
3.18 CONSTRUCTION IMPACTS

Introduction

This section describes the construction scenarios and potential short-term construction impacts of the proposed project. The description of the construction scenarios includes staging and construction techniques. Specifically, this analysis addresses construction impacts and mitigation measures related to transportation, air quality, 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, and visual quality.

Construction Scenario

Construction of the BRT phase of the proposed project would occur over a period of 12 to 18 months while construction of the Single Car LRT phase of the proposed project would occur over a period of 30 to 36 months. At the height of construction, a number of construction employees and equipment would occupy portions of the entire Corridor. The construction scenario for both phases of the proposed project is detailed below.

Phase 1 – BRT

Construction required for the implementation of BRT in the Corridor west of King Road would be relatively minor, consisting of “bus rapid transit stops,” or station areas for passenger boarding, bus bulb-outs, sign post work, and signal work. The BRT station platforms would be constructed as either an extension (i.e., bulb-out) of existing sidewalks along Santa Clara Street and/or as platforms within the median of Alum Rock Avenue. To minimize impacts to existing businesses, the existing sidewalks would remain intact during construction to the greatest extent possible.

For the sidewalk bulb-out platforms west of 34th Street, the construction staging would generally occur on one side of the roadway at a time. Construction of the BRT station platforms would involve as little as four feet of the sidewalk, or the entire sidewalk back to the face of the building, depending on the specific location. The curb lane would be closed adjacent to the work area. Once one side of the street is complete, work would then begin on the other side. By restricting the construction to one side of the street at a time, the portion of the street that can be maintained for travel lanes and on-street parking is maximized. Utility relocation would occur primarily in areas where the station platform would encroach onto an existing manhole, but also in areas where utilities conflict with BRT facilities. Drainage would be between the existing sidewalk and the new bulb-out platform area depending on design. Existing drainage inlets in areas proposed for platforms would be relocated.

Each station platform would be completed in approximately three months, depending on the work schedule. Finishing work, including final pavement treatment and the installation of shelters, ticket vending machines, and accessory features, would be completed approximately one month later.

The construction staging for center-running BRT east of King Road would occur in three stages.

During Stage 1, the traffic lanes would be re-striped to provide for two travel lanes in each direction running along the left side of the street. Left turns would remain and parking would be maintained along one side of the street. Barriers would be installed in the first stage to protect the work zone. A 38-foot construction zone would be developed, with water and gas lines relocated to the future automobile travel lanes.

Stage 2 would include re-striping the travel lanes to allow for two travel lanes in one direction and one travel lane in the other direction. Left turns would be allowed from the inside travel lanes and parking would remain on one side. To improve traffic flow during construction, it may be necessary to restrict left turns at some locations. The barrier would be moved in Stage 2 to the middle of the street, resulting in a 40-foot construction zone. Within the 40-foot construction zone, the pavement would be removed, excavation performed, a combined system duct bank installed, and curb walls installed.

In Stage 3, the platforms would be installed, the street is paved, re-striped and the barriers are moved to the side of the street.

Phase 2 – Single Car LRT

The construction scenario for the implementation of Single Car LRT service in the Corridor is described below for both center-running and side-running light rail platforms as well as for the center-running light rail without platforms.

Side-Running Light Rail. The construction staging for side-running light rail would occur on one side of the roadway at a time for a stretch of up to five blocks for roadway work. Once one side of the street is complete, work would then begin on the other side. By restricting the construction to one side of the street at a time, the portion of the street that can be maintained for travel lanes and on-street parking is maximized.

During Stage 1 (Figure 3.18-1), the traffic lanes would be re-striped to provide for one travel lane in one direction and two in the opposite direction. Left turn lanes are proposed to remain, and parking would be maintained along one side of the street. Barriers would be installed in the first stage to protect the work zone. A 34-foot construction zone would be developed, with the storm drain relocated to the future automobile travel lane and the water line relocated to behind the sidewalk. If the storm drain does not require relocation, this stage could be omitted except in areas where alternative access needs to be provided via a relocated manhole.

Stage 2 involves re-striping the travel lanes to allow for two travel lanes in each direction (Figure 3.18-2). Once again, left turns would be allowed from the inside travel lanes, and parking would remain on one side of the street. The construction barrier would be moved in Stage 2 to reduce the construction zone to approximately 23 feet. Within the 23-foot construction zone, the pavement would be removed, the sub-grade prepared, station platforms built as necessary, overhead contact system foundations constructed as necessary, and the tracks formed and the concrete trackway poured.

During Stage 3 (Figure 3.18-3), the station finishes and hardware would be installed. Station platforms would be raised, as appropriate, to accommodate LRT vehicles.

During Stage 4 (Figure 3.18-4), finishing work would be completed, including installation of OCS poles and wire, removal of construction barriers, and street re-striping. Construction activities during this phase may not be confined to five-block sections. The street would now provide for two parking lanes, two travel lanes in each direction (one shared with transit), and a center left-turn lane. For side-running light rail, the existing seven-foot-wide parking lanes would be increased to eight feet to prevent blockage of the trains. An identical process would then be followed on the opposite side of the street.

Center-Running Light Rail (Non-Platform). The construction staging for center-running light rail would occur at in two stages.

During Stage 1 (Figure 3.18-5), the traffic lanes would be re-striped to provide for two travel lanes in each direction running along the left side of the street. Left turns would remain and parking would be maintained along one side of the street. Barriers would be installed in the first stage to protect the work zone. A 38-foot construction zone would be developed, with water and gas lines relocated to the future automobile travel lanes.

Stage 2 would include re-striping the travel lanes to allow for two travel lanes in one direction and one travel lane in the other direction as noted in Figure 3.18-6. Left turns would be allowed from the inside travel lanes and parking would remain on one side. To improve traffic flow during construction, it may be necessary to restrict left turns at some locations. The barrier would be moved in Stage 2 to the middle of the street, resulting in a 40-foot construction zone. Within the 40-foot construction zone, the pavement would be removed, excavation performed, a combined system duct bank installed, curb walls installed, and ballast, ties, and rails placed.

Figure 3.18-7 shows Stage 3 for the median portion of the light rail alignment. In this stage, the street is re-striped and the barriers are moved to the side of the street. All work on the side of the street, including overhead contact system foundations, poles, lights and cables, are installed, along with the removal and replacement of the existing street lights, as necessary. Figure 3.18-8 illustrates the completed project (Stage 4) with removal of the barriers and resurfacing and re-striping the street.

Center-Running Light Rail Station Platform. The construction staging for center-running light rail station platforms would occur in the four stages in conjunction with the non-platform areas but would require a larger work area.

During Stage 1, traffic lanes would be re-striped to provide for two travel lanes in each direction running along the left side of the street. Left turns would be allowed and parking maintained along one side of the street. A barrier would also be installed in the first stage to protect the work zone. A 30-foot construction zone would be developed, with water and gas lines relocated to the future automobile travel lanes.

Stage 2 would involve re-striping the travel lanes to allow for two travel lanes in each direction and a left-turn pocket in the median area. The construction barriers at the side of the street would produce 32-foot construction zones on each side. Within the 32-foot construction zone, the OCS foundations, and lights would be installed, the curb gutter, sidewalk, and existing streetlights removed, the street widened, and curb, gutter, and sidewalk reinstalled.

Stage 3 would include re-striping the travel lanes to allow for two travel lanes in each direction. Once again, left turns would be allowed from the inside travel lanes. Parking would be removed. To improve traffic flow, it may be necessary to restrict left turns at some locations. The barrier would be moved in Stage 3 to the middle of the street, producing a 48-foot construction zone. Within the 48-foot construction zone, the pavement would be removed, excavation performed, a combined system duct bank installed, curb walls and platform concrete installed, and ballast, ties, and rails placed.

During Stage 4, finishing work would include installation of OCS poles and wires, station finishes, and hardware. Construction barriers would be removed and the street re-stripped.

Side-Running Light Rail Station Platforms. Side-running light rail platforms would be constructed as an extension of the sidewalk. To minimize impacts to existing businesses, the existing sidewalks would remain intact to the greatest extent possible. Approximately four feet of the sidewalk could be rebuilt, or the entire walk back to the face of the building. The new improvements would provide drainage between the sidewalk and the new platform area. The platform would be approximately 150 feet long to accommodate both bus and light rail.

Utility Relocation. The construction of the Phase 2 – Single Car LRT portion of the proposed project in the Santa Clara-Alum Rock Corridor in a combined side-running alignment and center-running, semi-exclusive alignment would require utility relocation where conflicts occur. VTA would relocate all utilities, both public and private third-party utilities.

Coyote Creek Bridge Widening. Implementation of Single Car LRT service in the Corridor would require the widening of the Coyote Creek Bridge by approximately 20 feet. The only right-of-way required for the bridge widening is a temporary construction easement from parcel numbers 467-30-001 and 497-30-002. One side would be widened using one half of the existing bridge for traffic. Traffic would then be shifted towards the newly-widened portion of the bridge and the remaining side would be widened. The expected construction would occur over two seasons to avoid impacts to Coyote Creek. Construction could begin in April/May of one season but would halt by September/October. Construction would continue the following year in April/May and be completed by September/October. The total construction period would be about 18 months. However, for six months of that time, no construction would occur.

Impact Assessment and Mitigation Measures

Approach and Methodology

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

Standards of Significance

Based on significance criteria, the proposed project may result in significant impacts related to construction if it would:

- result in long-term (one month or more) street closure, or closing of a lane or other interference of traffic flow on any major traffic-carrying street or diverting of traffic through residential areas (transportation);
- result in long-term (three months or more) loss of parking or pedestrian access essential for continued operation of businesses (transportation);
- result in increased emissions of criteria pollutants or excessive dust (air quality);
- substantially affect sensitive species or habitats, including natural communities and federally protected wetlands (biological resources);
- demolish or materially alter a significant historical, archaeological, or paleontological resource (cultural resources);
- consume non-renewable energy resources in a wasteful, inefficient, or unnecessary manner (energy);
- create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area (hazardous materials);
- result in construction-related effects on water quality during grading or other earthmoving activities (hydrology and water quality);
- disrupt a business for a period of three months or more (land use);
- generate noise and vibration that substantially affects nearby sensitive receptors (e.g., residences, schools, hospitals) (noise and vibration);
- create a new source of substantial light or glare which would significantly impact day or nighttime views in the area (visual quality); or
- substantially degrade visual quality.

Environmental Analysis

In order to determine construction impacts due to construction and operation of the proposed project, a level of significance is determined and reported in the impact statement. Conclusions of significance are defined as follows: significant (S), potentially significant (PS), less than significant (LTS), no impact (NI), and beneficial (B). If the mitigation measures would not diminish potentially significant or significant impacts to a less-than-significant level, the impacts are classified as “significant and unavoidable (SU).” For this section, CI refers to Construction Impacts.

For the purposes of this analysis, the proposed project includes the implementation of BRT and Single Car LRT in the Santa Clara-Alum Rock Corridor in two phases. Phase 1 includes the implementation of BRT service and Phase 2 includes the implementation of Single Car LRT service. Potential construction impacts associated with Phase 1 and Phase 2 of the proposed project, including project options, would be largely similar. Therefore, the analyses for the two project phases are discussed together. Areas in which the effects of the two phases differ are detailed within the discussion of each significance threshold.

Potential impacts associated with the extension of transit services in the Capitol Expressway Corridor were analyzed in the Capitol Expressway Light Rail Final Supplemental Environmental Impact Report (FSEIR) dated January 2007, which is incorporated herein by reference. Potential impacts of the proposed project not analyzed in the Capitol Expressway Light Rail FSEIR are described below, as necessary.

Transportation

CI-1. Construction activities associated with the proposed project may result in long-term (one month or more) street closure, lane closure, interference with traffic flow, loss of parking or pedestrian access essential for continued operation of business. (PS)

The construction of either phase of the proposed project would be a continuous, year-round process. As described above, construction of BRT in the Corridor would be relatively minor, consisting of “BRT stops,” or station-like areas for passenger boarding and bus bulb-outs, and construction in the median of Alum Rock Avenue east of 34th Street. West of 34th Street, construction would be limited to one side of the street at a time. Construction of Single Car LRT would be limited to up to one five-block segment at a time. Also, as described above, for side-running, the construction zone would be concentrated on one side of the street, and then shifted to the other side.

The peak of daily construction activity in any one area would take place during off-peak commute hours (typically between 9:00 AM and 3:00 PM) when the level of service on Corridor roadways at most intersections is at LOS C or better. This would minimize impacts to vehicles traveling through the construction zone.

Transit service on-time performance can be expected to drop slightly during the construction period. Since the construction period would be limited in geographic length and in duration, excessive delay to transit operations is not expected and delay would not be considered a significant impact.

Sidewalks currently exist along both sides of the Corridor. During construction, the sidewalks would be narrowed slightly as the trackway is constructed for light rail. For the construction of station platforms, the existing sidewalk would be closed for limited periods of time for the length of the platform (approximately 150 feet or one-half block). During these times, a walkway would be provided adjacent to buildings to safely accommodate pedestrians through the construction zone. Additionally, signs would be posted to direct pedestrians to cross at adjacent intersections to entirely avoid the construction area. Access to businesses within the construction zone would be maintained at all times during business hours. Impacts related to pedestrian movement through the Corridor would be less than significant.

Currently, bicyclists are able to travel in the outside travel lane of Santa Clara-Alum Rock Corridor shared with automobile traffic. During construction of the proposed project, the outside travel lane would be maintained at a sufficient width, as feasible, to allow bicyclists to continue to travel the Corridor during construction, thereby minimizing impacts if feasible. If this is not feasible, alternative routes would be provided and signed as part of the Construction Community Outreach Plan described below.

MITIGATION MEASURE. The following mitigation measure would reduce the transportation-related construction impacts to a less-than-significant impact. (LTS)

CI-1.1 Prepare Construction Community Outreach Plan. VTA, in concert with the City of San Jose and Caltrans, shall prepare a Construction Community Outreach Plan (CCOP) that shall be part of the construction contract for the proposed project. Based on the CCOP, contractors shall use flagmen and follow a daily construction schedule that restores as much traffic capacity as possible during peak periods on weekdays during the morning commute period of 7:00 AM to 9:00 AM and the evening commute period from 4:00 PM to 6:00 PM. VTA shall oversee construction to assure all mitigation measures are met. VTA shall establish a field office along the project Corridor that shall be open to the public during specific hours of the week. Construction equipment traffic from the contractors shall be controlled by flagmen and the procedures contained in the Traffic Management Plan. For example, the overnight storage of equipment shall be relegated to specific locations outside of the travel way during non-construction periods.

Traffic that may attempt to use neighborhood streets to avoid construction areas shall be limited by the characteristics of the roadway network through the study area and the construction philosophy for the Corridor. First, while there are few efficient, directly parallel detours for the Santa Clara-Alum Rock Corridor, some alternative roadway corridors could experience traffic diverted from the Corridor

during construction. The one-way pairs of Saint James and Julian and McKee Road to the north of the Corridor could be used as a potential detour route. Also, East San Carlos Street and San Antonio Street could be used as a detour to the south of the Corridor. Second, other than the routes noted above, there are very few paths of travel via neighborhood streets that cross Coyote Creek, U.S. 101, and I-680 parallel to the Santa Clara-Alum Rock Corridor. Therefore, most neighborhood streets shall be protected from being used as cut-through streets by motorists. Finally, the approach to construction shall be to only allow one side of the street to be under construction at a time. Motorists should find it easier to negotiate the construction zone for approximately five blocks, rather than divert to other routes.

During construction of the proposed project, every effort shall be made to ensure that the outside travel lane would be maintained at a sufficient width to allow bicyclists to continue to travel the Corridor during construction. If this is not feasible, alternative routes shall be provided and adequate signs shall be posted demarking the alternate bicycle route(s).

Air Quality

CI-2. Construction associated with the proposed project would result in a temporary increase in construction-related emissions during grading and other construction activities. (PS)

Construction of the proposed project would include demolition and reconstruction of sidewalk and street segments in the Corridor. The Phase 2 – Single Car LRT portion of the proposed project would also involve tearing up roadways to lay track for the light rail line. Fugitive dust emissions could be generated as a result of this construction activity.

It is difficult to quantitatively predict dust emissions due to construction, as there are many unknowns: the wind and relative humidity during the construction period, the soil conditions, the exact earth moving and grading activities that would occur, the schedule of construction activities, etc. It is not possible to know all of the many variables that affect the lofting of dust at construction sites; it is also the case that there are no refined predictive methods.

In the BAAQMD CEQA Guidelines, a quantitative criterion is not stated for identifying significant construction impacts. However, BAAQMD recommends that abatement measures be applied for PM₁₀ emissions, with measures being intensified during periods of heavy construction activity. BAAQMD also provides a list of PM₁₀ mitigation measures for construction. These measures are mostly geared toward typical development projects where substantial amounts of land will be cleared and graded. Not all of the measures are applicable to this project. However, all applicable measures to minimize the emissions of dust during construction would be implemented.

BAAQMD also has an opacity rule, which provides a process whereby excessive dust emissions at a construction site can bring about an abatement order if the dust is seen blowing off-site. This would also serve to ensure that PM₁₀ levels would not be generated in significant amounts.

BAAQMD does not require emissions from construction activities to be estimated, but it requires implementation of all feasible control measures that would limit emissions of PM₁₀ from construction activities. Experience indicates that, despite the variability in emissions, a number of control measures can be reasonably implemented to reduce PM₁₀ emissions during construction.

Operation of construction equipment also emits CO and ozone precursors. Construction-related emissions of these pollutants are not estimated, however, because they are already included in the emission inventory that forms the basis for BAAQMD's regional air quality plans, and because those emissions are not expected to impede attainment or maintenance of ozone and CO standards in the Bay Area.

During construction of either the phase of the proposed project, emissions of several air pollutants, including criteria pollutants, would be produced by various sources. Criteria pollutant emissions could be produced by construction equipment and fugitive dust created by wind and the operation of equipment over exposed earth. Construction-related emissions were not estimated, but, because construction activities could result in a significant increase in PM₁₀ and construction vehicle exhaust emissions, this impact is considered significant.

MITIGATION MEASURE. The following mitigation measure would reduce air quality-related construction impacts to a less-than-significant level. (LTS)

CI-2.1 Implement BAAQMD standard construction measures. BAAQMD has prepared a list of feasible construction dust control measures that can reduce construction impacts to a level that is less than significant. Since these control measures were designed with typical development activities in mind, not all of the measures will be applicable to this project. Nevertheless, some of the measures could help reduce PM₁₀ during the construction period.

VTA shall implement, or shall require the designated contractor to implement, the following basic BMPs to control dust emissions during construction.

- Water all active construction areas at least twice daily as required to control dust.
- Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water daily to, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

- Sweep (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites, as needed.
- Sweep streets (with water sweepers) if soil is visible on adjacent public streets, as needed.
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt and sand).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways, as needed.
- Reduce idling of internal combustion engines to an absolute minimum to the greatest extent feasible.
- Maintain construction equipment properly and tune engines to minimize exhaust emissions.
- Establish an activity schedule designed to minimize traffic congestion around the construction site.

Biological Resources

CI-3. Construction activities associated with the proposed project would disturb species and habitat and result in permanent effects to emergent wetlands and riparian habitat. (PS)

The vast majority of the significant impacts on biological resources that would result from the proposed project would be construction-related. Impacts to emergent wetlands and riparian habitat would occur with the implementation of Single Car LRT service and the widening of the Coyote Creek Bridge. These effects and their associated mitigation measures are discussed in Section 3.4, Biological Resources.

MITIGATION MEASURES. Mitigation measures BIO-4.1, BIO-4.2, BIO-5.1, BIO-5.2, BIO-6.1, BIO-6.2, BIO-7.1, all discussed in Section 3.4, Biological Resources, would reduce the impacts to less than significant. (LTS)

Community Services

CI-4. Construction activities associated with the proposed project could result in temporary disruption of emergency access. (PS)

Existing and planned service levels for police and fire protection are expected to be adequate with implementation of the proposed project. However, construction activities could temporarily disrupt emergency access within the Santa Clara-Alum Rock Corridor. Although the effect would not be permanent, the following mitigation measure is recommended to minimize the effect.

MITIGATION MEASURE. The following mitigation measures would reduce the community services-related construction impacts to a less-than-significant level. (LTS)

CI-4.1 Coordinate with emergency service providers. VTA shall expand fire safety and emergency response coordination to include the fire districts in the Santa Clara-Alum Rock 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 construction.

Cultural Resources

CI-5. Implementation associated with the proposed project could damage or destroy archaeological resources, including human burials, as a result of ground-disturbing activity. (PS)

Archival and records research has identified two locations with recorded prehistoric and historic archaeological resources within and immediately adjacent to the study area, as well as at least 86 locations with a potential for subsurface archaeological deposits dating from the early 18th to early 20th centuries and associated with the early development of the City of San Jose. The number of resources does not vary between Phase 1 and Phase 2 of the proposed project. Disturbance of these resources by ground-disturbing activities associated with implementation of either of the proposed phases would be considered a significant impact. The potential for significant impacts and their associated mitigation measures are discussed in Section 3.6, Cultural Resources.

MITIGATION MEASURE. Mitigation measures CR-2.1 and CR-2.2, discussed in Section 3.6, Cultural Resources, would reduce the construction-related construction impacts to cultural resources to a less-than-significant level. (LTS)

Energy

CI-6. Construction activities associated with the proposed project could result in consumption of nonrenewable energy resources in a wasteful, inefficient, and/or unnecessary manner. (PS)

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 (under Phase 2 – Single Car LRT), station platforms, and for the transportation of materials and equipment to and from the work sites. 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.

The highest indirect energy consumption would occur during demolition and construction of on-site facilities, such as trackwork (under Phase 2 – Single Car LRT), stations, and support facilities. This construction-related energy consumption would result in the one-time, non-recoverable energy costs associated with construction and the manufacture of BRT buses (the current VTA light rail vehicle fleet is sufficient to handle the additional service associated with the implementation of Phase 2). 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 result if construction equipment and machinery were not kept in good condition. Equipment and vehicles, if left idling, would also result in an unnecessary use of energy. Because the proposed project has only been designed to a conceptual level, specific details regarding construction practices and methods have not been specified. Effects to nonrenewable energy resources would, therefore, be considered potentially significant. However, adherence to the mitigation measure below would reduce this effect.

MITIGATION MEASURE. The following mitigation measure would reduce energy-related construction impacts to less than significant. (LTS)

CI-6.1 Adopt construction energy conservation measures. VTA shall 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 Phase 2 – Single Car LRT portion of the proposed project;
- 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; and
- Maintain equipment and machinery, especially those using gasoline and diesel, in good working condition.

CI-7. Construction activities associated with secondary facilities associated with the proposed project could result in the consumption of nonrenewable energy resources in a wasteful, inefficient, and unnecessary manner. (LTS)

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, California 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 proposed project would not consume nonrenewable energy resources in a wasteful, inefficient, or unnecessary manner, limiting the effect on nonrenewable energy resources. Therefore, impacts related to such would be less than significant.

Geology, Soils, and Seismicity

- CI-8. Construction activities associated with the proposed project could occur in areas subject to lateral spreading, subsidence, and collapse caused by underlying unstable geologic units. (LTS)*

The proposed project 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. This potential risk would result in a significant impact. The potential for unsuitable soils to create settlement problems for rails, roads, and utility lines through vertical or lateral movement, can be eliminated through soils re-engineering in the excavation and construction along the alignment. As part of the construction evaluation process, VTA shall prepare soils reports. The evaluations shall be conducted by registered soil professionals, and measures to eliminate inappropriate soil conditions shall be applied, depending on the soil conditions. The design of foundation support shall be consistent with standard building practices.

Based on the conditions outlined in the setting section of Section 3.10, Soils, Geology, and Seismicity, showing that a regulatory framework exists to address unsuitable soils unit issues, liquefaction, or similar ground failure, there would not be substantial hazards within the Corridor. Therefore, a less-than-significant impact would occur.

- CI-9. Construction activities associated with the proposed project could occur on expansive soils. (LTS)*

Transportation improvements proposed under the phases 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. This potential risk could result in a significant impact. However, adherence to the Caltrans Bridge Manual ensures protection available for users of buildings and infrastructure and their associated trenches, slopes, and foundations.

Based on the conditions outlined in the setting section of Section 3.10, Soils, Geology, and Seismicity, a regulatory framework exists to address unsuitable soils unit issues; therefore, the presence of expansive soils would not be a substantial hazard within the Corridor and impacts would be less than significant.

Hazardous Materials

- CI-10. Construction activities associated with the proposed project could result in a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (PS)*

Construction activities associated with the proposed project would involve subsurface construction activities (excavation, trenching, and/or relocation of utilities) which could lead to a finding of contaminated soil and/or groundwater. As discussed in Section 3.11, Hazardous Materials, there are four facilities ranked as having a moderate to high potential for an environmental condition located adjacent to the Santa Clara-Alum Rock Corridor. Construction activities in the vicinity of any of these four sites could result in construction workers and/or the public to come into contact with contaminated soil or groundwater. This would be considered a significant impact.

MITIGATION MEASURES. Mitigation measures HAZ-1.1 and HAZ-1.2, which are discussed in Section 3.11, Hazardous Materials, would reduce the hazardous materials-related construction impacts to a less-than-significant level. (LTS)

Hydrology and Water Quality

CI-11. Construction activities associated with the proposed project may impair water quality. (LTS)

Turbidity (sedimentation in receiving waters) is a major water quality concern during construction activities. Spills or leaks from heavy equipment and machinery (petroleum products and/or heavy metal), staging areas, or building sites (paints, solvents, and cleaning agents) also could affect receiving water quality significantly by polluting runoff during construction.

Implementation of the proposed project would include construction activities that would disturb soil. Construction runoff, as well as dust generated from other portions of the construction site, contains sediment that could enter receiving waters such as San Francisco Bay through the City's storm drainage systems, and degrade water quality. Construction activities associated with proposed phases would be required by California law to obtain and comply with the State General Construction Activity Stormwater Permit (NPDES requirement) because the project would disturb more than one acre of land. If any element of the phases were developed in increments of less than one acre, a permit still would be required because the construction activity would be part of the larger plan of development.

Compliance with the permit would involve filing a Notice of Intent (NOI) with Region 2 and preparing, at a minimum, a SWPPP prior to construction activities. The SWPPP is required to identify the sources of sediment and other pollutants on site, and to ensure the reduction of sediment and other pollutants in stormwater discharged from the site. A monitoring program is required to aid the implementation of, and assure compliance with, the SWPPP. The Region 2 permit requirements must be satisfied prior to project construction.

As part of the SWPPP, an Erosion and Sedimentation Control Plan must be prepared for the project alignment prior to grading. An erosion control professional, or landscape architect or civil engineer specializing in erosion control must design the Erosion and Sediment Transport Control Plan. The Associate of Bay Area Governments (ABAG) recommends the control plan

be designed using concepts similar to those formulated by ABAG, as appropriate, based on the specific erosion and sediment transport control needs of each area in which grading, excavation, and construction is to occur. A few of the most critical techniques to be considered include, but is not limited to, the following types of erosion control methods:

- Discharge grading and construction runoff into small drainages at frequent intervals to avoid the buildup of large potentially erosive flows;
- Stabilize disturbed areas as quickly as possible, either by vegetative or mechanical methods;
- Trap sediment before it leaves the site with such techniques as check dams, sediment ponds, or siltation fences; and
- Control landscaping activities carefully with regard to the application of fertilizers, herbicides, pesticides or other hazardous substances. Provide proper instruction to all landscaping personnel on the construction team.

During the installation of the erosion and sediment transport control structures, an erosion control professional is required to be onsite to supervise the implementation of the designs and the maintenance of facilities throughout the site clearing, grading and construction period.

Implementation of the SWPPP, as required by California law to comply with construction management procedures stipulated in Region 2's General Construction Activity Stormwater Permit and related applicable policies to minimize potential water quality effects associated with construction activities for either of the proposed phases. Therefore, impacts related to such would be less than significant.

Land Use

CI-12. Construction activities associated with the proposed project would not preclude access to local businesses. (LTS)

As noted in the discussion of transportation impacts during construction, lane and street closures, and detours would occur. A Traffic Management Plan shall 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. On- and off-street parking facilities would not be impacted for more than three months during construction. Pedestrians along the Corridor would be provided with alternative paths during construction of station platforms. Signs would be posted to direct pedestrians to intersections where they may cross to proceed along the roadways and to avoid construction areas. Pedestrians would be able to maintain access to local businesses along the Corridor. Therefore, impacts to local businesses for a period of three months or more would be less than significant.

Noise and Vibration

CI-13. *Construction activities associated with the proposed project would generate noise or vibration that could substantially affect nearby sensitive receptors. (PS)*

Construction noise criteria are based on the guidelines provided in the FTA guidance manual (1995). These criteria, summarized in Table 3.18-1, are based on land use and time of day and are given in terms of L_{eq} for an eight-hour work shift.

Table 3.18-1
Federal Transit Administration Construction Noise Criteria
Noise Limit, Eight-hour L_{eq} (dBA)

| Land Use | Daytime | Nighttime |
|-------------|---------|-----------|
| Residential | 80 | 70 |
| Commercial | 85 | 85 |
| Industrial | 90 | 90 |

Source: Federal Transit Administration, 1995.

Construction of the project would involve the breaking up and removal of pavement, and the laying of new pavement. Phase 2 would also involve the construction of overhead traction-power lines and the laying and embedding of the tracks. Consequently, with either phase, pavement-breaking equipment would be used. Most diesel-powered heavy construction equipment produces noise levels ranging from 80 to 85 dBA at a distance of 100 feet. Impact hammers for pavement breaking can produce peak noise levels of 90 dBA at 100 feet. Noise levels decrease by 6 dBA for every doubling of the distance of separation from a localized stationary source. These levels describe noises that could prove to be temporarily annoying to adjacent receptors. Given the temporary nature of the exposures to construction noise, impacts would not be significant unless construction activities were to be conducted at night near residences or other sensitive receptors, and would exceed the standards listed in Table 3.18-1, in which case the impacts would be potentially significant. On occasion, transportation-related construction activities are expected to be conducted at night, in order to have a substantial block of time available for work during which traffic on the affected roadway is light.

As described above, construction would involve the breaking up and removal of pavement and the laying of new pavement. Also, widening of the Coyote Creek Bridge as part of Phase 2 would include the use of pile driving. Vibration levels due to such equipment could be noticeable inside buildings very near the Santa Clara-Alum Rock Corridor right-of-way. Caltrans has found this type of equipment can occasionally cause damage to structures, if operated within 25 feet. Therefore, construction of either phase involving the use of pavement breakers within 25 feet of structures would be potentially significant. Pile driving activities associated with the widening of the Coyote Creek Bridge included in the Phase 2 would also be potentially significant.

MITIGATION MEASURES. The following mitigation measures would reduce the noise and vibration-related construction impacts to a less-than-significant level. (LTS)

CI-13.1 Survey, provide notice, and monitor nighttime construction noise/vibration levels. If nighttime construction is required, the following actions shall be implemented:

- The sites of nighttime construction activity shall be surveyed, to determine the locations of the nearest residences, hospitals, or other locations that would be occupied during the construction.
- Notice shall be given to affected persons or their representatives of the hours of construction and the reasons why the nighttime construction is needed. If percussive equipment is to be used (e.g., pavement breakers), the nature of the noise that would be emitted shall also be disclosed.
- Noise levels due to the construction equipment shall be estimated, and should the estimated outdoor noise levels from the combined equipment exceed 70 dBA L_{eq} , noise abatement measures (e.g., such as by erecting temporary intervening barriers near the property line, enclosing stationary equipment, wrapping certain equipment in acoustical blankets, procuring less noisy types of construction equipment, etc.) shall be included. For areas where the nighttime noise standards cannot be achieved with implementation of reasonable noise abatement measures, the residents shall be offered temporary overnight accommodations at a hotel or motel.

CI-13.2 Monitor and adjust pile driving equipment. The following precautions shall be taken with regard to the use of pavement breaking and pile driving equipment near structures:

Wherever heavy pavement breaking equipment (heavier than a hand-operated jackhammer) or pile driving would be used near structures, the project engineer shall evaluate the potential for pavement-breaker-generated vibrations to damage structures. If there is a substantial risk of damage, a plan for avoiding damage, such as the substitution of lighter equipment or the removal of a strip of pavement and underlying soil near the affected structures prior to using the heavy equipment (so as to provide isolation) shall be implemented (e.g., cut the pavement with a concrete saw so as to delineate the two sides of a trench, use a hand-operated jackhammer to demolish the strip of pavement between the cuts, then remove the demolished pavement and dig a trench). Special care shall be taken with regard to historical structures, and the project engineer shall survey and record preexisting cracks in the facades of affected structures as deemed appropriate to document existing conditions.

Safety and Security

CI-14. Construction activities associated with the proposed project could result in safety risks during construction. (PS)

Construction of the Phase 1 – BRT portion of the proposed project would last approximately 12 to 18 months while construction of the Phase 2 – Single Car LRT portion of the proposed project would last approximately 30 to 36 months. At the height of construction, construction employees and equipment would occupy portions of the street, including the median and parking lanes at active construction locations. This could result in a significant impact to safety in the Corridor.

MITIGATION MEASURE. The following mitigation measure would reduce the safety and security -related construction impacts to less than significant. (LTS)

CI-14.1 Implement BMPs. As part of the CCOP, VTA shall require construction contractors to implement the following Best Management Practices (BMPs) to ensure the safety of construction workers and local residents during construction of the project phases. Fencing and lighting of construction and staging areas (including all construction materials), 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.

Visual Quality

CI-15. Construction activities associated with the proposed project could result in significant impacts to visual quality by creating a new source of substantial light or glare. (PS)

During construction of either proposed phase, 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 a significant impact.

MITIGATION MEASURE. The following mitigation measure would reduce the property-related construction impacts to less than significant. (LTS)

CI-15.1 Direct lighting onto immediate area. 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.

CI-16. Construction activities associated with the proposed project would not result in a degradation of visual quality. (LTS)

During construction of either proposed phase, activities involving the use of heavy equipment, transport of soils and material, and other visual signs of construction would occur along the Santa Clara-Alum Rock Corridor and at construction staging areas.

Figure 3.18-9 depicts the existing and simulated views of activity associated with the construction of a typical sidewalk bulb-out station platform at the 28th Street Station, as well as a simulation of the completed station. Figure 3.18-10 depicts the existing and simulated views of activity associated with the construction of a typical center median BRT station platform at the King Road Station, as well as a simulation of the completed station. Figure 3.18-11 depicts the existing and simulated views of activity associated with the construction of the center-running segment of the Phase 1 – BRT portion of the proposed project along Alum Rock Avenue, as well as a simulation of the completed median-running segment.

Figure 3.18-12 depicts the existing and simulated views of activity associated with the construction of the side-running segment of the Phase 2 – Single Car LRT portion of the proposed project along Santa Clara Street, as well as a simulation of the completed median-running segment. Figure 3.18-13 depicts the existing and simulated views of activity associated with the construction of the center-running segment of the Phase 2 – Single Car LRT portion of the proposed project along Alum Rock Avenue, as well as a simulation of the completed median-running segment. Figure 3.18-14 depicts the existing and simulated views of activity associated with the construction of the center-running station Platform at the King Road Station under the Phase 2 – Single Car LRT portion of the proposed project, as well as a simulation of the completed median-running segment.

While construction activities under the Phase 1 – BRT portion of the proposed project would be less in scope than under the Phase 2 – Single Car LRT portion of the proposed project, as shown in the above figures, these activities would still be visible to the public. 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 setting, where roadway maintenance activities are accepted visual elements. Therefore, impacts to degradation of visual quality would be less than significant.

