5.2 AIR QUALITY

INTRODUCTION

This section discusses the Project's air quality impacts during construction and operation. Information in this section is primarily drawn from the *Air Quality Assessment* prepared for the Project (see **Appendix C** of this Draft Environmental Impact Report (EIR)).Greenhouse gas impacts are covered in **Section 5.6, Greenhouse Gas Emissions.**

Scoping Issues Addressed

No comments regarding air quality were raised during the public comment scoping period for the Project.

REGULATORY SETTING

The Federal Clean Air Act (FCAA) and California Clean Air Act (CCAA) have empowered federal and state governments to regulate the emission of airborne pollutants and have established ambient air quality standards for the protection of public health. The US Environmental Protection Agency (EPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (CARB) is the state equivalent in California. Local air quality management is provided by CARB through county-level or regional (multi-county) air pollution control districts. CARB is responsible for establishing air quality standards and the control of mobile emission sources, while the local districts are responsible for enforcing standards and regulating stationary sources. CARB has established 14 air basins statewide. Federal and state air quality standards are presented in **Table 5.2-1**.

Federal

Federal Clean Air Act

The US Environmental Protection Agency (EPA) is charged with implementing national air quality programs. The US EPA's air quality mandates are drawn primarily from the FCAA. Originally passed in 1963, the FCAA has been amended several times. In 1977 Congress added several provisions, including non-attainment requirements for areas not meeting National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration program. The FCAA allows states to adopt more stringent standards or to include other pollution types.

National Ambient Air Quality Standards

The FCAA requires the US EPA to establish primary and secondary NAAQS for a number of criteria air pollutants. The air pollutants for which standards have been established are considered the most prevalent air pollutants that are known to be hazardous to human health. NAAQS have been established for the following pollutants: ozone, carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter with a diameter of 10 micrometers or less (PM_{10}), fine particulate

matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. PM_{10} are particles that are small enough to be inhaled, while $PM_{2.5}$ are not readily filtered by the respiratory system and are therefore of particular health concern.

Title III of the Federal Clean Air Act

Hazardous air pollutants (HAPs) are the air contaminants identified by the US EPA as known or suspected to cause cancer other serious illnesses, birth defects, or death. The FCAA requires the US EPA to set standards for these pollutants and reduce emissions of controlled chemicals. Specifically, Title III of the FCAA requires the US EPA to disseminate National Emissions Standards for certain categories of sources that emit one or more pollutants that are identified as HAPs. The FCAA also requires the US EPA to set standards to control emissions of HAPs through mobile source control programs. These include programs for lower-emission gasoline, national low emission vehicle standards, gasoline sulfur control requirements, and heavy-duty engine standards.

HAPs tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods of time. Many HAPs originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of HAPs, and some MSATs have been identified as priority HAPs due to their known effects on human health. While vehicle miles traveled in the United States are expected to increase by 45 percent over the period 2010 to 2050, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.[1]

State

California Clean Air Act

The CCAA, signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards (CAAQS). CARB is the agency responsible for implementing the requirements of the CCAA and for coordination and oversight of state and local air pollution control programs in California. CARB overseas local district compliance with California and federal laws, approves local air quality plans, and submits the State Implementation Plans (SIPs) to the US EPA. CARB also monitors air quality, determines and updates area designations and maps, and sets emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

California Ambient Air Quality Standards

CAAQS have been established by CARB for the following pollutants: ozone, CO, nitrogen dioxide (NO_2), SO_2, PM_{10}, $PM_{2.5}$, lead, vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. In most cases, the CAAQS are a more stringent standard than the NAAQS. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide air pollutant emission sources and provides districts with the authority to regulate indirect air pollutant sources.

[1] Federal Highway Administration. 2016. Updated. Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.

Tanner Air Toxics Act and Air Toxics Hot Spots Information and Assessment Act

Toxic air contaminants (TACs)[2] in California are primarily regulated through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, also known as the Hot Spots Act). TACs are a broad class of compounds known to cause illness or death (primarily from cancer risk). TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g. dry cleaners). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level.

AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has also adopted the US EPA's list of HAPs as TACs. In 1998, diesel particulate matter (DPM) was added to CARB's list of TACs.

Once a TAC is identified, CARB adopts an Airborne Toxic Control Measure for sources that emit that particular TAC. If a safe threshold exists at which no toxic effect occurs from a substance, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate Best Available Control Technology to minimize emissions.

The Hot Spots Act requires existing facilities that emit TACs above the threshold level to prepare a toxic emissions inventory. If the inventory determines the emissions may cause a significant health risk, a risk assessment must be prepared, and the facility operator must notify the public of significant risk levels and implement risk reduction measures.

Diesel Exhaust and Diesel Particulate Matter

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs in California, based on the statewide average. According to CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This mixture makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as cancer-causing substances either under State Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium- and heavy-duty diesel trucks that generate the bulk of DPM emissions along California's highways. Regulations require affected vehicles to meet specific performance requirements between 2011 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or the equivalent by 2023. With implementation of these requirements, DPM concentrations are expected to be reduced by 85 percent in 2020 from the estimated 2000 levels.[3] As emissions are reduced, risks associated with exposure to emissions also are expected to be reduced.

[2] TACs are referred to as HAPs under the FCAA.

[3] CARB, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. https://www.arb.ca.gov/diesel/documents/rrpFinal.pdf

Table 5.2-1 Federal and State Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Primary Standard
Ozone (0_3)	1-hour	0.090 ppm	--
	8-hour	0.070 ppm	0.070 ppm
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	35 µg/m^3
	Annual	12 µg/m^3	12 µg/m^3
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	100 ppb
	Annual	0.030 ppm	0.053 ppm
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	75 ppb
	24-hour	0.04 ppm	0.14 ppm (for certain areas)
	Annual	--	0.030 ppm (for certain areas)
Lead	30-day	1.5 µg/m^3	--
	Calendar quarter	--	1.5 µg/m^3 (for certain areas)
	3-month	--	0.15 µg/m^3

Ppm = parts per million; ppb = parts per billion
Source: California Air Resources Board, 2016

Regional

The Bay Area Air Quality Management District (BAAQMD) regulates air quality in the San Francisco Bay Area Air Basin. BAAQMD is responsible for developing and enforcing air quality rules in the air district, and is responsible for planning for the attainment of the state's ambient air quality standards. BAAQMD inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law. It also reviews air quality analyses prepared for projects under the California Environmental Quality Act (CEQA) and has published the CEQA Air Quality Guidelines (BAAQMD Guidelines), which are commonly used in the evaluation of air quality impacts.

Bay Area Air Quality Management District Air Quality Management Plan

BAAQMD is responsible for developing a Clean Air Plan, which guides the region's air quality planning efforts to attain the CAAQS. BAAQMD adopted the 2017 Clean Air Plan in April 2017. The 2017 Clean Air Plan updates the 2010 Clean Air Plan in accordance with the requirements of the

California Clean Air Act to implement "all feasible measures" to reduce ozone; provide a control strategy to reduce ozone, particulate matter, TACs, and greenhouse gases in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in both the short term and through 2050. Accordingly, the 2017 Clean Air Plan contains district-wide control measures to reduce the ozone precursor emissions, reactive organic gases (ROG), oxides of nitrogen (NO_x), particulate matter, TACs, and greenhouse gas emissions.

Community Air Risk Evaluation Program

Initiated in 2004, the Community Air Risk Evaluation (CARE) program evaluates and reduces health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources, and on- and off-road mobile sources with an emphasis on diesel exhaust. The CARE program is ongoing and encourages community involvement and input. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and a high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area.

A health risk assessment is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances, to provide a quantitative estimate of health risks. As part of ongoing efforts to identify and assess potential health risks to the public, BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area.

Bay Area Air Quality Management District CEQA Air Quality Guidelines

The BAAQMD 2017 Guidelines were prepared to assist in the evaluation of air quality impacts within the Bay Area. [4] The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements. The guidelines include recommended methodologies for evaluation, thresholds of significance, example mitigation measures, and background air quality information.

In May 2017, BAAQMD published updated BAAQMD Guidelines responding to the 2015 California Supreme Court Decision in California Building Industry Association v. Bay Area Air Quality Management District. This decision included the determination by the court that CEQA does not generally require an agency to consider the effects of existing environmental conditions on a project's future users or residents, such as the effects of TACs and fine particulate matter from existing sources on future residents of a project. Nevertheless, the court stated that lead agencies must still evaluate existing environmental conditions to assess whether a project could exacerbate hazards that are already present. The court did not apply a holding to reach a conclusion on the

[4] BAAQMD. 2017. CEQA Air Quality Guidelines.

validity of BAAQMD's receptor thresholds. Instead, the Supreme Court remanded the case to the Court of Appeal to decide the question in light of the Court's opinion. As of the date of this document, BAAQMD has not formally re-instated the thresholds.

State Implementation Plan Conformity

Federal clean air laws require areas with unhealthy levels of air pollutants to develop plans, known as State Implementation Plans (SIPs). SIPs are comprehensive plans that describe how an area will attain NAAQS. The 1990 amendments to the FCAA set deadlines for attainment based on the severity of an area's air pollution problem.

Transportation projects are typically evaluated for their effects on regional air quality as a whole, in response to federal requirements. The FCAA outlines requirements for ensuring that federal transportation plans, programs, and projects are consistent with the purpose of the SIP to reduce transportation-related emissions for non-attainment or maintenance air pollutants. The Metropolitan Transportation Commission (MTC) is the transportation agency for the nine-county San Francisco Bay Area, and releases a Transportation Improvement Plan (TIP) that lists near-term transportation projects that involve federal funds or agencies, and regionally significant state- and locally-funded projects. The TIP is evaluated for conformity with the SIP; a conformity finding demonstrates that the total emissions projected for the TIP are within the emissions budgets established by the SIP. Conformity with the SIP means that a transportation project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS.

The conformity analysis for the 2019 TIP addresses the pollutants ozone, CO, and $PM_{2.5}$. The Federal Highway Administration and Federal Transit Administration approved the 2019 TIP in December 2018. The Project is listed in the 2019 TIP (Project TIP ID ALA150003).[5]

Local

City of Dublin

City of Dublin General Plan

The Dublin General Plan contains the following policies relating to air quality:

Implementing Policy 7.5.1.A.1:	Request that the Bay Area Air Quality Management District establish an air quality monitoring station in Dublin.
Implementing Policy 7.5.1.A.2:	Require an air quality analysis for new development projects that could generate significant air emissions on a project and cumulative level. Air quality analyses shall include specific feasible measures to reduce anticipated air quality emissions to a less than significant California Environmental Quality Act (CEQA) level.

[5] Metropolitan Transportation Commission and Association of Bay Area Governments. 2016. Plan Bay Area 2040. Amended March 2018.

Alameda County

Alameda County General Plan, East County Area Plan

The Alameda County (County) General Plan, East County Area Plan contains the following goals and policies relating to air quality:

Air Quality Goal	To ensure that air pollution levels do not threaten public health and safety, economic development, or future growth.
Policy 291	The County shall strive to meet federal and state air quality standards for local air pollutants of concern. In the event that standards are exceeded, the County shall require appropriate mitigation measures on new development.
Policy 292	The County shall coordinate subregional air quality planning and mitigation among East County cities using the results of the biennial monitoring report.
Policy 293	The County shall support the Bay Area Air Quality Management District (BAAWMD) in monitoring air pollutants of concern on a continuous basis.
Policy 294	The County shall require new development projects to include traffic and air pollutant reduction measures to help attain air quality standards. For non-residential projects, these measures could include Transportation Demand Management programs such as ridesharing and transit promotion.
Policy 296	The County shall review the cumulative impacts of proposed project for their potential effect on air quality conditions.
Policy 297	The County shall coordinate air quality planning efforts with their local, regional and state agencies.
Policy 298	The County shall address air quality as a factor in its Regional Element to assist cities in their environmental review procedures.
Policy 300	The County shall review proposed projects for their potential to generate hazardous air pollutants.
Policy 303	The County shall incorporate the provisions of the Association of Bay Area Government's (ABAG) Bay Air Quality Plan and BAAQMD's Air Quality and Urban Development Guidelines into project review procedures.
Policy 304	The County shall notify cities and the BAAQMD of proposed projects which may significant affect air quality.
Policy 305	The County shall cooperate with the BAAWMD and CARB in their enforcement of the provisions of the Clean Air Act, state and regional policies, and established standards for air quality.

City of Livermore

City of Livermore General Plan

The Livermore General Plan contains the following goals, objectives, and policies relating to air quality:

Goal OSC-6	Protect and improve the city's air quality.
Objective OSC-6.1	Minimize air pollution emissions.
Policy OSC-6.1-P1.	The City shall require project developers to develop and implement a construction-period air pollution control plan, consistent with dust and emission-abatement actions outlined in the CEQA handbook of the Bay Area Air Quality Management District.
Policy OSC-6.1-P3.	The City shall work with local and regional municipalities and agencies to reduce automobile-related vehicle emissions.
Policy OSC-6.1-P5.	The City shall attempt to increase the employment-to-population ratio to reduce commuting rates and associated vehicle-related pollution emissions.
Policy OSC-6.1-P6.	The City shall monitor air quality and shall consider implementing a population cap if air quality declines.
Policy OSC-6.1-P7.	The City shall support programs to encourage the development and maximum use of regional and local mass transit systems. To this end, the City shall actively support: (a) the funding and construction of a BART or light/commuter rail extension to Livermore; (b) the designation of special lanes on I-580 for the exclusive use of commuter buses during peak traffic periods; and (c) close coordination in the operations of local and regional transit systems in order to minimize the travel time between communities and major generating areas served by the regional system.

EXISTING CONDITIONS

The Project is located within Dublin, Livermore, and the County, within the San Francisco Bay Air Basin. Air quality regulation in the San Francisco Air Basin is administered by BAAQMD. These boundaries make up the air quality study area for regional impacts. The study area for localized air quality impacts includes the Project site plus a 1,000-foot buffer and nearby intersections evaluated in the *Transportation Impact Assessment* (TIA) prepared by Kittelson & Associates in August 2018 (see **Appendix D** of this Draft EIR).

Climate and Topography

The Project site is within the Livermore Valley, which is about 30 miles (48 km) east of the first coastal range of foothills that surround the San Francisco Bay Area. The Livermore Valley has an east-west orientation with mountain passes on the west and east connecting the Bay Area and the Central Valley. The passes are used by railroads and highways to connect the two regions. Livermore Valley is about 15 miles (24 km) long (east to west), 10 miles (16 km) wide (north to south), and surrounded by California coastal range mountains and foothills.

The Livermore Valley has a Mediterranean climate, although it is close to a semi-arid climate because of its relatively low annual precipitation. It features warm-to-hot dry summers and mild-to-cool wet winters. Daytime temperatures between June and October average between 75 and 85°F, but can reach 100°F and occasionally approach 110°F. Summer nights, however, are normally much cooler with lows from 50 to 60°F. The valley's passes direct the normal west to east flow of air through the valley. There are often strong evening winds in the summer that bring cool air off the Pacific Ocean into the Livermore Valley as it heads towards the much hotter Central Valley. The period from June to September is extremely dry and is characterized by clear skies, but in late summer, subtropical moisture occasionally surges into the Livermore Valley, bringing high humidity, monsoon clouds, and, much less commonly, thunderstorms. Nearly all the 14.6 inches of annual rainfall comes between September and May, but about 50 percent of the days are sunny during this period with no appreciable cloud cover. The peak rainy months are December to March.

Air quality in the region is controlled by meteorological conditions and the rate of pollutant emissions. Meteorological conditions such as wind speed, atmospheric stability, and mixing height may all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while frequent, short-term variations result from changes in atmospheric conditions.

Air quality standards for ozone are traditionally exceeded when relatively stagnant air conditions occur for periods of several days during the warmer months of the year. Key components of ground-level ozone formation are sunlight and heat. Therefore, significant ozone formation only occurs during the months from late spring through early fall. Prevailing winds during the summer and fall can transport and trap ozone precursors from the more urbanized portions of the Bay Area in the Livermore Valley. Meteorological factors make air pollution potential in the study area relatively high during summer and fall months.

Air Pollutants

As discussed in **Regulatory Setting**, there are six air pollutants of primary concern. Federal and state air pollutant standards are shown in **Table 5.2-1**.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_X. The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines)

and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, shortness of breath, and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthy levels that adversely affect local sensitive receptors (discussed further below). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce chest pain in persons with serious heart disease. Very high levels of CO can be fatal.

Nitrogen Dioxide

NO_2 is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns (PM_{10}). $PM_{2.5}$ refers to fine suspended particulate matter 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces and can enter the human body through the lungs.

Lead

Lead is a metal found naturally in the natural environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the US EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The US EPA banned the use of leaded gasoline in highway vehicles in 1995. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically. Metal processing is currently the primary source of lead emissions, with the highest levels of lead in the air generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufactures.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the US EPA and the CARB. High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) pose the highest risk to adjacent sensitive receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, or schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

Sensitive Receptors

Some groups of people are more affected by air pollution than others, and are known as sensitive receptors. The state has identified the following groups of people who are most likely to be affected by air pollution: children under 16, the elderly over 65, people conducting athletic activities, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, outdoor athletic fields, and elementary schools. Air quality studies evaluate health impacts to sensitive receptors that are within 1,000 feet of a project, as receptors beyond 1,000 feet would generally not be close enough to experience any effects from project air pollutant emissions. Sensitive receptors for this Project include residences and Cottonwood Creek Elementary School located north and northwest of the Project, approximately 619 to 864 feet from the nearest edge of the Project site, shown on **Figure 5.2-1**. There is a private school along North Canyons Parkway, east of the Project site, which is currently unoccupied. This analysis considered the vacant school as a sensitive receptor since the infrastructure for a school remains and it could reasonably be anticipated to reopen in the future. There are no other existing sensitive uses, such as hospitals, within 1,000 feet of the Project site.

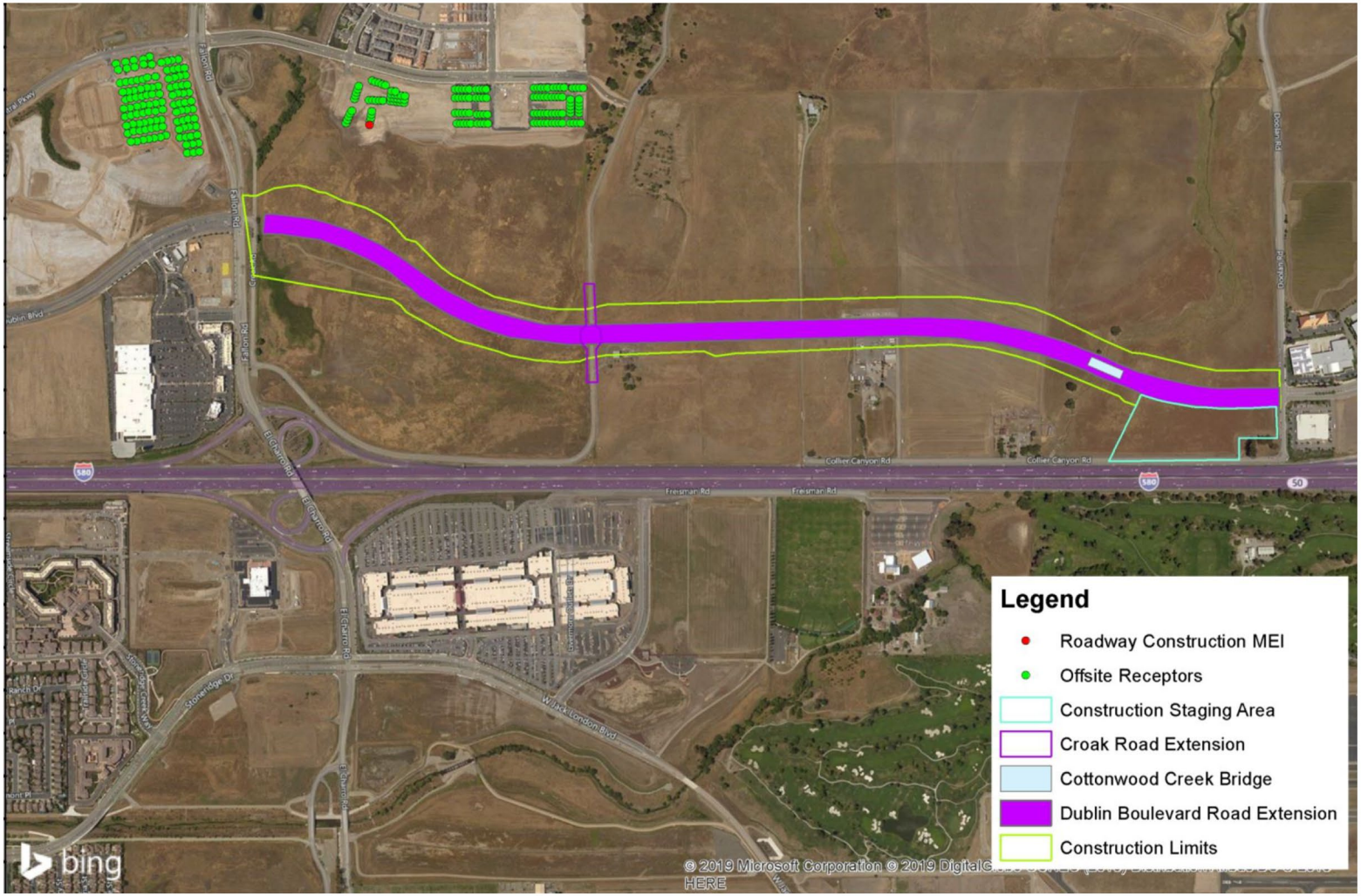
Regional Air Quality Attainment Status

BAAQMD monitors criteria pollutants and air quality conditions throughout the San Francisco Air Basin. Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The San Francisco Air Basin is not in attainment of state and federal standards with respect to ozone and $PM_{2.5,}$ and is not in attainment of state standards for PM_{10}, as shown in **Table 5.2-2**.

Table 5.2-2 Bay Area Air Basin Attainment Status

Pollutant	California Attainment Status	Federal Attainment Status
Ozone (0_3)	Non-attainment	Non-attainment (Moderate)
Respirable Particulate Matter (PM_{10})	Non-attainment	Attainment – Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Non-attainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment – Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment – Unclassified
Sulfur Dioxide (SO_2)	Attainment	Attainment – Unclassified
Lead	Attainment	Attainment – Unclassified

Source: BAAQMD, 2018



Sensitive Receptor Locations Figure **5.2-1**

Source: Illingworth & Rodkin, 2019

IMPACTS AND MITIGATION MEASURES

Significance Criteria

The following significance criteria for air quality were derived from the Environmental Checklist in the State CEQA Guidelines Appendix G. The Project would have a significant impact if it:

A. Conflicts with or obstructs implementation of the BAAQMD 2017 Clean Air Plan

B. Violates any air quality standard or contributes substantially to an existing or projected air quality violation

C. Exposes sensitive receptors to substantial pollutant concentrations, including those that increase health risks such as cancer

D. Creates objectionable odors affecting a substantial number of people

E. Cumulative impact of any criteria pollutant

Significance thresholds established in the BAAQMD CEQA Guidelines, updated in 2017 and summarized in **Table 5.2-3**, were used to evaluate the air quality impacts of the Project. The BAAQMD Guidelines are intended to be applied to land-use type projects but provide an informative comparison in determining the magnitude of emissions from roadway projects. The significance thresholds are as follows:

- The operational threshold of significance for ROG and NO_x is 54 pounds per day and 10 tons per year.
- The operational threshold of significance for PM_{10} is 82 pounds per day or 15 tons per year, considering only exhaust emissions.
- The operational threshold of significance for $PM_{2.5}$ is 54 pounds per day or 10 tons per year considering only exhaust emissions.
- The thresholds of significance for construction are equivalent to the operational thresholds and are based on averaged daily emissions.
- Thresholds of significance for health hazards are based on single sources and combined (cumulative) sources, and address both health and cancer risk.

Table 5.2-3 BAAQMD Air Quality Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**For Single Sources Within 1,000-foot Zone of Influence:**	**For Combined Sources (Cumulative from all sources within 1,000-foot zone of influence):**	
Excess Cancer Risk	>10.0 per one million	>100.0 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^3	

Source: Illingworth & Rodkin, 2019

Methodology

Emissions of air pollutants that could affect both regional and local air quality were addressed by modeling emissions and comparing them to BAAQMD significance thresholds identified in **Table 5.2-3**. This included emissions for both Project construction and operation. Operational air pollutant emissions from the Project would be generated by changes in traffic patterns and traffic conditions, so predicted traffic conditions along with vehicle emission rates were combined to predict the daily change in traffic emissions. A dispersion model was used to predict the off-site air pollutant concentrations resulting from Project construction so that increased cancer risk and health risk could be predicted. The existing conditions environmental baseline for the Project is 2017, the opening year is anticipated to be 2025, and the cumulative year is 2040. See **Chapter 4, Introduction to Environmental Analysis**, for full details on Project baseline and operational years.

Construction Period Emissions

Average daily construction exhaust emissions were predicted using the Sacramento Metropolitan Air Quality Management District Road Construction Emissions Model (RoadMod), version 8.1.0. BAAQMD recommends the use of RoadMod to analyze construction emissions for transportation projects. The model predicts emissions of ozone precursor pollutants (ROG and NO_x) and particulate matter (PM_{10} and $PM_{2.5}$). The Project schedule and equipment usage assumptions are

that the Project would be built out over a period of approximately 18 months beginning in 2020, or an estimated 396 construction workdays (based on an average of 22 workdays per month). Average daily emissions were computed by dividing the total construction emissions by the number of construction days. **Appendix C** includes the construction schedule and equipment assumptions and RoadMod model output for construction emissions.

Operational Period Emissions

Regional Conformity

For transportation projects, air quality impacts are evaluated at a regional level by considering the entire transportation sector of emissions. This is done through the SIP conformity process, where transportation projects are evaluated at the regional level. The SIP is intended to attain and maintain national ambient air quality standards. Most public transportation projects are included in the Transportation Improvement Program (TIP). The TIP is evaluated for conformance with the SIP through an emissions analysis conducted by MTC and approved by the U.S. Department of Transportation's Federal Highway Administration. The purpose of this "conformity determination" is to ensure that transportation emissions associated with the transportation network do not exceed the emissions budget established by the region to obtain and maintain ambient quality standards. It can be concluded that a change in emissions caused by the operation of a project programmed in the TIP are less than significant at a regional level, as the project emissions were anticipated in the conformity analysis.

Traffic Modeling

The *Transportation Impact Analysis* (TIA) prepared for the Project used the Alameda County Transportation Commission's countywide travel demand model (TDM) with Plan Bay Area Projections (BART Livermore Extension Version – No BART Scenario) and updated land uses from local general plans to predict the Project's effects on traffic conditions.[6] The TIA can be found in **Appendix D** of this Draft EIR. The TDM accounts for background traffic growth between existing conditions and 2040 and approved but not yet constructed changes to land use in the area, and models potential traffic changes as a result of the Project. The TDM presented in the TIA predicted daily vehicle miles travelled, vehicle hours travelled, and computed travel speed for roadways in the study area without and with the Project.

Emissions Modeling

The Caltrans Emission Factor 2014 (CT-EMFAC2014) Version 6.0 model was used to predict vehicle emission rates. CT-EMFAC2014 models on-road vehicle emissions for criteria pollutants, mobile source air toxics, and CO_2. The tool's underlying data is based on CARB's EMFAC2014 on-road emissions model and mobile source air toxins speciation factors supplied by CARB and the US EPA. Emission processes modeled include running exhaust for all pollutants, running losses for organic

[6] Kittelson & Associates, Inc. 2018. Dublin Boulevard-North Canyons Parkway Extension Transportation Impact Analysis.

compounds (such as ROG), and tire and brake wear for PM_{10} and $PM_{2.5}$. The predicted daily traffic conditions were combined with CT-EMFAC2014 emissions factors to predict emissions in pounds per day.

Health Risk and Cancer Risk from Project Operation

The Project would be constructed within 1,000 feet of existing sensitive receptors including residences to the north and northwest along Central Parkway and Cottonwood Creek Elementary School. Substantial sources of air pollution, such as roadways, can adversely affect nearby sensitive receptors. For local roadways, BAAQMD has provided the Roadway Screening Analysis Calculator to assess whether roadways with traffic volumes of over 10,000 vehicles per day may have a potentially significant effect on sensitive receptors. This community risk assessment models concentrations of diesel particulate matter and $PM_{2.5}$, which are then used to evaluate potential cancer risk, non-cancer health hazards, and annual concentrations of $PM_{2.5}$.[7] Two adjustments were made to the cancer risk predictions made by this calculator: (1) adjustment for latest vehicle emissions rates and (2) adjustment of cancer risk to reflect new Office of Environmental Health Hazard Assessment guidance.

Traffic for the Project was based on the traffic data found in the TIA. The predicted number of average daily trips along the Project ranges from 11,525 vehicles in the 2025 Plus Project Scenario and 19,145 vehicles for 2040 Plus Project Scenario. This analysis conservatively used the highest 2040 conditions. To determine the distance from the Project to the nearest sensitive receptor, the proposed edge of the roadway was entered into the model. The roadway orientation, distance and direction, and traffic volume were also entered.

Impact Analysis

No Impact Summary

There are no "no impact" determinations for this topic.

Impacts of the Project

A. Conflicts with or obstructs implementation of the BAAQMD 2017 Clean Air Plan

As described above, the Project is included in the current TIP, which was determined to be in conformity with the SIP with respect to air pollutant emissions. Thus the Project is part of a plan that conforms to the region's air quality planning efforts. Based on SIP conformity, the Project would not interfere with the control measures described in the 2017 Clean Air Plan. Furthermore, the Project would not conflict with the latest Clean Air Plan because the Project would have emissions below the BAAQMD criteria pollutant thresholds (see **Table 5.2-4** and **Table 5.2-5** below and associated discussion).

[7] Diesel particulate matter is identified by California as a TAC due to the potential to cause cancer

Additionally, the Project would provide transportation benefits that reduce pollutant emissions. This would include improving traffic operational efficiency and encouraging multi-modal travel through the provision of bicycle and pedestrian facilities in the short-term, and through long-term support of Dublin and Livermore's plans for transit access along Dublin Boulevard between the two municipalities. Finally, the Project is included as part of the adopted the Dublin General Plan roadway network and the Livermore General Plan planned roadway network. Therefore, the Project would not conflict with or obstruct implementation of the Clean Air Plan and this is a **less-than-significant** impact.

B. Violates any air quality standard or contributes substantially to an existing or projected air quality violation

As discussed above under Existing Conditions, the Bay Area Air Basin is considered a non-attainment area for ground-level ozone and $PM_{2.5}$ under both federal and state standards, and non-attainment for PM_{10} under state standards. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter, BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_x), PM_{10}, and $PM_{2.5}$ and apply to both construction and operational period impacts.

Impact AIR-1: Construction of the Project would result in temporary air quality impacts related to fugitive dust. **(Less than Significant with Mitigation)**

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils within the construction footprint and trucks carrying uncovered loads of soils across the construction footprint and on local roadways. Unless properly controlled, vehicles leaving the Project site may deposit mud on local streets, which could be an additional source of airborne dust after the mud dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are implemented to reduce these emissions. **Mitigation Measure AQ-1** would implement BAAQMD-recommended best management practices. With implementation of this mitigation measure, fugitive dust from project construction would be greatly minimized, and would no longer have the potential to result in dust to an extent that it would result in an impact to localized air quality. With **Mitigation Measure AQ-1**, this impact would be less than significant.

Mitigation for Impact AIR-1

> **Mitigation Measure AQ-1:** Implement the most current BAAQMD best management practices at the time of construction to control dust and exhaust. Best management practices issued by BAAQMD change over time, and may include but are not limited to:
>
> During any construction period ground disturbance, implement the following best management practices to control dust and exhaust:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations CCR). Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Less than Significant Impacts

Construction Equipment Emissions

As shown in **Table 5.2-4**, results from the modeling described in Methodology predict Project emissions would not exceed BAAQMD significance thresholds which are established to prevent temporary, localized impacts to air quality, and thus, this impact would be **less than significant**. However, based on the level of projected NOx emissions which are approaching the threshold, and the possibility that final construction work may vary from current assumptions, Dublin has elected to include **Mitigation Measure AQ-2**. This mitigation measure will further reduce construction-period emissions, further minimizing this to less-than-significant impact. **Appendix C** includes the construction assumptions (schedule and equipment) and RoadMod model output for construction emissions.

> **Mitigation Measure AQ-2**: All off-road diesel-powered construction equipment greater than 50 horsepower shall meet United States Environmental Protection Agency Tier 4 interim off-road emissions standards to the extent feasible.

Table 5.2-4 Construction Period Emissions

Scenario	ROG	NO_x	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction emissions (tons)	0.90 tons	9.36 tons	0.48 tons	0.42 tons
Average daily emissions (pounds)[1]	4.63 lbs	47.3 lbs	2.44 lbs	2.1 lbs
BAAQMD Thresholds (pounds per day)	*54* lbs	*54* lbs	*82* lbs	*54* lbs
Exceed Threshold?	**No**	**No**	**No**	**No**

[1]Assumes 264 working days
Source: Illingworth & Rodkin, 2019

Operational Emissions

Operational air pollutant emissions from the Project would be generated by changes in traffic patterns and traffic conditions (e.g., speed). **Table 5.2-5** shows the predicted air pollutant emissions in terms of average daily emissions for both the No Project and Project scenarios for the three analysis years (i.e., 2017, 2025, and 2040). **Appendix C** includes the traffic and CT-EMFAC model output files for the proposed Project emission factors and modeling calculations.

Table 5.2-5 Daily Project Operational Emissions

Scenario	ROG (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	PM_{10} Total (lbs/day)	$PM_{2.5}$ Total (lbs/day)
2017 Project	4.8	20.8	48.8	1.6	0.9
BAAQMD Thresholds	*54*	*54*	*n/a*	*82*	*54*
Exceed Threshold?	**No**	**No**	**n/a**	**No**	**No**
2025 No Project	2.8	8.0	26.3	1.9	0.8
2025 Plus Project	6.2	17.4	57.5	4.1	1.7
BAAQMD Thresholds	*54*	*54*	*n/a*	*82*	*54*
Exceed Threshold?	**No**	**No**	**n/a**	**No**	**No**
2040 No Project	3.8	11.3	35.3	4.0	1.6
2040 Plus Project	5.3	15.6	48.6	5.5	2.3
BAAQMD Thresholds	*54*	*54*	*n/a*	*82*	*54*
Exceed Threshold?	**No**	**No**	**n/a**	**No**	**No**

Source: Illingworth & Rodkin, 2019

Project emissions would be less than the BAAQMD thresholds for ozone (i.e., ozone precursors) and particulate matter. These thresholds have been established to meet CAAQS and NAAQS. Therefore, the Project would not contribute substantially to existing or projected violations of those standards.

CO emissions from traffic generated by the Project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to

cause high, localized concentrations of CO. Air pollutant monitoring data indicate that CO levels have been below state and federal standards in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. The highest measured level over any 8-hour averaging period during the last three years in the Bay Area is less than 3.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. Intersections affected by the Project would have traffic volumes less than the BAAQMD screening criteria for CO hot spots and therefore the Project would not cause a violation of this ambient air quality standard.[8]

In addition to BAAQMD thresholds, which provide a basis for quantitatively determining whether the Project would contribute to air quality violations, transportation air quality impacts are assessed for the entire transportation sector, as described in detail above. This is done through the SIP conformity process**,** in which transportation projects are evaluated at the regional level. The Project is included in the 2019 TIP that has been determined to conform to the SIP. Based on the Project's SIP conformity and that the Project's operational emissions would be well below the emission thresholds recommended by BAAQMD, this impact would be **less than significant**.

C. Exposes sensitive receptors to substantial pollutant concentrations, including those that increase health risks such as cancer

The potential for the Project to result in increased community health or cancer risk would occur primarily from the Project being a new source of operational TACs in the vicinity of sensitive receptors. BAAQMD recommends a 1,000-foot screening radius around a project site to identify health and cancer risks. BAAQMD thresholds address both the impact of single and cumulative TAC sources on sensitive receptors (see **Table 5.2-2**). In addition to operational TACs, Project construction activities would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors.

Health Risk and Cancer Risk from Construction Activities

A community health risk assessment of Project construction activities was conducted to evaluate potential health effects on sensitive receptors. This analysis focuses on DPM and $PM_{2.5}$. Sensitive receptors potentially affected by Project construction include residences within 1,000 feet of the construction area (north and northwest along North Canyons Parkway) and portions of the existing roadway network affected by construction traffic from the Project. As shown in **Table 5.2-6**, the maximum increased residential risk would be below the BAAQMD significance threshold of a cancer risk of 10 in one million or greater. The maximum annual $PM_{2.5}$ concentration and computed hazard index (HI) are also below the significance threshold. These thresholds have been established to ensure that unacceptable risks to human health, including cancer, are avoided. Therefore, this impact would be **less than significant**.

[8] For a land-use project type, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less than significant impact to localized CO concentrations if the project would not increase traffic at affected intersections with more than 44,000 vehicles per hour.

Table 5.2-6 Maximum Community Risk from Construction Activities

Location and Exposure Type	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)[a]	Chronic Hazard Index
Maximum Residential			
Infant/Child	1.1	0.03	<0.01
Adult	0.02	--	--
BAAQMD Significance Threshold	*>10.0*	*>0.3*	*>1.0*
Exceed Threshold	**No**	**No**	**No**

Source: Illingworth & Rodkin, 2019
[a]The annual PM2.5 concentration is the sum of the DPM and fugitive PM2.5 concentrations.

Health Risk and Cancer Risk from Project Operation

Based on the BAAQMD screening calculator results, potential excess cancer risk from Project operation would range from one in one million to four in one million at existing sensitive receptors. This is below the BAAQMD significance threshold of 10 in one million. Annual $PM_{2.5}$ concentrations from Project operation would be 0.12 $\mu g/m^3$, which would not exceed the BAAQMD significance threshold of 0.3$\mu g/m^3$. The maximum community risks from Project operation are summarized in **Table 2.5-7**. These results are based on a calculation that assumes current (2017) vehicle emission rates. However, vehicle emission rates are anticipated to decrease over time as required by state and federal standards. A refined modeling scenario that considers lower emissions rates for the years 2025 and 2040 would likely predict lower impacts.

Project operation would not result in health risk or cancer risk that exceeds BAAQMD thresholds, even when higher vehicle pollutant emissions rates are used. This impact would be **less than significant**.

Table 5.2-7 Maximum Community Risk from Project Operations

Scenario	Fallon Road. & Dublin Blvd.		Croak Rd. & Dublin Blvd. Extension	Doolan Rd. & N. Canyons Parkway
	ADT west	ADT east	ADT east	ADT east
Existing 2017	7,565	0	0	895
No Build 2025	9,705	0	0	985
2025 Plus Project	16,480	11,525	9,850	10,770
2025 ADT Increase	6,775	11,525	9,850	9,785
No Build 2040	11,835	0	0	895
2040 Plus Project	18,555	19,145	15,780	16,460
2040 ADT Increase	6,720	19,145	15,780	15,565
Closest Sensitive Receptor	40 ft North	>700 ft North	>700 ft South	>15 ft North
Cancer Risk	3.56	1.30	0.66	<4.15[3]

Scenario	Fallon Road. & Dublin Blvd.		Croak Rd. & Dublin Blvd. Extension	Doolan Rd. & N. Canyons Parkway
	ADT west	ADT east	ADT east	ADT east
$PM_{2.5}$	0.10	0.04	0.02	0.12
BAAQMD Significance Threshold	Cancer Risk (per million)		Annual $PM_{2.5}$ ($\mu g/m^3$)[1]	
	Less than 10.0 ppm		Less than 0.3 ppm	
Exceed Threshold	**No**		**No**	

Source: Illingworth & Rodkin, 2019
ADT = Average daily trips
[1]The annual $PM_{2.5}$ concentration is the sum of the diesel particulate matter and fugitive $PM_{2.5}$ concentrations.
[2] Roadway Screening Calculator does not consider roadways to be sources of substantial HI.
[3] Note screening cancer risk prediction based on residential exposure (i.e., infant, child and adult exposure over 30 years), where nearest receptor is a school and with less exposure duration (i.e., child exposure over 9 years).

D. Creates objectionable odors affecting a substantial number of people

BAAQMD lists types of land uses typically associated with odor complaints including but not limited to wastewater treatment plants, landfills, confined animal facilities, composting stations, and food manufacturing plants. Neither construction nor operation of the Project is expected to produce objectionable odors. Project implementation would not include the addition or expansion of any of the land use types or activities known to cause objectionable odors. Therefore, this impact would be **less than significant**.

E. Cumulative impact of any criteria pollutant

The Project would not result in a cumulative impact of any criteria air pollutant, as shown in **Table 5.2-5**. See discussion under significance criteria "B" above.

CUMULATIVE IMPACTS

As explained in the discussion above, air quality impacts for transportation projects are assessed across the transportation corridor in order to evaluate impacts at both local and regional levels. The qualitative and quantitative analysis above takes into consideration cumulative conditions (2040), through incorporation of land use changes anticipated in 2040 as reflected in the TIA. Because the Project would not exceed thresholds for the Bay Area Air Basin set by BAAQMD, and is included in the 2019 TIP that was found to conform with the SIP, the Project would not contribute to any cumulative impact. Future development listed in Chapter 4, Introduction to Environmental Analysis, would be required to complete independent air quality analysis under CEQA, and would also be required to implement applicable mitigation measures established in prior environmental documents such as the Dublin General Plan EIR, Eastern Dublin Specific Plan EIR, and the Fallon Village SEIR. Therefore, a cumulative impact would not occur. The Project would result in a less than cumulatively considerable contribution to any significant cumulative impact.

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