

## Section 3.18 Construction

### Introduction

This section describes the construction scenarios and potential short-term construction impacts of the alternatives analyzed in this Supplemental DEIS. The description of the construction scenarios includes staging and construction techniques.

Specifically, this analysis addresses potential adverse construction effects and mitigation measures related to transportation, air quality and climate change, biological resources, community services, cultural resources, energy, geology, soils, and seismicity, hazardous materials, hydrology and water quality, land use, noise and vibration, safety and security, utilities, visual quality, as well as station specific impacts. This section incorporates individual resource topic section project impact analyses and mitigation, as appropriate.

### Affected Environment

The project would be constructed along the Capitol Expressway corridor, between the existing Alum Rock Light Rail Station and Eastridge Transit Center. In the vicinity of the proposed project, Capitol Expressway consists of two four-lane segments that are divided by a median strip. Residential, industrial, commercial, and public uses, as well as vacant lots, are scattered along the expressway. Various utilities that cross or parallel the corridor and run underneath or above the corridor include sanitary sewers, storm drains, gas and electricity lines, and fiber optics and telephone lines.

The following specific pre-construction activities are anticipated to occur:

- Geotechnical Investigations
- Final Design and Development of Construction Contracts
- Construction Education and Outreach Plan
- Pre-Construction Business Survey
- Land and Easement Acquisition
- Permits and Approvals

The following specific construction activities are also anticipated to occur:

- Construction Staging
- Schedule
- Utility Relocation
- Trackwork

- Stations and Facilities
- System Testing and Startup

## CONSTRUCTION SCENARIO

Please refer to the description of the construction scenario in Chapter 2, *Alternatives Analysis*.

## Environmental Consequences

### APPROACH AND METHODS

Analysis of construction impacts was based on quantitative and qualitative assessments of short-term, construction-period effects identified for each resource topic area.

### EFFECTS AND MITIGATION MEASURES

#### *No-Build Alternative*

The No-Build Alternative would not contribute to construction-period impacts. Planned projects included in the No-Build Alternative would be evaluated in separate environmental analyses to identify impacts and determine mitigation measures.

#### *Light Rail Alternative*

##### Transportation

Project construction could potentially have short-term, construction-period transportation effects on local businesses and residents, motorists, bicyclists, and pedestrians. These effects and the associated mitigation measures to reduce effects are discussed as follows.

**Impact: Long-Term Closure of Sidewalks, Streets, Lanes, or Interference of Traffic Flow**

Construction of the Light Rail Alternative would be a continuous, year-round process with construction taking place within specific segments at any one time. However, the peak of daily construction activity in any single area would take place during the off-peak commute hours when the LOS on Capitol Expressway at most major intersections is C or better. Additionally, the sidewalks and road shoulders would be maintained to allow pedestrians and bicyclists to effectively use the corridor during construction. Implementation of CON-1 through CON-4 would further reduce potential adverse effects

related to the long-term closure of sidewalks, streets, lanes, or interference of traffic flow.

**Mitigation: CON-1 – Prepare Traffic Management Plan**

VTA shall require its contractors to prepare and implement traffic handling plans in concert with the City of San Jose and the County of Santa Clara. Based on the Traffic Management Plan, contractors would use flagmen and follow a daily construction schedule that would restore traffic capacity during peak periods on weekdays (the morning commute period is 7:00 to 9:00 a.m. and the evening commute period is 4:00 to 6:00 p.m.). VTA would assign a specific Construction Management team to oversee construction including contractor compliance and mitigation measures such as adequate flagmen and the Traffic Management Plans.

Construction equipment traffic from the contractors would be controlled by flagman and the procedures contained in the Traffic Management Plan. For example, the use of the median to store large pieces of equipment overnight would be regulated. Traffic that may attempt to use neighborhood streets to avoid construction areas would be controlled by two characteristics of the roadway network adjacent to Capitol Expressway:

- First, while there are no efficient, directly parallel detours around Capitol Expressway, some arterials are capable of handling traffic diverted from Capitol Expressway. White Road, King Road, and Tully Road will likely handle most of the diverted traffic. Portable electronic variable message signs and other signage would be positioned at approaches to individual construction zones to warn motorists of construction ahead and direct traffic to use alternative routes where feasible. Flagmen would be used as needed to assist in the control of traffic and support the use of these roads as a detour.
- Second, there are very few paths of travel through neighborhood streets that offer parallel routes to Capitol Expressway. Therefore, neighborhood streets would be protected from being used as cut-through streets by motorists.

**Mitigation: CON-2 – Provide Signage Directing Bicyclists and Pedestrians Away from the Construction Area**

VTA shall post signs to direct pedestrians to cross at intersections in order to proceed along Capitol Expressway and avoid the construction area. VTA shall also post detour signs directing bicyclists to use alternative corridors during construction.

**Mitigation: CON-3 – Coordinate with Residents and Minimize Effects on Residential Access**

VTA shall coordinate the construction activities with homeowners and tenants. Residents shall be notified at least one to two weeks in advance of construction and be provided with a detailed schedule. Any adjustments to the schedule shall be conveyed to the residents upon determination of the need to adjust the schedule. The construction duration and disruptions to residents shall be kept to a minimum.

**Mitigation: CON-4 – Coordinate with Businesses and Minimize Effects on Business Access and Visibility**

VTA shall maintain access to businesses during construction. Property owners and businesses shall be notified at least one to two weeks in advance of construction and be provided with a detailed construction schedule if their access will be restricted. Changes to the construction schedule shall be conveyed as soon as possible. Construction duration shall be kept to a minimum. Signs shall be provided along Capitol Expressway indicating that affected businesses are open during construction and that access is available. Businesses shall be notified seven days in advance of any traffic circulation that may affect them.

Air Quality and Climate Change

Air quality impacts related to odors and emissions of several pollutants, including Ozone Precursors (ROG and NO<sub>x</sub>), CO, CO<sub>2</sub>, PM10, and PM2.5 would be produced during project grading and construction. In addition, GHG would be produced. These effects and the associated mitigation measures to reduce effects are discussed as follows.

**Impact: Creation of Objectionable Odors Affecting a Substantial Number of People**

The use of diesel powered construction vehicles may generate temporary odors while construction of project improvements is underway. However, once construction activities have been completed, these odors would cease. Consequently, this effect is not considered to be adverse.

**No adverse effects. No mitigation is required.**

**Impact: Temporary Increase in Ozone Precursors (ROG and NO<sub>x</sub>), CO, and PM<sub>10</sub> Emissions During Grading and Construction Activities**

Federal transportation conformity requires the evaluation of construction-related hot-spot emissions if construction activities will last longer than five years in one general location. As construction of the project is expected to last 28 months, a hot-spot analysis is not required under transportation conformity requirements. However, to provide a comprehensive analysis, construction emissions were analyzed using the SMAQMD's Road Construction Emissions Model (Version 6.3.2). It was assumed that construction would begin in 2015 and proceed according to the schedule provided by VTA (see ICF International 2010) (Jaworski pers. comm. 2010). Construction of the Light Rail Alternative and Light Rail Alternative, No Ocala Station Option would include the use of water trucks and import and export 40 cubic yards of soil per day. Both design options were assumed to be approximately 80 acres and disturb a maximum of 15 acres per day. The maximum daily emissions from construction activities are summarized in Table 3.18-1.

**Table 3.18-1. Summary of Construction Emissions (pounds per day)**

Phase	ROG	NO <sub>x</sub>	CO	PM <sub>10</sub>			PM <sub>2.5</sub>			CO <sub>2</sub> <sup>a</sup>
				Total	Exhaust	Dust	Total	Exhaust	Dust	
<b>Light Rail Alternative</b>										
Grubbing/Land Clearing	2.0	6.5	22.8	150.6	0.6	150.0	31.5	0.3	31.2	51
Grading/Excavation	2.4	9.6	24.3	264.7	0.7	264.0	55.4	0.5	54.9	1,236
Drainage/Utilities/Sub-Grade	5.6	34.1	33.3	451.8	1.8	450.0	95.0	1.4	93.6	1,735
Paving	3.9	18.6	26.9	1.3	1.3	-	0.9	0.9	-	1,124
<i>BAAQMD Threshold</i>	<i>54</i>	<i>54</i>	<i>-</i>	<i>82</i>	<i>-</i>	<i>-</i>	<i>54</i>	<i>-</i>	<i>-</i>	<i>-</i>
<b>Light Rail Alternative, No Ocala Station Option</b>										
Grubbing/Land Clearing	2.0	6.5	22.8	150.6	0.6	150.0	31.5	0.3	31.2	51
Grading/Excavation	2.4	9.6	24.3	264.7	0.7	264.0	55.4	0.5	54.9	1,179
Drainage/Utilities/Sub-Grade	5.6	34.1	33.3	451.8	1.8	450.0	95.0	1.4	93.6	1,735
Paving	3.9	18.6	26.9	1.3	1.3	-	0.9	0.9	-	1,041
<i>BAAQMD Threshold</i>	<i>54</i>	<i>54</i>	<i>-</i>	<i>82</i>	<i>-</i>	<i>-</i>	<i>54</i>	<i>-</i>	<i>-</i>	<i>-</i>

<sup>a</sup> Presented in MT per year

Based on Table 3.18-1, construction activities associated with the proposed action are not anticipated to exceed the BAAQMD thresholds. Nevertheless, the current BAAQMD guidelines recommend that that all projects, regardless of whether emissions exceed thresholds, implement construction measures. Therefore, the

project would implement construction measures. Implementation of CON-5 would reduce potential effects related to increases in emissions during construction.

**Mitigation: CON-5 – Implement the BAAQMD’s Control Measures to Control Construction-Related Dust**

In accordance with the BAAQMD’s current CEQA guidelines (2010), the project applicant shall implement the following BAAQMD-recommended basic control measures to reduce particulate matter emissions from construction activities. Additional control measures (including watering, washing, and other control measures) as detailed in the 2010 BAAQMD CEQA guidelines, would further reduce particulate matter emissions and should be implemented when feasible.

**Basic Control Measures**

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This

person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

**Impact: Generate Greenhouse Gas Emissions as a Result of Construction**

GHG emissions would result from construction of the Light Rail Alternative.

**Construction Emissions**

GHG emissions include emissions produced as a result of onsite construction equipment (see Table 3.18-1). However, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. These long-term GHG reductions would offset the short-term construction emissions. Implementation of CON-6 would reduce potential effects related to increases in GHG emissions during construction.

**Mitigation: CON-6 – Implement the BAAQMD's Best Management Practices for GHG Emissions**

The project applicant will implement, to the extent feasible, the BAAQMD's BMPs to reduce GHG emissions from construction equipment. These BMPs are outlined in their 2010 CEQA Guidelines.

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

**Biological Resources**

The vast majority of the adverse effects on biological resources that would result from the Light Rail Alternative would be short-term and construction-related, especially the temporary disturbance of species and their habitats. These effects and the associated mitigation measures (also described in Section 3.3 *Biological Resources*) to reduce effects are discussed as follows.

**Impact: Permanent Loss of Potential Burrowing Owl Habitat**

Implementation of the Light Rail Alternative would result in the disturbance and potential permanent loss of approximately 5.21 acres of ruderal habitat within the study area. Development in this portion of the study area includes construction of a traction power system substation and multi-use path, and relocation of an existing electrical tower between Ocala Avenue and Cunningham Avenue that would disturb and potentially permanently remove up to 3.77 acres of ruderal habitat adjacent to the Reid-Hillview Airport. Construction of an elevated section of the alignment, which would veer west across Capitol Expressway approximately 700 feet north of Tully Road, then skirt along the western side of the roadway on the approach to the Eastridge Transit Station, would permanently remove 1.18 acres of ruderal habitat between Cunningham Avenue and Tully Road, and 0.26 acres of ruderal habitat between Tully Road and Eastridge Loop. The use of the section south of Capitol Expressway, between Tully Road and Cunningham Avenue, as a staging area, would temporarily remove 2.76 acres of ruderal habitat.

Based on the biological surveys conducted in November 2002, 7.97 acres of ruderal habitat within the study area was identified as potential habitat for burrowing owl. Although the habitat is not currently occupied by burrowing owls, the species is known to occur near the corridor and could colonize currently unoccupied habitat before construction begins.

Although ruderal habitat is not a sensitive natural community and is common both locally and regionally, the permanent loss of 5.21 acres of ruderal habitat that could potentially be occupied by the special-status burrowing owl, temporary loss of 2.76 acres of potential habitat (in the staging area), and temporary disturbance due to construction-related noise would be considered a substantial adverse effect. However, implementation of BIO-1 would reduce this adverse effect.

**Mitigation: BIO-1 – Conduct Preconstruction Surveys for Nesting and Wintering Burrowing Owls and Implement Measures to Avoid or Minimize Adverse Effects if Owls Are Present**

Preconstruction surveys for burrowing owls shall be conducted by a qualified ornithologist before any development within the habitat identified in Figures 3.3-1a and 3.3-1b. These surveys will be consistent with those described in Condition 16 in Chapter 6 of the Santa Clara Valley Habitat Plan (SCV Habitat Plan or Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan [HCP/NCCP]) which is discussed on page 3.3-8 of this section.



All survey requirements outlined in Condition 16 will be applied as dictated to avoid impacts to individual burrowing owls.

VTA will ensure that the permanent loss of burrowing owl habitat in the study area is replaced with habitat of equal or greater value. Location of the compensation habitat will be identified in conjunction with CDFG and the SCV Habitat Plan Implementing Entity. It is anticipated that coverage for these impacts will be sought under the SCV Habitat Plan. Therefore, the burrowing owl conservation fee will be paid as described in the SCV Habitat Plan to the Implementing Entity or land will be set aside consistent with the burrowing owl conservation strategy outlined in the draft SCV Habitat Plan.

**Impact: Temporary Disturbance to Nesting Habitat for Migratory Birds (Including Raptors)**

Construction of the Light Rail Alternative could disturb nesting migratory birds, including raptors, in nearby trees. Migratory bird nests and eggs are protected by federal and state laws, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5. Temporary disturbance of nesting migratory birds would be considered a substantial adverse effect if that disturbance disrupts the nesting cycle or indirectly causes a nest to fail (e.g., due to noise). However, implementation of BIO-2 would avoid this adverse effect.

**Mitigation: BIO-2 – Conduct Preconstruction Surveys for Nesting Migratory Birds, including Raptors**

If construction activities are scheduled to occur during the bird breeding season (February 1–August 31) a preconstruction survey for nesting migratory birds shall be conducted prior to commencement of any vegetation removal activities. If an active nest is identified within the study area a qualified ornithologist will work with the construction personnel to identify a buffer around the nest so that construction activities can continue without changing the behavior of the birds. The buffer will be communicated to CDFG and will remain in place until the young are able to fly and move out of the area or the nest is unsuccessful as determined by the ornithologist.

**Impact: Conflict with the Provisions of an Adopted Habitat Conservation Plan or Natural Community Conservation Plan**

One HCP/NCCP is currently under development in the vicinity of the project area. This is the SCV Habitat Plan. The Final Habitat Conservation Plan is being revised based on comments received on the

Draft. Implementation of the Plan is expected in mid-2013. If development and/or species permits are going to be granted prior to mid-2013, then the project is ahead of the SCV Habitat Plan and would not be covered. If the project does not need permits until after the Plan is in place, then it would likely be a covered activity. Based on the current schedule the Light Rail Alternative is expected to be included within the HCP's list of covered activities. This inclusion would ensure that any development of the Light Rail Alternative would not conflict with the intentions of the Plan. If the project moved ahead of the SCV Habitat Plan, approval of the mitigation shown above would not be in conflict with the Plan. Therefore, there would be no adverse effects.

**No adverse effects. No mitigation required.**

**Impact: Loss of Urban Trees**

Construction of the Light Rail Alternative may result in the removal of trees in landscaped areas along the proposed alignment. Trees that may be removed include California pepper, olive, tree-of-heaven, and blue gum eucalyptus (*Eucalyptus globulus*). These large trees may serve as nest sites or perches for raptors and bats, and loss of these trees would be considered a substantial adverse effect. However, implementation BIO-3 (and BIO-4 as needed) would minimize this adverse effect.

**Mitigation: BIO-3 – Conduct a Tree Survey to Assess Tree Resources Impacted**

VTA will conduct a tree survey along the Capitol Expressway Corridor to identify trees subject to removal or loss during construction. If the survey determines that no trees would be lost, no further mitigation is required. However, if the survey identifies trees that would be removed or damaged, VTA will also implement Mitigation Measure BIO-4.

**Mitigation: BIO-4 – Replace Trees**

All urban trees that are to be removed or lost shall be replaced. Trees with a diameter less than 12 inches shall be replaced at a 2:1 ratio. All trees with a diameter of 12 inches or more shall be replaced at a 3:1 ratio. If urban trees (nonnatives and ornamentals) are replaced with native trees, a reduced mitigation ratio of 1:1 for all trees smaller than 12 inches in diameter, and 2:1 for all trees with a diameter 12 inches or more, shall be implemented. These trees shall be irrigated and maintained for a period of not fewer than 3 years.

### Community Services

Project construction could potentially have short-term, construction-period community services effects on police and fire services. These effects and the associated mitigation measures to reduce effects are discussed as follows.

**Impact: Temporary Disruption of Emergency Access**

Existing and planned service levels for police and fire protection are expected to be adequate with implementation of the Light Rail Alternative. However, construction activities would temporarily disrupt emergency access within the Capitol Expressway Corridor. Although the effect would not be permanent, implementation of CON-7 is recommended to minimize the potential adverse effect.

**Mitigation: CON-7 – Coordinate Construction and Operational Activities with Emergency Service Providers**

VTA shall expand fire safety and emergency response training to include the fire districts in the Capitol Expressway Corridor that will be responsible for providing these services. VTA shall work with emergency service providers to develop alternative routes and to adjust service areas and destinations as necessary to maintain emergency service coverage and response times during and after construction.

### Cultural Resources

There are no known archaeological resources in the APE. However, several prehistoric archaeological sites are recorded within a mile of the right-of-way, suggesting that the project area is sensitive for the presence of archaeological resources. Therefore, there is a possibility of discovering cultural materials during ground-disturbing activities. If buried cultural resources or human remains are encountered, standard practice measures (also described in Section 3.5, *Cultural Resources*) would be implemented.

**Impact: Effects to Buried Cultural Resources or Human Remains**

There are no previously recorded cultural resources in the APE. However, one prehistoric archaeological site is recorded near the intersection of Quimby Road and Capitol Expressway, and to additional sites are recorded within a mile of the right-of-way. This suggests that the project area is moderately sensitive for the presence of archaeological resources, and therefore there is a possibility of discovering cultural materials during ground-disturbing activities. This has the potential to adversely affect lots, and below-grade alignment sections, have the potential to adversely affect unknown archaeological resources in the corridor. Thus, implementation of the

standard practice if resources are encountered, as described below, would minimize this adverse effect.

**Standard Practice: Standard Practice if Buried Cultural Resources or Human Remains are Encountered**

In reference to several criteria stated above, ground-disturbing activities associated with construction of the Light Rail Alternative could result in the discovery of and potential disturbance of unknown archaeological resources, including human remains. The following procedures represent the standard practice that would be followed in the case of inadvertent discovery of cultural resources or human remains.

- **Stop work if buried cultural deposits are encountered during construction activities:** Should any cultural and/or archaeological resources be discovered (such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains) during construction activities, VTA shall suspend work in the immediate vicinity, and VTA’s construction inspector shall coordinate site investigations by a qualified archaeologist to assess the materials and determine their significance. VTA shall notify all appropriate local jurisdictions.
- **Stop work if human remains are encountered during construction activities:** If human remains are unearthed during construction, pursuant to Section 50977.98 of the PRC and Section 7050.5 of the State Health and Safety Code, VTA shall suspend work in the immediate vicinity and the county coroner will be immediately notified, as well as local planning and permitting jurisdictions and the Native American Heritage Commission.

Energy

Construction-related energy consumption would result from project construction and secondary facilities. Energy consumed for project construction would be that used for the construction of trackway and support facilities, and for the transportation of materials and equipment to and from the work site. A secondary facility is a facility, such as a factory, that produces construction materials and machinery that would be used in the construction and maintenance of the structures and attendant facilities. These effects are discussed qualitatively. Special attention was given to the efficiency with which construction materials and machinery are produced and the choices made regarding construction methodology and procedures, including the adequacy of equipment maintenance.

**Impact: Wasteful, Inefficient, and/or Unnecessary Use of Energy for Project Construction**

The highest indirect energy consumption would occur during demolition and construction of onsite facilities, such as trackwork, guideways, structures, stations, and support facilities. This construction-related energy consumption would result in one-time, nonrecoverable energy costs. Unplanned and inefficient delivery of materials to the work sites would increase the number of truck trips required, resulting in wasteful use of energy. Wasteful consumption of energy would also result if construction equipment and machinery were not kept in good condition or if left idling. Effects to nonrenewable energy resources would therefore be considered potentially adverse. However, implementation of CON-8 would minimize this adverse effect.

**Mitigation: CON-8 – Adopt Energy Conservation Measures**

VTA will require contractors to adopt construction energy conservation measures including, but not limited to, those listed below.

- Use energy-efficient equipment and incorporate energy-saving techniques in the construction of the Light Rail Alternative.
- Avoid unnecessary idling of construction equipment.
- Consolidate material delivery as much as possible to ensure efficient vehicle utilization.
- Schedule delivery of materials during non-rush hours to maximize vehicle fuel efficiency.
- Encourage construction workers to carpool.
- Maintain equipment and machinery, especially those using gasoline and diesel, in good working condition.

**Impact: Consumption of Nonrenewable Energy Resources in a Wasteful, Inefficient, and Unnecessary Manner from Secondary Facilities Activities**

It is assumed that secondary facilities, such as those that produce cement and steel, employ all reasonable energy conservation practices in the interest of minimizing business costs. For example, Californian industry reduced electricity usage (mostly generated by natural gas, a nonrenewable fuel) from 54.7 million MWh in 2000 to 52.2 million MWh in 2001, a 4.6 percent reduction, even as the state's population increased by 513,352, or 1.5 percent. As such, it can be assumed that construction-related energy consumption by secondary facilities under the Light Rail Alternative would not consume nonrenewable energy

resources in a wasteful, inefficient, or unnecessary manner, limiting the effect on nonrenewable energy resources. Consequently, the effect is not considered adverse.

**No adverse effects. No mitigation required.**

Geology, Soils, and Seismicity

The alignment of the Light Rail Alternative would be located in an area that may be susceptible to lateral spreading, subsidence, collapse, and expansive soils. Soils and underlying geologic materials that are susceptible to lateral spreading, subsidence, and collapse, or that have expansive properties, could increase the risk of structural loss, injury, or death. These effects and the associated measures (also described in Section 3.8 *Geology, Soils, and Seismicity*) to reduce effects are discussed as follows.

**Impact: Ground Shaking**

The Light Rail Alternative proposes aerial structures extending north of Capitol Avenue to south of Story Road and an elevated crossing of Tully Road, as well as a two-level station in the median of Story Road. These structures would be located in an area of strong seismic ground shaking. Strong seismic ground shaking could result in structural failures and could increase the risk of structural loss, injury, or death. The potential for strong ground shaking is considered to be moderate to high. Implementation of GEO-1 would minimize this adverse effect.

**Mitigation: GEO-1 – Incorporate Caltrans Seismic Design Criteria**

During the design process, VTA shall design any and all proposed infrastructure in accordance with the appropriate Caltrans Seismic Design Criteria. The criteria include, but are not limited to, designing infrastructure that can withstand an earthquake of magnitude 7.5 and a peak bedrock acceleration of 0.6 g with modifications. With the implementation of these criteria into the design and ultimate construction of the light rail system structures, there would not be any adverse effects on people or structures resulting from strong seismic ground shaking under this alternative.

**Impact: Liquefaction**

Sections of the Light Rail Alternative alignment would be grade separated and proposed aerial structures are located in an area that is highly susceptible to liquefaction. In addition, portions of the alignment would be placed within retained fill. Soils and underlying geologic materials that are susceptible to liquefaction could increase the risk of structural loss, injury, or death. Implementation of GEO-2 would minimize this adverse effect.

**Mitigation: GEO-2 – Incorporate Liquefaction Minimization Methods to Prevent Localized Liquefaction**

VTA shall conduct geotechnical and geologic investigations during final design, including field excavation and laboratory testing, to provide site-specific geotechnical conclusions and recommendations for design and construction of the proposed facilities. If liquefiable soils or soils susceptible to seismically induced settlement are determined to be present at any location along the corridor, corrective actions shall be taken, including removal and replacement of soils, in-site densification, grouting, design of special foundations, or other similar measures, depending on the extent and depth of susceptible soils.

**Impact: Lateral Spreading, Subsidence, and Collapse Caused by Underlying Unstable Geologic Units**

As described above, the Light Rail Alternative alignment would be located in an area that may be susceptible to lateral spreading, subsidence, and collapse. Soils and underlying geologic materials that are susceptible to lateral spreading, subsidence, and collapse could increase the risk of structural loss, injury, or death. Implementation of GEO-3 would minimize this adverse effect.

**Mitigation: GEO-3 – Implement Proper Construction Methods to Minimize Risk of Lateral Spreading, Subsidence, and Collapse Hazards**

Prior to implementation of the proposed transit improvement activities the following construction methods shall be employed:

- construct edge containment structures such as berms, dikes, retaining structures, or compacted soil zones;
- remove or treat soils and geologic materials prone to lateral spreading and settling; and,
- install drainage measures to lower the groundwater table below the level of settleable soils (California Division of Mines and Geology 1997).

**Impact: Expansive Soils**

As described above, transportation improvements proposed under the Light Rail Alternative would be located in an area that may have expansive soils. Expansive soils could cause structures to fail, presenting a risk of structural loss, injury, or death. Implementation of GEO-4 would minimize this adverse effect.

**Mitigation: GEO-4 – Reinforce Foundations or Excavate Expansive Soil to Minimize Risk of Soil Expansivity Hazards**

Special engineering techniques such as using reinforced steel in foundations, using drainage control devices, and/or over-excavating and backfilling with non-expansive soil shall be implemented during construction activities to minimize the risk of structural loss, injury, or death.

Hazardous Materials

Construction of the Light Rail Alternative would involve subsurface drilling, which could lead to a finding of contaminated soil and/or groundwater. These effects and the associated mitigation measures (also described in Section 3.9 *Hazardous Materials*) to reduce adverse effects are discussed as follows.

**Impact: Hazard to the Public or Environment through Reasonable Foreseeable Upset and Accident Conditions Caused by the Release of Hazardous Materials**

Along the proposed 2.3-mile extension, the Light Rail Alternative would vary from at-grade to above grade aerial structures. Construction of this alternative would involve subsurface drilling, which could lead to a finding of contaminated soil and/or groundwater. This would be considered an adverse effect. Implementation of HAZ-1 and HAZ-2 would minimize this adverse effect.

**Mitigation: HAZ-1 – Conduct Subsurface Investigations in Areas of the Corridor That May Be Underlain by Contaminated Soil or Groundwater**

VTA shall conduct Phase I (and if necessary Phase II) site investigations to determine whether any chemicals of concern are present. If necessary, a risk assessment shall be prepared and procedures established before construction to address the identification, excavation, handling, and disposal of hazardous materials. If contaminated soil or groundwater is encountered, VTA shall notify the appropriate local environmental management agencies and local fire departments. VTA shall ensure that any identified environmental site conditions that may represent a risk to public health and safety will be remediated in accordance with federal, state, and local environmental laws and regulations.

Before construction, a determination shall be made by a qualified environmental assessor (based on field sampling of media, laboratory analysis of samples, visual confirmation of environmental conditions, etc.) as to the nature of environmental risk associated with



construction activities at the identified hazardous materials sites. A similar determination shall also be made for the proposed Park-and-Ride lot site. Recommendations of the qualified environmental assessor (e.g., preparation of a health and safety plan [HSP] for the project, implementation of a soil management work plan [SMWP] for the project, remediation of affected soil and groundwater, etc.) that are required to comply with federal, state, and local environmental laws and regulations shall be implemented by VTA and all its representatives, including contractors and earthwork construction workers, such that people are not exposed to an environmental condition on the project site as a result of an existing sources of contamination.

Before construction activities, soil samples shall be taken at park-and-ride lot facilities (only where grading is planned) to determine the presence or absence of banned pesticides. If soil samples indicate the presence of any contaminant in hazardous quantities, VTA shall contact the RWQCB and Department of Toxic Substances Control (DTSC) to determine the level of any necessary remediation efforts. These soils shall be remediated in compliance with applicable laws.

**Mitigation: HAZ-2 – Control Contamination Resulting from Previously Unidentified Hazardous Waste Materials**

In the event that previously unidentified waste or debris is discovered during construction/grading activities, and the waste or debris is believed to involve hazardous waste or materials, the contractor shall:

- immediately stop work in the vicinity of the suspected contaminant, and remove workers and the public from the area;
- notify the Resident Inspector;
- secure the area as directed by the Resident Inspector;
- notify the City of San Jose Hazardous Waste/Materials Coordinator and the San Jose Fire Department; and
- notify the City of San Jose Hazardous Waste/Materials Coordinator and the San Jose Fire Department.

Hydrology and Water Quality

Project construction activities (grading and construction water usage) could result in water quality impairment and depletion of water supplies/interference with groundwater recharge. These effects and the associated mitigation measures (also described in Section 3.10 *Hydrology and Water Quality*) to reduce adverse effects are discussed as follows.

**Impact: Creation or Contribution of Additional Runoff, Including Increasing Additional Sources of Polluted Runoff (Water Quality Impairment Caused by Grading and Construction Activities)**

During construction of the Light Rail Alternative, large areas of bare soil would be exposed to erosive forces for long periods of time. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading activities could result in increased erosion and sedimentation to surface waters. If precautions are not taken to contain contaminants, construction activities could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality. Hazardous materials associated with construction equipment (such as fuels and lubricants) could also adversely affect water quality if spilled or stored improperly. This is considered an adverse effect. However, implementation of CON-9 and HYD-1 (from Section 3.10 *Hydrology and Water Quality*), would minimize these adverse effects.

**Mitigation: CON-9 – Implement Water Quality Control Measures during Construction Activities**

VTA shall require the contractor to submit and implement an approved erosion and sedimentation control plan to control erosion and prevent water pollution during project construction. No ground-disturbing activities shall be performed until such a plan is accepted. The plan shall emphasize standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff from disturbed areas. Each rainy season (October 1 to May 1), the contractor shall have in place desilting basins for runoff from areas disturbed by cleaning, grubbing, and grading operations.

VTA shall require the contractor to submit a spill prevention, containment, and clean-up (SPCC) plan for fuels, oils, lubricants and other hazardous substances that may be used during construction. No construction activities shall be performed until such a plan is accepted.

**HYD-1 – Comply with All Applicable Regulations and Permits Related to Water Quality Control**

In implementing the project, VTA shall comply with the federal Clean Water Act, including all National Pollutant Discharge Elimination System (NPDES) permit requirements. VTA shall obtain coverage under the State Water Resources Control Board's Construction General Permit for Storm Water, Order No. 2009-0009-DWQ (CGP),

and shall comply with all applicable requirements. These include temporary construction best management practices (BMPs) related to land grading and disturbance and (after September 2012) permanent water quality post construction standards.

VTA shall require the construction contractor to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to improve water quality during construction. This includes BMPs for erosion prevention, sediment control, waste management, and spill prevention/housekeeping.

If the project continues past September 2012, VTA will implement the CGP post-construction standards for those areas in VTA-owned right-of-way. This includes the requirement for all construction sites to match pre-project hydrology to help ensure that the physical and biological integrity of aquatic ecosystems are sustained. In addition, a long-term maintenance plan (minimum of five years) shall be developed in accordance with the CGP requirements and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.

For those areas in City or County right-of-way, VTA shall implement water quality measures required pursuant to provision C.3 of the Municipal Regional Stormwater NPDES permit (Order No. R2-2009-0074). This permit requires projects that result in the displacement of more than 43,560 square feet (1 acre) of impervious surface to implement treatment BMPs to the maximum extent practicable (MEP). BMPs may include detention/retention units, infiltration structures, swales, sand filters, wetlands, or other low impact development measures that improve water quality.

**Impact: Alterations in Existing Drainage Patterns**

Under the Light Rail Alternative, no permanent changes to existing drainage patterns are anticipated. However, drainage patterns may be temporarily altered during construction activities. This temporary alteration could result in erosion, siltation, or flooding onsite or offsite, and is considered an adverse effect. Implementation of the following mitigation measure would minimize this effect.

**Mitigation: CON-9 – Implement Water Quality Control Measures During Construction Activities**

This mitigation is discussed above.

**Impact: Depletion of Groundwater Supplies or Interference with Groundwater Recharge**

Construction activities associated with this alternative could result in a temporary increase in water demand. Although this increase is not considered substantial, implementation of CON-10 would minimize this potentially adverse effect.

**Mitigation: CON-10 – Use Non-Potable Water for Construction Activities**

VTA shall require that non-potable water be used for construction activities as feasible.

Land Use

Project construction activities could interfere with the operation of local businesses. This potential construction-period effect is discussed as follows.

**Impact: Disruption of Local Businesses**

As noted in the discussion of transportation impacts during construction, lane and street closures, and detours would occur. A Traffic Management Plan would be implemented that would provide a daily construction schedule to restore traffic capacity and access to local businesses during peak periods for the duration of construction. Additionally, because on-street parking is not allowed along Capitol Expressway, and off-street parking facilities are provided, local businesses would not be adversely affected. Signs would be posted to direct pedestrians to intersections where they may cross to proceed along Capitol Expressway and to avoid construction areas. Pedestrians would be able to maintain access to local businesses along Capitol Expressway. Consequently, there would be no adverse effect to local businesses.

**No adverse effects. No mitigation required.**

Noise and Vibration

Construction noise and vibration impacts are predicted to occur primarily as the result of pile driving activities. Pile driving activity generally results in noise that exceeds the FTA Construction Noise Criteria within about 270 feet of the activity and vibration that exceeds the FTA Construction Vibration guidelines within about 144 feet of the activity. These effects would be considered adverse. However, adherence to the mitigation below (also described in Section 3.12, *Noise and Vibration*), would reduce this effect. However, depending on the effectiveness of these mitigation measures, this effect may still be adverse.

**Impact: Exposure of Sensitive Receptors to Construction Noise and Vibration Levels**

Construction noise and vibration impacts are predicted to occur primarily as the result of pile driving activities. Pile driving activity is predicted to result in noise that exceeds the FTA Construction Noise Criteria within about 270 feet of the activity and would result in noise impacts at 57 homes and 2 churches. Exceedance of the FTA Construction Vibration guidelines is predicted to occur within about 144 feet of pile driving and result in impacts at 59 homes and 2 churches. Implementation of NOI-2 would minimize this adverse noise and vibration effect. However, depending on the effectiveness of the mitigation, this effect may still be adverse.

**Mitigation: NOI-2 – Employ Measures to Reduce Construction Noise and Vibration**

A combination of the following measures should be considered if reasonable and feasible to reduce noise and vibration impacts from pile driving:

1. **Noise Shield:** A pile driving noise shield could be effective at reducing the pile driving noise by a minimum 5 dBA, depending on the size of the shield and how well it surrounds the pile and hammer. A portable shield/barrier could be implemented to provide a nominal 10 dBA noise reduction.
2. **Pre-Drilling Piles:** Pre-drilling a portion of the hole may provide a means to reduce the duration of impact pile driving, and should be explored. Reducing the total impact time to an aggregate duration of no more than 2 hours per day will reduce the equivalent noise level by 6 dBA to a range of 80 to 90 dBA ( $L_{eq}$ ) at a distance of 100ft.
3. **Non-Impact Piles or Cast in Drilled Hole (CIDH) piles:** Using the Soil-Mix or CIDH method would reduce the vibration below the FTA Criteria. This method is recommended for homes which would be within 75 ft of pile driving.
4. **Reduced Impact Pile Driving Time:** Limiting the hours per day of impact pile driving would reduce the equivalent noise level and would reduce potential work interference.
5. **Excessive Vibration:** If pile driving amplitudes exceed the building threshold criteria, cosmetic repair work may be required at nearby buildings. A detailed preconstruction crack survey will be conducted at homes and businesses where these criteria are expected to be exceeded. Vibration monitoring, crack monitors and

photo documentation will be employed at these locations during pile driving activity.

6. Relocating Items on Shelves: Since items on shelves and walls may move during pile driving activity, nearby residents will be advised through the community outreach process that they should move fragile and precious items off of shelves and walls for the duration of the impact pile driving. Achievement of standards for building damage would not eliminate annoyance, since the vibration would still be quite perceptible.
7. Advance Notification (Work Interference): The impact pile driving vibration may cause interference with persons working at home or the office on their computers. Nearby residents and businesses will be advised in advance of times when piles would be driven, particularly piles within 160 ft of any occupied building, so that they may plan accordingly, if possible.
8. Notification of Pile Driving Schedule: Nearby residents and businesses will be notified of the expected pile driving schedule. In particular, these notifications should be made with home-bound residents, homes where there is day-time occupancy (e.g., work at home, stay-at-home parents) and offices/commercial businesses where extensive computer/video monitor work is conducted.

### **Contractor Controls**

In addition to the above list of specific noise and vibration control measures, the following are recommended for inclusion in the Contractor specifications for the Indicator and Production pile driving programs if reasonable and feasible:

- Comply with the equivalent noise levels ( $L_{eq}$ ) limits specified on page 12-8 of FTA 2006 and a maximum noise level limits of 90 dBA (slow) or 125 dBC (fast) for residential buildings,
- Comply with the maximum vibration limits specified in Table 12-3 of FTA 2006,
- Perform a detailed survey and photo documentation prior to construction of all potentially affected wood-frame buildings within 135 ft of the piling activity,
- Coordinate and perform noise and vibration monitoring at a representative sampling of potentially affected buildings along the Project corridor,
- Install crack monitors where appropriate and provide photo documentation at all potentially affected buildings during pile driving activity and through construction,

- Community Notification and Involvement:
  - provide a minimum four-week advance notice of the start of piling operations to all affected receptors (e.g., internet, phone and fax), and regular, up-to-date communications. This includes education of the public on the expected noise and vibration,
  - provide a knowledgeable Community Liaison to respond to questions and complaints regarding pile driving noise and vibration,
  - provide assistance as needed to nearby residents or offices who may require help relocating valuable items off shelves.

It is possible that even with the incorporation of this mitigation measure that there could still be an adverse effect.

### Proposed Options

Under the Light Rail Alternative with No Ocala Station option the Ocala Station would not be built. Without the Ocala Station, there would be some minor differences in traffic volume, but the traffic noise increase would be essentially unchanged. There would also be differences in the horizontal alignment and light rail vehicle operating speed near Ocala Avenue. The net difference would be approximately a 0.1 dBA increase over the Light Rail Alternative. The noise impacts however would be similar to the Light Rail Alternative as summarized in Table 3.12-7.

Under the Light Rail Alternative (With No Ocala Station Option) vibration levels will be slightly higher near Ocala Avenue than the Light Rail Alternative. However the level of vibration impact is similar for the alternatives. Table 3.12-8 summarizes the vibration impacts that are predicted to occur under the Light Rail Alternative (With Ocala Station Option). Twenty-six (26) vibration impacts are predicted to occur, so there would be an adverse effect.

Furthermore, construction noise and vibration impacts are predicted to occur primarily as the result of pile driving activities. Pile driving activity is predicted to result in noise that exceeds the FTA Construction Noise Criteria within about 270 feet of the activity and would result in noise impacts at 57 homes and 2 churches.

Exceedance of the FTA Construction Vibration guidelines is predicted to occur within about 144 feet of pile driving and result in impact at 59 homes and 2 churches.

Under this option, implementation of Mitigation Measure NOI-1, NOI-2, VIB-1, and VIB-2 (as discussed in Section 3.12 *Noise and Vibration*) would still apply.

### Safety and Security

Project construction could potentially result in safety and security effects. The construction-period effect to safety and the associated mitigation measure to reduce the effect is discussed as follows.

**Impact: Potential for Safety Risks during Construction**

Construction of the Light Rail Alternative would last approximately 3 years. At the height of construction (18–24 months into the process), construction employees and equipment would occupy portions of the street, including the median and parking lanes at active construction locations. Implementation of CON-11 would reduce potential adverse effects related to safety and security.

**Mitigation: CON-11 – Implement Construction BMPs to Protect Workers and the Public**

VTA shall require construction contractors to implement BMPs to ensure the safety of construction workers and local residents during construction of the project. Fencing and lighting of construction and staging areas, including materials storage, shall be used to contain construction activities and avoid accidents. VTA shall require the construction project coordinator to be responsible for job-site safety and security.

### Utilities

Project construction could potentially result in disruption in utility services. The construction-period effect to utility services and the associated mitigation measure to reduce the effect is discussed as follows.

**Impact: Disrupt a Utility Service for a Period of 24 Hours or More**

Under the Light Rail Alternative, a 14-foot-wide strip running along and directly underneath the proposed light rail alignment has been defined as a “utility envelope.” This strip contains utility infrastructure that would need to be relocated under this alternative. Relocation of utilities, which may necessitate the disruption of service, are commonly required during construction. Related service disruptions are not expected to last more than a few hours, and disruptions of 24 hours are highly unlikely. Therefore, relocation and temporary disruption of these utilities is not considered an adverse effect.



However, implementation of CON-12 would minimize potential effects.

**Mitigation: CON-12 – Coordinate with Utility Service Providers Prior to Construction of Light Rail Facilities**

VTA shall conduct careful and periodic coordination with all utility providers during final design and construction stages to identify potential strategies for overcoming potential problems. VTA shall coordinate with all affected utility providers to restrict utility service disruption by time duration and geographic extent.

Visual Quality

Project construction could potentially result in visual quality impacts related to light and glare and degradation to visual quality. These construction-period effects to visual quality and the associated mitigation measure to reduce the effects are discussed as follows.

**Impact: Creation of a New Source of Substantial Light or Glare**

During construction of the Light Rail Alternative, nighttime construction activities would involve the use of lighting equipment that could cause glare, potentially affecting the residents adjacent to the light rail alignment. This would result in an adverse effect. However, implementation of CON-13 would minimize potential adverse effects.

**Mitigation: CON-13 – Direct Lighting toward Construction Areas**

To reduce glare from lighting used during nighttime construction activities, VTA shall require construction contractors to direct lighting onto the immediate area under construction only, and to avoid shining lights toward residences.

**Impact: Degradation of Visual Quality**

During construction of the Light Rail Alternative, activities involving the use of heavy equipment, transport of soils and material, and other visual signs of construction would occur along the Capitol Expressway Corridor and at construction staging areas. These activities would be most visible to pedestrians along the corridor and residents of adjacent homes. Viewers traveling through the corridor such as VTA bus transit passengers, automobile drivers, and bicyclists would have intermittent views of these activities and construction staging areas. However, these construction-related visual changes would be short-term in nature and would not substantially alter the visual character of the

urban expressway, where roadway maintenance activities are accepted visual elements. Consequently, there would be no adverse effect.

**No adverse effects. No mitigation required.**

### Station Specific Impacts

The following discussion addresses potential adverse construction effects and mitigation measures related to the construction, improvement, and design alterations to the proposed stations (i.e., Alum Rock Station, Story Station, Ocala Station, and Eastridge Station). In general, construction of the stations will include: changes in traffic control, increased congestion (i.e., longer commutes), lane closures, detours (ingress/egress issues for pedestrians/bicyclists, and motorists), and increased noise/dust, night work (e.g., introduction of light and noise during evening hours).

#### **Alum Rock LRT Station**

The Alum Rock Station already exists as a station platform for the Capitol Avenue LRT Line and no modification to the current Park-and-Ride configuration is anticipated. Construction would substantially begin at the southern end, connecting to the existing LRT line. Overall, there would be minimal construction impacts at this station.

#### **Story Road Station**

A two-level station would be constructed at the median of Story Road with a mezzanine level and an elevated center platform. Construction activities would reduce available parking in the Story Road area. The construction of the aerial guideway between Capitol Avenue and Story Road and at Tully Road would require 9 to 12 piles to be driven per day for 5 to 10 days which would have noise impacts on the neighboring area. Traffic impacts would include detours/delays for pedestrian/bicyclists, and motorists -including traffic control delays (with the new signalized crosswalks), lane closures and detours, although VTA will make all efforts to maintain traffic flow. Furthermore, construction of the station would generate dust which could stray outside of the construction site. Equipment and fencing connected to construction may obstruct business signage and may therefore have an impact on local businesses, particularly non-appointment based businesses such as the S&S Market and the Auto-Zone.

#### **Ocala Avenue Station**

Ocala Avenue Station would be an at-grade station constructed at Ocala Avenue and would consist of a center platform located in the median of Capitol Expressway. Impacts on available parking would be expected during construction periods. Construction may impact pedestrian/bicycle access and local traffic flow by restriction of available lanes, although VTA will make all efforts to keep three lanes

open. Construction of the station would generate dust which could be blown by wind into neighboring residential properties.

### **Eastridge Station**

An at-grade station with two center platforms would be constructed adjacent to the Eastridge Transit Center. The Park-and-Ride facilities at the Eastridge Station would be expanded to satisfy future parking demand. The Eastridge Transit Center is highly utilized by bus passengers that will have obstructed access during construction. Impacts to traffic at this highly utilized ingress/egress to Eastridge Shopping Mall, including lane closures and detours, would be expected, though VTA will make all efforts to maintain traffic flow. Construction would generate dust which could be blown by wind into the neighboring shopping center parking lot.

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