DRAFT
AIR QUALITY STUDY

Santa Clara-Alum Rock Corridor

Prepared for:
Santa Clara Valley Transportation Authority
3331 North First Street
San Jose, California 95134-1927

Prepared by:
PBS&J
353 Sacramento Street, Suite 1000
San Francisco, California 94111

July 2008

AIR QUALITY STUDY

Santa Clara-Alum Rock Corridor

Table of Contents

Section **Page**

Tables

Figures

Chapter 1 Project Description

The Santa Clara Valley Transportation Authority (VTA) is considering a proposed project for improving direct transit service in the Santa Clara-Alum Rock Corridor (Corridor) in the City of San Jose (City) in Santa Clara County (County) (Figure 1). The proposed project includes the implementation of Phase 1 - Bus Rapid Transit (BRT), or Phase 2 - Single Car Light Rail Transit (Single Car LRT) service (Figure 2). This section describes the proposed project.

1.1 Phase 1 - Bus Rapid Transit

Implementation of BRT service has been recommended by Staff, the Downtown East Valley Policy Advisory Board, and the VTA Board as the preferred near term (Phase 1) development strategy for the Santa Clara-Alum Rock Corridor. Specialized BRT vehicles with unique features and a distinctive brand identity would be a key component of the BRT Alternative. The BRT alternative is designed to follow criteria set out in VTA's Service Design Guidelines.

With implementation of BRT, two separate BRT lines (the 522 El Camino and the 523 Stevens Creek) would operate in the Santa Clara-Alum Rock Corridor. West of 34th Street, BRT vehicles would operate in the curb lane of Santa Clara Street and Alum Rock Avenue. East of 34th Street, the alignment would transition to a median busway within the center of Alum Rock Avenue. Limited stop BRT service between the Downtown San Jose Transit Mall to the Eastridge Transit Center would be provided. At the Downtown Transit Mall, the two BRT lines would split with westbound 522 El Camino service continuing on West Santa Clara Street to the San Jose Arena. Westbound 523 Stevens Creek service would turn south on Second Street and west on West San Carlos Street, stopping at the San Jose Convention Center and Bird Avenue.[1] While BRT service would extend for both lines west of Bird Avenue and the San Jose Arena, capital improvements associated with those services would be incorporated into the Stevens Creek and El Camino BRT projects. On the east end of the Corridor both BRT lines would turn south from Alum Rock Avenue to Capitol Avenue and Capitol Expressway, with intermediate stops at Story Road and Ocala Avenue, before terminating at the Eastridge Transit Center.

BRT service would utilize articulated vehicles (approximately 60 feet in length) with unique branding. The two BRT lines would operate at 12-minute headways during the peak periods with off set schedules allowing for a combined six-minute headway between the transit mall and the Eastridge Transit Center.

BRT service would utilize articulated vehicles (approximately 60 feet in length) with unique branding. The two BRT lines would operate at 12-minute headways during the peak periods with off set

[1] East bound buses would travel on 1st Street between the Convention Center and Santa Clara Street.

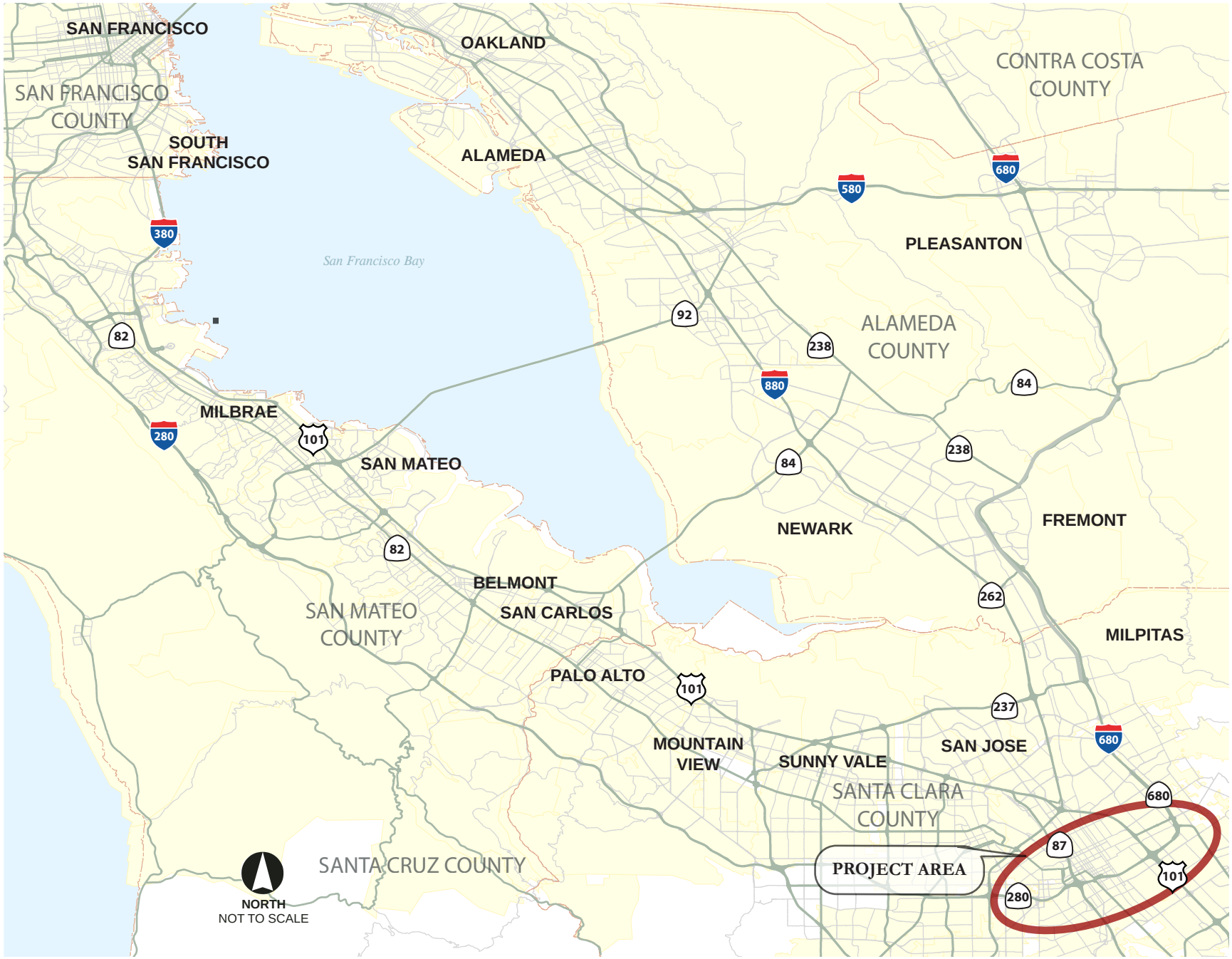


FIGURE 1: PROJECT LOCATION

Source: PBS&J, 2008.

FIGURE 2: PROPOSED STATION LOCATIONS

Source: DMJM Harris, 2007.

schedules allowing for a combined 6-minute headway between the transit mall and the Eastridge Transit Center.

BRT service would include the following features:

- BRT stations (sidewalk "bulb-out" or median platform design with expanded shelters, lighting, etc.);
- Off board fare collection;
- Real-time information at stops; and
- Transit priority measures such as signal priority, where appropriate.

Lines 22 and 23 would continue to provide local bus service all day in the Santa Clara-Alum Rock Corridor from downtown San Jose to Palo Alto and De Anza College respectively.

1.1.1 Proposed Stations

Thirteen BRT stations and one optional station are proposed at the following locations (also shown in Figure 2):

- Bird (Line 523 Only);
- Convention Center (Line 523 Only);
- San Jose Arena (Cahill Street/Montgomery Street, Line 522 Only);
- Transit Mall (1st and 2nd Streets);
- 6th Street/City Hall;
- 16th Street;
- 28th Street;
- King Road;
- Jackson Avenue;
- Alexander Avenue/Muirfield Drive (optional station)
- Capitol Avenue;
- Story Road;
- Ocala Avenue; and
- Eastridge Transit Center.

The proposed station locations were selected based on criteria set out in the VTA Service Design Guidelines as follows:

- Transit demand;

- Connections to bus and rail;
- Surrounding land uses;
- Station spacing;
- Station visibility and access;
- Right-of-way impacts;
- Traffic and parking impacts; and
- Public support.

All BRT stations would be constructed at-grade and would be fully compliant with ADA requirements. Most existing bus stops located between proposed BRT stations would remain and would be served by local buses. No improvements are planned at these existing bus stops. However, some existing bus stops located in the vicinity of the proposed BRT stations would be relocated to the new station platforms. The typical platform for the BRT stations would be 180 feet in length for stations along the shared right-of-way of the Corridor (west of 34th Street), 75 feet in length at stations in the semi-exclusive section of the Corridor (east of 34th Street), and 235 feet in length at the Transit Mall Station. As described below, most platforms along the shared right-of-way section of the Corridor would be constructed as an extension (or bulb-out) of the existing sidewalk and would be 8 feet wide (not including the existing sidewalk) with a curb height of 6 inches. At stations in the semi-exclusive section of the Corridor, the platforms would be located adjacent to the median alignment with a 12.5-foot width. Actual plans for the station platforms are not yet finalized. The proposed stations and station options are described below.

Bird Avenue (Line 523 Only). The Bird Avenue Station would be constructed adjacent to the curb in both directions without bulb-outs. The eastbound platform would be located on the farside of Bird Avenue in front of Delmas Park Apartments. The westbound platform would be constructed along the curb on the nearside of the intersection at the existing local bus stop. The platforms will include BRT capital improvements and enhanced amenities. Bulb-outs will be added to the stations in the future as the area continues to redevelop.

Convention Center (Line 523 Only). The Convention Center Station would include the construction of a bulb-out on West San Carlos Street in the westbound direction. The station would be located at the existing local bus stop west of the signalized mid-block crosswalk between Market Street and Almaden Boulevard. The eastbound platform would occupy the existing turn-out in front of the San Jose Convention Center.

San Jose Arena (Cahill Street/Montgomery Street, Line 522 Only). The San Jose Arena Station would include two station platforms, without bulb-outs, to be located along West Santa Clara Street between Cahill Street and Montgomery Street. The eastbound platform would occupy most of the length of curb between Cahill Street and Montgomery Street. The westbound platform would be located on the opposite side of West Santa Clara Street.

Transit Mall Station. To accommodate the high level of passenger activity at this location, the Transit Mall Station would be located along the entire block of East Santa Clara Street between 1st Street and 2nd Street. The station would have bulb-out platforms adjacent to the curb lane on both sides of East Santa Clara Street. Construction of the station would require the relocation of the existing truck loading zones from East Santa Clara Street to West Santa Clara Street in the vicinity of the proposed station. The eastbound loading zone would be moved to a location just west of 1st Street, and the westbound loading zone would be moved to a location just east of 2nd Street. Existing bus stops located between 3rd Street and 4th Street would be removed.

Line 23 and 523 would stop at the existing bus stations on 1st Street and 2nd Street between East San Fernando and East Santa Clara Streets. Passengers from both BRT lines would be able to transfer to and from the Mountain View-Winchester LRT Line and the Alum Rock-Santa Teresa LRT Line, as well as several VTA bus lines at the station.

6th Street/City Hall Station. The City Hall Station includes the construction of two bulb-out platforms, both of which would be located adjacent to the curb lane of East Santa Clara Street west of 6th Street. The bus stops currently located at the intersection of East Santa Clara Street and 7th Street would be relocated to the City Hall Station platform.

Under BRT Station Option 1, the eastbound bulb-out platform would be located west of 7th Street. This location would require the removal of on-street parking and the driveway that opens on to Santa Clara Street.

16th Street Station. The 16th Street Station includes the construction of bulb-out platforms located adjacent to the curb lane on opposite sides of 16th Street. The bulb-out platform for westbound buses would be located west of 16th Street and the bulb-out platform for eastbound buses would be located east of 16th Street. The two bus stops currently located along East Santa Clara Street at 17th Street would be relocated to the 16th Street Station platforms. Both the bus stops currently located at the southeast corner of East Santa Clara Street and 15th Street and the bus stop currently located at the northwest corner of East Santa Clara Street and 14th Street would be removed. The intersection of East Santa Clara Street and 16th Street would be signalized to enhance passenger safety while accessing this station.

28th Street Station. The 28th Street Station includes bulb-out platforms adjacent to the curb lanes of East Santa Clara Street, on opposite sides of 28th Street. The westbound bulb-out platform would be located east of 28th Street in front of Five Wounds Church and the eastbound bulb-out platform would be located west of 28th Street in front of the former Empire Lumber site. Construction of the eastbound bulb-out platform would require the removal of one of the two curb cuts at 1260 East Santa Clara Street. The bus stop currently located at the northwest corner of East Santa Clara Street and 26th Street would be removed. The 28th Street Station would provide a connection point for passengers transferring to and from the proposed Alum Rock BART Station.

King Road Station. The King Road Station would be constructed adjacent to the median running alignment on the opposite sides of King Road. The westbound platform would be located west of King

Road and the eastbound platform would be located east of King Road. Access to the platforms would be via the pedestrian crosswalks across King Road.

Jackson Avenue Station. The Jackson Avenue Station would be constructed adjacent to the median running alignment on opposite sides of Jackson Avenue. The median platform for eastbound buses would be located east of Jackson Avenue and the median platform for westbound buses would be located west of Jackson Avenue.

Capitol Avenue Station: Baseline Alum Rock Transit Center. The baseline assumes that the BRT line would stop at the Alum Rock Transit Center providing transfer opportunities at the end-of-line LRT station. If the Capitol Expressway LRT extension project is delayed, VTA would move forward with the Baseline Alternative.

Optional Alexander Avenue/Muirfield Drive Station. BRT Station Option 2 includes a station at Alexander Avenue/Muirfield Drive. Construction of this station assumes that LRT would be extended along Capitol Expressway to the Eastridge Transit Center and the existing Alum Rock Transit Center would no longer function as a primary transfer facility. Under this station option, the platform for westbound buses would be located adjacent to the median-running alignment west of Alexander Avenue/Muirfield Drive. Access to the platform would be via the pedestrian crosswalks across Alum Rock Avenue. The platform for eastbound buses would be located east of Alexander Avenue/Muirfield Drive as a sidewalk bulb-out platform.

Construction of the westbound platform would require the relocation of the bus stop east of Alexander Avenue/Muirfield Drive to a location west of Alexander Avenue/Muirfield Drive. Construction of the eastbound platform would also require the removal of one of the driveways into the shopping center located along Alum Rock Avenue. However, access to the shopping center would still be available from other driveways located along Alum Rock Avenue as well as from driveways located along Muirfield Drive and Capitol Avenue.

If the Capitol Expressway LRT extension project is delayed, the Alexander Drive/Muirfield Drive Station would not be constructed. BRT would stop at the Alum Rock Transit Center providing transfer opportunities at the end-of-line Alum Rock-Santa Teresa LRT Line station.

Story Road Station. The Story Road Station includes bus duckouts adjacent to the curb lanes on Capitol Expressway. Both northbound and southbound stations will be located on the farside of the intersection of Story Road and Capitol Expressway.

Ocala Avenue Station. The Ocala Avenue Station includes bus duckouts adjacent to the curb lanes on Capitol Expressway. Ocala will have a split-station configuration, with the southbound duckout located south of Ocala Avenue and the northbound duckout located north of Cunningham Avenue.

1.2 Phase 2 - Single Car Light Rail Transit

Phase 2 includes the construction of a LRT line in the Santa Clara-Alum Rock Corridor extending from the Diridon LRT Station on the west to the Alum Rock Station on the east. The LRT line would also

utilize stations on the future Capitol Expressway Corridor LRT Line. As a result, completion of the Capitol Expressway LRT extension is a pre-requisite for the implementation of LRT service in the Santa Clara-Alum Rock Corridor. In addition because Santa Clara Street between Market and 3rd Street will be excavated for BART construction, Single Car LRT can not be implemented until BART construction is complete. It is estimated that the BART construction will be complete in 2018. The proposed alignment is from the Diridon LRT Station along San Fernando Street on trackway used for the Mountain View-Winchester LRT Line, continues with new trackway constructed along West San Fernando Street from Delmas Avenue to Almaden Boulevard: transitions to Santa Clara Street along Almaden Boulevard: and continues along Santa Clara Street and Alum Rock Avenue to Capitol Avenue. From Capitol Avenue, the alignment would connect with the trackway for the future Capitol Expressway LRT extension.

An optional alignment (LRT Alignment Option 1) is under consideration on the western end of the Corridor. Rather than utilize the Mountain View-Winchester LRT Line track at Diridon Station and its approaches, the optional alignment would remain on Santa Clara Street toward the San Jose Arena. At Montgomery Street, the alignment would turn south into the San Jose Diridon Station parking lot. The terminus station, tail track, and crossover would be located within the parking lot.

Single Car LRT service would utilize new VTA low-floor vehicles operating as a single car running at 15-minute headways through the Corridor during peak periods. LRT vehicles would operate at-grade in a semi-exclusive (separate from automobile traffic) center right-of-way along West San Fernando Street and Almaden Boulevard; in shared operation with automobiles in the outside lanes (curb lanes) of Santa Clara Street and Alum Rock Avenue west of 34th Street; and transition back to a semi-exclusive center right-of-way in the median of Alum Rock Avenue east of 34th Street.

Following completion of the project, single car LRT vehicles would provide service between the Diridon LRT Station and the Eastridge Transit Center. Line 22, Line 23, and Line 522 would provide further supplemental bus service in the Santa Clara-Alum Rock Corridor. Additional bus lines in the Corridor (including DASH service) may be modified to better accommodate the new LRT service.

The proposed LRT alignment and station locations are depicted on Figure 2. A description of the alignment and alignment options as well as the stations proposed is provided below.

1.2.1 Alignment Description

As described above, between the Diridon LRT Station and West San Fernando Street, the proposed alignment would share trackway for the Mountain View-Winchester LRT line, which extends along West San Fernando Street between Delmas Avenue and Almaden Boulevard; transition to West Santa Clara Street along Almaden Boulevard; and continue along Santa Clara Street and Alum Rock Avenue to Capitol Avenue; where it would connect with the trackway for the Alum Rock-Santa Teresa LRT Line along Capitol Avenue. The LRT line would also utilize stations on the future Capitol Expressway Corridor LRT Line. The proposed alignment and alignment options are described below.

West San Fernando Street from Delmas Avenue to Almaden Boulevard. Between the Diridon LRT Station and Delmas Avenue, Single Car LRT would operate on the Mountain View-Winchester LRT

tracks. East of Delmas Avenue, new tracks would be constructed to transition LRT trains into the center median of West San Fernando Street. These tracks would continue in the center median along West San Fernando Street to Almaden Boulevard. The bus stop currently located mid-block along westbound West San Fernando Street would be relocated to the corner of West San Fernando Street and Almaden Boulevard.

Within this segment of the alignment, a mid-block pedestrian crossing would be provided for the existing pedestrian/bicycle trail located west of the State Route (SR) 87 overcrossing. This crossing would be protected with swing gates to prevent pedestrians and cyclists from entering the crossing when LRT vehicles are approaching.

A design option for this alignment segment includes the construction of approximately 275 feet of non-revenue LRT tracks connecting the Santa Clara-Alum Rock Corridor with the Mountain view-Winchester LRT line east of Delmas Avenue. This design option would provide greater flexibility in the movement of LRT trains throughout VTA's system.

Almaden Boulevard from West San Fernando Street to West Santa Clara Street. Along this short section of Almaden Boulevard between West San Fernando Street and West Santa Clara Street, LRT tracks would be placed in the center median, separate from automobile traffic. At West Santa Clara Street, the alignment would shift to the outside curb lanes for shared LRT/automobile options. Striping for two through lanes and one left-turn lane along each direction of West Santa Clara Street between Notre Dame Street and Almaden Boulevard would be provided. This would require the removal of the two passenger loading zones along westbound West Santa Clara Street located on either side of Notre Dame Street.

Under a design option under consideration in this segment, striping for two through lanes and one left-turn lane along westbound West Santa Clara Street, but only one through lane and one shared through/left-turn lane along eastbound Santa Clara Street between Notre Dame Street and Almaden Boulevard would be provided. This design option would allow the existing passenger loading zones along westbound Santa Clara Street on opposite sides of Notre Dame Street to remain.

LRT Alignment Option 1: West Santa Clara Street from Montgomery Street to Almaden Boulevard. As described above, LRT Alignment Option 1 would not interline with the Mountain View-Winchester LRT line. This alignment option would have the western terminus light rail platform in the southwest quadrant of the Santa Clara Street/Montgomery Street intersection in the parking lot of the San Jose Diridon Station. A track crossover would be provided in front of the platform to allow trains to switch from one track to another. No new tracks would be constructed along West San Fernando Street or Almaden Boulevard under LRT Alignment Option 1.

Santa Clara Street/Alum Rock Avenue from Notre Dame Street to 34th Street. Along Santa Clara Street and Alum Rock Avenue from Notre Dame Street to 34th Street, LRT tracks would be constructed in the outside (curb) lane. LRT trains would operate in shared lanes with automobile traffic throughout this segment. Within this segment, the existing 60-foot wide Coyote Creek Bridge would be widened by 20 feet to accommodate the operation of LRT vehicles.

Alum Rock Avenue from 34th Street to Capitol Avenue. At 34th Street, the LRT alignment would transition from shared LRT/automobile operation within the outside (curb) lane of Alum Rock Avenue to transit-only operation in the median of Alum Rock Avenue. Within this segment, the Alum Rock Avenue/34th Street intersection and the Alum Rock Avenue/McCreery Avenue intersection would be signalized. Left turns from eastbound Alum Rock Avenue onto Eastgate Avenue would no longer be permitted.

LRT trains would operate in a semi-exclusive lane in the center of Alum Rock Avenue from Eastgate Avenue to Capitol Avenue. At Capitol Avenue, the LRT tracks would transition south to interline with the Alum Rock-Santa Teresa LRT line and the future Capitol Expressway LRT Line. No new tracks would be constructed along Capitol Avenue or Capitol Expressway to accommodate the addition LRT line. However, a design option under consideration at the Alum Rock Avenue/Capitol Avenue intersection includes the construction of tracks for a non-revenue connection that would transition north to join the Alum Rock-Santa Teresa LRT Line. This option would provide greater flexibility in the movement of LRT trains throughout VTA's system.

1.2.2 Proposed Stations

In addition to serving the Diridon LRT Station and the San Fernando Street Station (both included on the Mountain View-Winchester LRT Line); the Alum Rock Station (included on the Alum Rock-Santa Teresa LRT Line); and the Story Road Station, the Ocala Avenue Station, and the Eastridge Transit Center (all included in the proposed Capitol Expressway Corridor Project), service would also be provided to the six stations in the Santa Clara-Alum Rock Corridor constructed as part of BRT Phase 1. These stations are proposed at the following locations (as Shown in Figure 2):

- Transit Mall (1st Street and 2nd Street);
- 6th Street/City Hall;
- 16th Street;
- 28th Street;
- King Road; and
- Jackson Avenue

In addition, a new station would be constructed along Almaden Boulevard as part of the implementation Phase 2. For LRT Alignment Option 1, the Mountain View-Winchester LRT Line stations at Diridon and San Fernando Street would not be served by the Santa Clara/Alum Rock LRT Line. In addition, the Almaden Boulevard Station would not be constructed. Instead, the Diridon terminal station would be located in the Caltrain parking lot along Montgomery Street. These two stations are described below.

All stations would be constructed at-grade and would be fully compliant with ADA requirements. Most existing bus stops would remain and would be served by local buses. However, some existing bus stops located in the vicinity of the proposed LRT stations would be relocated to the station platforms.

Similar to BRT station platforms, typical side-running LRT stations in the shared operations section (along Santa Clara Street and Alum Rock Avenue west of 34th Street) would include a bulbed-out sidewalk area 9 feet wide (not including the existing sidewalk) and approximately 230 feet long to accommodate both buses and LRT vehicles. The platform height would vary from 6 inches at the ends of the platform and the bus boarding area, ramping up to 14 inches at train boarding locations.

East of King Road in the semi-exclusive median-running operation, the typical platform length for the stations would be 90 feet, the width would be 12.5 feet, and the platform height would be 14 inches. Ramps leading to the platforms from crosswalks would be approximately 25 feet in length.

The Transit Mall Station would need to accommodate large volumes of both passengers and pedestrians. Therefore, the LRT platforms at the Transit Mall Station would be 240 feet in length and 9 feet wide (not including the existing sidewalk). Similar to the BRT stations, the side-running LRT stations would be constructed as an extension (or bulb-out) of the existing sidewalk. The bus loading section of these platforms would have a height of 6 inches, ramping up to a height of 14 inches at the LRT loading section. The proposed stations and station options are further described below.

Diridon Station (LRT Alignment Option 1 Only). For LRT Alignment Option 1, the existing Vasona line stations and the proposed Almaden Boulevard Station would not be served by Santa Clara/Alum Rock LRT vehicles. The terminal station would consist of a center platform for both eastbound and westbound trains located in the Caltrain parking lot along Montgomery Street. Tailtrack would be provided past the platform and a crossover in front of the platform.

Almaden Boulevard Station. The Almaden Boulevard Station would be located in the median of Almaden Boulevard north of Post Street. The station would consist of a center platform for both eastbound and westbound trains. Passenger access would be provided by a pedestrian crosswalk. To ensure passenger safety while accessing the station, the Almaden Boulevard/Post Street intersection would be signalized.

1.2.3 Support Systems

In addition to the primary alignment and stations, Single Car LRT service would incorporate light rail support systems, including traction power system and substations, overhead contact, and communications support systems are described in the following sections.

Traction Power System and Substations. A traction power system is a distribution system that converts high-voltage commercial electrical power received from substations to medium-voltage direct current (DC) electric power and distributes it to the light rail vehicles via the overhead catenary or contact wire as they travel along the alignment. A traction power system consists of the power distribution mechanism and electrical substations.

The alignment would require four traction power substations (TPSS). The final location and placement of the substations along the alignment would be determined during the preliminary engineering phase. Locations for new substations that are under consideration include the following:

- In Caltrans right-of-way west of SR 87 north of West San Fernando Street;
- Along eastbound East Santa Clara Street between 11th Street and 12th Street in the parking lot of an existing restaurant;
- In Caltrans right-of-way at U.S. 101 and 30th Street, south of Alum Rock Avenue; and
- In Caltrans right-of-way east of I-680, south of Alum Rock Avenue.

Electrical power would be supplied to each TPSS by an underground feeder from the electrical utility distribution system. Alternate substations would be equipped with two primary feeders from the utility company and an automatic transfer switch to supply reliable power to the substation.

Each TPSS would be contained in a prefabricated substation housing that is factory-wired to accommodate internal components and built on a concrete foundation. Foundations would be equipped with embedded conduits to accommodate incoming alternating current primary power cables, control and communications cables, and the DC feeder cables to the overhead contract system.

The estimated size for each TPSS would be approximately 650 to 750 square feet in area and 12 to 15 feet in height. Substations sites need to allow a service vehicle to park, unless convenient parking is available on an adjacent roadway.

Overhead Contact System. For the side-running portion of the alignment west of 34th Street, poles for overhead power would be located along the sidewalk, jointly with streetlights wherever possible. Span wires to support the overhead power connections could alternatively be attached to buildings. For the center-running alignment east of 34th Street, typical TES poles between the two tracks would be utilized. Final location of Overhead Contact System (OCS) features would be determined during the preliminary engineering phase of the project. The final design would adhere to VTA design guidelines.

Communications System. The communications equipment and design would be fully compatible with the communications system that serves VTA's existing light rail operations. A wayside cable system, fiber optic cable, and two-way radio system would link light rail stations and traction power substations with the existing Operations Control Center by the use of supervisory control and data acquisition and remote terminal units. The communications system would consist of the following main components:

- Public address system with two-way voice announcement linking the Operations Control Center and the light rail stations;
- Two-way radio system with two-way voice announcement linking the Operations Control Center and light rail vehicles;
- Supervisory control and data acquisition system with the capability to monitor and control the TPSS switchgear functions from the Operations Control Center via the remote terminal units and wayside cable system;
- Pulse code modulation carrier system to provide for the multiplexing of voice and data channels between the Operations Control Center and locations along the Corridor; and

- Cable transmission system designed to incorporate both the backbone communications distribution (fiber optics) and metallic distribution. Wayside cabling would utilize a combined systems duct installed continuously along the Corridor.

Tailtrack at Diridon LRT Station. Implementation of LRT service in the Santa Clara-Alum Rock Corridor would not require any new vehicle maintenance facilities. Heavy maintenance activities and storage for most vehicles used on this line would continue to be performed at the existing Younger Street facility. However, a new tailtrack for mid-day storage of up to three vehicles, along with operator break facilities, would be constructed adjacent to the Diridon LRT Station. This tailtrack facility would include LRT track, TES poles, and overhead wires to accommodate up to three light rail vehicles.

Chapter 2 Environmental Setting

2.1 Topography, Meteorology, and Climate

The Santa Clara-Alum Rock Corridor is located in the southeastern portion of the San Francisco Bay Area Air Basin (SFBAAB) in Santa Clara Valley. The SFBAAB topography is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays. The only major break in California's Coast Range occurs in the Bay Area. The Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the Bay Area and the Central Valley.

The Santa Clara Valley is bounded by the San Francisco Bay to the north and by mountains to the east, south, and west. Temperatures are warm on summer days and cool on summer nights, and winter temperatures are fairly mild. At this southeastern end of the valley, temperatures can be more than 10 degrees warmer on summer afternoons and more than 10 degrees cooler on winter nights than the rest of the Valley.

Winds in the Santa Clara Valley are greatly influenced by the terrain, resulting in a prevailing flow that roughly parallels the Valley's northwest-southeast axis. A north-northwesterly sea breeze flows through the Valley during the afternoon and early evening, and a light south-southeasterly drainage flow occurs during the late evening and early morning. In the summer, the southern end of the Valley sometimes becomes a "convergence zone," when air flowing from the Monterey Bay gets channeled northward into the southern end of the Valley and meets with the prevailing north-northwesterly winds.

The air pollution potential of the Santa Clara Valley is high. High summer temperatures, stable air, and mountains surrounding the Valley combine to promote ozone formation. In addition to the many local sources of pollution, ozone precursors from San Francisco, San Mateo, and Alameda Counties are carried by prevailing winds to the Santa Clara Valley. The Valley tends to channel pollutants in a southeasterly direction. In addition, on summer days with low-level inversions, ozone can be recirculated by southerly drainage flows in the late evening and early morning and by the prevailing northwesterlies in the afternoon. A similar recirculation pattern occurs in the winter, affecting levels of carbon monoxide (CO) and particulate matter. This movement of the air up and down the Valley increases the impact of the pollutants such as ozone, CO, and particulate matter significantly.

The Santa Clara-Alum Rock Corridor is characterized by a large number of mobile sources. The San Jose Convention Center, Center for the Performing Arts, Civic Auditorium, San Jose State University, San Jose Medical Center, and the Mexican Heritage Plaza (among others) are all located in or near the Corridor and attract vehicle trips. State Route 87 (SR-87), Interstate 280 (I-280), Interstate 680 (I-680), and U.S. 101 also pass through or near the Corridor and contribute to air pollution in the Valley.

Chapter 3 Regulatory Framework

3.1 Federal

3.1.1.1 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives.

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

3.2 State

The California Air Resources Board (CARB), a part of the California EPA, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets California Ambient Air Quality Standards, compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. CARB establishes emissions standards for motor vehicles sold in California, consumer products (e.g., hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In 2005, in recognition of California's vulnerability to the effects of climate change, the Governor issued Executive Order S-3-05, which sets forth a series of target dates by which statewide emissions of GHG would be progressively reduced. These target dates include reduction of GHG emissions to 2000 levels by 2010, reduction of GHG emissions to 1990 levels by 2020, and reduction of GHG emissions to 80 percent below 1990 levels by 2050.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32 or AB 32), which requires CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). AB 32 also establishes a timetable for CARB to adopt emission limits, rules, and regulations designed to achieve the intent of the Act, including early action greenhouse gas emissions reduction measures to be identified by June 2007. CARB has identified three groups of early action measures that will make a substantial contribution to the overall 2020 statewide GHG emission reduction goal of approximately 174 million metric tons of CO2-equivalent gases. These measures are summarized as follows:

- Group 1. Three new GHG-only regulations were adopted June 21, 2007, to meet the narrow legal definition of "discrete early action GHG reduction measures": a low-carbon fuel standard, reduction of refrigerant losses from motor vehicle air conditioning system maintenance, and increased methane capture from landfills. These regulations are to take effect by January 1, 2010.

- Group 2. CARB is initiating work on another 23 GHG emission reduction measures in the 2007 to 2009 time period with rulemaking to occur as soon as possible, where applicable. These GHG measures relate to the following sectors: agriculture, commercial, education, energy efficiency, fire suppression, forestry, oil and gas, and transportation.

- Group 3. CARB is initiating work on 10 conventional air pollution controls aimed at criteria and toxic air pollutants, but with concurrent climate co-benefits through reductions in carbon dioxide or non-Kyoto pollutants (i.e., diesel particulate matter, other light-absorbing compounds, and/or ozone precursors) that contribute to global warming.

3.3 Regional

3.3.1.1 Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for comprehensive air pollution control in the SFBAAB, including Alameda County. To that end, the BAAQMD, a regional agency, works directly with the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and local governments and cooperates actively with all federal and state government agencies. The BAAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emissions sources, and enforces such measures through educational programs or fines, when necessary.

The BAAQMD is directly responsible for reducing emissions from stationary (area and point) sources and for assuring that state controls on mobile sources are effectively implemented. It has responded to this requirement by preparing a sequence of *Ozone Attainment Plans* and *Clean Air Plans* that comply with the Federal Clean Air Act (FCAA) and the California Clean Air Act (CCAA) to accommodate growth, reduce the pollutant levels in the Bay Area, meet federal and state ambient air quality standards (AAQS), and minimize the fiscal impact that pollution control measures have on the local economy.

Although the BAAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate the air quality issues associated with plans and new development projects within the Bay Area. Instead, the BAAQMD has used its expertise and prepared the *BAAQMD CEQA Guidelines* to indirectly address these issues in accordance with the projections and programs of the Ozone Attainment Plan and Clean Air Plan. The purpose of the *BAAQMD CEQA Guidelines* is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties, in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. Specifically, the *BAAQMD CEQA Guidelines* explain the procedures that the BAAQMD recommends be followed during environmental review processes required by CEQA. The *BAAQMD CEQA Guidelines* provide

direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. The BAAQMD intends that by providing this guidance, the air quality impacts of plans and development proposals will be analyzed accurately and consistently throughout the Bay Area, and adverse impacts will be minimized.

3.3.1.2 Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) determines if federally funded roadway improvement and transit projects, and roadway improvement projects for which federal permits are required, are consistent with BAAQMD's local attainment plan for ozone as well as with the SIP for the FCAA. This determination is based upon traffic studies that model the effects of roadway and transportation improvement projects and upon assessed changes in area-wide emissions of ozone precursors that the projects may bring about. If foreseeable changes would not upset the SIP schedule for attainment, then the studied projects may be added to the Regional Transportation Plan (RTP), a listing of funded roadway projects that involve federal funding or require federal permits.

3.3.1.3 Ambient Air Quality Standards

Based on the authority of the FCAA, as amended, and the CCAA, federal and State regulatory agencies set upper limits on airborne concentrations of ozone, CO, Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), particulate matter, and lead. Particulate matter is regulated as inhalable particulate matter less than ten microns in diameter (PM_{10}) and fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$).

The federal and State standards for criteria pollutants are summarized in Table 1. Such upper limits or AAQS are designed to protect all segments of the population including those most susceptible to the pollutants' adverse effects (e.g., the very young, the elderly, people weak from illness or disease, or persons doing heavy work or exercise). The potential human health effects of these air pollutants are presented in Table 2.

3.4 Attainment Status and Regional Air Quality Plans

Federal and state air quality laws require identification of areas not meeting the AAQS and implementation of regional air quality plans to eventually attain these standards. Under the FCAA and the CCAA, the SFBAAB does not meet the federal 8-hour standard for ozone nor the state AAQS for ozone and PM_{10}.

The FCAA, as amended, and the CCAA provide the legal framework for attaining and maintaining the ambient air quality standards. Both the federal and state acts require that the CARB designate as "nonattainment areas" portions of the state where federal or state AAQS are not met. Where a pollutant exceeds standards, air quality management plans must be formulated that demonstrate how the standards will be achieved. These laws also provide the basis for the implementing agencies to develop mobile and stationary source performance standards.

Table 1
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard[1, 3]	Federal Standard[2]	
			Primary[3, 4]	Secondary[3, 5]
Ozone	1-hour	0.09 ppm (180μg/m^3)	NA[6]	NA[6]
	8-hour	0.070 ppm (137 μg/m^3)	0.08 ppm (160 μg/m^3)	Same as Primary
Carbon Monoxide	1-hour	20.0 ppm (23 μg/m)	35 ppm (40 μg /m^3)	---
	8-hour	9.0 ppm (10 μg/m^3)	9.0 ppm (10 mg/m^3)	---
Nitrogen Dioxide	1-hour	0.18 ppm (338 μg/m^3)	---	---
	Annual Arith Mn	0.030 ppm (56 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as Primary
PM_{10}	24-hour	50 μg/m^3	150 μg/m^3	Same as Primary
	Ann Geo Mn	20 μg/m^3	---	---
	Ann Arith Mn	---	50 μg/m^3	Same as Primary
$PM_{2.5}$	24-hour	---	35 μg/m^3	Same as Primary
	Ann Arith Mn	12μg/m^3	15 μg/m^3	Same as Primary
Sulfur Dioxide	1-hour	0.25 ppm (655 μg/m^3)	---	---
	3-hour	---	---	---
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	---
	Ann Arith Mn	---	0.03 ppm (80 μg/m^3)	---
Sulfates	24-hour	25 μg/m^3	---	---
Lead	30-day Avg	1.5 μg/m^3	---	---
	Calendar Qtr	---	1.5 μg/m^3	Same as Primary
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m^3)	---	---
Visibility Reducing Particles[7]	8-hour observation	Extinction coefficient of 0.23 per kilometer[6]	---	---

Source: *Bay Area Air Quality Management District*, http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, 2008.

Notes:

--- = no standard; ppm = parts per million; μg/m^3 = microgram per cubic meter; μg /m^3 = milligrams per cubic meter, Avg. = average, Ann = annual, Arith = arithmetic, Geo = geometric, Mn = mean, Qtr = quarter

1. California standards for ozone, CO, SO_2, NO_2, and PM_{10} and visibility reducing particles are values that are not to be exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. In addition, Section 70200.5 lists vinyl chloride under standards for hazardous substances.
2. The form of the national standards (i.e., how the standard is applied) varies from pollutant to pollutant. For further information, 40 CFR Part 50 includes the relevant form for each federal standard.
3. Concentration expressed first in units in which it as promulgated. Equivalent units given in parenthesis are based upon reference temperature of 25ºC and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25ºC and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
4. Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the United States Environmental Protection Agency (EPA).
5. Secondary Standards: The levels of air quality necessary, to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by EPA.
6. As of June 2005, the federal 1-hour standard was revoked by the EPA.
7. U.S. EPA lowered the 24-hour $PM_{2.5}$ standard from 65 μg/m^3 to 35 μg/m^3 in 2006. The U.S. EPA is required to designate the attainment status of BAAQMD for the new standard by December of 2009.
8. Prevailing visibility is defined as the greatest visibility that is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors. Visibility standard expressed in terms of extinction due to particles when the relative humidity is less than 70 percent.

The U.S EPA approval of the *1982 Bay Area Air Quality Plan* (referred to as the 1982 Plan), which indicates how BAAQMD will implement federal air quality requirements, resulted in the 1982 Plan being incorporated into the SIP. The region's SIP is a compilation of plan components and air pollution control regulations that when taken together are designed to enable the region to attain and maintain the federal standards. Along with BAAQMD, MTC and the ABAG also contribute to the SIP. BAAQMD updated the 1982 Plan and adopted the *Bay Area '91 Clean Air Plan* to implement the requirements of the CCAA of 1988.

Table 2
Health Effects Summary of the Major Criteria Air Pollutants

Air Pollutant	Adverse Effects
Ozone	Eye irritation Respiratory function impairment
Carbon Monoxide	Impairment of oxygen transport in the blood stream Aggravation of cardiovascular disease Impairment of central nervous system function Fatigue, headache, confusion, dizziness Can be fatal in the case of very high concentrations in enclosed places
Nitrogen Dioxide	Risk of acute and chronic respiratory illness
Sulfur Dioxide	Aggravation of chronic obstruction lung disease Increased risk of acute and chronic respiratory illness
Lead	Impairment of blood functions and nerve constriction Behavioral and learning problems in children
Particulate Matter	May be inhaled and lodge in and irritate the lungs Increased risk of chronic respiratory disease with long exposure Altered lung function in children May produce acute illness with sulfur dioxide

Source: *Bay Area Air Quality Management District*. CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, April 1996, revised December 1999.*

As required by the CCAA and subsequent 1992 amendments, BAAQMD also prepared the *1994 Clean Air Plan Update*, the *Bay Area '97 Clean Air Plan*, and the *Bay Area 2000 Clean Air Plan*. To meet the State ozone standard, BAAQMD adopted the *2000 Clean Air Plan* on December 20, 2000 and submitted it to CARB, as required by the CCAA. The *2000 Clean Air Plan* includes a control strategy review to ensure that the plan continues to include all feasible measures to reduce ozone. No State plan is required to meet State PM_{10} standards.

In 1998, the Bay Area was redesignated as nonattainment for the federal ozone standards. Under the EPA's direction, BAAQMD prepared and submitted the *Bay Area Ozone Attainment Plan* in June 1999, as a revision to the SIP. This attainment plan was partially rejected by EPA. The parts of the 1999 plan that were disapproved include ozone attainment assessment, consistency of regional transportation plans and programs with air quality attainment plans, and the Reasonably Available Control Measure demonstration. In response to EPA's disapproval of the 1999 plan, a *Bay Area 2001 Ozone Attainment Plan* (Final Plan) was prepared in June 2001 by BAAQMD, MTC, and ABAG. This 2001 Plan was initially rejected by CARB prior to its submittal to EPA, but addenda were added and

CARB approved the plan and submitted it to EPA. On February 14, 2002, EPA approved the Final Plan.

The most recent SIP that has been developed to comply with state and federal regulation by the BAAQMD, the MTC, and the ABAG is the *Bay Area 2005 Ozone Strategy* (adopted January 4, 2006). The intent of *Bay Area 2005 Ozone Strategy* is to bring the SFBAAB into compliance with federal and state standards for ozone. The plan consists of adopted measures, emission inventories, contingency measures, and demonstration of emission reductions so that the region can attain ozone standards.

3.5 Local Air Quality Characteristics

3.5.1 Local Air Monitoring Data

BAAQMD monitors air quality conditions at stations throughout the San Francisco air basin. The nearest air quality monitoring station to the project site is San Jose – Jackson Street site. This monitoring station provided data on O_3, particulate matter (PM_{10} and $PM_{2.5}$), CO, and NO_x. The most recent three years of available data are presented in Table 3.

Table 3
Ambient Air Quality (2004 to 2006) at San Jose Central Monitoring Station

Pollutant	2004	2005	2006
Ozone			
Max 1-hr ppm	0.09 ppm	0.113 ppm	0.118 ppm
0.09 ppm (exceeds CAAQS)	0	1	5
Highest 8-hour	0.068	0.080	0.087
>0.08 ppm (exceeds NAAQS)	0	0	1
>0.09 ppm (exceeds CAAQS)	NA	NA	NA
Carbon Monoxide			
Max 8-hour	2.96 ppm	3.11 ppm	2.92 ppm
>9 ppm (1-hour NAAQS)	0	0	0
>9 ppm (1-hour CAAQS)	0	0	0
Particulates (PM_{10})			
Highest 24-hour	55.4 $\mu g/m^3$	49.9 $\mu g/m^3$	68.9 $\mu g/m^3$
>150 $\mu g/m^3$ (24-hour NAAQS)	0	0	0
>50 $\mu g/m^3$ (24-hour CAAQS)	4	2	2
Particulates ($PM_{2.5}$)			
Highest 24-hour	51.5 $\mu g/m^3$	54.6 $\mu g/m^3$	64.4 $\mu g/m^3$
>150 $\mu g/m^3$ (24-hour NAAQS)	0	0	0
Nitrogen Dioxide (NO_2)			
Highest 24-hour	0.073 $\mu g/m^3$	0.074 $\mu g/m^3$	0.074 $\mu g/m^3$
>150 $\mu g/m^3$ (24-hour NAAQS)	0	0	0

Source: California Air Resources Board, *Aerometric Data Analysis & Management*, http://www.arb.ca.gov/adam/welcome.html, March 2008.
Note: N/A – Not Available.

The San Jose – Jackson Street monitoring station recorded O_3 and PM_{10} exceedances between 2004 and 2006. The state 1-hour standard was exceeded once in 2005 and five times in 2006. PM_{10} data indicated four exceedances in 2004 and two in both 2005 and 2006. As previously discussed under Section 3.4, the SFBAAB is currently designated non-attainment for federal and State ozone and particulate matter standards.

3.5.2 Sensitive Receptors

Land uses such as schools, hospitals, residences, and convalescent homes are considered to be relatively sensitive to poor air quality because the young, the old, and the infirm are more susceptible to respiratory infections and other air-quality-related health problems than the general public.

There are a number of sensitive receptors along the entire project route. While Santa Clara Street and Alum Rock Avenue are largely commercial, residential uses (both single-family and multi-family) are also ubiquitous. A number of residences are also found along San Fernando Street, as well as on secondary streets adjacent to the Corridor. Other possible sensitive receptors along the Corridor include medical offices located on the 600 block of East Santa Clara Street. A medical office also exists on the 1600 block of Alum Rock Avenue.

Chapter 4 Impact Analysis

4.1 Significance Criteria

The California Environmental Quality Act (CEQA) prescribes the scope and content of environmental assessments and requires that assessments include declarations of significant adverse impacts and recommendations of feasible measures to mitigate the impacts. For air quality, the term "significant" describes an adverse effect that exceeds an existing State or regional agency standard governing that effect, or it may be applied to a project-generated change that is inconsistent with a local plan for attainment of air quality, meeting ambient air quality standards, where the local component of the SIP for the FCAA is such a local plan.

Based on significance criteria used by VTA and professional practice, the proposed project would result in substantial adverse effects related to air quality if they would:

- conflict with or obstruct of implementation of the federal or California CAA;
- violate federal or California air quality standards or contribute substantially to an existing or projected air quality violation;
- exceed BAAQMD's significance criteria;
- expose sensitive receptors to substantial pollutant concentrations;
- create objectionable odors affecting a substantial number of people; or
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or California ambient air quality standard.

With regard to the BAAQMD significance criteria above, thresholds are contained in the BAAQMD CEQA guidelines (1999). The proposed project is subject to these guidelines and would result in a significant impact on air quality if they would result in:

- a net increase in pollutant emissions of 80 pounds per day or 15 tons per year of reactive organic gases (ROG), nitrogen oxides (NO_X), or PM_{10}; or
- a net increase in CO emissions exceeding 550 pounds per day, reduction of roadway LOS of intersections operating at LOS E or F, reduction of intersection LOS to E or F, or increase in traffic volumes on nearby roadways by 10 percent or more, and violation of State CO concentration standards as determined by the modeling of CO emissions; or
- construction-related emissions would be considered a significant impact unless feasible control mitigation measures are employed to minimize particulate emissions.

4.2 Methodology

In the following analysis, mobile source emissions of ROG, NO_x, CO, and PM_{10} were estimated utilizing the Emission Factors (EMFAC) model. EMFAC was developed by CARB and is used to

calculate emissions rates from on-road motor vehicles from light-duty, heavy-duty trucks, and buses that operate on highways, freeways, and local roads in California. The model was adjusted to account for vehicle emissions in Santa Clara County. The most recent version of EMFAC was used for this analysis, which is EMFAC 2007.

BAAQMD recommends the use of CALINE4, a dispersion model for predicting localized CO concentrations, as the preferred method of estimating pollutant concentrations at sensitive receptors near congested roadways and intersections. For each intersection analyzed, CALINE4 adds roadway-specific CO emissions calculated from peak-hour turning volumes to the existing ambient CO air concentrations. For this analysis, CO concentrations were calculated based on a simplified CALINE4 screening procedure developed by BAAQMD. The simplified model is intended as a screening analysis in order to identify potential CO hotspots. This methodology assumes worst-case conditions and provides a screening of maximum, worst-case CO concentrations.

4.3 Project Construction Impacts

Construction and demolition activities are a major source of airborne particulate matter contamination in Santa Clara County. Construction activities for the proposed project could have a temporary adverse effect on local air quality in the immediate vicinity of the site due to the effects of such activities on local concentrations of airborne particulate matter. Fugitive dust emissions could be generated as a result of construction activity. However, BAAQMD-specified mitigation measures would be implemented to reduce dust impacts from project construction to a less-than-significant level.

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 adverse construction impacts. However, BAAQMD recommends that abatement measures be applied for PM_{10} emissions, with measures being intensified during periods of heavy construction activity. BAAQMD also provides a list of PM_{10} 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 will be implemented. These measures are listed below in Section 4.3.1, Mitigation Measures.

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 will also serve to ensure that PM_{10} levels will not be generated in significant amounts.

4.3.1 Mitigation 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 PM_{10} during the project's construction period. Except when it is raining, the following construction practices would be implemented during construction of the project:

- Water all active construction areas at least twice daily;
- Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard; and
- Sweep daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

Other mitigation measures are suggested by BAAQMD for reduction of PM_{10} during project construction, but due to the lack of unpaved roads, and soil piles on the project site, and the minimal amount of active construction site at any one time, these measures are not applicable.

4.4 Project Operational Impacts

4.4.1 Emissions of Criteria Pollutants

BRT buses would utilize existing infrastructure. According to the *Santa Clara-Alum Rock Corridor Operating and Maintenance Statistics and Costs* document (dated December 2007), under the proposed BRT service, buses would travel approximately 476,100 miles annually, which would translate into approximately 1,304 miles per day. Using the EMFAC2007 model emission inventory BRT emissions for CO, NO_X, PM_{10}, and ROG were calculated. Table 4 indicates the results of the modeling. Modeling assumptions and EMFAC model outputs can be found in Appendix A.

The emissions associated with the BRT service would not exceed the BAAQMD thresholds of significance. While ROG, PM_{10}, CO, and NO_x emissions generated by the BRT service would already be less than significant, they would be even lower in future years. The VTA plans on using zero-emission buses (ZEBs) into the fleet. The EMFAC2007 model does not account for the use of ZEBs; therefore the analysis provides a worst-case analysis of emissions generated by buses under the BRT service. The use of ZEBs would further decrease CO, NO_X, PM_{10}, and ROG emissions.

Single Car LRT vehicles would be run by electric power. Consequently, emissions from the operation of the cars themselves would be essentially zero for the pollutants ROG, PM_{10}, CO, and NO_x and would not exceed BAAQMD ROG/NO_x significance thresholds for operational emissions. Likewise, because the Single Car LRT vehicles will be running on steel rails, emissions of PM_{10} produced by the operation of the light rail will also be essentially zero, and the BAAQMD PM_{10} threshold would not be exceeded by the operation of the project.

Table 4

Operational Project Emissions			
Pollutant	**Project Emissions (pounds/day)**	**BAAQMD Thresholds (pounds/day)**	**Threshold Exceeded?**
ROG	0.58	80	***No***
NO_X	17.86	80	***No***
PM_{10}	0.30	80	***No***
CO	42.28	550	***No***

Source: CARB, *EMFAC 2007*, modeled March 2008.

Note:

The calculations and EMFAC Modeling runs can be found in Appendix A.

4.4.2 Mobile Source Air Toxics

Mobile source air toxics (MSATs) are air pollutants that cause adverse health effects. The U.S. EPA has focused most of its air toxics efforts to date on carcinogens, which are compounds that cause cancer. MSATs include several pollutants that EPA classifies as known or probable human carcinogens. Benzene, for instance, is a known human carcinogen, while formaldehyde, acetaldehyde, 1,3-butadiene and diesel particulate matter are probable human carcinogens.

The area of MSATs is a new and emerging issue and is a continuing area of research. Although much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques available for assessing project-specific health impacts from MSATs are limited. Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue. The Federal Highway Administration (FHWA) is currently preparing guidance as to how mobile-source health risks should factor into project-level decision making. In addition, EPA has not established regulatory concentration targets for the six relevant MSAT pollutants appropriate for use in the project development process.

As previously discussed, BRT service would include the use of ZEB buses. In addition, Single Car LRT service would operate LRT cars which would be run by electric power. Therefore, impacts associated with MSATs would be considered less than significant.

4.4.3 Local Carbon Monoxide Concentrations

High concentrations of CO usually occur at congested intersections where traffic is slow or idling. CO impacts could be created if the proposed project would cause decreased levels of service at any intersection. BAAQMD specifies that localized CO concentration should be analyzed at intersections that would result in a reduction of roadway level of service (LOS) of intersections operating at LOS E or F; reduction of intersection LOS to E or F; or an increase in traffic volumes on nearby roadways by 10 percent or more. For this analysis, a simplified CALINE 4 CO analysis was used to evaluate "worst-case" air quality conditions for Year 2030.

The traffic information for the CO analysis was obtained from the *Transportation Study for the Santa Clara-Alum Rock Corridor* (dated September 2007) and the Addendum to the September 2007 *Transportation Study for the Santa Clara-Alum Rock Corridor* (dated June 2008). Under both Year

2012 and 2030 scenarios, the PM peak hour would include the highest traffic volumes and have more intersections operating at a deficient LOS. Under Year 2012, the CO analysis accounts for only the development of BRT service. Under Year 2012, only three intersections would result in a deficient LOS of D or worse. Table 5 includes the findings of the Year 2012 scenario.

Under Year 2030, five intersections were considered for BRT operations. Table 6 indicates which intersections would result in a deficient LOS of D or worse with the implementation of BRT service. The intersections that were modeled resulted in the greatest increase in delay times with implementation of the project. The CO concentrations were based on a screening level analysis for localized hotspots. CO modeling output sheets can be found in the Air Quality Study.

As indicated in Table 5 and Table 6, CO emissions as a result of BRT service for both Year 2012 and 2030 would be well below both the 1-hour and 8-hour standard of 20.0 ppm and 9.0 ppm. The implementation of BRT service would result in a less-than-significant impact in regards to CO.

Table 3.3-5
CO Concentrations Resulting from BRT Operations—Year 2012

Intersection	1-hr Standard (ppm)[a]	1-hr Emissions Year 2012 BRT Operations (ppm)	8-hr Standard (ppm)[a]	8-hr Emissions Year 2030 BRT Operations (ppm)
Santa Clara Street/ 24th Street	20.0	3.9	9.0	2.7
680 SB Ramp/ Alum Rock Avenue	20.0	3.7	9.0	2.6
680 NB Ramp/ Alum Rock Avenue	20.0	3.8	9.0	2.7

Notes:

Total concentrations are based on CALINE4 output including background ambient 1-hour CO concentrations of 2.7 ppm for year 2030 based on EMFAC 2007 Emissions.

a. The State 1-hour standard is 20 ppm; the federal standard is 35 ppm. The more stringent State standard is reflected in the table. The State and federal eight-hour standard is 9 ppm.

CO impacts were also analyzed for Single Car LRT service. The implementation of Single Car LRT service would not generate CO emissions directly as it would operate using electricity. However, the addition of LRT service in the Corridor would increase delay times at surrounding intersections which could potentially increase CO levels within the surrounding areas. Table 7 includes an analysis of intersections that would operate at an LOS D or worse as a result of the implementation of Single Car LRT service. The results of the CO analysis indicate that the highest CO emissions would occur at the 10th Street/Santa Clara intersection with emissions at 3.4 ppm (1-hour) and 2.3 ppm (8-hour). Similar to BRT operations CO analysis discussed above, CO emissions with the implementation of Single Car LRT service were analyzed for the PM peak hour.

As shown in Tables 5, 6, and 7, implementation of BRT or Single Car LRT service would not result in emissions that could violate federal or State standards for CO. Both BRT and Single Car LRT would generate relatively similar CO emissions. Therefore, the proposed project would result in a less-than-significant impact regarding CO.

Table 6
CO Concentrations Resulting from BRT Service – Year 2030[1]

Intersection	1-hr Standard (ppm)[2]	1-hr Emissions Year 2030 BRT Service (ppm)	8-hr Standard (ppm)[2]	8-hr Emissions Year 2030 BRT Service (ppm)
2nd Street/Santa Clara Street	20.0	3.1	9.0	2.3
Santa Clara Street/28th Street	20.0	3.4	9.0	2.4
Alum Rock Avenue/McCreery	20.0	3.2	9.0	2.3
680 SB Ramp/Alum Rock Avenue	20.0	3.3	9.0	2.3
680 NB Ramp/Alum Rock Avenue	20.0	3.3	9.0	2.3

Notes:

1. Total concentrations are based on CALINE4 output including background ambient 1-hour CO concentrations of 2.7 ppm for year 2030 based on EMFAC 2007 Emissions.
2. The State 1-hour standard is 20 ppm; the federal standard is 35 ppm. The more stringent State standard is reflected in the table. The State and federal eight-hour standard is 9 ppm.

Table 7
CO Concentrations Resulting from LRT Services – Year 2030[1]

Intersection	1-hr Standard (ppm)[2]	1-hr Emissions Year 2030 LRT Service (ppm)	8-hr Standard (ppm)[2]	8-hr Emissions Year 2030 LRT Service (ppm)
Market Street/Santa Clara Street	20.0	3.3	9.0	2.3
10th Street/Santa Clara Street	20.0	3.4	9.0	2.4
Alum Rock Avenue/McCreery	20.0	3.2	9.0	2.3
650 SB/Alum Rock Avenue	20.0	3.3	9.0	2.3

Notes:

1. Total concentrations are based on CALINE4 output including background ambient 1-hour CO concentrations of 2.7 ppm for year 2030 based on EMFAC 2007 Emissions.
2. The State 1-hour standard is 20 ppm; the federal standard is 35 ppm. The more stringent State standard is reflected in the table. The State and federal eight-hour standard is 9 ppm.

4.5 Cumulative Impacts

The BAAQMD CEQA Guidelines indicate that a project would have a "cumulatively considerable" impact if the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. According to the BAAQMD CEQA Guidelines, any proposed project that would individually

have a significant air quality impacts would also be considered to have a significant cumulative air quality impact.

As discussed in Section 4.4, the operational emissions resulting from both the Single Car LRT and BRT services would not exceed the BAAQMD significance thresholds for ROG, NOX, and PM_{10}. For cumulative ROG, NOX, and PM_{10} impacts as related to long-term operational emissions, the Single Car LRT service would contribute essentially zero ROG, NO_X, and PM_{10} emissions and would therefore not lead to a cumulatively adverse impact. The BRT service would also contribute minimal amounts of ROG, NOX, and PM_{10}. Based upon the guidance provided by the BAAQMD, the proposed project would not result in a cumulatively considerable contribution with regard to criteria pollutants, and this impact would be less than significant.

For CO, the cumulative impact threshold for emissions is the same as that for project-specific impacts (20 ppm averaged over 1 hour and 9 ppm averaged over 8 hours). For analysis of cumulative indirect CO emissions, cumulative traffic impacts are compared to the same criteria listed above for project-specific indirect CO emissions. As shown in the CO concentration analysis in this study, the CO concentrations resulting from cumulative conditions (Year 2030 conditions) for the proposed project would not exceed either State or federal AAQS. Therefore, the project would not lead to a cumulatively adverse CO impact.

The proposed project would generate PM_{10} during the construction phase. Cumulative impacts from PM_{10} construction-related emissions, in association with the collective contribution of PM_{10} from nearby sources, cannot be quantitatively determined. The *BAAQMD CEQA Guidelines* state that construction emissions from a project need not be quantified, but that all feasible mitigation measures would be implemented to reduce any impact. Implementation of applicable mitigation measures from *BAAQMD's CEQA Guidelines* (Section 4.3.1, Mitigation Measures) would reduce the impacts of construction emissions of particulate matter to the extent feasible, resulting in an impact that would be temporary and less-than-cumulatively considerable.

Appendix A: **EMFAC2007 Models and Calculations**

ROG, NOX, PM10 and CO Emissions Calculations

Assumptions

Total VMT			
Annual	476,100		
Daily [1]	1304.38		
Mass			
1 gram = lbs	0.002205		
Hours of Operation		***Fleet***	
Daily Hours	17	***Total Buses***	10

ROG Emissions

Speed	Emfac Emissions (grams/mile/hour)	Project Emission grams/miles/ day[2]	Project ROG lbs/mile/day	Total Buses lbs/mile/day
35	0.331	26.17	0.0577	0.5769

NOx Emissions Emissions

Speed	Emfac Emissions (grams/mile/hour)	Project Emission grams/miles/ day[2]	Project NOx lbs/mile/day	Total Buses lbs/mile/day
35	10.25	810.30	1.7864	17.8640

PM10 Emissions Emissions

Speed	Emfac Emissions (grams/mile/hour)	Project Emission grams/miles/ day[2]	Project PM10 lbs/mile/day	Total Buses lbs/mile/day
35	0.165	13.04	0.0288	0.2876

CO Emissions Emissions

Speed	Emfac Emissions (grams/mile/hour)	Project Emission grams/miles/ day[2]	Project CO lbs/mile/day	Total Buses lbs/mile/day
35	1918	1918.00	4.2285	42.2847

Notes:

1. Daily Miles were determined based on a 365 day year.
2. The following equation was used to determine Project emissions in Grams/Mile/day

Project Emissions (gram/mile/day) = (EMFAC/Hours of Operation)*Daily Miles Traveled

2. The following equation was used to detrmined the Project Emissions (lbs/mile/day):

Project Emissions (lbs/mile/day) = Project Emissions (gram/mile/day) x 0.002205(gram/lbs)

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	2.746	6.422	0.000	0.000	0.423
35	0.007	0.015	0.021	0.158	0.331	1.773	0.029

Pollutant Name: Carbon Monoxide Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	17.494	40.343	0.000	0.000	2.680
35	0.562	1.010	1.184	1.097	1.773	13.788	0.873

Pollutant Name: Oxides of Nitrogen Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	4.200	83.441	0.000	0.000	2.970
35	0.043	0.090	0.172	1.848	10.258	1.176	0.148

Pollutant Name: Carbon Dioxide Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	819.141	4888.694	0.000	0.000	220.098
35	309.410	395.059	534.951	1486.760	1918.650	139.912	393.660

Pollutant Name: Sulfur Dioxide Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.008	0.047	0.000	0.000	0.002
35	0.003	0.004	0.005	0.014	0.018	0.002	0.004

Pollutant Name: PM10 Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.043	0.401	0.000	0.000	0.016
35	0.008	0.018	0.021	0.081	0.165	0.014	0.015

Pollutant Name: PM10 - Tire Wear Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.008	0.008	0.009	0.023	0.009	0.004	0.008

Pollutant Name: PM10 - Brake Wear Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.013	0.013	0.013	0.020	0.013	0.006	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	28.555	22.336	16.489	17.738	17.679	52.961	25.634

Pollutant Name: Diesel - mi/gal Temperature: 75F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	29.156	29.156	19.461	6.079	4.019	0.000	8.070

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.005	0.009	0.026	0.052	0.083	0.567	0.015
10	0.010	0.018	0.051	0.101	0.162	0.704	0.026
20	0.018	0.035	0.099	0.191	0.308	0.965	0.048
30	0.027	0.051	0.145	0.271	0.437	1.212	0.067
40	0.034	0.065	0.188	0.340	0.548	1.444	0.086
50	0.041	0.079	0.229	0.399	0.643	1.660	0.102
60	0.048	0.091	0.267	0.447	0.721	1.819	0.117
120	0.073	0.143	0.447	0.546	0.880	2.154	0.173
180	0.078	0.152	0.477	0.579	0.934	2.302	0.184
240	0.083	0.162	0.507	0.611	0.986	2.447	0.196
300	0.088	0.171	0.537	0.643	1.036	2.588	0.207
360	0.093	0.180	0.567	0.673	1.085	2.727	0.218
420	0.097	0.190	0.597	0.702	1.132	2.863	0.229
480	0.102	0.199	0.626	0.730	1.177	2.996	0.240
540	0.106	0.208	0.655	0.757	1.220	3.125	0.250
600	0.111	0.216	0.685	0.783	1.262	3.252	0.261
660	0.115	0.225	0.714	0.808	1.302	3.376	0.271
720	0.120	0.234	0.742	0.832	1.341	3.497	0.281

Pollutant Name: Carbon Monoxide Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.067	0.127	0.326	0.735	0.741	2.833	0.166
10	0.132	0.250	0.644	1.441	1.453	3.309	0.308
20	0.257	0.486	1.258	2.762	2.785	4.225	0.579
30	0.375	0.710	1.841	3.964	3.996	5.095	0.833
40	0.487	0.920	2.395	5.046	5.087	5.920	1.071
50	0.591	1.117	2.920	6.008	6.058	6.698	1.292
60	0.689	1.300	3.414	6.852	6.908	7.431	1.497
120	1.088	2.046	5.504	9.393	9.471	10.841	2.302

180	1.196	2.245	6.102	9.668	9.748	11.889	2.505
240	1.293	2.425	6.636	9.952	10.034	12.865	2.689
300	1.379	2.584	7.106	10.244	10.329	13.769	2.854
360	1.453	2.723	7.513	10.546	10.633	14.600	3.000
420	1.517	2.842	7.856	10.857	10.946	15.358	3.127
480	1.570	2.941	8.135	11.177	11.269	16.044	3.236
540	1.612	3.020	8.350	11.506	11.600	16.658	3.325
600	1.643	3.078	8.501	11.844	11.941	17.199	3.395
660	1.663	3.117	8.588	12.191	12.291	17.667	3.446
720	1.672	3.135	8.612	12.547	12.650	18.063	3.479

Pollutant Name: Oxides of Nitrogen Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.034	0.081	0.509	0.211	0.397	0.148	0.108
10	0.036	0.087	0.534	0.318	0.598	0.186	0.119
20	0.041	0.098	0.580	0.505	0.951	0.254	0.139
30	0.045	0.107	0.619	0.658	1.238	0.309	0.155
40	0.049	0.114	0.653	0.776	1.460	0.353	0.168
50	0.051	0.120	0.680	0.860	1.617	0.385	0.178
60	0.053	0.124	0.701	0.908	1.709	0.406	0.185
120	0.057	0.134	0.764	0.912	1.715	0.407	0.197
180	0.057	0.133	0.762	0.908	1.708	0.402	0.197
240	0.057	0.132	0.756	0.903	1.699	0.396	0.195
300	0.056	0.131	0.747	0.896	1.686	0.389	0.193
360	0.055	0.128	0.733	0.888	1.670	0.379	0.190
420	0.054	0.126	0.716	0.877	1.650	0.368	0.186
480	0.052	0.122	0.695	0.865	1.627	0.355	0.181
540	0.051	0.118	0.670	0.851	1.601	0.341	0.176
600	0.049	0.114	0.642	0.835	1.571	0.325	0.169
660	0.047	0.108	0.609	0.818	1.538	0.307	0.162
720	0.044	0.103	0.573	0.799	1.502	0.288	0.154

Pollutant Name: Carbon Dioxide Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	11.965	15.175	21.358	2.819	2.799	13.224	13.527
10	13.431	17.085	24.109	5.622	5.583	15.419	15.329
20	16.855	21.524	30.477	11.182	11.104	19.730	19.473
30	20.931	26.786	38.000	16.679	16.563	23.934	24.336
40	25.662	32.874	46.678	22.114	21.960	28.030	29.919
50	31.046	39.786	56.510	27.486	27.295	32.020	36.222
60	37.083	47.522	67.498	32.797	32.568	35.903	43.244
120	86.418	110.327	156.181	55.781	55.393	53.339	99.349
180	98.092	125.282	177.418	65.901	65.442	57.584	112.890
240	109.747	140.202	198.590	75.424	74.899	61.581	126.376
300	121.384	155.087	219.697	84.350	83.762	65.327	139.804
360	133.002	169.936	240.739	92.678	92.032	68.825	153.177
420	144.602	184.750	261.716	100.409	99.709	72.074	166.493
480	156.183	199.529	282.629	107.542	106.793	75.073	179.753
540	167.746	214.272	303.476	114.079	113.284	77.823	192.956
600	179.291	228.980	324.258	120.018	119.181	80.324	206.103
660	190.817	243.652	344.975	125.359	124.486	82.576	219.193

720	202.325	258.289	365.628	130.103	129.197	84.579	232.228

Pollutant Name: Sulfur Dioxide Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.001	0.000	0.000	0.000	0.000
60	0.000	0.000	0.001	0.000	0.000	0.001	0.000
120	0.001	0.001	0.002	0.001	0.001	0.001	0.001
180	0.001	0.001	0.002	0.001	0.001	0.001	0.001
240	0.001	0.001	0.002	0.001	0.001	0.001	0.001
300	0.001	0.002	0.002	0.001	0.001	0.001	0.001
360	0.001	0.002	0.002	0.001	0.001	0.001	0.002
420	0.001	0.002	0.003	0.001	0.001	0.001	0.002
480	0.002	0.002	0.003	0.001	0.001	0.001	0.002
540	0.002	0.002	0.003	0.001	0.001	0.001	0.002
600	0.002	0.002	0.003	0.001	0.001	0.001	0.002
660	0.002	0.002	0.003	0.001	0.001	0.001	0.002
720	0.002	0.003	0.004	0.001	0.001	0.001	0.002

Pollutant Name: PM10 Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.001	0.001	0.000	0.000	0.007	0.001
10	0.001	0.002	0.002	0.001	0.001	0.006	0.001
20	0.002	0.004	0.004	0.001	0.002	0.005	0.003
30	0.003	0.006	0.006	0.002	0.002	0.004	0.004
40	0.003	0.007	0.007	0.003	0.003	0.003	0.005
50	0.004	0.009	0.009	0.003	0.004	0.003	0.006
60	0.005	0.010	0.010	0.004	0.004	0.003	0.007
120	0.008	0.017	0.017	0.005	0.006	0.006	0.012
180	0.009	0.019	0.019	0.005	0.006	0.008	0.013
240	0.010	0.021	0.021	0.005	0.006	0.010	0.014
300	0.011	0.022	0.022	0.005	0.006	0.012	0.015
360	0.011	0.024	0.024	0.005	0.007	0.014	0.016
420	0.012	0.025	0.025	0.006	0.007	0.016	0.017
480	0.012	0.025	0.026	0.006	0.007	0.017	0.017
540	0.012	0.026	0.026	0.006	0.007	0.018	0.018
600	0.013	0.027	0.027	0.006	0.007	0.018	0.018
660	0.013	0.027	0.027	0.006	0.008	0.019	0.018
720	0.013	0.027	0.027	0.006	0.008	0.019	0.018

Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.028	0.045	0.031	0.003	0.015	0.123	0.033
10	0.051	0.084	0.058	0.006	0.028	0.230	0.061
20	0.088	0.143	0.099	0.011	0.049	0.400	0.105
30	0.113	0.184	0.128	0.014	0.063	0.524	0.135
40	0.122	0.200	0.139	0.015	0.068	0.574	0.146

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
75	0.037	0.077	0.067	0.002	0.001	0.395	0.061

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5b: Multi-Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
75	0.003	0.006	0.004	0.000	0.000	0.037	0.005

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 6a: Partial Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
75	0.019	0.046	0.046	0.001	0.001	0.148	0.033

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 6b: Multi-Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
75	0.002	0.003	0.003	0.000	0.000	0.015	0.003

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.553	0.326	0.080	0.032	0.001	0.007	1.000
%TRIP	0.543	0.297	0.107	0.045	0.000	0.008	1.000
%VEH	0.566	0.315	0.073	0.018	0.000	0.027	1.000

Title : VTA Alum Rock SC-AR
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 10:26:39
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Santa Clara
****
*****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 8: Evaporative Running Loss Emissions (grams/minute)

Pollutant Name: Reactive Org Gases Temperature: 75F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.009	0.260	0.221	0.062	0.206	0.004	0.110
2	0.007	0.133	0.114	0.032	0.105	0.036	0.058
3	0.009	0.093	0.080	0.022	0.072	0.054	0.043
4	0.010	0.075	0.065	0.018	0.056	0.064	0.036
5	0.012	0.064	0.056	0.015	0.046	0.070	0.033
10	0.015	0.043	0.039	0.010	0.028	0.084	0.026
15	0.016	0.037	0.034	0.008	0.023	0.089	0.024
20	0.016	0.035	0.033	0.008	0.021	0.091	0.024
25	0.017	0.034	0.032	0.008	0.021	0.093	0.024
30	0.017	0.034	0.032	0.008	0.021	0.093	0.024
35	0.017	0.034	0.032	0.008	0.021	0.093	0.024
40	0.017	0.034	0.032	0.008	0.021	0.093	0.024
45	0.017	0.034	0.032	0.008	0.021	0.093	0.024
50	0.017	0.034	0.032	0.008	0.021	0.093	0.024
55	0.017	0.034	0.032	0.008	0.021	0.094	0.024
60	0.017	0.034	0.032	0.008	0.021	0.094	0.024

VTA-Alum Rock CO.rts

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	2.746	6.669	0.000	0.000	0.431
5	0.046	0.090	0.124	1.264	1.430	4.962	0.143
10	0.029	0.056	0.078	0.725	1.021	3.743	0.092
15	0.019	0.038	0.053	0.386	0.756	2.970	0.062
20	0.014	0.027	0.039	0.247	0.581	2.479	0.046
25	0.010	0.020	0.030	0.211	0.463	2.178	0.038
30	0.008	0.016	0.024	0.181	0.383	2.014	0.033
35	0.007	0.014	0.020	0.157	0.328	1.961	0.030
40	0.006	0.012	0.018	0.139	0.292	2.010	0.028
45	0.006	0.011	0.016	0.124	0.269	2.168	0.028
50	0.006	0.011	0.016	0.113	0.257	2.460	0.030
55	0.006	0.011	0.016	0.107	0.254	2.934	0.033
60	0.006	0.012	0.017	0.103	0.261	3.675	0.039

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	17.494	46.335	0.000	0.000	2.869
5	0.913	1.669	2.078	5.126	10.443	25.867	1.581
10	0.829	1.508	1.834	3.327	6.681	21.924	1.372
15	0.756	1.370	1.640	2.204	4.534	19.312	1.213
20	0.691	1.249	1.482	1.615	3.264	17.645	1.093
25	0.635	1.144	1.349	1.355	2.492	16.716	1.001
30	0.584	1.053	1.236	1.187	2.017	16.436	0.926
35	0.540	0.972	1.139	1.083	1.731	16.818	0.866
40	0.500	0.901	1.055	1.028	1.576	17.973	0.821
45	0.465	0.839	0.982	1.012	1.520	20.151	0.791
50	0.434	0.784	0.920	1.033	1.555	23.807	0.778
55	0.406	0.735	0.866	1.091	1.686	29.753	0.788
60	0.382	0.693	0.822	1.190	1.937	39.436	0.831

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	4.200	81.147	0.000	0.000	2.898
5	0.093	0.200	0.336	4.602	23.977	1.500	0.333
10	0.081	0.173	0.290	3.548	18.446	1.435	0.273
15	0.072	0.152	0.256	2.805	14.928	1.391	0.230
20	0.065	0.137	0.232	2.366	12.702	1.365	0.202
25	0.060	0.125	0.215	2.158	11.354	1.355	0.185
30	0.056	0.117	0.204	2.000	10.656	1.358	0.173
35	0.053	0.111	0.198	1.890	10.493	1.373	0.166
40	0.051	0.107	0.196	1.827	10.837	1.399	0.162
45	0.050	0.106	0.199	1.813	11.739	1.437	0.162
50	0.050	0.106	0.207	1.851	13.341	1.487	0.167
55	0.051	0.109	0.220	1.951	15.915	1.550	0.176
60	0.053	0.114	0.241	2.125	19.943	1.628	0.192

Pollutant Name: Carbon Dioxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	819.141	4689.763	0.000	0.000	213.822
5	924.038	1180.543	1672.323	2694.153	2509.847	266.277	1121.217
10	698.259	892.163	1242.057	2261.541	2263.162	221.972	853.323
15	547.645	699.789	963.112	1932.224	2117.485	190.659	673.994
20	445.798	569.703	778.682	1702.674	2028.785	168.693	552.858
25	376.645	481.377	655.638	1611.039	1973.659	153.761	472.817
30	330.280	422.157	574.260	1540.351	1939.316	144.433	418.959
35	300.599	384.246	522.729	1486.760	1918.650	139.912	384.275
40	283.953	362.985	494.135	1448.156	1907.773	139.905	364.598
45	278.395	355.885	484.856	1423.502	1904.769	144.582	357.713
50	283.289	362.137	493.760	1412.523	1909.129	154.631	362.909
55	299.194	382.452	521.970	1415.620	1921.597	171.399	380.841
60	327.968	419.203	573.104	1433.995	1944.388	197.188	413.659

Pollutant Name: Sulfur Dioxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.008	0.045	0.000	0.000	0.002
5	0.009	0.011	0.016	0.026	0.024	0.003	0.011
10	0.007	0.009	0.012	0.022	0.022	0.003	0.008
15	0.005	0.007	0.009	0.018	0.020	0.002	0.006
20	0.004	0.005	0.007	0.016	0.019	0.002	0.005
25	0.004	0.005	0.006	0.015	0.019	0.002	0.005
30	0.003	0.004	0.006	0.015	0.019	0.002	0.004
35	0.003	0.004	0.005	0.014	0.018	0.002	0.004
40	0.003	0.003	0.005	0.014	0.018	0.002	0.004
45	0.003	0.003	0.005	0.014	0.018	0.002	0.003
50	0.003	0.003	0.005	0.013	0.018	0.002	0.003
55	0.003	0.004	0.005	0.014	0.018	0.002	0.004
60	0.003	0.004	0.006	0.014	0.019	0.003	0.004

Pollutant Name: PM10 Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.043	0.416	0.000	0.000	0.017
5	0.051	0.109	0.129	0.199	0.681	0.030	0.081
10	0.033	0.070	0.084	0.160	0.492	0.024	0.054
15	0.022	0.048	0.058	0.131	0.368	0.019	0.037
20	0.016	0.035	0.042	0.110	0.286	0.017	0.028
25	0.012	0.026	0.032	0.096	0.230	0.015	0.021
30	0.010	0.021	0.025	0.087	0.191	0.014	0.017
35	0.008	0.018	0.021	0.081	0.165	0.014	0.015
40	0.007	0.016	0.019	0.079	0.148	0.014	0.014
45	0.007	0.015	0.018	0.079	0.137	0.016	0.013
50	0.007	0.015	0.018	0.082	0.131	0.018	0.013
55	0.007	0.015	0.018	0.087	0.130	0.021	0.014
60	0.008	0.017	0.020	0.095	0.134	0.026	0.015

Pollutant Name: PM10 - Tire Wear Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.008	0.008	0.009	0.023	0.009	0.004	0.008
10	0.008	0.008	0.009	0.023	0.009	0.004	0.008
15	0.008	0.008	0.009	0.023	0.009	0.004	0.008
20	0.008	0.008	0.009	0.023	0.009	0.004	0.008
25	0.008	0.008	0.009	0.023	0.009	0.004	0.008
30	0.008	0.008	0.009	0.023	0.009	0.004	0.008
35	0.008	0.008	0.009	0.023	0.009	0.004	0.008
40	0.008	0.008	0.009	0.023	0.009	0.004	0.008
45	0.008	0.008	0.009	0.023	0.009	0.004	0.008
50	0.008	0.008	0.009	0.023	0.009	0.004	0.008
55	0.008	0.008	0.009	0.023	0.009	0.004	0.008
60	0.008	0.008	0.009	0.023	0.009	0.004	0.008

Pollutant Name: PM10 - Brake Wear Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.013	0.013	0.013	0.020	0.013	0.006	0.013
10	0.013	0.013	0.013	0.020	0.013	0.006	0.013
15	0.013	0.013	0.013	0.020	0.013	0.006	0.013
20	0.013	0.013	0.013	0.020	0.013	0.006	0.013
25	0.013	0.013	0.013	0.020	0.013	0.006	0.013
30	0.013	0.013	0.013	0.020	0.013	0.006	0.013
35	0.013	0.013	0.013	0.020	0.013	0.006	0.013
40	0.013	0.013	0.013	0.020	0.013	0.006	0.013
45	0.013	0.013	0.013	0.020	0.013	0.006	0.013
50	0.013	0.013	0.013	0.020	0.013	0.006	0.013
55	0.013	0.013	0.013	0.020	0.013	0.006	0.013

60	0.013	0.013	0.013	0.020	0.013	0.006	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	9.572	7.483	5.201	3.511	3.499	27.467	8.625
10	12.664	9.899	6.964	5.277	5.260	33.047	11.396
15	16.143	12.616	8.980	7.507	7.483	38.487	14.511
20	19.826	15.493	11.146	10.109	10.076	43.407	17.806
25	23.462	18.333	13.312	12.883	12.842	47.418	21.056
30	26.752	20.903	15.291	15.540	15.492	50.151	23.993
35	29.393	22.967	16.889	17.743	17.688	51.312	26.344
40	31.118	24.315	17.933	19.173	19.114	50.715	27.869
45	31.744	24.806	18.301	19.610	19.551	48.326	28.406
50	31.202	24.384	17.951	18.983	18.927	44.286	27.893
55	29.552	23.097	16.925	17.393	17.342	38.917	26.386
60	26.967	21.079	15.342	15.084	15.040	32.699	24.045

Pollutant Name: Diesel - mi/gal Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	29.156	29.156	19.461	4.567	4.019	0.000	6.824
10	29.156	29.156	19.461	4.861	4.019	0.000	7.066
15	29.156	29.156	19.461	5.226	4.019	0.000	7.367
20	29.156	29.156	19.461	5.610	4.019	0.000	7.683
25	29.156	29.156	19.461	5.776	4.019	0.000	7.820
30	29.156	29.156	19.461	5.935	4.019	0.000	7.951
35	29.156	29.156	19.461	6.079	4.019	0.000	8.070
40	29.156	29.156	19.461	6.202	4.019	0.000	8.170
45	29.156	29.156	19.461	6.294	4.019	0.000	8.246
50	29.156	29.156	19.461	6.350	4.019	0.000	8.293
55	29.156	29.156	19.461	6.366	4.019	0.000	8.306
60	29.156	29.156	19.461	6.340	4.019	0.000	8.285

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.009	0.018	0.043	0.083	0.134	1.142	0.028
10	0.018	0.035	0.086	0.163	0.262	1.379	0.048
20	0.035	0.067	0.168	0.308	0.497	1.839	0.086
30	0.051	0.097	0.245	0.437	0.704	2.278	0.122
40	0.066	0.125	0.319	0.548	0.884	2.695	0.155
50	0.079	0.151	0.388	0.643	1.037	3.091	0.185
60	0.092	0.175	0.454	0.721	1.163	3.376	0.211
120	0.137	0.262	0.715	0.583	0.940	3.155	0.282
180	0.082	0.160	0.507	0.619	0.998	2.549	0.196
240	0.087	0.170	0.539	0.653	1.053	2.712	0.208
300	0.092	0.180	0.571	0.687	1.107	2.872	0.220
360	0.097	0.189	0.603	0.719	1.159	3.028	0.232
420	0.102	0.199	0.634	0.750	1.209	3.182	0.243
480	0.107	0.208	0.666	0.780	1.257	3.332	0.255
540	0.112	0.218	0.697	0.809	1.304	3.479	0.266
600	0.116	0.227	0.728	0.836	1.349	3.622	0.277
660	0.121	0.236	0.759	0.863	1.391	3.763	0.288
720	0.125	0.245	0.789	0.888	1.432	3.900	0.299

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.152	0.288	0.740	1.670	1.684	3.892	0.355
10	0.300	0.568	1.463	3.273	3.300	5.382	0.681
20	0.584	1.106	2.857	6.274	6.326	8.200	1.303
30	0.853	1.613	4.184	9.004	9.078	10.800	1.886
40	1.106	2.091	5.443	11.462	11.556	13.182	2.431
50	1.343	2.539	6.634	13.649	13.761	15.347	2.937
60	1.565	2.957	7.756	15.564	15.692	17.293	3.404
120	2.413	4.459	11.836	9.569	9.648	21.889	4.518
180	1.374	2.581	6.455	9.849	9.930	12.579	2.753
240	1.486	2.787	7.019	10.138	10.222	13.781	2.959
300	1.584	2.970	7.517	10.436	10.522	14.884	3.143
360	1.671	3.130	7.946	10.744	10.832	15.888	3.305
420	1.744	3.267	8.308	11.060	11.151	16.792	3.446
480	1.805	3.380	8.603	11.386	11.480	17.597	3.566
540	1.853	3.471	8.831	11.721	11.818	18.303	3.665
600	1.889	3.538	8.991	12.066	12.165	18.909	3.742
660	1.912	3.583	9.084	12.419	12.521	19.417	3.798
720	1.922	3.604	9.109	12.782	12.887	19.824	3.832

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: ALL

VTA-Alum Rock CO.rts

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.041	0.097	0.594	0.245	0.460	0.177	0.127
10	0.044	0.104	0.623	0.369	0.693	0.221	0.140
20	0.050	0.117	0.676	0.586	1.103	0.300	0.163
30	0.055	0.128	0.722	0.764	1.436	0.365	0.183
40	0.059	0.137	0.761	0.901	1.694	0.417	0.198
50	0.062	0.144	0.793	0.997	1.876	0.454	0.210
60	0.064	0.149	0.817	1.054	1.982	0.478	0.218
120	0.069	0.161	0.894	1.078	2.027	0.486	0.234
180	0.074	0.173	0.914	1.074	2.020	0.486	0.242
240	0.074	0.172	0.907	1.068	2.008	0.479	0.241
300	0.073	0.170	0.896	1.060	1.993	0.469	0.238
360	0.072	0.167	0.880	1.049	1.974	0.458	0.234
420	0.070	0.163	0.859	1.037	1.951	0.444	0.229
480	0.068	0.159	0.834	1.023	1.924	0.428	0.223
540	0.066	0.154	0.804	1.006	1.893	0.411	0.217
600	0.063	0.148	0.770	0.988	1.858	0.391	0.209
660	0.061	0.141	0.731	0.967	1.819	0.369	0.200
720	0.057	0.134	0.688	0.944	1.776	0.345	0.190

Pollutant Name: Carbon Dioxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	11.965	15.175	21.358	2.819	2.799	13.224	13.527
10	13.431	17.085	24.109	5.622	5.583	15.419	15.329
20	16.855	21.524	30.477	11.182	11.104	19.730	19.473
30	20.931	26.786	38.000	16.679	16.563	23.934	24.336
40	25.662	32.874	46.678	22.114	21.960	28.030	29.919
50	31.046	39.786	56.510	27.486	27.295	32.020	36.222
60	37.083	47.522	67.498	32.797	32.568	35.903	43.244
120	86.418	110.327	156.181	55.781	55.393	53.339	99.349
180	98.092	125.282	177.418	65.901	65.442	57.584	112.890
240	109.747	140.202	198.590	75.424	74.899	61.581	126.376
300	121.384	155.087	219.697	84.350	83.762	65.327	139.804
360	133.002	169.936	240.739	92.678	92.032	68.825	153.177
420	144.602	184.750	261.716	100.409	99.709	72.074	166.493
480	156.183	199.529	282.629	107.542	106.793	75.073	179.753
540	167.746	214.272	303.476	114.079	113.284	77.823	192.956
600	179.291	228.980	324.258	120.018	119.181	80.324	206.103
660	190.817	243.652	344.975	125.359	124.486	82.576	219.193
720	202.325	258.289	365.628	130.103	129.197	84.579	232.228

Pollutant Name: Sulfur Dioxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.001	0.000	0.000	0.001	0.000
50	0.000	0.000	0.001	0.000	0.001	0.001	0.000

60	0.000	0.001	0.001	0.001	0.001	0.001	0.000
120	0.001	0.001	0.002	0.001	0.001	0.001	0.001
180	0.001	0.001	0.002	0.001	0.001	0.001	0.001
240	0.001	0.001	0.002	0.001	0.001	0.001	0.001
300	0.001	0.002	0.002	0.001	0.001	0.001	0.001
360	0.001	0.002	0.002	0.001	0.001	0.001	0.002
420	0.001	0.002	0.003	0.001	0.001	0.001	0.002
480	0.002	0.002	0.003	0.001	0.001	0.001	0.002
540	0.002	0.002	0.003	0.001	0.001	0.001	0.002
600	0.002	0.002	0.003	0.001	0.001	0.001	0.002
660	0.002	0.002	0.003	0.001	0.001	0.001	0.002
720	0.002	0.003	0.004	0.001	0.001	0.001	0.002

Pollutant Name: PM10 Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.001	0.001	0.000	0.000	0.007	0.001
10	0.001	0.002	0.002	0.001	0.001	0.006	0.001
20	0.002	0.004	0.004	0.001	0.002	0.005	0.003
30	0.003	0.006	0.006	0.002	0.002	0.004	0.004
40	0.003	0.007	0.007	0.003	0.003	0.003	0.005
50	0.004	0.009	0.009	0.003	0.004	0.003	0.006
60	0.005	0.010	0.010	0.004	0.004	0.003	0.007
120	0.008	0.017	0.017	0.005	0.006	0.006	0.012
180	0.009	0.019	0.019	0.005	0.006	0.008	0.013
240	0.010	0.021	0.021	0.005	0.006	0.010	0.014
300	0.011	0.022	0.022	0.005	0.006	0.012	0.015
360	0.011	0.024	0.024	0.005	0.007	0.014	0.016
420	0.012	0.025	0.025	0.006	0.007	0.016	0.017
480	0.012	0.025	0.026	0.006	0.007	0.017	0.017
540	0.012	0.026	0.026	0.006	0.007	0.018	0.018
600	0.013	0.027	0.027	0.006	0.007	0.018	0.018
660	0.013	0.027	0.027	0.006	0.008	0.019	0.018
720	0.013	0.027	0.027	0.006	0.008	0.019	0.018

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara
****
*****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.026	0.042	0.030	0.003	0.014	0.089	0.030
10	0.047	0.078	0.055	0.006	0.025	0.165	0.056
20	0.081	0.132	0.093	0.010	0.043	0.285	0.096
30	0.104	0.169	0.119	0.013	0.055	0.371	0.123
40	0.112	0.183	0.129	0.014	0.060	0.405	0.133

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.007	0.015	0.015	0.000	0.000	0.014	0.010

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara

****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5b: Multi-Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.001	0.001	0.001	0.000	0.000	0.001	0.001

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara
****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 6a: Partial Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.006	0.012	0.012	0.000	0.000	0.011	0.008

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara
****

Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County

Average

Table 6b: Multi-Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.000	0.001	0.001	0.000	0.000	0.001	0.001

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara
****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.553	0.326	0.080	0.032	0.001	0.007	1.000
%TRIP	0.543	0.297	0.107	0.045	0.000	0.008	1.000
%VEH	0.566	0.315	0.073	0.018	0.000	0.027	1.000

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/03/31 14:50:00
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Winter
Area : Santa Clara
****
Year: 2030 -- Model Years 1986 to 2030 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 8: Evaporative Running Loss Emissions (grams/minute)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.009	0.264	0.225	0.063	0.211	0.004	0.112
2	0.008	0.138	0.118	0.033	0.109	0.038	0.060
3	0.009	0.098	0.085	0.023	0.076	0.057	0.045
4	0.011	0.080	0.070	0.019	0.060	0.069	0.039
5	0.013	0.070	0.061	0.016	0.051	0.077	0.036
10	0.017	0.050	0.045	0.011	0.033	0.100	0.030
15	0.019	0.045	0.041	0.010	0.029	0.114	0.030
20	0.021	0.044	0.041	0.010	0.029	0.124	0.030
25	0.022	0.045	0.042	0.010	0.030	0.134	0.032
30	0.023	0.047	0.044	0.011	0.031	0.141	0.033
35	0.024	0.049	0.046	0.011	0.033	0.148	0.034
40	0.025	0.051	0.047	0.012	0.034	0.155	0.036
45	0.025	0.053	0.049	0.012	0.035	0.161	0.037
50	0.026	0.054	0.050	0.012	0.037	0.167	0.038
55	0.027	0.056	0.052	0.013	0.038	0.173	0.039
60	0.027	0.057	0.053	0.013	0.039	0.179	0.040

VTA-Alum Rock CO-2012.rts

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara

****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	3.004	8.602	0.000	0.000	0.539
5	0.286	0.465	0.465	4.850	3.360	5.438	0.554
10	0.187	0.310	0.303	2.812	2.322	4.179	0.356
15	0.129	0.217	0.208	1.496	1.671	3.371	0.235
20	0.094	0.160	0.150	0.898	1.251	2.856	0.168
25	0.073	0.124	0.114	0.715	0.975	2.541	0.133
30	0.059	0.102	0.091	0.578	0.789	2.375	0.110
35	0.050	0.087	0.076	0.480	0.665	2.332	0.096
40	0.045	0.079	0.067	0.414	0.581	2.405	0.088
45	0.043	0.075	0.062	0.377	0.528	2.605	0.085
50	0.043	0.074	0.060	0.366	0.499	2.962	0.087
55	0.045	0.078	0.061	0.381	0.489	3.533	0.094
60	0.050	0.086	0.065	0.420	0.498	4.419	0.107

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	18.649	50.459	0.000	0.000	3.249
5	3.754	6.481	5.432	19.652	23.194	34.949	5.563
10	3.238	5.480	4.470	13.424	15.049	29.094	4.611
15	2.848	4.746	3.803	9.462	10.346	25.357	3.936
20	2.544	4.192	3.319	7.052	7.536	23.112	3.448
25	2.301	3.765	2.956	5.710	5.814	22.026	3.091
30	2.106	3.434	2.677	4.795	4.751	21.960	2.820
35	1.949	3.177	2.461	4.182	4.111	22.939	2.618
40	1.824	2.985	2.295	3.799	3.766	25.152	2.475
45	1.729	2.850	2.173	3.612	3.653	29.011	2.390
50	1.663	2.775	2.093	3.610	3.752	35.270	2.367
55	1.630	2.766	2.058	3.802	4.078	45.263	2.421
60	1.637	2.841	2.079	4.224	4.693	61.370	2.581

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	4.450	78.869	0.000	0.000	3.024
5	0.392	0.816	1.199	20.248	35.852	1.411	1.323
10	0.341	0.702	1.031	14.856	27.564	1.395	1.050
15	0.303	0.619	0.912	11.456	22.290	1.393	0.871
20	0.275	0.558	0.827	9.966	18.952	1.402	0.773
25	0.254	0.514	0.769	9.436	16.930	1.421	0.722
30	0.239	0.484	0.732	9.077	15.881	1.448	0.688
35	0.229	0.464	0.714	8.875	15.633	1.483	0.668
40	0.224	0.455	0.712	8.830	16.146	1.525	0.661
45	0.222	0.454	0.727	8.948	17.494	1.574	0.668
50	0.225	0.463	0.759	9.247	19.890	1.630	0.688
55	0.231	0.481	0.813	9.761	23.742	1.694	0.725
60	0.242	0.510	0.895	10.545	29.773	1.767	0.783

Pollutant Name: Carbon Dioxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	819.841	4740.552	0.000	0.000	227.738
5	948.252	1179.617	1665.931	2777.909	2607.790	249.855	1141.973
10	716.678	892.122	1238.498	2323.350	2451.853	210.151	869.939
15	562.198	700.340	961.276	1974.747	2359.767	181.229	687.601
20	457.737	570.653	777.923	1730.966	2303.698	160.197	564.370
25	386.809	482.598	655.567	1634.859	2268.851	145.159	483.211
30	339.254	423.559	574.627	1560.219	2247.142	134.887	428.545
35	308.811	385.765	523.364	1503.303	2234.078	128.639	393.292
40	291.738	364.570	494.915	1462.058	2227.202	126.049	373.240
45	286.037	357.492	485.678	1435.477	2225.304	127.092	366.149
50	291.057	363.724	494.530	1423.290	2228.060	132.102	371.298
55	307.370	383.976	522.583	1425.888	2235.941	141.855	389.345
60	336.883	420.615	573.432	1444.440	2250.348	157.746	422.456

Pollutant Name: Sulfur Dioxide Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.008	0.045	0.000	0.000	0.002
5	0.009	0.011	0.016	0.027	0.025	0.003	0.011
10	0.007	0.009	0.012	0.022	0.024	0.003	0.008
15	0.005	0.007	0.009	0.019	0.023	0.002	0.007
20	0.004	0.006	0.008	0.017	0.022	0.002	0.005
25	0.004	0.005	0.006	0.016	0.022	0.002	0.005
30	0.003	0.004	0.006	0.015	0.022	0.002	0.004
35	0.003	0.004	0.005	0.014	0.021	0.002	0.004
40	0.003	0.004	0.005	0.014	0.021	0.002	0.004
45	0.003	0.003	0.005	0.014	0.021	0.002	0.004
50	0.003	0.004	0.005	0.014	0.021	0.002	0.004
55	0.003	0.004	0.005	0.014	0.021	0.002	0.004
60	0.003	0.004	0.006	0.014	0.022	0.003	0.004

Pollutant Name: PM10 Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.051	1.155	0.000	0.000	0.043
5	0.049	0.099	0.111	1.035	0.953	0.045	0.105
10	0.032	0.065	0.073	0.732	0.690	0.035	0.071
15	0.022	0.045	0.051	0.511	0.518	0.029	0.049
20	0.016	0.033	0.037	0.378	0.403	0.025	0.036
25	0.012	0.025	0.029	0.318	0.324	0.023	0.029
30	0.010	0.020	0.023	0.275	0.270	0.021	0.024
35	0.008	0.017	0.020	0.246	0.233	0.021	0.021
40	0.007	0.015	0.017	0.231	0.209	0.022	0.019
45	0.007	0.014	0.016	0.229	0.193	0.024	0.018
50	0.007	0.014	0.016	0.239	0.186	0.027	0.018
55	0.007	0.015	0.016	0.261	0.184	0.032	0.019
60	0.008	0.016	0.018	0.296	0.190	0.040	0.022

Pollutant Name: PM10 - Tire Wear Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.008	0.008	0.009	0.023	0.009	0.004	0.009
10	0.008	0.008	0.009	0.023	0.009	0.004	0.009
15	0.008	0.008	0.009	0.023	0.009	0.004	0.009
20	0.008	0.008	0.009	0.023	0.009	0.004	0.009
25	0.008	0.008	0.009	0.023	0.009	0.004	0.009
30	0.008	0.008	0.009	0.023	0.009	0.004	0.009
35	0.008	0.008	0.009	0.023	0.009	0.004	0.009
40	0.008	0.008	0.009	0.023	0.009	0.004	0.009
45	0.008	0.008	0.009	0.023	0.009	0.004	0.009
50	0.008	0.008	0.009	0.023	0.009	0.004	0.009
55	0.008	0.008	0.009	0.023	0.009	0.004	0.009
60	0.008	0.008	0.009	0.023	0.009	0.004	0.009

Pollutant Name: PM10 - Brake Wear Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.013	0.013	0.013	0.020	0.013	0.006	0.013
10	0.013	0.013	0.013	0.020	0.013	0.006	0.013
15	0.013	0.013	0.013	0.020	0.013	0.006	0.013
20	0.013	0.013	0.013	0.020	0.013	0.006	0.013
25	0.013	0.013	0.013	0.020	0.013	0.006	0.013
30	0.013	0.013	0.013	0.020	0.013	0.006	0.013
35	0.013	0.013	0.013	0.020	0.013	0.006	0.013
40	0.013	0.013	0.013	0.020	0.013	0.006	0.013
45	0.013	0.013	0.013	0.020	0.013	0.006	0.013
50	0.013	0.013	0.013	0.020	0.013	0.006	0.013
55	0.013	0.013	0.013	0.020	0.013	0.006	0.013

60	0.013	0.013	0.013	0.020	0.013	0.006	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	9.278	7.397	5.182	3.377	3.372	27.534	8.418
10	12.269	9.779	6.935	5.077	5.069	32.960	11.115
15	15.631	12.458	8.939	7.223	7.213	38.281	14.146
20	19.189	15.291	11.091	9.728	9.715	43.156	17.351
25	22.699	18.087	13.242	12.401	12.387	47.218	20.511
30	25.877	20.617	15.207	14.963	14.950	50.103	23.368
35	28.429	22.650	16.795	17.089	17.079	51.487	25.657
40	30.101	23.981	17.832	18.472	18.467	51.133	27.147
45	30.714	24.470	18.201	18.899	18.900	48.936	27.676
50	30.201	24.062	17.857	18.302	18.308	44.968	27.186
55	28.617	22.801	16.841	16.774	16.785	39.515	25.728
60	26.127	20.818	15.270	14.551	14.565	33.067	23.455

Pollutant Name: Diesel - mi/gal Temperature: 50F Relative Humidity: 10%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	28.143	28.994	19.526	4.396	3.834	0.000	8.650
10	28.143	28.994	19.526	4.714	3.834	0.000	8.887
15	28.143	28.994	19.526	5.109	3.834	0.000	9.181
20	28.143	28.994	19.526	5.523	3.834	0.000	9.490
25	28.143	28.994	19.526	5.702	3.834	0.000	9.623
30	28.143	28.994	19.526	5.874	3.834	0.000	9.751
35	28.143	28.994	19.526	6.030	3.834	0.000	9.867
40	28.143	28.994	19.526	6.162	3.834	0.000	9.966
45	28.143	28.994	19.526	6.262	3.834	0.000	10.040
50	28.143	28.994	19.526	6.323	3.834	0.000	10.086
55	28.143	28.994	19.526	6.340	3.834	0.000	10.098
60	28.143	28.994	19.526	6.312	3.834	0.000	10.078

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara

****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.092	0.121	0.182	0.693	0.276	1.861	0.152
10	0.159	0.208	0.324	0.958	0.379	2.020	0.243
20	0.285	0.371	0.591	1.455	0.572	2.354	0.414
30	0.399	0.519	0.834	1.910	0.749	2.711	0.569
40	0.501	0.652	1.052	2.322	0.910	3.091	0.710
50	0.592	0.770	1.247	2.691	1.054	3.493	0.836
60	0.670	0.870	1.414	2.975	1.165	3.746	0.940
120	0.820	1.008	1.508	2.142	0.786	2.766	1.027
180	0.521	0.675	1.212	2.282	0.838	2.571	0.739
240	0.552	0.715	1.285	2.419	0.888	2.753	0.783
300	0.583	0.755	1.355	2.553	0.938	2.934	0.826
360	0.612	0.793	1.425	2.683	0.986	3.113	0.869
420	0.642	0.831	1.493	2.809	1.033	3.290	0.910
480	0.670	0.868	1.559	2.932	1.078	3.465	0.951
540	0.698	0.904	1.624	3.051	1.123	3.639	0.991
600	0.725	0.939	1.688	3.167	1.166	3.810	1.029
660	0.751	0.974	1.750	3.280	1.208	3.980	1.067
720	0.777	1.008	1.811	3.389	1.248	4.147	1.104

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.893	1.306	2.236	7.890	2.543	5.114	1.515
10	1.663	2.430	4.224	12.806	4.249	5.896	2.711
20	3.125	4.561	7.986	22.045	7.453	7.409	4.974
30	4.482	6.537	11.463	30.492	10.379	8.853	7.068
40	5.735	8.357	14.653	38.148	13.028	10.229	8.991
50	6.883	10.021	17.558	45.011	15.399	11.536	10.744
60	7.928	11.530	20.176	51.083	17.492	12.774	12.327
120	10.756	14.615	19.514	30.430	9.667	14.269	13.774
180	6.415	9.218	13.868	32.470	10.268	11.121	9.279
240	6.822	9.783	14.677	34.408	10.842	12.979	9.859
300	7.195	10.303	15.424	36.245	11.389	14.644	10.394
360	7.534	10.776	16.110	37.981	11.910	16.114	10.883
420	7.837	11.204	16.733	39.616	12.403	17.391	11.326
480	8.105	11.586	17.295	41.150	12.870	18.474	11.725
540	8.339	11.921	17.794	42.584	13.311	19.363	12.078
600	8.538	12.211	18.232	43.916	13.724	20.058	12.385
660	8.702	12.455	18.608	45.147	14.111	20.560	12.647
720	8.831	12.652	18.922	46.277	14.471	20.868	12.864

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.212	0.363	0.850	0.740	0.307	0.223	0.349
10	0.244	0.412	0.990	1.099	0.457	0.258	0.413
20	0.300	0.499	1.238	1.729	0.722	0.321	0.525
30	0.347	0.572	1.443	2.244	0.937	0.374	0.618
40	0.384	0.630	1.605	2.641	1.104	0.417	0.691
50	0.411	0.673	1.724	2.923	1.222	0.449	0.745
60	0.429	0.701	1.800	3.088	1.291	0.472	0.779
120	0.453	0.746	1.904	3.159	1.320	0.484	0.820
180	0.485	0.796	1.945	3.146	1.315	0.479	0.856
240	0.482	0.790	1.932	3.127	1.307	0.468	0.850
300	0.476	0.781	1.912	3.101	1.297	0.454	0.841
360	0.469	0.770	1.885	3.069	1.283	0.437	0.829
420	0.461	0.755	1.851	3.030	1.267	0.418	0.814
480	0.450	0.737	1.811	2.984	1.249	0.396	0.797
540	0.438	0.716	1.764	2.932	1.227	0.370	0.776
600	0.424	0.692	1.710	2.874	1.203	0.343	0.753
660	0.408	0.665	1.649	2.809	1.177	0.312	0.726
720	0.390	0.635	1.582	2.737	1.147	0.278	0.697

Pollutant Name: Carbon Dioxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	11.104	13.636	18.196	7.440	3.306	21.394	12.536
10	13.229	16.339	22.305	10.747	5.114	23.869	15.103
20	17.864	22.208	31.116	17.291	8.693	28.702	20.642
30	23.012	28.692	40.717	23.740	12.225	33.381	26.720
40	28.673	35.792	51.108	30.093	15.708	37.904	33.339
50	34.848	43.508	62.289	36.351	19.143	42.273	40.497
60	41.535	51.839	74.259	42.514	22.530	46.487	48.195
120	89.519	110.883	156.002	69.425	37.276	65.809	101.885
180	102.296	126.772	178.875	79.992	43.305	68.427	116.483
240	114.868	142.386	201.262	89.936	48.978	70.892	130.807
300	127.236	157.726	223.163	99.257	54.296	73.205	144.858
360	139.399	172.792	244.578	107.955	59.258	75.366	158.634
420	151.358	187.583	265.507	116.029	63.864	77.376	172.135
480	163.112	202.099	285.950	123.480	68.115	79.233	185.363
540	174.662	216.341	305.908	130.308	72.010	80.937	198.317
600	186.007	230.309	325.379	136.513	75.550	82.490	210.996
660	197.148	244.003	344.365	142.095	78.733	83.891	223.401
720	208.084	257.421	362.865	147.054	81.561	85.140	235.532

Pollutant Name: Sulfur Dioxide Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.001	0.000	0.000	0.000
30	0.000	0.000	0.001	0.001	0.000	0.001	0.000
40	0.000	0.000	0.001	0.001	0.000	0.001	0.000
50	0.000	0.001	0.001	0.001	0.000	0.001	0.001

60	0.001	0.001	0.001	0.001	0.001	0.001	0.001
120	0.001	0.001	0.002	0.001	0.001	0.001	0.001
180	0.001	0.001	0.002	0.001	0.001	0.001	0.001
240	0.001	0.002	0.002	0.001	0.001	0.001	0.001
300	0.001	0.002	0.002	0.002	0.001	0.001	0.002
360	0.001	0.002	0.003	0.002	0.001	0.001	0.002
420	0.002	0.002	0.003	0.002	0.001	0.001	0.002
480	0.002	0.002	0.003	0.002	0.001	0.001	0.002
540	0.002	0.002	0.003	0.002	0.001	0.001	0.002
600	0.002	0.002	0.003	0.002	0.001	0.001	0.002
660	0.002	0.003	0.004	0.002	0.001	0.001	0.002
720	0.002	0.003	0.004	0.002	0.001	0.001	0.002

Pollutant Name: PM10 Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.001	0.000	0.012	0.001
10	0.001	0.002	0.002	0.001	0.001	0.011	0.002
20	0.002	0.004	0.004	0.002	0.001	0.008	0.003
30	0.003	0.006	0.006	0.002	0.001	0.007	0.004
40	0.004	0.008	0.007	0.003	0.002	0.005	0.006
50	0.005	0.010	0.009	0.004	0.002	0.004	0.007
60	0.006	0.011	0.010	0.004	0.002	0.003	0.008
120	0.009	0.017	0.015	0.006	0.003	0.008	0.012
180	0.009	0.019	0.017	0.006	0.003	0.013	0.013
240	0.010	0.020	0.018	0.006	0.003	0.017	0.014
300	0.010	0.021	0.019	0.006	0.003	0.020	0.014
360	0.011	0.022	0.020	0.007	0.003	0.023	0.015
420	0.011	0.023	0.020	0.007	0.004	0.026	0.016
480	0.012	0.024	0.021	0.007	0.004	0.028	0.016
540	0.012	0.024	0.022	0.007	0.004	0.029	0.017
600	0.012	0.025	0.022	0.008	0.004	0.031	0.017
660	0.013	0.025	0.022	0.008	0.004	0.031	0.017
720	0.013	0.026	0.023	0.008	0.004	0.032	0.018

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara
****
*****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.062	0.071	0.036	0.013	0.028	0.137	0.060
10	0.114	0.130	0.066	0.025	0.051	0.254	0.111
20	0.195	0.223	0.114	0.043	0.087	0.436	0.190
30	0.251	0.287	0.147	0.056	0.112	0.565	0.245
40	0.272	0.312	0.160	0.061	0.121	0.614	0.265

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara
****
Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.013	0.015	0.009	0.001	0.000	0.014	0.013

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara
****
Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 5b: Multi-Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.001	0.001	0.001	0.000	0.000	0.001	0.001

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara
****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 6a: Partial Day Resting Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.010	0.012	0.007	0.001	0.000	0.011	0.010

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara
****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County

Average

Table 6b: Multi-Day Resting Loss Emissions

(grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
50	0.001	0.001	0.000	0.000	0.000	0.001	0.001

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara

****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity: ALL

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.550	0.324	0.083	0.034	0.001	0.007	1.000
%TRIP	0.540	0.299	0.107	0.046	0.000	0.008	1.000
%VEH	0.565	0.316	0.072	0.019	0.000	0.027	1.000

Title : SC-AR CO Emissions
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/07/01 12:13:22
Scen Year: 2012 -- All model years in the range 1968 to 2012 selected
Season : Winter
Area : Santa Clara

****

Year: 2012 -- Model Years 1968 to 2012 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Santa Clara County Average

Table 8: Evaporative Running Loss Emissions (grams/minute)

Pollutant Name: Reactive Org Gases Temperature: 50F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.018	0.524	0.274	0.222	0.135	0.051	0.211
2	0.021	0.276	0.145	0.120	0.075	0.090	0.118
3	0.025	0.196	0.104	0.087	0.056	0.113	0.090
4	0.029	0.157	0.085	0.070	0.046	0.127	0.077
5	0.032	0.135	0.074	0.060	0.041	0.137	0.071
10	0.040	0.095	0.055	0.042	0.030	0.168	0.060
15	0.044	0.087	0.052	0.037	0.028	0.189	0.060
20	0.048	0.087	0.054	0.035	0.028	0.207	0.062
25	0.052	0.092	0.057	0.035	0.028	0.224	0.066
30	0.054	0.096	0.060	0.036	0.029	0.234	0.069
35	0.056	0.101	0.062	0.038	0.030	0.244	0.072
40	0.058	0.105	0.065	0.039	0.031	0.253	0.074
45	0.060	0.108	0.067	0.040	0.032	0.262	0.077
50	0.061	0.112	0.069	0.042	0.033	0.269	0.079
55	0.062	0.116	0.071	0.043	0.034	0.275	0.081
60	0.063	0.119	0.073	0.044	0.035	0.281	0.083

Appendix B: **CALINE4 Results**

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

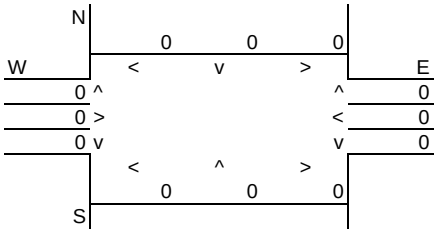
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

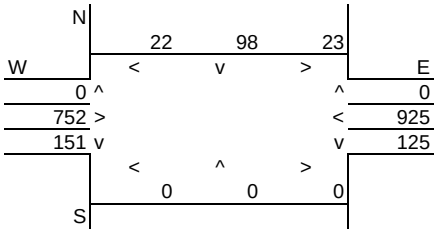
Intersection: 2nd-Santa Clara
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	El Charro	At Grade	4	35	35
East-West Roadway:	Stoneridge/JLB	At Grade	2	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	374
E-W Road:	0	E-W Road:	1,850

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.7	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	374	0.87	0.01	0.01	0.01
East-West Road	7.6	5.7	4.0	1,850	1.00	0.14	0.11	0.07

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

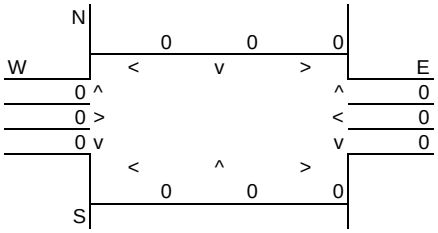
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2012

Roadway Data

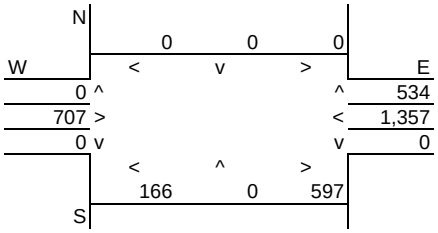
Intersection: 680 NB -Alum Rock
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	680 NB	At Grade	4	35	35
East-West Roadway:	Alum rock	At Grade	4	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	763
E-W Road:	0	E-W Road:	3,195

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	2.62	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	3.09	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	763	2.62	0.05	0.04	0.03
East-West Road	7.0	5.4	3.8	3,195	3.09	0.69	0.53	0.38

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

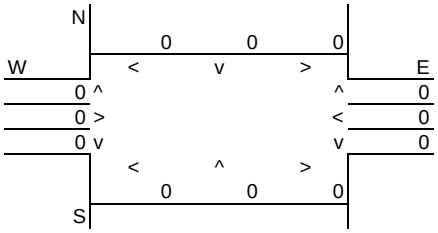
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

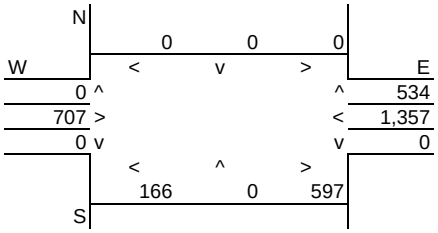
Intersection: 680 NB -Alum Rock
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	680 NB	At Grade	4	35	35
East-West Roadway:	Alum rock	At Grade	4	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	763
E-W Road:	0	E-W Road:	3,195

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	763	0.87	0.02	0.01	0.01
East-West Road	7.0	5.4	3.8	3,195	1.00	0.22	0.17	0.12

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

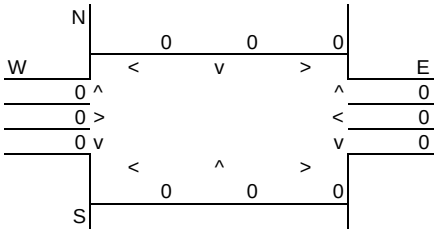
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

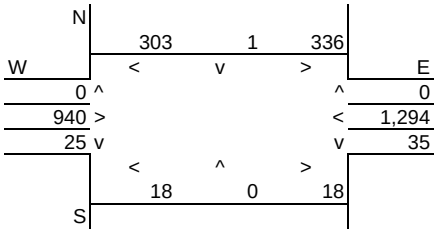
Intersection: 680 SB -Alum Rock
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	680 SB	At Grade	4	35	35
East-West Roadway:	Alum rock	At Grade	4	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	640
E-W Road:	0	E-W Road:	2,623

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	640	0.87	0.01	0.01	0.01
East-West Road	7.0	5.4	3.8	2,623	1.00	0.18	0.14	0.10

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

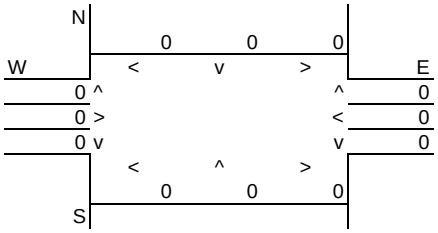
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2012

Roadway Data

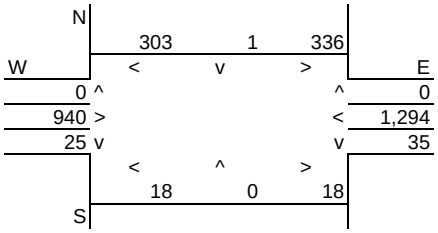
Intersection: 680 SB -Alum Rock
Analysis Condition: 2012 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	680 SB	At Grade	4	35	35
East-West Roadway:	Alum rock	At Grade	4	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	640
E-W Road:	0	E-W Road:	2,623

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	2.62	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	3.09	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	640	2.62	0.04	0.04	0.03
East-West Road	7.0	5.4	3.8	2,623	3.09	0.57	0.44	0.31

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

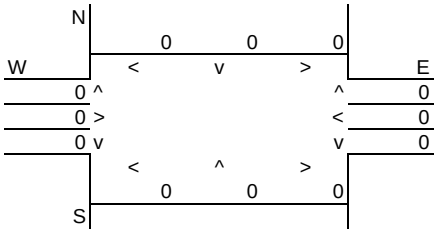
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

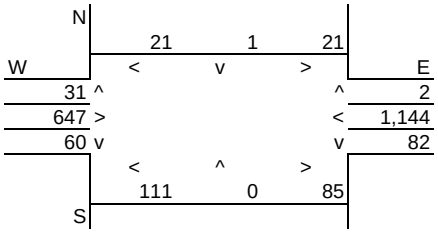
Intersection: Alum Rock - McCreery
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Alum Rock	At Grade	4	35	35
East-West Roadway:	McCreery	At Grade	4	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	339
E-W Road:	0	E-W Road:	2,014

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	339	0.87	0.01	0.01	0.00
East-West Road	7.0	5.4	3.8	2,014	1.00	0.14	0.11	0.08

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

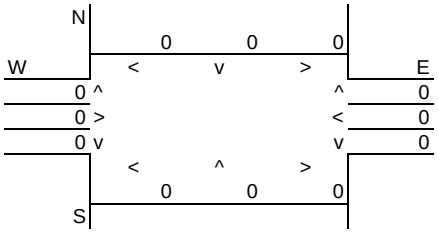
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2012

Roadway Data

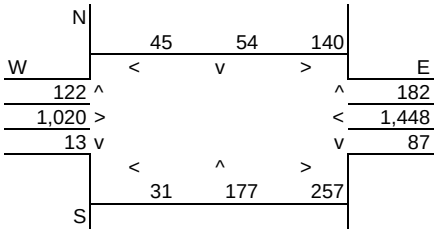
Intersection: Santa Clara-28th
Analysis Condition: 2012 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	El Charro	At Grade	4	35	35
East-West Roadway:	Stoneridge/JLB	At Grade	2	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	720
E-W Road:	0	E-W Road:	3,134

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	2.62	0.00	0.00	0.00
East-West Road	2.7	2.2	1.7	0	3.09	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	720	2.62	0.05	0.04	0.03
East-West Road	7.6	5.7	4.0	3,134	3.09	0.74	0.55	0.39

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

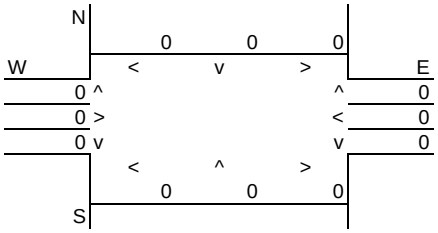
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

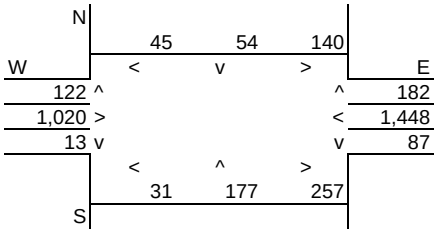
Intersection: Santa Clara-28th
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	El Charro	At Grade	4	35	35
East-West Roadway:	Stoneridge/JLB	At Grade	2	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	720
E-W Road:	0	E-W Road:	3,134

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.7	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	720	0.87	0.02	0.01	0.01
East-West Road	7.6	5.7	4.0	3,134	1.00	0.24	0.18	0.13

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

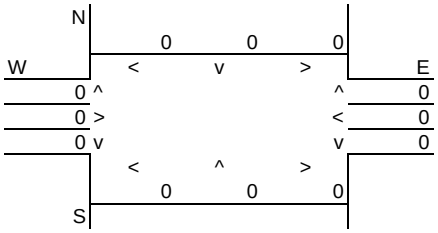
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

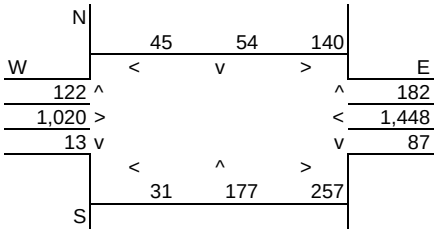
Intersection: Santa Clara-28th
Analysis Condition: 2030 BRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	El Charro	At Grade	4	35	35
East-West Roadway:	Stoneridge/JLB	At Grade	2	25	25

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	720
E-W Road:	0	E-W Road:	3,134

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.7	2.2	1.7	0	1.00	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	720	0.87	0.02	0.01	0.01
East-West Road	7.6	5.7	4.0	3,134	1.00	0.24	0.18	0.13

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

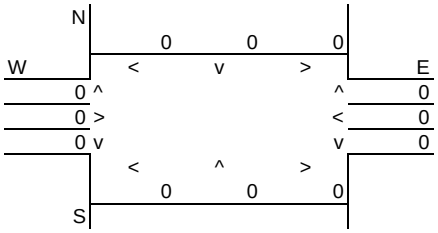
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

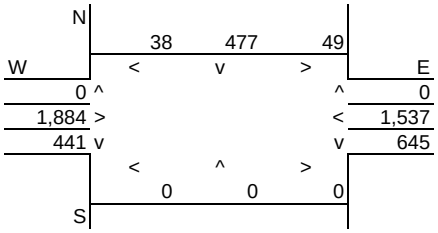
Intersection: Market-Santa Clara
Analysis Condition: 2030 LRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	10th	At Grade	4	35	35
East-West Roadway:	Santa Clara	At Grade	4	35	35

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	1,563
E-W Road:	0	E-W Road:	4,115

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	0.87	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,563	0.87	0.04	0.03	0.02
East-West Road	7.0	5.4	3.8	4,115	0.87	0.25	0.19	0.14

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

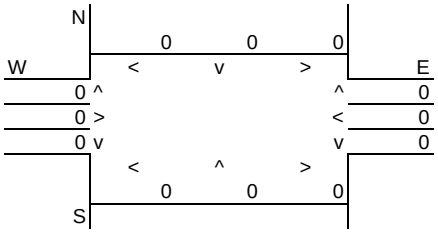
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

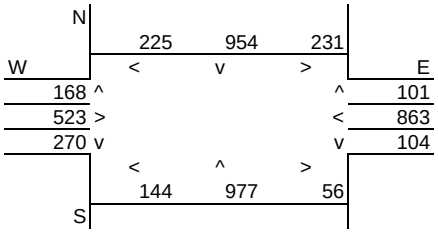
Intersection: Market-Santa Clara
Analysis Condition: 2030 LRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Market	At Grade	4	35	35
East-West Roadway:	Santa Clara	At Grade	4	35	35

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	2,656
E-W Road:	0	E-W Road:	2,193

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	0.87	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	2,656	0.87	0.16	0.12	0.09
East-West Road	2.6	2.2	1.7	2,193	0.87	0.05	0.04	0.03

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

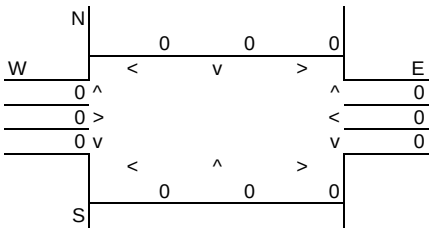
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

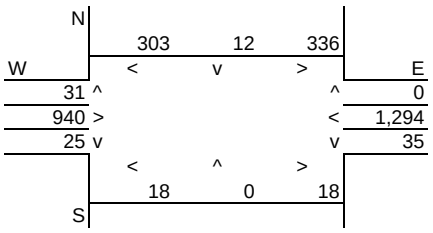
Intersection: Alum Rock-Mc Creery
Analysis Condition: 2030 LRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	Alum Rock	At Grade	4	35	35
East-West Roadway:	680 SB	At Grade	4	35	35

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	682
E-W Road:	0	E-W Road:	2,623

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	0.87	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	682	0.87	0.02	0.01	0.01
East-West Road	7.0	5.4	3.8	2,623	0.87	0.16	0.12	0.09

[1] Methodology from Bay Area Air Quality Management District ***BAAQMD CEQA Guidelines*** (1996).

SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 100558-03
Project Title: Santa Clara-Alum Rock

Background Information

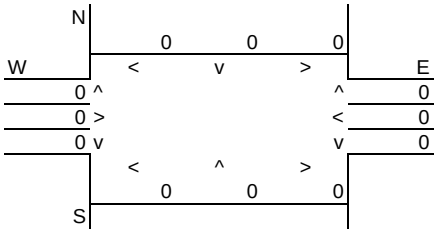
Nearest Air Monitoring Station measuring CO:	San Jose - Jackson Street
Background 1-hour CO Concentration (ppm):	3.1
Background 8-hour CO Concentration (ppm):	2.2
Persistence Factor:	0.7
Analysis Year:	2030

Roadway Data

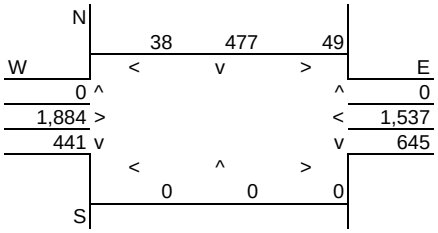
Intersection: Market-Santa Clara
Analysis Condition: 2030 LRT

		Roadway Type	No. of Lanes	Average Speed A.M.	Average Speed P.M.
North-South Roadway:	10th	At Grade	4	35	35
East-West Roadway:	Santa Clara	At Grade	4	35	35

A.M. Peak Hour Traffic Volumes



P.M. Peak Hour Traffic Volumes



Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	0	N-S Road:	1,563
E-W Road:	0	E-W Road:	4,115

Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000[1]

Roadway	A_1 Reference CO Concentrations 25 Feet	A_2 Reference CO Concentrations 50 Feet	A_3 Reference CO Concentrations 100 Feet	B Traffic Volume	C Emission Factors[2]	Estimated CO Concentrations 25 Feet	Estimated CO Concentrations 50 Feet	Estimated CO Concentrations 100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	0	0.87	0.00	0.00	0.00
East-West Road	2.6	2.2	1.7	0	0.87	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,563	0.87	0.04	0.03	0.02
East-West Road	7.0	5.4	3.8	4,115	0.87	0.25	0.19	0.14