to start in mid-2013 with revenue service scheduled to begin in late 2014.

Given that improvements to bus service were implemented or are in the process of being implemented, these improvements have been included in the No-Build Alternative and the Baseline Alternative has been eliminated from the Supplemental DEIS. No other alternative that meets the purpose and need has been identified that can address transportation needs in the corridor without a major capital investment in new infrastructure. This includes additional express bus service that was recommended in EPA's comments on the environmental scoping.

No-Build Alternative

It is assumed that transit services provided by VTA within the corridor will continue at September 2009 levels, except for planned improvements that would be reasonably expected to occur in the foreseeable future regardless of the implementation of the proposed alternative. These conditions are based on current plans and are consistent with available infrastructure and community services. As stated elsewhere in this chapter, the No-Build Alternative includes the introduction of BRT service on Capitol Expressway, which is planned to begin revenue service in late 2014.

Two BRT routes are being planned along the Capitol Expressway Corridor. The 522 route connects the Eastridge Transit Center to the Palo Alto Transit Center and runs along Capitol Expressway between the Alum Rock LRT Station and the Eastridge Transit Center. This route exists today and would be upgraded to be part of the BRT project. A second BRT route, 523, would connect the Eastridge Transit Center to Cupertino via Alum Rock Avenue, Santa Clara Street, and Stevens Creek Boulevard. Similarly, it would run along Capitol Expressway between the Alum Rock LRT Station and Eastridge Transit Center. These two routes would individually operate at 12-minute headways and jointly operate at 6 minute headways between downtown San Jose and Eastridge Transit Center.

The BRT project would utilize articulated vehicles with unique branding. BRT service would include the following features:

- BRT stations (sidewalk "bulb-out" or median platform design with expanded shelters, lighting, etc.).
- Off board fare collection with ticket vending machines.
- Real-time information at stops.

- Transit priority measures such as signal priority, where appropriate.
- Queue jump lanes, where appropriate.

The No-Build Alternative is illustrated in Figure 2-4.

Light Rail Alternative

The proposed project will extend light rail along Capitol Expressway between the existing Alum Rock Light Rail Station and Eastridge Transit Center, a distance of approximately 2.3 miles (see Figure 2-3c). Light rail will operate primarily in the median of Capitol Expressway within exclusive and semi-exclusive rights-of-way. Property acquisition for the project will be minimized through the removal of two HOV lanes on Capitol Expressway. The alignment will include an elevated section that will extend north of Capitol Avenue to south of Story Road, and an elevated crossing of Tully Road. The project will include new light rail stations at Story Road (aerial), Ocala Avenue (at-grade) and Eastridge Transit Center (at-grade). At Eastridge Mall, the Park-and-Ride lot will be expanded to accommodate the project. The project will also include traction power substations at Ocala Avenue and Eastridge Transit Center. Approximately five 115-kilovolt electrical transmission towers and two tubular steel poles (TSPs) will require relocation from the median of Capitol Expressway to the east side of Capitol Expressway in order to accommodate the project.

The following sections describe the Light Rail Alternative urban design, alignment, stations, Park-and-Ride lots, and other facilities under consideration.

URBAN DESIGN

Since the conceptual engineering phase, there has been a consistent effort to incorporate attractive, urban design elements into the Light Rail Alternative. These principles reflect the policy guidance of the PAB. The following section highlights the key urban design elements of the Light Rail Alternative.

Urban Design Principles

- Transform the expressway from an auto-oriented corridor to a multi-modal boulevard.
- Establish pedestrian and bicycle linkages along and across the corridor to connect neighborhoods to activity centers.
- Design stations to facilitate safe and convenient pedestrian access and to convey the personality and identity of adjacent neighborhoods.
- Introduce special treatments along the edges of the boulevard to reduce visual and noise impacts and to create a more positive relationship with adjacent neighborhoods.

Source: Korve Engineering 2003.

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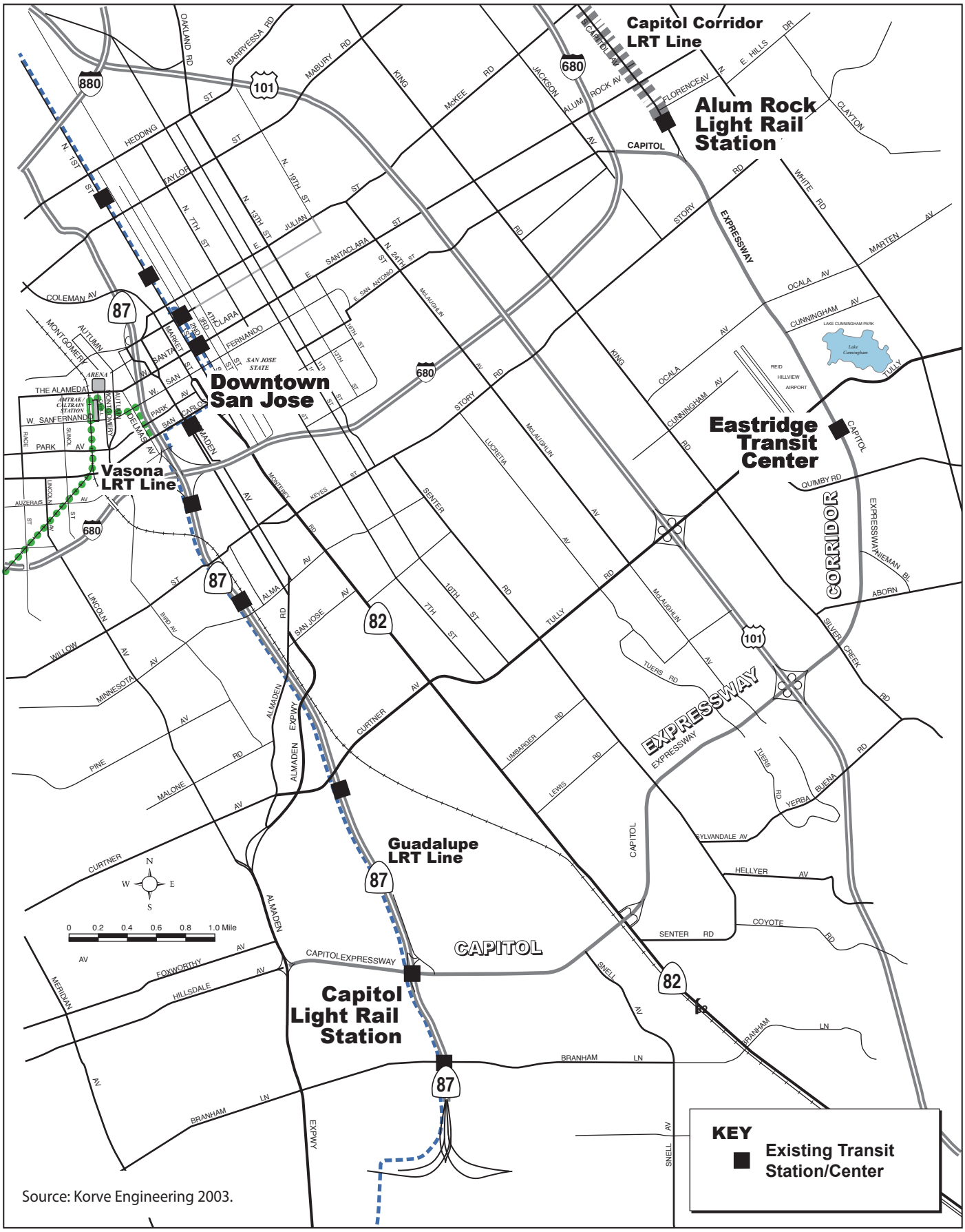
Figure 2-3c
Light Rail Alternative (Current)



Source: Korve Engineering 2003.

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Figure 2-4
No-Build Alternative

- Promote opportunities for transit-oriented development that will enhance ridership and the quality of life of the surrounding community.

STATIONS AS NEIGHBORHOOD GATEWAYS

The design of stations and their relationship with the adjacent neighborhoods is critical to promote a viable transit environment. Convenience, safety, and ease of access for residents and employees arriving by foot, bike, bus, or car are primary design objectives. Additionally, stations can create identities and gateways to communities. Stations can also provide opportunities for neighborhood-serving retail uses and/or a mix of commercial, residential, and recreational uses. The Light Rail Alternative will be consistent with the goal to integrate high-quality design enhancements, designed by artists and project architects, that reflect the identity of the communities and neighborhoods in which they are located.

There are numerous examples of community influenced design enhancements that have been incorporated into VTA's existing light rail stations. For example, at Alum Rock Station, artists working in coordination with the community designed special railings, shelter canopy glass, pavers, art tile benches, and entry markers.

ALIGNMENT DESCRIPTION

The Light Rail Alternative would be designed to reduce travel time and to support higher speed transit operations with signal priority at intersections and grade separation at congested intersections. Construction of the light rail would alter the roadway geometry along some portions of Capitol Expressway. Perhaps the most dramatic change to the expressway would be the removal of existing HOV lanes between Capitol Avenue and Tully Road to provide the additional right-of-way to accommodate light rail. While some property acquisition is required for improvements and for utility relocations, especially at stations, substations, and the Eastridge Transit Center, the removal of the HOV lanes would minimize the need to acquire additional property for the Light Rail Alternative and would be consistent with past policy decisions in the City of San Jose's Evergreen Specific Plan and Evergreen Specific Plan Transportation Improvements Environmental Impact Report (EIR). Except for restriping and a slight reduction in lane width, minimal modifications to the remaining traffic lanes would be required.

Under the Light Rail Alternative, pedestrian and landscaping enhancements would be implemented at various locations along the light rail corridor. Between Foxdale Drive and Ocala Avenue, VTA is considering an option that would not replace the existing sidewalk along the west side of Capitol Expressway with a new multi-use path and landscaping for a distance of about 1,500 feet.

This option is being considered to avoid or minimize the acquisition of the backyards of nine single-family homes. To accommodate bicyclists to the greatest extent possible, curb lanes on both sides of Capitol Expressway will be 17–18 feet for the

entire length to allow use of the shoulders by bicycles. For safety reasons, the light rail corridor would be separated from the roadway by fencing.

The following sections describe the Light Rail Alternative vertical and horizontal alignment and the options for each segment of the light rail corridor.

Alum Rock LRT Station to Story Road

The light rail alignment would begin at the existing Alum Rock LRT Station on the Capitol Avenue LRT Line. In this section of the corridor, an aerial guideway would be constructed for the full distance from south of the Alum Rock LRT Station to south of Story Road to support higher speed transit operations and minimize congestion at major intersections. The guideway would be located largely in the median of Capitol Avenue and Capitol Expressway. At its northern end, the aerial structure would cross the northbound lanes of Capitol Avenue and Capitol Expressway and transition to an alignment in the median of Capitol Expressway. The light rail alignment would continue on the aerial structure over Story Road and resume a ground-level profile south of Story Road.

Story Road to Eastridge Transit Center

From south of Story Road, the alignment would be at-grade through the Ocala and Cunningham Avenue intersections. Before reaching Tully Road, an aerial guideway would be constructed to transition the alignment from median-running north of Tully Road to side-running south of Tully Road in the Eastridge Transit Center.

PROPOSED STATIONS AND PARK-AND-RIDE FACILITIES

Three new stations are included with the Light Rail Alternative between the northern terminus at the existing Alum Rock LRT Station and the southern terminus at the existing Eastridge Transit Center. The stations would be located approximately 0.75 miles apart. The placement of the proposed stations was based on the desire to balance convenient passenger access and minimize travel time delay. The following sections describe each station along the alignment of the Light Rail Alternative, and representative photographs are presented in Figures 2-5 and 2-7.

Alum Rock LRT Station (existing)

At its northern end, the Light Rail Alternative would connect to the existing light rail network at the Alum Rock LRT Station on the Capitol Avenue LRT Line (see Figure 2-5). The two lines would meet at the station, and the Capitol Avenue LRT Line would be through-routed with the Light Rail Alternative. Both lines would share the existing station platform and could operate in the same corridor. No improvements are anticipated at this station.

Alum Rock Station, looking northeast

Source: ICF International

Figure 2-5
Alum Rock Station

Story Road Station (proposed)

The Light Rail Alternative includes a two-level station in the median of Story Road with a mezzanine level and an elevated center platform. The station would be centered over the Story Road/Capitol Expressway intersection. Since the traffic volumes and pedestrian/bicycle activity at the Story Road intersection are high, a single pedestrian overcrossing would be located south of Story Road connecting the southern corners of the intersections to the station. From the mezzanine level, an elevator and stairs would provide access to the station platform. There would also be convenient access to the station from the signalized crosswalks.

Ocala Avenue Station (proposed)

The Light Rail Alternative includes an at-grade station at Ocala Avenue. The station would consist of a center platform located in the median of Capitol Expressway. A walkway in the median of Capitol Expressway would provide a connection between the station and Cunningham Avenue.

VTA is proposing that Ocala Station be considered as optional or for future construction as part of the Light Rail Alternative since ridership levels do not meet VTA's standard for new Light Rail construction as defined in the Transit Sustainability Policy; and a future BRT station will be located at Ocala Avenue that will meet the Policy criteria.

Eastridge Station (proposed)

The Eastridge Transit Center is currently the second busiest transfer point in the VTA system, with significant bus transfer activity and a Park-and-Ride lot. Most bus routes serving the Downtown/East Valley area terminate at or pass through the center. The Light Rail Alternative includes an at-grade station with two center platforms adjacent to Eastridge Transit Center (see Figure 2-6).

Park-and-Ride Facilities (existing)

Two existing Park-and-Ride lots are located along the alignment: Alum Rock Station and Eastridge Transit Center.

To serve the Light Rail Alternative, there would be no increase in parking at Alum Rock Station due to space constraints. At Eastridge Transit Center Park-and-Ride, a total of approximately 270 parking spaces are proposed to meet demand from the Light Rail Alternative. There are currently 135 parking spaces at Eastridge Transit Center.

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Eastridge Transit Center

Graphics … 01277.01 (11-10)

Source: ICF International

Figure 2-6
Eastridge Station

SUPPORT SYSTEMS

In addition to the primary alignment, stations, and Park-and-Ride facilities, the Light Rail Alternative would incorporate light rail support systems, including traction power and substations, overhead contact, communications, signaling, gates, and noise and vibration abatement. Support systems are described in the following sections.

Traction Power System and Substations

A traction power system is a distribution system that converts high-voltage commercial electrical power received from substations to medium-voltage direct current (DC) and distributes it to the light rail vehicles via the overhead catenary or contact wire as they travel along the alignment. A traction power system consists of the power distribution mechanism and electrical substations. For the Light Rail Alternative, the traction power system would provide the potential for three-car light rail trains operating at speeds up to 55 mph on 10-minute headways.

The alignment would require a total of two substations, not including one existing substation south of the Alum Rock LRT Station near the Park-and-Ride lot.

Locations for new substations include the following:

- southwest corner of Capitol Expressway and Ocala Avenue;
- Eastridge Transit Center;

Electrical power would be supplied to each traction power substation (TPSS) by an underground feeder from the electrical utility distribution system. Alternate substations would be equipped with two primary feeders from the utility company and an automatic transfer switch to supply reliable power to the substation. Each TPSS would be contained in a prefabricated substation housing that is factory wired to accommodate internal components and built on a concrete foundation. Foundations would be equipped with embedded conduit to accommodate incoming alternating current primary power cables, control and communication cables, and the DC feeder cables to the overhead contact system.

The estimated size for each TPSS would be approximately 650–750 square feet in area and 12–15 feet in height. Parcels used as substation sites would need to be large enough to provide for side clearance from passing trains and automobiles and to allow a service vehicle to park, unless convenient parking is available on an adjacent roadway.

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Overhead Contact System at Alum Rock Station

Graphics … 01277.01 (11-10)

Source: ICF International

Figure 2-7
Overhead Contact System

Overhead Contact System

The overhead contact system (OCS) would be an auto-tensioned simple catenary (ATSC) consisting of a contact wire, a messenger wire, and counterweight terminations (see Figure 2-7). This configuration represents the typical application for the VTA light rail system. The height of the contact wire would conform to the requirements of *VTA Light Rail Design Criteria Manual 2004 Metric Version* (Santa Clara Valley Transportation Authority 2004) and the California Public Utilities Commission's (CPUC's) General Order 95 (California Public Utilities Commission 1941). All OCS poles, except counterweight poles, would be constructed as tubular, hollow, tapered, round poles made of rigid galvanized steel. Counterweight poles would be nontapered. The pole height would be adjusted to suit the contact wire height and would match the existing system as closely as possible. The OCS poles would be located between the tracks or on the outside of the tracks, depending on space restrictions.

Communications Systems

The communications equipment and design would be fully compatible with the communications system that serves VTA's existing light rail operations. A wayside cable system, fiber optic cable, and two-way radio system would link light rail stations and TPSSs with the existing Operations Control Center. The communications system would consist of the following main components:

- public address system with two-way voice announcement linking the Operations Control Center and the light rail stations;
- two-way radio system with two-way voice announcement linking the Operations Control Center and light rail vehicles;
- capability to monitor and control the TPSS switchgear functions from the Operations Control Center via the remote terminal units and wayside cable system;
- cable transmission system designed to incorporate both the backbone communications distribution (fiber optics) and metallic distribution.

Wayside cabling would utilize a combined systems duct installed continuously along the corridor.

Signaling and Gates System

The signal system for the Light Rail Alternative would be an extension of the existing light rail signal system and would be functionally compatible with the existing lines. The light rail signal system would include a wayside color light aspect with no cab signal and Automatic Block Signaling (ABS). (*Wayside color light aspect* refers to a signal at the side of the tracks indicating the next block is either clear or occupied.) The signal system would provide for minimum train headway of 5 minutes, allowing

a 5-minute safety factor over the design headways of 10 minutes. Generally, the alignment would not be gated. However, any side-running, at-grade alignment would likely require rail crossing gates at the side street crossings.

Noise and Vibration Abatement

As described in more detail in Chapter 3.12, *Noise and Vibration*, the project includes noise abatement that was recommended as part of the 2007 SEIR. Aerial and embankment soundwalls are included at various locations to reduce noise from wheel squeal.

VEHICLE STORAGE FACILITIES

The Light Rail Alternative does not include any new vehicle maintenance and overnight storage facilities. Heavy maintenance activities for vehicles used on this line would continue to be performed at the existing Guadalupe Light Rail Division on Younger Street in San Jose.

PEDESTRIAN AND LANDSCAPING ENHANCEMENTS

A separate project will provide pedestrian and landscaping improvements at various locations along Capitol Expressway between Capitol Avenue and Quimby Road. The Light Rail Alternative will relocate or upgrade these improvements where there are conflicts with the proposed alignment, especially where additional right-of-way is required for aerial guideways, stations, and utility relocations. The enhancements could include sidewalk, landscaping, or a multi-use path consisting of sidewalk, landscaping, and street lighting.

UTILITY RELOCATIONS

The project will include minor utility relocations (e.g., water, gas, communications, electric lines, sanitary sewer, stormwater, etc.), as necessary, to construct the Light Rail Alternative.

In addition, 5 electrical transmission towers and 2 TSPs carrying the Pacific Gas & Electric Company's (PG&E) McKee-Piercy and Milpitas-Swift sections of the 115 kilovolt transmission lines would need to be relocated from Ocala Avenue to north of Quimby Road as described below:

- No. 47: Conductor realignment only. The tower, which is located north of Ocala Avenue and west of Capitol Expressway, will be raised by adding a 10 foot vertical extension.
- No. 48: Tower will be relocated to the east of its current location, which is south of Ocala Avenue and west of Capitol Expressway, and replaced with a TSP.

- No. 49: Conductor realignment only. The tower, which is located south of Ocala Avenue and west of Capitol Expressway, will be raised by adding a 15 foot cage extension.
- Nos. 50–51: Towers, which are currently located south of Cunningham Avenue, will be relocated from the median to the east side of Capitol Expressway and replaced with TSPs.
- No. 51A: One new TSP pole will be added for span balancing[1] on the east side of Capitol Expressway between Cunningham Avenue and Tully Road.
- No. 52–54: Towers, which are currently located between north of Tully Road and south of Eastridge Access Road, will be relocated from the west side to the east side of Capitol Expressway and replaced with TSP's.
- No. 55: TSP, which is located on the east side of Capitol Expressway between Eastridge Access Road and Quimby Road, is moving slightly west and replaced with a new TSP.

TSP's number 48, 50, 51, 51A, 52 and 53 will be 105 feet in height. TSP's 54 and 55 will be 100 feet in height. Figure 3.16-2a and 2b illustrates the proposed changes to the TSP's.

PG&E has also indicated that they will need access to each TSP for maintenance. For TSP's located immediately adjacent to Capitol Expressway, a pull-out area will be provided for safe ingress and egress for maintenance vehicles.

RIGHT-OF-WAY REQUIREMENTS

The majority of the improvements will be constructed within existing public right-of-way. There are a number of locations, however, where the Light Rail Alternative will require minor amounts of additional right-of-way. Based on preliminary designs, the locations where additional right-of-way will be required are listed in Table 2-4 and illustrated in Appendix E.

Easements and other acquisitions may change (i.e., increase or decrease in size, change type, and/or change from permanent to temporary, etc.) during final design while being within the scope of the project and minor in nature. It is the intent of this environmental document to environmentally clear easements and other acquisitions that are generally indicative of the type of work required, recognizing some adjustments may be necessary based on final design and/or working with individual property owners during the real estate acquisition process. Should modifications beyond the scope of the project trigger the need for additional environmental review pursuant to NEPA, subsequent environmental analysis would be required.

[1] Because of recommended span lengths in this area, an additional TSP is required to balance the system.

Table 2-4. Preliminary Right-of-Way Requirements

No.	Assessor's Parcel Number	Address	Existing Use	Right-of-Way Needed
1	484-24-134	2706 Wilbur Avenue	Single-Family	TCE
2	484-24-060	420 S. Capitol Avenue	Single-Family	TCE
3	484-24-059	440 S. Capitol Avenue	Single-Family	TCE
4	484-24-058	460 S. Capitol Avenue	Single-Family	TCE
5	484-24-057	480 S. Capitol Avenue	Single-Family	TCE
6	484-24-056	13511 Westboro Drive	Single-Family	TCE
7	484-28-013	13510 Westboro Drive	Single-Family	TCE
8	484-28-012	500 S. Capitol Avenue	Single-Family	TCE
9	484-28-011	520 S. Capitol Avenue	Single-Family	TCE
10	484-28-010	540 S. Capitol Avenue	Single-Family	TCE
11	484-28-009	560 S. Capitol Avenue	Single-Family	TCE
12	484-28-008	13501 Highwood Drive	Single-Family	TCE
13	484-33-043	888 S. Capitol Avenue	Business	TCE, Permanent Easement
14	484-33-107 484-33-108	2701 Story Road	Business	TCE, Permanent Easement
15	488-01-041	2710 Story Road	Business	Partial, TCE, Permanent Easement
16	488-01-002	1148 S. Capitol Avenue	Business	Partial, TCE, Permanent Easement
17	488-01-004	2710 Kollmar Drive	Multi-Family	Partial,TCE, Permanent Easement
18	488-18-001	1701 S. Capitol Avenue	Single-Family	TCE
19	491-01-016	SE Corner of Capitol Expressway & Cunningham avenue	Public	Partial, TCE, Permanent Easement
20	491-02-073	3000 E. Capitol Expressway	Business	TCE, Permanent Easement
21	491-02-074	3001 E. Capitol Expressway	Business	TCE, Permanent Easement
22	491-02-070	2950 E. Capitol Expressway	Business	Permanent Easement
23	491-02-071	2950 E. Capitol Expressway	Business	Permanent Easement
24	491-02-072	2990 E. Capitol Expressway	Business	Permanent Easement
25	491-02-066	Thompson Creek	Public	Permanent Easement
26	491-48-006	Thompson Creek	Public	Permanent Easement
27	484-45-117	2693 Lombard Avenue	Single-Family	TCE

No.	Assessor's Parcel Number	Address	Existing Use	Right-of-Way Needed
28	484-45-060	2686 Lombard Avenue	Single-Family	TCE, Permanent Easement
29	484-45-061	353 S. Capitol Avenue	Single-Family	TCE, Permanent Easement
30	484-45-062	455 S. Capitol Avenue	Single-Family	TCE, Permanent Easement
31	484-45-116	461 S. Capitol Avenue	Business	Partial, Permanent Easement, TCE
32	484-38-044	Silver Creek	Public	Partial
33	484-34-013	985 S. Capitol Avenue	Single-Family	TCE
34	484-34-014	1001 S. Capitol Avenue	Single-Family	TCE
35	484-34-015	1017 S. Capitol Avenue	Single-Family	TCE
36	484-34-016	1033 S. Capitol Avenue	Single-Family	TCE
37	484-34-017	1049 S. Capitol Avenue	Single-Family	Partial, TCE
38	484-34-131	1091 & 1093 S. Capitol Avenue	Business	Full
39	484-34-019	2695 Story Road	Business	Partial, TCE, Permanent Easement
40	486-43-106	2690 Story Road	Business	Partial, TCE, Permanent Easement
41	486-43-108	2680 Story Road	Business	TCE
42	486-39-031	1221 S. Capitol Avenue	Multi-Family	Partial, TCE
43	486-39-025	2671 Foxdale Drive	Multi-Family	Partial, TCE
44	486-42-015	2517 Brownstone Court	Single-Family	Partial, TCE
45	486-42-014	2518 Brownstone Court	Single-Family	Partial, TCE
46	486-42-013	2510 Brownstone Court	Single-Family	Partial, TCE
47	486-42-008	1646 Pinkstone Court	Single-Family	Partial, TCE
48	486-42-007	1652 Pinkstone Court	Single-Family	Partial, TCE
49	486-42-006	1658 Pinkstone Court	Single-Family	Partial, TCE
50	486-42-003	1682 Silverstone Place	Single-Family	Partial
51	486-42-002	1690 Silverstone Place	Single-Family	Partial, TCE, Permanent Easement
52	486-42-001	1698 Silverstone Place	Single-Family	Partial, TCE
53	491-15-003	Reid Hillview Airport	Public	Partial
54	491-15-004	Swift Avenue	Utility	Partial, TCE, Permanent Easement
55	491-13-009	Reid Hillview	Public	Partial, TCE, Permanent Easement

No.	Assessor's Parcel Number	Address	Existing Use	Right-of-Way Needed
56	491-05-001	North of Airport Access Road	Public	TCE, Permanent Easement
57	491-05-020	Reid Hillview	Public	Permanent Easement
58	491-04-012	Eastridge Mall, SW Corner of Tully Road and Capitol Expwy	Business	Partial, TCE, Permanent Easement
59	491-04-047	Eastridge Mall, SW Corner of Tully Road and Capitol Expwy	Business	Partial, TCE, Permanent Easement
60	491-04-050	Eastridge Mall	Business	Partial, TCE, Permanent Easement

Note: TCE = Temporary Construction Easement

OPERATING ASSUMPTIONS

For the purposes of environmental analysis, the operating assumptions are based on past, current, and reasonably foreseeable future service plans. The purpose is to assess the project's effect on the environment under the "worst-case" conditions. The key operating assumptions are as follows:

- The Light Rail Alternative is assumed to operate as an extension of the Capitol Avenue LRT Line from Alum Rock LRT Station to the Eastridge Transit Center. The Capitol Avenue LRT Line currently operates between Alum Rock and Santa Teresa LRT Stations.
- The Light Rail Alternative is assumed to operate one to three-car train consists depending on ridership demands.
- The hours of operation are assumed to be between 4:30 a.m. and 1:30 a.m.
- Headways are assumed to range from 10 to 60 minutes with peak hour headways of 10-minutes on weekdays and 15-minutes on weekends.
- For the segment of the alignment between the Alum Rock LRT Station and Eastridge Transit Center, the estimated running time would be approximately 5 minutes. Table 2-5 [Modified from Transportation Study] shows estimated travel times between stations along the light rail alignment.
- Generally, the Light Rail Alternative will be designed for 55 mph operations except for between Ocala Avenue and Cunningham Avenue.

Table 2-5. Travel Time and Speed Data for Light Rail in 2018

		Northbound				Southbound			
		AM		PM		AM		PM	
Travel Times and Speeds	Distance (miles)	Travel Time (minutes)	Speed (mph)	Travel Time (minutes)	Speed (mph)	Travel Time (minutes)	Speed (mph)	Travel Time (minutes)	Speed (mph)
Between Alum Rock TC & Ocala Station	1.30	3.02	25.82	3.02	25.82	3.02	25.82	3.02	25.82
Between Ocala Station & Eastridge TC	1.03	1.98	31.21	1.98	31.21	1.98	31.21	1.98	31.21
Total	**2.33**	**5.00**	**27.96**	**5.00**	**27.96**	**5.00**	**27.96**	**5.00**	**27.96**

Sources: AECOM 2010.

CONSTRUCTION SCENARIO

Construction of light rail transit on Capitol Expressway would take place over several years beginning in 2015 and ending in 2018. Most of the construction work would occur in sequential order along the project corridor either from Alum Rock LRT Station or Eastridge Transit Center. Construction will consist of clearing and grubbing, grading, utility relocations, paving, and structural work.

At the height of construction, a number of construction employees and equipment would occupy portions of the street, including the median and parking spaces, at active construction locations. In the most active areas, construction activities would periodically reduce the capacity of Capitol Expressway from three lanes to two in each direction during the mid-day off peak periods. VTA would make every effort to keep all three lanes open during peak periods of travel.

The aerial guideway sections between Capitol Avenue and Story Road and at Tully Road would require extensive pile driving. It is anticipated that 9 to 12 piles would be driven per day for 3 to 6 days at each column site. The column sites are spaced approximately 120 to 130 feet apart.

The main construction staging area would likely occur on vacant airport property between Cunningham Avenue and Tully Road and at Eastridge Transit Center (see Figure 2-8) subject to the concurrence of Santa Clara County Roads and Airports. The median and lane closures would be used as regular short term staging areas for daily activities.

Section 2.4 List of Federal Permits, Licenses, and Other Entitlements Needed

No federal permits, licenses, and other entitlements will be needed for the No-Build and the Light Rail Alternatives.

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Figure 2-8
Main Construction Staging Area