4.2 Air Quality

4.2.1 Introduction

This section describes the affected environment and environmental consequences related to air quality from operations of the NEPA Alternatives. Information in this section is based on *VTA's BART Silicon Valley – Phase II Extension Project Air Quality Study* (Terry A. Hayes Inc. 2016), which is included with this SEIS/SEIR as a technical report and provides calculation details and air quality data.

4.2.2 Environmental and Regulatory Setting

4.2.2.1 Environmental Setting

Existing Air Quality Conditions

Climate and Meteorology

Regional Context

The BART Extension Alternative alignment passes through the Cities of San Jose and Santa Clara. The west portal is less than 1 mile west of Mineta San Jose International Airport. The corridor is in an air basin that includes nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. Air quality in the region is affected by natural factors, such as proximity to the bay and ocean, topography, meteorology, and existing air pollution sources. At the northern end of the peninsula, in San Francisco, pollutant emissions are high, especially with motor vehicle congestion. Localized pollutants, such as carbon monoxide (CO), can build up in "urban canyons." However, the winds are generally strong enough to carry the pollutants away before they can accumulate.

The Bay Area is characterized by a Mediterranean-type climate, with warm, dry summers and cool, wet winters. The terrain of the area influences both the climate and air pollution potential. The Cities of San Jose and Santa Clara lie in the Santa Clara Valley climatological subregion of the air basin. The northwest/southeast-oriented Santa Clara Valley is bounded by the Santa Cruz Mountains to the west, the Diablo Range to the east, the San Francisco Bay to the north, and the convergence of the Gabilan Range and the Diablo Range to the south. Winter temperatures are mild, except for very cool but generally frostless mornings. At the northern end of the Santa Clara Valley, Mineta San Jose International Airport reports mean maximum temperatures ranging from the high 70s to the low 80s during the summer and the high 50s to the low 60s during the winter; mean minimum temperatures range from the high 50s during the summer to the low 40s during the winter. Farther inland, where the moderating effect of the bay is not as strong, temperature extremes are greater.

Local Climate

The annual average temperature along the BART Extension alignment is approximately 60°F (Western Regional Climate Center 2015). The corridor area experiences an average winter temperature of approximately 50°F and an average summer temperature of approximately 68°F. Total precipitation in the corridor averages approximately 14.6 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer.

The wind patterns in the Santa Clara Valley are influenced greatly by the terrain, resulting in a prevailing flow roughly parallel to the valley's northwest-southeast axis, with a north-northwesterly ocean breeze that flows up the valley in the afternoon and early evening and a light south-southeasterly flow during the late evening and early morning. In the summer, a convergence zone is sometimes observed in the southern end of the valley between Gilroy and Morgan Hill when air flowing from the Monterey Bay through the Pajaro Gap is channeled northward into the south end of the Santa Clara Valley and meets with the prevailing north-northwesterly winds. Speeds are greatest in the spring and summer; nighttime and early morning hours have light winds and are frequently calm in all seasons. Summer afternoons and evenings can be windy.

Air Quality Monitoring

The Bay Area Air Quality Management District (BAAQMD) monitors air quality conditions at more than 30 locations throughout the Bay Area. The nearest air monitoring station to the BART Extension is in San Jose at 158 East Jackson Street, approximately 0.9 mile northwest of Santa Clara Street and 0.5 mile east of State Route (SR) 87. The East Jackson Street monitoring station is representative of air quality conditions throughout the alignment. Historical data from this station were used to characterize existing conditions in the vicinity of the BART Extension and establish a baseline for estimating future conditions with and without the extension. Pollutants monitored at the 158 East Jackson Street Monitoring Station include ozone, CO, and particulate matter (PM), which consists of PM that is 10 microns in diameter or less (PM10) and PM that is 2.5 microns in diameter or less (PM2.5).

Monitored data is compared to National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) to determine if existing conditions exceed health standards. Table 4.2-1 summarizes the NAAQS, and the CAAQS are provided for reference. Table 4.2-2 summarizes ambient air quality conditions from 2010 to 2014 and number of exceedances as compared to NAAQS and CAAQS.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The California Air Resources Board (ARB) has identified the following groups who are most likely to be affected by air pollution: children under 14, the elderly (over 65 years of age), athletes, and people with cardiovascular and chronic respiratory diseases. Typically, sensitive receptors include

residences, schools, playgrounds, child-care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The 6-mile extension passes through San Jose and ends in Santa Clara. The alignment is surrounded by a mix of residential, industrial, commercial, institutional, and recreational land uses. Refer to Section 4.4, *Community Services and Public Facilities*, for locations of schools, parks, and recreational facilities, and religious or civic institutions that may be sensitive to air quality pollutants. Refer to Section 4.11, *Land Use*, for locations of residential uses along the alignment.

Table 4.2-1: Federal and State Air Quality Standards and Attainment Status, San Francisco Bay Area

Pollutant	Averaging Period	Federal (NAAQS)		California (CAAQS)	
		Standards	**Attainment Status**	**Standards**	**Attainment Status**
Ozone	1 hour	No federal standard	No federal standard	0.09 ppm (180 µg/m³)	Nonattainment
	8 hours	0.070 ppm (137 µg/m³)	Nonattainment	0.070 ppm (137 µg/m³)	Nonattainment
Respirable Particulate Matter (PM10)	24 hours	150 µg/m³	Unclassified	50 µg/m³	Nonattainment
	Annual arithmetic mean	No federal standard	No federal standard	20 µg/m³	Nonattainment
Fine Particulate Matter (PM2.5)	24 hours	35 µg/m³	Nonattainment	No state standard	No state standard
	Annual arithmetic mean	12.0 µg/m³	Unclassified	12 µg/m³	Nonattainment
Carbon Monoxide	8 hours	9 ppm (10 mg/m³)	Attainment/Maintenance	9.0 ppm (10 mg/m³)	Attainment
	1 hour	35 ppm (40 mg/m³)	Attainment/Maintenance	20 ppm (23 mg/m³)	Attainment
Nitrogen Dioxide	Annual arithmetic mean	53 ppb (100 µg/m³)	Attainment	0.030 ppm (57 µg/m³)	Attainment
	1 hour	100 ppb (188 µg/m³) /a/	Unclassified	0.18 ppm (339 µg/m³)	Attainment
Sulfur Dioxide	24 hours	0.14 ppm (365 µg/m³)	Attainment	0.04 ppm (105 µg/m³)	Attainment
	1 hour	75 ppb (196 µg/m³)	Attainment	0.25 ppm (655 µg/m³)	Attainment
Lead	30-day average	--	Attainment	1.5 µg/m³	Attainment
	Calendar quarter	1.5 µg/m³	Attainment	No state standard	No state standard
	Rolling 3-month average	0.15 µg/m³	--	No state standard	No state standard
Visibility-Reducing Particles	8 hours	No federal standard		Extinction coefficient of 0.23 per kilometer	Unclassified
Sulfates	24 hours	No federal standard		25 µg/m³	Attainment
Hydrogen Sulfide	1 hour	No federal standard		0.03 ppm (42 µg/m³)	Unclassified

Note: ppb = parts per billion; ppm = parts of million
Source: California Air Resources Board 2015b.

Table 4.2-2: 2010–2014 Ambient Air Quality Data in BART Extension Vicinity[a]

Pollutant	Pollutant Concentration and Standards	Number of Days Above State Standard				
		2010	2011	2012	2013	2014
Ozone	Maximum 1-hour Concentration (ppb)	126	98	101	93	89
	Days > 90 ppb (state 1-hour standard)	5	1	1	1	0
	Maximum 8-hour Concentration (ppm)	86	67	62	79	66
	Days > 70 ppb (state 8-hour standard)	3	0	0	1	0
	Days > 75 ppb (federal 8-hour standard)	3	0	0	1	0
Carbon Monoxide	Maximum 1-hour concentration (ppm)	2.8	2.5	2.6	3.1	2.4
	Days > 20 ppm (state1-hour standard)	0	0	0	0	0
	Days > 35 ppm (federal 1-hour standard)	0	0	0	0	0
	Maximum 8-hour concentration (ppm)	2.2	2.2	1.9	n/a	n/a
	Days > 9.0 ppm (state 8-hour standard)	0	0	0		
	Days > 9.0 ppm (federal 8-hour standard)	0	0	0		
Respirable Particulate Matter (PM10)	Maximum 24-hr Concentration (µg/m³)	44.2	41.3	56.5	55.8	56.4
	Estimated Days > 50 µg/m³ (state 24-hour standard)	0	0	1	5	1
	Estimated Days > 150 µg/m³ (federal 24-hour standard)	0	0	0	0	0
Fine Particulate Matter (PM2.5)	Maximum 24-hr Concentration (µg/m³)	41.5	50.5	38.4	57.7	60.4
	Estimated Days > 35 µg/m³ (federal standard)	3	3	2	4	2

Note: ppb = parts per billion; ppm = parts of million; µg/m³ = microgram per cubic meter

[a.] PM2.5 and PM10 background data were obtained from the East Jackson Street monitoring station.

Source: California Air Resources Board 2015a.

4.2.2.2 Regulatory Setting

Background on Air Pollutants

The federal government has established NAAQS for six criteria pollutants: ozone, CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM10, and PM2.5. Effective October 1, 1993, ARB required a new sulfur limit of 0.05 percent (500 ppm) termed "low sulfur" diesel fuel, which is applicable to both highway and off-road vehicles. The new low sulfur diesel fuel led to negligible SO_2 emissions as compared to emissions of other criteria pollutants such as nitrogen oxides (NO_X) and CO. The proposed project is not considered a significance source of SO_2 emissions. In addition, the local air district does not consider SO_2 to be a pollutant of concern in the air basin. The primary pollutants of concern for the BART Extension Alternative are ozone, CO, PM, and NO_2. which is assessed as NO_X. The principal characteristics surrounding these pollutants are discussed below. Toxic air contaminants

(TACs)/mobile-source air toxics (MSATs) are also discussed, although there are no federal standards for these pollutants.

Ozone

Ground-level ozone is not emitted directly into the air but is created by chemical reactions between NO_X and volatile organic compounds (VOCs)/reactive organic compounds (ROGs) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_X and VOCs. Breathing ozone can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. Ground-level ozone can also have harmful effects on sensitive vegetation and ecosystems.

Carbon Monoxide

CO, a colorless, odorless gas, is emitted from combustion processes. In urban areas, the majority of CO emissions to ambient air come from mobile sources. CO can cause harmful health effects by reducing oxygen delivery to the body's organs (e.g., the heart and brain) and tissues.

Particulate Matter

PM is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of the particles is directly linked to their potential for causing health problems. The U.S. Environmental Protection Agency (EPA) is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. EPA groups particle pollution into two categories: inhalable coarse particles, which include PM10, and fine particles, which include PM2.5. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries, and automobiles react in the air.

Numerous scientific studies have linked particle pollution exposure to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased incidences of respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing. People with heart or lung diseases, children, and older adults are most likely to be affected by particle pollution. However, even healthy individuals may experience temporary symptoms from exposure to elevated levels of particle pollution.

Toxic Air Contaminants/Mobile Source Air Toxics

Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the ARB) has consistently found that there are no levels or

thresholds below which exposure is risk free. Individual TACs vary greatly with regard to the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs are a category of air pollutants that have been shown to have an impact on human health but are not classified as criteria pollutants.

Air toxics are generated by a number of sources, including stationary sources (e.g., dry cleaners, gas stations, auto body shops, combustion sources), mobile sources (e.g., diesel trucks, ships, trains), and area sources (e.g., farms, landfills, construction sites). Ten TACs have been identified, with use of ambient air quality data, as posing the greatest health risks in California. Adverse health effects of TACs can be carcinogenic (cancer causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders.

EPA has identified a group of 93 compounds that are emitted from mobile sources and listed them in its Integrated Risk Information System. From this list of 93 compounds, EPA has identified seven as priority MSATs: acrolein, benzene, 1,3-butadiene, diesel particulate matter/diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter.

Federal

The federal regulations discussed below are applicable to the study area. Chapter 6, Section 6.3, *Air Quality*, provides further details regarding state and local regulations related to air quality.

Clean Air Act

The Clean Air Act (CAA) governs air quality in the United States. EPA is responsible for enforcing the CAA and establishing the NAAQS, which are required under the 1977 CAA and subsequent amendments. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. In addition, EPA has jurisdiction over emission sources that are outside state waters (e.g., beyond the outer continental shelf). It also establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards, which are established by ARB.

The CAA requires EPA to designate areas as *attainment*, *nonattainment*, or *maintenance* (previously nonattainment and currently attainment) areas with regard to each criteria pollutant, based on whether the NAAQS have been achieved. Table 4.2-2 summarizes the NAAQS; CAAQS are provided for reference. The attainment status of the BART Extension area with respect to the NAAQS and CAAQS is also presented.

Transportation Conformity

CAA Section 176(c)(1) (U.S. Code, Title 42, Section 7506) states that "No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated…" A transportation conformity analysis is required to ensure that federally supported highway and transit project activities are consistent with the purpose of the State Implementation Plan (SIP). Conformity with the CAA takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Mobile-Source Air Toxics

The CAA made controlling air toxic emissions a national priority; therefore, Congress mandated that EPA regulate 188 air toxics. These substances are also known as hazardous air pollutants (HAPs). In its latest rule on the control of HAPs from mobile sources (72 *Federal Register* 8430), EPA identified a group of 93 compounds that are emitted from mobile sources and listed them in its Integrated Risk Information System. From this list of 93 compounds, EPA identified seven as priority MSATs: acrolein, benzene, 1,3-butadiene, diesel particulate matter/diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter. The high regulation priority of these seven MSATs was based on EPA's 1999 National Air Toxics Assessment.

In March 2001, EPA issued regulations that required the producers of urban air toxics to decrease emissions of these pollutants by target dates in 2007 and 2020. As a result, on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde will be reduced by 67 to 76 percent between 1990 and 2020. On-highway diesel particulate matter emissions will be reduced by 90 percent. These reductions are expected as a result of the national mobile-source control programs listed below.

- Reformulated gasoline program
- New threshold for the toxic content of gasoline
- National low-emission vehicle standards
- Tier 2 motor vehicle emissions standards and gasoline sulfur-control requirements
- Heavy-duty engine and vehicle standards and on-highway diesel-fuel sulfur-control requirements

The predicated improvements are net emission reductions that will be experienced even after the number of vehicle miles traveled (VMT) is taken into account.

4.2.3 Methodology

4.2.3.1 Overview

Based on EPA's transportation conformity rule (40 Code of Federal Regulations [CFR] Parts 51 and 93) and federal air quality regulations, the BART Extension would have an adverse effect on air quality if it were to result in the conditions listed below.

- Design and scope of the BART Extension would be inconsistent with the Metropolitan Transportation Commission's (MTC's) *Transportation 2035 Plan* (Regional Transportation Plan [RTP]) or 2015 *Transportation Improvement Program* (Federal Transportation Improvement Program [FTIP}).
- BART Extension Alternative would worsen existing or contribute to new localized CO or PM hot spots.
- BART Extension Alternative would generate substantial levels of MSAT emissions.

A project's air quality impacts are considered significant under the CAA if project emissions cause or contribute to ambient air concentrations that exceed a NAAQS.

Regional Conformity

Regional conformity for a given project is analyzed by determining if the project was included in a conforming RTP or FTIP with substantially the same design concept and scope that was used for the regional conformity analysis. Accordingly, the regional conformity analysis was conducted by comparing the BART Extension Alternative's design, concept, and scope to its description in *Plan Bay Area* and associated air quality analyses.

Project-Level Conformity (localized CO or PM hot-spots)

Project-level conformity is analyzed by determining if the project would cause localized exceedances of CO, PM2.5, and/or PM10 standards or interfere with "timely implementation" of the transportation control measures called out in the SIP. The sections that follow summarize the methodology used to evaluate project-level conformity requirements for CO, PM10, and PM2.5.

Carbon Monoxide

The BART Extension would be located in a maintenance area with regard to the federal CO standard (see Table 4.2-2). Consequently, an evaluation of transportation conformity related to CO would be required. The CO transportation conformity analysis would be based on the CO screening criteria established by the BAAQMD (BAAQMD 2010). The criteria provide a conservative indication of whether a project will generate new air quality violations, worsen existing violations, or delay attainment of the NAAQS and CAAQS with regard to CO. If the screening criteria are met, a quantitative analysis of project-related CO emissions would not be necessary because the transportation conformity requirements would be satisfied.

The BART Extension was evaluated against the BAAQMD CO screening criteria listed below.

- Consistency with an applicable congestion management program established by the county congestion management agency for designated roads or highways, a regional transportation plan, and local congestion management agency plans.
- Increased traffic volumes at affected intersections with more than 44,000 vehicles per hour.

Particulate Matter

The BART Extension would be located in a nonattainment area with regard to the federal PM2.5 standard. Consequently, a project-level conformity determination for PM2.5 would be required (see Table 4.2-2).

In December 2010, EPA finalized conformity guidance for determining which transportation projects must be analyzed for local air quality impacts in PM2.5 and PM10 nonattainment and maintenance areas. The guidance requires a quantitative hot-spot analysis to be performed for a project of air quality concern (POAQC) or any other project identified by the PM10 or PM2.5 SIP as a localized air quality concern. POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a localized air quality concern.

For projects that have not been identified as a POAQC, PM2.5 and PM10 hot-spot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that CAA and 40 CFR 93.116 requirements have been met without a hot-spot analysis because the projects have not been found to be an air quality concern under 40 CFR 93.123(b)(1).

Mobile-Source Air Toxics

The Federal Highway Administration's (FHWA's) *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* was used to evaluate potential MSAT emissions associated with the BART Extension Alternative (Federal Highway Administration 2012). The guidance uses a tiered approach to address MSAT impacts from roadway projects. The analysis levels outlined in FHWA's interim guidance, and listed below, were used to evaluate the BART Extension Alternative's MSAT impacts.

Level 1 – Exempt projects with no potential for meaningful MSAT effects. These projects require no analysis. The types of projects included in this category are:

- Projects that qualify for a categorical exclusion under 23 CFR 771.117(c).
- Projects that are exempt under the CAA conformity rule under 40 CFR 93.126.
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

Level 2 – Projects with low potential for MSAT effects. These projects require a qualitative analysis. The types of projects included in this category are those that improve highway, transit, or freight operations without adding substantial new capacity or creating a facility that is likely to meaningfully increase MSAT emissions. Examples of these types of projects are minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design-year traffic is not projected to meet the 140,000 to 150,000 average daily traffic (ADT) criterion.

Level 3 – Projects with higher potential MSAT. These projects require quantitative analysis to differentiate alternatives. To fall into this category, a project must:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes where the ADT is projected to be in the range of 140,000 to 150,000 or more by the design year; and
- Be located in proximity to populated areas.

The FHWA guidance for the assessment of MSATs in NEPA documents does not specifically address the analysis of construction-related emissions because of their relatively short duration. FHWA is considering whether more guidance is needed regarding construction activities in future versions of its guidance.

4.2.3.2 Local Air District Thresholds

Although the BART Extension Alternative would be subject to transportation conformity, the BAAQMD CEQA thresholds are used to evaluate the intensity of operational emissions. BAAQMD's applicable mass emission threshold are summarized below.

- ROG and NOx: 54 pounds per day, 10 tons per year
- PM10: 82 pounds per day, 15 tons per year
- PM2.5: 54 pounds per day, 10 tons per year

4.2.4 Environmental Consequences and Mitigation Measures

This section identifies impacts and evaluates whether such impacts would be adverse under NEPA, using the criteria identified in Section 4.2.3, *Methodology*. This section also identifies design commitments, best management practices, and other measures to avoid, minimize, or mitigate impacts.

4.2.4.1 No Build Alternative

The No Build Alternative consists of the existing transit and roadway networks and planned and programmed improvements in the study area (see Chapter 2, Section 2.2.1, *NEPA No*

Build Alternative, for a list of these projects). Given the mix of projects, some of the projects may reduce air quality and greenhouse gas emissions by providing transit, bicycle and pedestrian improvements and also reducing congestion. Other projects may result in short-term exceedances in air quality standards during construction. Projects planned under the No Build Alternative would, however, undergo separate environmental review to determine whether the projects would result in adverse air quality and greenhouse gas effects. Several of these projects have already been programmed in the Regional Transportation Plans. Review would include an analysis of impacts and identification of mitigation measures to mitigate potential project impacts.

4.2.4.2 BART Extension Alternative

Regional Conformity

The BART Extension is included in MTC's 2015 FTIP, which was adopted by MTC on September 24, 2014. FTA and FHWA approved the 2015 FTIP on December 15, 2014. The 2015 FTIP Identification Number is BRT030001 (Metropolitan Transportation Commission 2015b). The BART Extension is described as "BART: Extend BART from Berryessa Station to San Jose and Santa Clara." The BART Extension is also included in the RTP under Identification Number 240375 and described as "Extend BART from Berryessa to San Jose/Santa Clara (Phase 2)." The regional planning documents assume construction beginning in 2018, with completion in 2024. Passenger service is anticipated to begin in late 2025/2026. It is anticipated that the assumed open-to-traffic-year change will occur through the FTIP and RTP amendment process before completion of the NEPA process. The FTIP and RTP amendments will ensure that, prior to preparation of the final environmental document for the BART Extension, the design, concept, and scope will be consistent with the project description in the FTIP and RTP amendment. Therefore, the BART Extension's regional conformity determination requirement is satisfied.

BART Extension Alternative Conformity

Conformity requires demonstration that a project will not result in new local CO or PM2.5 exceedances or worsen existing violations.

Carbon Monoxide Hot-Spot Analysis

CO hot-spot analysis is required under the EPA Transportation Conformity regulations for non-exempt projects in nonattainment or maintenance areas for CO. BAAQMD air quality monitors have not recorded an exceedance of the federal CO standards since at least 1994. CO concentrations throughout California have steadily declined over time as vehicle engines have become more efficient and less polluting. BAAQMD has recognized this trend and published a screening methodology for determining the possibility for a CO hot spot (BAAQMD 2010).

VTA's BART Silicon Valley – Phase II Extension Project Draft Traffic Impact Analysis of the BART Extension Only (Hexagon 2016) assessed 17 signalized intersections in the vicinity of the Alum Rock/ 28th Street Station, 29 signalized intersections in the vicinity of the Diridon Station (South and North Options), and 16 signalized intersections in the vicinity of the Santa Clara Station. The identified intersections support fewer than 5,000 vehicles during the weekday AM and PM peak hours. The BART Extension Alternative would not increase traffic volumes at any intersection in the traffic study area to more than 24,000 vehicles per hour. No potential exists for a new localized CO hot spot or worsening of an existing CO hot spot.

PM2.5 Hot-Spot Analysis

The alignment is within a nonattainment area for the federal PM2.5 standard. Therefore, pursuant to 40 CFR Part 93, a project-level PM2.5 analysis is required for conformity purposes.

A quantitative hot-spot analysis is required only for a project that has been identified as a POAQC, as defined in 40 CFR 93.123(b)(1). As described below, the BART Extension Alternative does not meet the criteria that would classify it as a POAQC under EPA's final rule. Accordingly, the BART Extension Alternative is not considered to be a POAQC, and the project-level PM conformity determination requirements are satisfied. Confirmation of this finding was obtained following interagency consultation with MTC's Air Quality Conformity Task Force. Under the BART Extension Alternative, there would be *no adverse effect* related to worsening existing or contributing to new localized PM hot spots.

Projects involving new or expanded highway facilities and a significant number of, or a significant increase in the number of, diesel vehicles (*significant number* is defined as more than 125,000 AADT, with 8 percent or more of such AADT being diesel truck traffic or, in practice, truck AADT of 10,000 or more regardless of total AADT; *significant increase* is defined in practice as a 10 percent increase in the volume of heavy-duty truck traffic).

A list of projects that are considered to be POAQCs is provided below, along with an analysis of why the BART Extension Alternative is not considered to be a POAQC.

1. Projects affecting intersections that are at level of service (LOS) D, E, or F, with a significant number of diesel vehicles, or will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to BART Extension Alternative.
2. New bus and rail terminals and transfer points with a significant number of diesel vehicles congregating at a single location.
3. Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.
4. Projects in or affecting locations, areas, or categories of sites identified in the PM2.5 or PM10 Implementation Plan or Implementation Plan submission, as appropriate, as sites of possible violation.

The BART Extension Alternative is a heavy-rail transit project that would not directly increase diesel truck traffic on the roadway network. The level of service related to increased traffic volumes from a significant number of diesel vehicles related to the BART Extension Alternative is not relevant. In addition, although the BART Extensions Alternative would involve new bus and rail transfer points, the new bus and rail transfer points would be located at the Alum Rock/28th Street Station and Santa Clara Station, and in central San Jose. At the Alum Rock/28th Street Station, the new bus transfer location would be provided along North 28th Street. At the Santa Clara Station, a new bus transfer location would be provided along Brokaw Road. The bus transfer locations would operate similar to existing bus stops on a local roadway; they are not considered significant terminals or transfer points with a significant number of diesel vehicles (VTA will have phased out diesel buses by 2025).

The No Build Alternative bus fleet includes services to shuttle passengers between the Berryessa Station and downtown destinations. This shuttle service would be eliminated in the BART Extension Alternative resulting in a decrease in bus activity in response to the light rail transit (LRT). Based on a bus demand study completed by VTA, the Santa Clara Station would experience a decrease of 96 buses in late 2025/2026 and 160 buses in 2035. The Alum Rock/28th Street Station would experience no change in daily late 2025/2026 or 2035 bus volumes. Central San Jose would experience no change in 2026 bus volumes and a decrease of 32 buses in 2035.

VTA operates diesel-hybrid buses that generate significantly less diesel emissions than standard buses. Bus idling would increase localized emissions; however, idling time is typically limited to less than 1 minute per vehicle. Although sensitive receptors would be located within 1,000 feet of the transfer points, these land uses would not be exposed to adverse diesel particulate matter emissions given the bus type (hybrids) and limited idling time.

The Diridon Station Options include an existing bus transit facility. The existing facility will be reconstructed for better bus circulation in the same location for both Diridon Station Options. Similar to the Santa Clara Station Option, the Diridon Station Options would experience a decrease of 96 buses in late 2025/2026 and 192 buses in 2035. In addition, VTA operates diesel-hybrid buses that generate significantly less diesel emissions than standard buses.

In addition, the BART Extension Alternative sites have not been identified as possible violation sites in the PM2.5 or PM10 Implementation Plan or Implementation Plan submission. Due to the above reasons, the MTC's Air Quality Conformity Task Force determined on June 23, 2016, that the BART Extension Alternative is not considered to be a POAQC.

Mobile-Source Air Toxics

This SEIS/SEIR includes a basic qualitative analysis of the likely MSAT emission impacts of the BART Extension Alternative. However, available technical tools do not make it possible to predict the specific health impacts of the emission changes associated with the BART Extension Alternative.

The BART Extension Alternative would be electrically powered and would not generate MSAT emissions. FHWA has published guidance related to roadway emissions. Thus, the MSAT analysis focuses on how the BART Extension Alternative would affect exposure to roadway MSAT.

New bus transfer points would be located at the Alum Rock/28th Street Station and Santa Clara Station. At the Alum Rock/28th Street Station, a bus transfer location would be provided along North 28th Street. At the Santa Clara Station, a bus transfer location would be provided along Brokaw Road. In addition, the Diridon Station (both Options) include an existing bus transit facility. The existing facility would be reconstructed for better bus circulation. It is not anticipated that this facility would accommodate any increased bus frequency. VTA operates diesel-hybrid buses that generate significantly less diesel emissions than standard buses. Bus idling would increase localized emissions; however, idling time is typically limited to less than 1 minute per vehicle. Given the above qualitative analysis, diesel-hybrid bus activity would not represent a significant source of new exposure.

The Newhall Maintenance Facility, including vehicle storage at the facility, would not include significant sources of combustion-related TACs, such as heavy-duty diesel trucks or active power generators. The maintenance facility would require the use of chemicals related to repair and cleaning activities, resulting in evaporative emissions. However, the chemicals would be stored in accordance with BAAQMD permitting requirements and state safety guidelines; the majority of related activities would occur within maintenance facilities. This would reduce the potential for exposure to substantial MSAT concentrations. Given the above qualitative analysis, the maintenance facility would not represent a significant source of new exposure and, therefore, would result in *no adverse effect* related to operational MSAT emissions.

Operational Emissions

The operational analysis for the BART Extension Alternative considers emissions benefits associated with vehicle mode shift. It is anticipated that the BART Extension Alternative would increase ridership, thereby decreasing regional passenger VMT through mode shift from private automobiles to transit. Accounting for emissions reductions associated with

mode shift is consistent with recommendations from APTA (2009). Table 4.2-3 shows regional VMT associated with the No Build and BART Extension Alternatives. The VMT and associated emissions analysis are presented for 2025 Opening Year and 2035 Forecast Year.

Table 4.2-3: Regional Vehicle Miles Traveled – BART Extension Alternative

Analysis Year	Vehicle Miles Traveled (miles per day)		% VMT Change from No Build Alternative	% VMT Change from Existing
	No Build Alternative	BART Extension Alternative		
2025 Opening Year	54,981,379	54,693,572	(0.52%)	5%
2035 Forecast Year	59,777,409	59,492,258	(0.48%)	15%
Source: *VTA's BART Silicon Valley – Phase II Extension Project Draft Traffic Impact Analysis of the BART Extension Only* (Hexagon 2016).				

Estimated criteria pollutant emissions from all vehicles in the region are shown in Table 4.2-4. The differences in emissions between the alternatives represent criteria pollutant emissions generated as a result of implementation of the BART Extension Alternative. Considering the small decrease in regional VMT, differences in operational emissions generated by the BART Extension Alternative are expected to be minor and related primarily to changes in VMT and vehicle speeds as a result of use of public transportation.

Table 4.2-4: Estimated Maximum Daily Operational Emissions – Bart Extension Alternative

Criteria Pollutant or Ozone Precursor	Pounds per Day				
	ROGs	NO_X	CO	PM10	PM2.5
2025 Opening Year					
No Build Alternative	1,453	7,207	75,108	5,962	2,499
BART Extension Alternative	1,446	7,181	74,715	5,932	2,486
Net Change from No Build	**(-7)**	**(-26)**	**(-393)**	**(-30)**	**(-13)**
BAAQMD Significance Thresholds	54	54	--	82	54
Exceeds Threshold?	**No**	**No**	**--**	**No**	**No**
2035 Forecast Year					
No Build Alternative	927	4,852	52,408	6,360	2,607
BART Extension Alternative	924	4,839	52,158	6,331	2,595
Net Change from No Build	**(-3)**	**(-13)**	**(-250)**	**(-29)**	**(-12)**
BAAQMD Significance Thresholds	54	54	--	82	54
Exceeds Threshold?	**No**	**No**	**--**	**No**	**No**
Sources: ARB, EMFAC2014, CalEEMod version 2013.					

The analysis shows that the BART Extension Alternative would reduce regional criteria pollutant emissions and associated concentrations. Therefore, implementation of the BART Extension Alternative would result in a regional air quality benefit by encouraging a modal

shift from single-occupancy vehicles toward transit, and would not generate emissions that exceed the NAAQS. Consequently, operation of the BART Extension Alternative would result in *no adverse effect*.

4.2.5 NEPA Conclusion

The design, concept, and opening year of the BART Extension Alternative are consistent with MTC's RTP and FTIP. The BART Extension Alternative would not result in a CO or PM2.5 hot spot. Accordingly, the BART Extension Alternative's regional and project-level conformity requirements are satisfied. Neither the VTA buses nor the new maintenance facility would represent a significant source of new MSATs. Long-term operation of the BART Extension Alternative would reduce criteria pollutant emissions, relative to the No Build Alternative, and therefore result in a beneficial air quality effect. For these reasons, operation of the BART Extension Alternative would result in *no adverse effect*.

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