4.3 AIR QUALITY

4.3.1 INTRODUCTION

This section considers long-term impacts and benefits of the SVRTC project alternatives with regard to regional air quality. It also considers the project's conformity with the applicable State Implementation Plan (SIP) as required under the federal Clean Air Act (CAA) amendments of the 1993 United States Environmental Protection Agency (USEPA) transportation conformity regulations, found in the federal Code of Regulations, Title 40, Part 93 (40 CFR Part 93), for operations emissions. Impacts are assessed by comparing conditions under the No-Action, Baseline, and BART alternatives and by comparing projected concentrations of pollutants to the ambient air quality standards.

4.3.2 EXISTING CONDITIONS

4.3.2.1 Existing Setting

Climate Effects on Air Quality

Prevailing light to moderate winds from the northwest carry pollutants released by autos and factories from areas along the San Francisco peninsula toward the SVRTC, particularly during the summer months. The northwest winds are generated by air flowing from a high pressure system over the northern Pacific Ocean (the "Pacific High").

Air quality generally worsens during periods of low wind speed, as more pollutants accumulate within a period of time. The accumulation of air pollutants can be compounded in valleys, which restrict the movement of air. In general, autumn is the calmest time of the year, and the relatively stable atmosphere allows air pollution to increase substantially. Occasionally, during the summer and autumn, a warm and dry wind from the northeast will blow when the Pacific High has positioned itself over the North American continent. This condition usually lasts about two to three weeks causing high temperatures and degrading ambient air quality.

In addition to low wind speeds, temperature inversions also contribute to the buildup of air pollution. The highest air pollutant concentrations in the Bay Area generally occur during inversions when higher temperatures occur at higher altitudes. Air close to the ground is prevented from mixing with the air above it and air pollutants are trapped near the ground. Summer inversions occur when an upper layer of warm air mass forms over the cool marine layer preventing air pollutants from dispersing upward. Additionally, hydrocarbons and nitrogen dioxide (NO_2) react under strong sunlight creating pollution commonly referred to as smog. Light daytime winds predominantly from the northwest further aggravate the condition by driving air pollutants from upwind areas of the peninsula to the project area. During the summer, inversions are generally elevated above ground level but are present over 90 percent of the time in both the morning and afternoon. In winter, surface-based inversions dominate in the morning hours but frequently dissipate by the afternoon.

During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO_2 emissions. CO concentrations are generally worse in the morning and late evening (around 10:00 p.m.). Morning levels are relatively high due to the colder temperatures and large number of cars during the commute. The high levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the Bay Area are associated with heavy traffic. NO_2 levels are also generally higher during autumn or winter days. High levels of NO_2 in the fall and winter usually occur on days with summer-like conditions.

Air Monitoring Data

The Bay Area Air Basin is classified as a federal and state non-attainment area for ozone. The state has classified the area as non-attainment for particulate matter less than 10 microns in diameter (PM_{10}). USEPA has designated the Bay Area Air Basin as unclassified for PM_{10} and fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$).

Bay Area Air Quality Management District (BAAQMD) monitors air quality conditions at 31 locations throughout the Bay Area. The nearest air monitoring stations to the SVRTC project are the San Jose Piedmont Road Monitoring Station, the San Jose 4th Street Monitoring Station, and the Fremont Chapel Way Monitoring Station. Data from these monitoring stations were used to characterize existing conditions within the vicinity of the SVRTC project and to establish a baseline for estimating future conditions. Table 4.3-1 presents four years of data from these stations to demonstrate pollution trends. The table also indicates federal and state standards for these pollutants and where federal and state standards have been exceeded. The data presented in the table are summarized below.

San Jose Piedmont Road Monitoring Station. Ozone exceeded the California Ambient Air Quality Standards (CAAQS) five times in 1998, twice in 1999, and once in 2000; the ozone level did not exceed the state standard in 2001. Ozone exceeded the 1-hour National Ambient Air Quality Standards (NAAQS) one time in 1998, but it did not exceed the federal 8-hour standard. Ozone remained within federal limits for the years 1999 through 2001. This station monitored PM_{10} for only the year of 1998. For that year, PM_{10} exceeded the state 24-hour standard six times but did not exceed federal standards.

San Jose 4th Street Monitoring Station. Ozone exceeded the state 1-hour standard four times in 1998, three times in 1999, and two times in 2001. Ozone exceeded both federal 1-hour and 8-hour standards once in 1998. PM_{10} exceeded state standards 18 times in 1998, 30 times in 1999, 42 times in 2000, and 24 times in 2001, but did not exceed federal standards during this same period. There were no exceedences of state or federal standards for NO_2 or CO.

Fremont Chapel Way Monitoring Station. Ozone exceeded the state 1-hour standard seven times in 1998, three times in 1999, twice in 2000, and three times in 2001. In 1999, ozone exceeded both the federal 1-hour standard and 8-hour standard once. PM_{10} exceeded the state 24-hour standard six times in 1998, 12 times in 1999, six times in 2000, and 18 times in 2001, but did not exceed the federal 24-hour standard. There were no exceedences of state or federal standards for NO_2 or CO.

4.3.2.2 Regulatory Setting

Federal, State, and Local Air Quality Standards

Air quality in the U.S. is governed by the federal CAA, which resulted in the adoption of federal NAAQS for pollutants including CO, ozone, sulfur dioxide (SO_2), nitrogen oxides (NO_X), PM_{10}, and $PM_{2.5}$. The federal NAAQS are shown as National Standards in Table 4.3-2. These pollutants are referred to as criteria pollutants. Health effects resulting from these pollutants are shown in Table 4.3-3. Although ambient air quality standards exist for criteria pollutants, ambient standards exist neither for toxic air contaminants (TACs) (also known as hazardous air pollutants [HAPs]) nor for greenhouse gases. However, both TACs and greenhouse gases are discussed below.

In addition to being subject to the requirements of the CAA, air quality in California is also governed by the California Clean Air Act (CCAA), and the CAAQS are generally more stringent than the NAAQS. The CAAQS are listed as California Standards in Table 4.3-2. Existing compliance within the greater project area (i.e., area "attainment") with the NAAQS and CAAQS for criteria pollutants is discussed below along with existing pollutant concentrations.

Table 4.3-1: Air Quality Standards, Ambient Measurements, and Violations at Air Monitoring Stations

Pollutant	Federal Standard	State Standard	Year	Maximum Level			Violation Days (Federal/State)		
				San Jose Piedmont Road	San Jose 4th Street	Fremont Chapel Way	San Jose Piedmont Road	San Jose 4th Street	Fremont Chapel Way
Ozone 1 hour	0.12 ppm	0.09 ppm	1998	0.129	0.147	0.115	1 / 5	1 / 4	0 / 7
			1999	0.116	0.109	0.133	0 / 2	0 / 3	1 / 3
			2000	0.096	0.073	0.102	0 / 1	0 / 0	0 / 2
			2001	0.091	0.105	0.109	0 / 0	0 / 2	0 / 3
Ozone 8 hour	0.08 ppm	N/A	1998	0.082	0.091	0.077	0 / NA	1 / NA	0 / NA
			1999	0.082	0.084	0.086	0 / NA	0 / NA	1 / NA
			2000	0.068	0.061	0.075	0 / NA	0 / NA	0 / NA
			2001	0.061	0.074	0.081	0 / NA	0 / NA	0 / NA
Respirable Particulate Matter (PM_{10}) 24 hours	150 $\mu g/m^3$	50 $\mu g/m^3$	1998	54.4	92.0	62.7	0 / 6	0 / 18	0 / 6
			1999	*	114.4	87.9	*	0 / 30	0 / 12
			2000	*	76.1	58.1	*	0 / 42	0 / 6
			2001	*	76.7	57.6	*	0 / 24	0 / 18
Carbon Monoxide (CO) 8 hour	9.5 ppm	9.1 ppm	1998	*	6.27	2.80	*	0 / 0	0 / 0
			1999	*	6.28	3.13	*	0 / 0	0 / 0
			2000	*	7.03	2.70	*	0 / 0	0 / 0
			2001	*	5.09	2.72	*	0 / 0	0 / 0
Nitrogen Dioxide (NO_2) 1 hour	0.05 ppm (annual)	25 ppm (1 hr)	1998	*	0.083	0.098	*	1 / 4	NA / 0
			1999	*	0.128	0.112	*	0 / 3	NA / 0
			2000	*	0.114	0.081	*	0 / 0	NA / 0
			2001	*	0.108	0.078	*	0 / 2	NA / 0
Sulfur Dioxide	0.14 ppm (24 hr)	0.05 ppm (1 hr)	1998	*	*	*	*	1 / NA	*
			1999	*	*	*	*	0 / NA	*
			2000	*	*	*	*	0 / NA	*
			2001	*	*	*	*	0 / NA	*

Notes:

* indicates the pollutant was not monitored

ppm = parts per million

$\mu g/m^3$ = micrograms per cubic meter

Violation days = # of days exceeding federal or state standard

N/A = not applicable

Source: California Air Resources Board, Air Quality Data, 1996-2001.

Table 4.3-2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	National Standards	California Standards
Ozone	1-hour 8-hour	0.12 ppm (235 µg/m^3) 0.08 ppm (157 µg/m^3)	0.09 ppm (180 µg/m^3) N/A
Carbon Monoxide (CO)	1-hour 8-hour	35 ppm (40 mg/m^3) 9 ppm (10 mg/m^3)	20 ppm (23 mg/m^3) 9.0 ppm (10 mg/m^3)
Nitrogen Oxides (NO$_X$)	1-hour annual	--- 0.053 ppm (100 µg/m^3)	0.25 ppm (470 µg/m$^{3)}$ ---
Sulfur Dioxide (SO$_2$)	1-hour 24-hour annual	--- 0.14 ppm (365 µg/m^3) 0.03 ppm (80 µg/m^3)	0.25 ppm (655 µg/m^3) 0.04 ppm (105 µg/m^3) ---
Respirable Particulate Matter (PM$_{10}$)	24-hour annual	150 µg/m^3 50 µg/m^3	50 µg/m^3 20 µg/m^3
Fine Particulate Matter (PM$_{2.5}$)	24-hour annual	65 µg/m^3 15 µg/m^3	---

Notes:
pm = parts per million
g/m^3 = micrograms per cubic meter

*Source***:** *California Air Resources Board, 2003.*

Table 4.3-3: Health Effects 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: BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans, April 1996, revised December 1999.

At the federal level, the CAA is administered by the USEPA. In California, the CCAA is administered by the California Air Resources Board (CARB) at the state level and by the Air Quality Management Districts at the regional and local levels. The SVRTC project is located in the Bay Area Air Basin. The BAAQMD is the agency principally responsible for air pollution control in this basin.

A number of models were used to determine air quality impacts. The USEPA-approved emissions factor model in California is EMFAC2002. EMFAC2002 estimates emission factors for motor vehicles (passenger cars, trucks, and buses) operating in California for calendar years 1970-2040. CAL3QHC is a microcomputer based model used to predict CO concentrations from motor vehicles at roadway intersections. This model includes a traffic algorithm for estimating vehicular queue lengths at signalized intersections. The model estimates total air pollution concentrations from both moving and idling vehicles. A third model, SCREEN3 is a Gaussian plume model used to provide maximum ground-level pollution concentrations for point, area, flare, and volume sources. SCREEN3 estimates maximum ground-level concentrations and the distance to the maximum concentrations. SCREEN3 applies a range of meteorological conditions including stability classes and wind speeds to determine maximum concentrations.

Toxic Air Contaminants

Due to their potential to increase the risk of developing cancer or because of the acute or chronic health risks that may result from exposure to these substances, many pollutants are identified as TACs. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another is. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a factor called a Hazard Index is used to evaluate risk.

TACs are emitted during combustion of gasoline and diesel fuel by motor vehicles. Benzene, formaldehyde, 1,3-butadiene, and particulate matter are some of the TACs that are emitted in diesel exhaust. Particulate matter from diesel exhaust represents the greatest health risk. CARB formally identified particulate matter emitted by diesel-fueled engines as a TAC on August 27, 1998. Since the vast majority of diesel exhaust particles are very small (94% of their combined mass consists of particles less than 2.5 micrometers in diameter), they are easily inhaled into the lungs. The CARB action will lead to additional control by CARB of diesel exhaust in coming years. The USEPA has also begun an evaluation of both the cancer and non-cancer health effects of diesel exhaust.

BAAQMD has developed a methodology to evaluate the significance of TAC emissions from stationary sources, but their approach does not apply to mobile sources. Automobiles and trucks are mobile sources of TAC emissions in the Bay Area, and the quantity of TAC emissions from motor vehicles is directly correlated with the amount of VMT.

Greenhouse Gases

Greenhouse gases absorb heat in the atmosphere. Since the industrial revolution, concentrations of greenhouse gases in the earth's atmosphere have been gradually increasing. Many scientists believe that recently recorded increases in the earth's average temperature are the result of increases in concentrations of greenhouse gases.

Naturally occurring greenhouse gases include water vapor, carbon dioxide (CO_2), methane, nitrous oxide, and ozone. Certain human activities, however, add to the levels of most of these naturally occurring gases. CO_2 is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), wood and wood products are burned. Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. CO_2 and nitrous oxide are the two greenhouse gases released in greatest quantities from mobile sources burning gasoline and diesel fuel.

Air Quality Conformity Requirements

As amended in 1990, the federal CAA provides the current framework to ensure conformity of transportation projects with a SIP for air quality. The CAA defines conformity as follows:

> "Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards."

Section 176 of the CAA specifies that no federal agency may approve, support, or fund an activity that does not conform to the applicable implementation plan. In late 1993, the USEPA promulgated final rules for determining conformity of transportation plans, programs, and projects. These final rules, contained in 40 CFR Part 93 govern the conformity assessment for the SVRTC project.

BAAQMD, in coordination with the MTC and ABAG, is responsible for preparing air quality plans pursuant to the federal and California Acts. Under the federal CAA, SIPs are required for areas that are designated as non-attainment for ozone, CO, NO_2, SO_2, or PM_{10}. For the Bay Area Air Basin, a SIP is required for ozone since the region is currently designated as a federal non-attainment area for this pollutant. The current SIP is called the Bay Area 2001 Ozone Attainment Plan, which was adopted by MTC, ABAG, and BAAQMD in October 2001. CARB adopted this plan in November 2001, and USEPA approved the associated emissions budget in February 2002.

Whereas the SIP is prepared pursuant to the federal CAA, the Bay Area Clean Air Plan (CAP) is prepared to meet the requirements of the CCAA. The CAP is the region's plan for reducing ground-level ozone. The CAP identifies how the Bay Area Air Basin would meet the state ozone standard by its attainment date. The 2000 CAP focuses on identifying and implementing control measures that would reduce ozone. It was adopted by the BAAQMD in December 2000.

MTC is responsible for establishing that the Regional Transportation Plan (RTP) and Bay Area Regional Transportation Improvement Program (TIP) conform to the SIP. An RTP conformity analysis has been completed. A draft analysis was released for public review in September 2001 and revised in November 2001. A final conformity analysis was adopted by MTC in March 2002 following USEPA's approval of the Bay Area mobile source emissions budget.

4.3.3 IMPACT ASSESSMENT AND MITIGATION MEASURES

4.3.3.1 Regional Air Quality Impacts

There is a direct relationship between vehicle miles traveled (VMT) and air pollution. In the SVRTC project area, mobile emissions are the primary source of air pollution. A major transportation project that would increase or decrease regional VMT would also degrade or improve air quality, respectively, within the transportation corridor. Criteria pollutant emissions were estimated using estimated VMT and emission factor data from the traffic analysis for the SVRTC alternatives. Results for each project alternative are presented in Table 4.3-4 and discussed below. A negative value indicates the alternative will decrease the indicated pollutant.

No-Action Alternative

As shown in Table 4.3-4, criteria pollutant emissions for the No-Action Alternative are marginally higher than the Baseline and BART alternatives, with the exception of an incremental increase in NO_x for the Baseline Alternative compared to the No-Action Alternative. In addition, the quantities of TAC emissions and greenhouse gases are higher for the No-Action Alternative than for the Baseline and BART

Table 4.3-4: Criteria Pollutant Emissions Comparison

Project Alternative	Criteria Pollutant Emissions (pounds per day)				
	CO	Reactive Organic Gases (ROG)	NO_X	SO_2	PM_{10}
No-Action	699,758.7	101,621.3	79,472.3	1,890.6	18,803.0
Baseline Alternative	699,229.0	101,612.3	79,478.1	1,889.1	18,788.7
BART Alternative	695,251.6	101,014.3	78,985.9	1,878.4	18,682.4
MOS 1E	695,432.0	101,040.6	79,007.5	1,878.9	18,687.2
Baseline vs. No-Action	-529.7	-9.0	5.8	-1.5	-14.3
BART vs. No-Action	-4,507.1	-607.0	-486.4	-12.2	-120.6
MOS 1E vs. No-Action	-4,326.7	-580.7	-464.8	-11.7	-115.8

Source: Manuel Padron & Associates, Terry A. Hayes Associates LLC, 2003.

alternatives because TAC and greenhouse gases from motor vehicles are directly correlated with the amount of VMT. Therefore, the No-Action Alternative is generally less beneficial to regional air quality than the Baseline and BART alternatives.

Baseline Alternative

As shown in Table 4.3-4, criteria pollutant emissions are anticipated to incrementally decrease by 529.7 pounds per day (ppd) for CO, 9.0 ppd for reactive organic gases (ROG), 1.5 ppd for SO_2, and 14.3 ppd for PM_{10}, and increase by 5.8 ppd for NO_x when compared to the No-Action Alternative. In addition, the quantities of TAC emissions and greenhouse gases for the Baseline Alternative are lower than the No-Action Alternative, but higher than the BART alternative because TAC and greenhouse gases from motor vehicles are directly correlated with the amount of VMT. Thus, the Baseline alternative would have an overall beneficial impact on regional air quality.

BART Alternative

The BART Alternative would have greater benefits on regional air quality. As shown in Table 4.3-4, the reductions of criteria pollutant emissions under the BART Alternative are anticipated to be even greater than reductions projected under the Baseline Alternative. Emissions are projected to decrease by 4,507.1 ppd for CO, 607.0 ppd for ROG, 486.4 ppd for NO_X, 12.2 ppd for SO_2, and 120.6 ppd for PM_{10} when compared to the No-Action Alternative. In addition, the reduction in VMT with the BART Alternative in comparison to the No-Action and the Baseline alternatives, results in fewer TAC emissions.

The BAAQMD has not developed any significance thresholds for greenhouse gases. This is because greenhouse gases, especially carbon dioxide, do not pose any health risks at ambient concentrations. The impacts associated with greenhouse gases are long-term climatic changes, which are beyond the regulatory purview of the air district. However, automobiles are a major source of greenhouse gas emissions, and the quantity of greenhouse gas emissions from automobiles is directly correlated with the amount of VMT. Accordingly, implementation of the BART Alternative would reduce emissions of greenhouse gases from automobiles compared to the No-Action and Baseline Alternatives, resulting in a beneficial impact.

MOS-1E would generate approximately 0.3 percent more VMT than the full-build BART Alternative. In terms of regional emissions, this translates to less than 1 percent of the emissions produced by the full-build BART Alternative for CO_2, reactive organic gases, nitrogen oxide, sulfur oxide, and particulate matter. MOS-1E would result in a decrease in TAC emissions and greenhouse gases in comparison to the No-Action and Baseline alternatives, but would result in marginally increased TAC emissions and greenhouse gases resulting from the 0.3 percent increase in VMT in comparison to the BART Alternative. Although MOS-1E would emit slightly more pollution than the full-build BART Alternative, MOS-1E would still reduce regional emissions and have a beneficial impact on air quality.

4.3.3.2 Microscale Air Quality Impacts

Overall, CO concentrations are expected to be much lower than existing conditions in year 2025 due to stringent state and federal mandates for lowering vehicle emissions. Although total traffic volumes would be higher in the future both with and without the SVRTC alternatives, CO emissions from vehicles are expected to be much lower due to technological advances in vehicle emissions systems, as well as turnover in the vehicle fleet.

No-Action Alternative

As shown in Table 4.3-5, future CO concentrations with the No-Action Alternative would not exceed either the state 1-hour standard of 20 ppm or the state 8-hour standard of 9 ppm.

Baseline and BART Alternatives

Baseline and BART Alternatives Intersection Analysis

Within the urban setting, the highest concentrations of CO are found within close proximity to busy intersections. To provide a worst-case simulation of CO concentrations within the SVRTC project area, CO concentrations at sidewalk locations adjacent to 35 project area intersections were analyzed where traffic would operate at Level of Service E (LOS E) or LOS F under the Baseline or BART alternative. As shown in Table 4.3-5, future CO concentrations at these 35 project area intersections would not exceed the state 1-hour CO standards of 20 ppm or the state 8-hour CO standards of 9 ppm for either the No-Action or BART alternative. With minimal changes to the level of service at the 35 intersections, MOS 1E would also not exceed state standards. Localized traffic impacts were not separately modeled under the Baseline Alternative because these effects would be very similar to those of the No-Action Alternative.

Even though the Baseline and BART alternatives would decrease regional VMT and emissions of TAC, it would increase traffic volumes, traffic congestion, and TAC emissions near transit stations. Increases in local TAC concentrations would likely result from increases in emissions from light duty vehicles (automobiles, trucks, and SUVs) rather than diesel powered vehicles since light duty vehicles would be the predominate users of the BART station parking facilities. As such, the increase in TAC emissions from gasoline combustion is expected to be negligible. This conclusion is based on the results of the CO modeling analysis that shows decreases in ambient concentrations at some receptors and only small increases in CO concentrations at other locations. The concentrations of TAC would be expected to follow a pattern similar to CO because the TAC of primary concern, diesel particulates, is, like CO, non reactive. Consequently, the increase in emissions of TAC locally would not result in an adverse impact to air quality.

Table 4.3-5: Future Carbon Monoxide Concentrations *(parts per million)* [1]

	1-Hour		8-Hour	
	No Action	**BART**	**No Action**	**BART**
Abel Street / Serra Way	2.9	2.9	1.7	1.7
The Alameda / Hedding Avenue	3.0	3.0	1.8	1.8
Almaden Boulevard / San Carlos Street	3.2	3.2	1.9	1.9
Almaden Boulevard / San Fernando Street	3.0	3.0	1.8	1.8
Autumn Street / Santa Clara Street	2.9	3.0	1.7	1.8
Auzerais Avenue / Delmas Avenue	3.1	3.1	1.9	1.9
Benton Street / Lafayette Street	2.9	2.9	1.7	1.7
Berryessa Road / Lundy Avenue	3.2	3.2	1.9	1.9
Bird Avenue / San Carlos Street	3.1	3.1	1.9	1.9
Brokaw Road / Oakland Avenue	3.0	3.2	1.8	1.9
Capitol Avenue / Cropley Avenue	3.1	3.1	1.9	1.9
Central Expressway / De La Cruz Boulevard	3.3	3.1	2.0	1.9
Central Expressway / Lafayette Street	3.1	3.2	1.9	1.9
Coleman Avenue / I-880	3.3	3.2	2.0	1.9
El Camino Real / Monroe Street	3.2	3.2	1.9	1.9
Great Mall Parkway / I-880 NB Ramps	3.1	3.1	1.9	1.9
King Road / McKee Road	3.1	3.2	1.9	1.9
King Road / San Antonio Street	3.0	3.0	1.8	1.8
King Road / Story Road	3.1	3.1	1.9	1.9
Julian Street / Twenty Fourth Street	3.1	3.0	1.9	1.8
Julian Street / Twenty Eighth Street	2.9	3.0	1.7	1.8
Julian Street / Eighty Seventh Street	3.0	3.1	1.8	1.9
Julian Street / US-101 Southbound Ramps	3.0	3.2	1.8	1.9
Lincoln Avenue / San Carlos Street	3.0	3.0	1.8	1.8
Market Street / San Carlos Street	3.1	3.1	1.9	1.9
Meridian Street / San Carlos Street	3.1	3.1	1.9	1.9
Milpitas Boulevard / Jacklin Road	3.0	3.0	1.8	1.8
Milpitas Boulevard / SR 237	3.1	3.1	1.9	1.9
Montague Expressway / Milpitas Boulevard	3.2	3.2	1.9	1.9
Montgomery Street / Santa Clara Street	3.3	3.3	2.0	2.0
Park Avenue / Race Street	2.9	2.9	1.7	1.7
Park Victoria Drive / Calaveras Boulevard	2.9	2.9	1.7	1.7
Park Victoria Drive / Landess Avenue	3.0	3.0	1.8	1.8
San Tomas Road / Benton Street	3.0	3.0	1.8	1.8
Tasman Drive / I-880 Southbound Ramps	3.0	3.0	1.8	1.8
State Standard	**20.0**		**9.0**	

Note:

[1] All concentrations include year 2025 1- and 8-hour ambient concentrations of 2.6 ppm and 1.6 ppm, respectively.

Source: Terry A. Hayes Associates, LLC, 2003.

BART Alternative Park-and-Ride Analysis

Park-and-Ride Hot Spot Analysis

The station area concept plans for the BART Alternative indicate that multi-level parking structures, as shown in Table 4.3-6, are proposed at the following stations:

Table 4.3-6: BART Station Parking Structure Spaces

BART Station	Vehicle Spaces in Parking Structure
South Calaveras (Future)	1,000 - 1,200
Montague/Capitol	1,200 - 1,600
Berryessa	1,500 - 3,500
Alum Rock	1,500 - 2,500
Diridon/Arena	1,500 - 2,200
Santa Clara	800 - 1,200

Because of the large parking capacities proposed (1,200 to 3,500 spaces), a CO hot spot analysis was conducted to determine whether slow moving and idling vehicles within the parking structures during peak periods would result in CO concentration violations. The USEPA SCREEN 3 dispersion model was used for this purpose. Year 2025 conditions were assumed.

The results of the analysis are shown in Table 4.3-7 for the six parking structures, which include two design options each for the South Calaveras (Future), Berryessa, and Diridon/Arena stations. Because a plume of pollutants tends to rise from a multi-level parking structure, the highest 1-hour CO concentrations occur some distance from the structure. For the BART station parking structures at Diridon/Arena, Montague/Capitol, and Santa Clara, the highest concentration would occur approximately 500 feet from the structure in the prevailing wind direction. For the South Calaveras (Future), Berryessa, and Alum Rock station parking structures, the concentrations do not change with distance.

When the year 2025 ambient 1-hour background concentration of 2.6 ppm and 8-hour background concentration of 1.6 are taken into account, total concentrations would range from 2.6 to 2.7 ppm for the 1-hour period and would be approximately 1.6 ppm for the 8-hour period. The CAAQS of 20 ppm for 1-hour concentrations and 9 ppm for the 8-hour period would not be exceeded, and no substantial air quality impacts from the parking structures are anticipated.

Both MOS-1E and MOS-1F would have fewer parking spaces than the full-build BART Alternative would, resulting in slightly less CO concentrations and TAC emissions. Thus, the MOS scenarios would also be within the state 1- and 8-hour standards near station parking structures.

4.3.3.3 Design Requirements and Best Management Practices

No Design Requirements or Best Management Practices are proposed for the Baseline or BART alternatives.

Table 4.3-7: Carbon Monoxide Concentrations Near Station Parking Structures (2025) [1]

Station	South Calaveras (Future)		Berryessa		Alum Rock	Diridon/Arena		Montague/ Capitol	Santa Clara
Spaces	1,200	1,200 [2]	2,800	3,500	2,500	1,500	2,200	1,600	1,200
Acres	2.3	2	5.1	6.2	4.2	2.1	2.8	3.4	3.6
Parking Levels	5	4	5	5	5	6	7	4	4
1-Hour CO Concentration (parts per million)									
50 feet	2.6	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
100 feet	2.6	2.7	2.7	2.7	2.7	2.6	2.7	2.6	2.6
500 feet	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
1,000 feet	2.6	2.7	2.7	2.7	2.7	2.6	2.7	2.6	2.6
1,500 feet	2.6	2.7	2.7	2.7	2.7	2.6	2.7	2.6	2.6
8-Hour CO Concentration (parts per million)									
50 feet	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
100 feet	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
500 feet	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
1,000 feet	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
1,500 feet	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Notes:

[1] CO concentrations assume peak evening operations at parking structures. EMFAC2002 emissions factors for running exhaust emissions and starting emissions were used. The USEPA SCREEN 3 dispersion model was used to estimate concentrations at ground level from mobile sources on each level of a multi-level parking structure. Parking garages are assumed to have sufficient egress capacity to clear the peak parking demand during a one-hour period. All concentrations include year 2025 1- and 8-hour ambient concentrations of 2.6 ppm and 1.6 ppm, respectively.

[2] Includes a surface parking lot.

Source: Terry A. Hayes Associates LLC, 2003, Appendix F.

4.3.3.4 Mitigation Measures

No-Action Alternative

Projects planned under the No-Action Alternative would undergo separate environmental review to define any appropriate mitigation measures.

Baseline and BART Alternatives

Mitigation measures are not required for either the Baseline or BART alternative, including the MOS scenarios, for operational air quality impacts. With the implementation of both the Baseline and BART alternatives, all criteria pollutant emissions, TAC emissions, and greenhouse gases are anticipated to incrementally decrease, with the exception of NO_x, which would marginally increase as a result of the Baseline Alternative in comparison to the No-Action Alternative. Therefore, no adverse impacts would result from either the Baseline or BART alternative, including the MOS scenarios.

4.3.4 AIR QUALITY CONFORMITY DETERMINATION

FTA cannot approve funding for SVRTC project activities beyond preliminary engineering unless the project is in conformity with USEPA transportation conformity regulations (40 CFR Part 93). The criteria that the Baseline and BART alternatives must satisfy are discussed below. The federal conformity criteria are applicable only to operations emissions. They do not apply to construction emissions.

§93.110 The conformity determination must be based on the latest planning assumptions.

ABAG and MTC are the Metropolitan Planning Organizations responsible for determining areawide population and employment forecasts, modeling regional travel demand, and formulating the RTP and the TIP. Assumptions used in the transportation and traffic analysis for this project, upon which the microscale CO and regional criteria pollutant analyses are based, are derived from ABAG's most recently adopted population, employment, travel, and congestion estimates. Travel forecasts are based on ABAG's growth assumptions for year 2025.

§93.111 The conformity determination must be based on the latest emission estimation model available.

Emission estimates are based on the CARB EMFAC7F model. The USEPA CAL3QHC and SCREEN 3 dispersion models were used for CO modeling. EMFAC7F, CAL3QHC and ISCST3 dispersion models are the most recent models approved by USEPA.

§93.112 Conformity determination must be made according to the consultation procedures of this rule and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR Part 450. The conformity determination must be made according to §93.105(a)(2) and (e) and the requirements of 23 CFR Part 450.

The MTC followed the consultation procedures in 20 CFR Part 450, 40 CFR Part 51, and 40 CFR Part 93 before making its conformity determination. The 2001 RTP, 2001 TIP, and 2003 TIP were made available for public review prior to adoption.

§93.114 There must be a currently conforming transportation plan and TIP at the time of project approval.

Under federal law, the MTC is responsible for the long-range transportation plan in the San Francisco Bay Area. The transportation plan provides long-term solutions to the region's transportation needs under a framework that meets mobility, air quality regulations, and other regional goals. The current transportation plan is the 2001 RTP. The Federal Highway Administration (FHWA) and FTA approved the conformity determination for the 2001 RTP for the San Francisco Bay Area on March 5, 2002.

The TIP is a short-term federal transportation improvement program, which includes a list of proposed transportation projects. Since the 2003 TIP does not include any regionally significant projects beyond those currently included in the 2001 RTP, the 2003 TIP does not require separate air quality conformity determination. Also, the TIP consists only of projects that are exempt from air quality conformity, and projects that substantially support implementation of Transportation Control Measures. MTC used the 2001 RTP and 2001 TIP conformity analysis for the 2003 TIP. The 2001 TIP was federally approved on March 18, 2002.

§93.115 The proposed project must come from a conforming transportation plan and TIP.

The SVRTC project is included in the 2001 RTP and the 2001 and 2003 TIP. The 2001 RTP and the 2003 TIP have been found by MTC, FHWA, and FTA to conform to the CAA. The 2003 RTP, which does not contain any regionally significant projects beyond those currently included in the 2001 RTP, was adopted by MTC on January 23, 2003. The design concept and scope of the BART Alternative have not changed from the project that is included in the 2001 RTP, the 2001 TIP, and the 2003 TIP.

§93.116 The proposed project would not cause or contribute to any new localized CO or PM_{10} violations or increase the frequency or severity of any existing CO or PM_{10} violations in CO and PM_{10} non-attainment and maintenance areas.

Operations of the BART Alternative would change travel patterns and concentrations of motor vehicle traffic in the vicinity of BART station areas (particularly those with park-and-ride lots), which would cause small increases in CO concentrations in the area, however, the state and federal standards would not be violated. The BART and Baseline alternatives would decrease regional vehicle trips and VMT. VMT is anticipated to decrease since the transit project would decrease the number of automobile trips in the corridor. As a result, CO and PM_{10} emissions for the Baseline and BART alternatives would be less than for the No-Action Alternative. As discussed in Section 4.3.3, the SVRTC project would not violate state or federal air quality standards.

§93.117 The proposed project must comply with PM_{10} control measures that are contained in the applicable implementation plan.

PM_{10} control measures are not available for the San Francisco Bay Area since the BAAQMD does not have an implementation plan for PM_{10}. The Baseline and BART alternatives would reduce VMT in the region, which would reduce regional PM_{10} emissions when compared to the No-Action Alternative. If a federal PM_{10} attainment plan is required in the future, VTA would identify appropriate control measures for PM_{10} emissions.

Based on the above, the SVRTC project satisfies the USEPA's project-level conformity requirements (40 CFR Part 93).

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