EVANS LANE COMMUNITY

COMMUNITY HEALTH RISK ASSESSMENT

SAN JOSÉ, CALIFORNIA

August 17, 2018

♦ ♦ ♦

Prepared for:

Tyler Rogers
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

James A. Reyff
& William Popenuck

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
1 Willowbrook Court, Suite 120
Petaluma, CA 94954
(707) 794-0400

Project: 18-101

Introduction

This report assesses the toxic air contaminant (TAC) and fine particulate matter (PM2.5) impacts from nearby sources affecting the proposed Evans Lane residential project in San Jose, California. The project proposes 8 permanent residential buildings, a community/office building, and a satellite public library to be developed on a vacant lot along Evans Lane. Additionally, a community garden, a dog park, and a bioretention basin would also be included as part of the proposed project. The residential buildings would be constructed from retrofitted shipping containers and contain six to eight studio units each, for a total of 61 units. The community building and satellite public library would be prefabricated buildings. All buildings would be constructed off-site and transported to the project site, and each building would be one-story tall.

Potential cancer risk, fine particulate matter ($PM_{2.5}$) and hazard impacts resulting from nearby pollution sources are assessed in this report. This analysis uses significance levels identified by the Bay Area Air Quality Management District's (BAAQMD) in their 2011 version of the California Environmental Quality Air (CEQA) Air Quality Guidelines that was updated in 2017 (see http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en).

Setting

The project site is located in the San Francisco Bay Area Air Basin, which is comprised of the nine-county Bay Area. However, the air basin only includes the southern portion of Sonoma County and the southwestern portion of Solano County. Air quality in the region is affected by natural factors such as proximity to the Bay and ocean, topography, and meteorology, as well as proximity to sources of air pollution. This assessment addresses

Particulate Matter

Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM10." Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and, while also respirable, can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the vicinity of the project site is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products such as smoke. Extended exposure to PM can increase the risk of chronic respiratory disease (BAAQMD 2011a)[1,]

[1] BAAQMD 2016. Planning Healthy Places. May Accessed at http://www.baaqmd.gov/~/media/files/planning-and-research/planning-healthy-places/php_may20_2016-pdf.pdf?la=en on August 24, 2016

[2]. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer or serious illness) and include, but are not limited to criteria air pollutants. 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). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established ambient air quality standards. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an ambient air quality standard or emission-based threshold.

Diesel exhaust is the predominant cancer-causing TAC in California. CARB estimates that about 70% of total known cancer risk related to air toxics in California is attributable to DPM[3]. According to CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles[4]. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

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 represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet 2010 or later engine standards that have much lower DPM and $PM_{2.5}$ emissions.

[2] BAAQMD 2011. CEQA Air Quality Guidelines. May. Updated May 2017

[3] CARB. *Summary: Diesel Particulate Matter Health Impacts*. https://www.arb.ca.gov/research/diesel/diesel-health_summ.htm

[4] California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000.

This regulation will substantially reduce these emissions between 2013 and 2023. While new trucks and buses will meet strict federal standards, this measure is intended to accelerate the rate at which the fleet either turns over so there are more cleaner vehicles on the road, or is retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads sooner.

CARB has also adopted and implemented regulations to reduce DPM and NOx emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and nitrogen oxides (NOx) exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent Federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NOx.

<u>Regulatory Setting</u>

San José Envision 2040 General Plan

The San José Envision 2040 General Plan includes goals, policies, and actions to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants or TACs[5]. The following goals, policies, and actions are applicable to the proposed project:

<u>Applicable Goals – Toxic Air Contaminants</u>

Goal MS-11 Minimize exposure of people to air pollution and toxic air contaminants such as ozone, carbon monoxide, lead, and particulate matter.

<u>Applicable Policies – Toxic Air Contaminants</u>

MS-11.1 Require completion of air quality modeling for sensitive land uses such as new residential developments that are located near sources of pollution such as freeways and industrial uses. Require new residential development projects and projects categorized as sensitive receptors to incorporate effective mitigation into project designs or be located an adequate distance from sources of toxic air contaminants (TACs) to avoid significant risks to health and safety.

MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources.

MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses.

[5] City of San Jose, California (2011). *Envision San José 2040 General Plan*. November. Accessed at http://www.sanjoseca.gov/DocumentCenter/View/474 on August 13, 2018.

Actions – Toxic Air Contaminants

MS-11.7 Consult with BAAQMD to identify stationary and mobile TAC sources and determine the need for and requirements of a health risk assessment for proposed developments.

Sensitive Receptors

"Sensitive receptors" are defined as facilities where sensitive population groups, such as children, the elderly, the acutely ill, and the chronically ill, are likely to be located. These land uses include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. The project would include sensitive receptors in the form of new residences that could include infants and children.

Impact Analysis

Standard of Significance

The BAAQMD provides guidance in assessing impacts to lead agencies in the Bay Area. In May 2011, BAAQMD adopted new CEQA Air Quality Guidelines that included thresholds of significance to assist in the review of projects under CEQA. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines.[6] The BAAQMD CEQA Air Quality Guidelines consider exposure of sensitive receptors to air pollutant levels that result in an unacceptable cancer risk or hazard, to be significant. For cancer risk, which is a concern with diesel particulate matter and other mobile-source TACs, the BAAQMD considers an increased risk of contracting cancer that is 10 in one million chances or greater, to be significant risk for a single source. The BAAQMD CEQA Guidelines also consider single-source TAC exposure to be significant if annual $PM_{2.5}$ concentrations exceed 0.3 micrograms per cubic meter ($\mu g/m^3$) or if the computed hazard index is greater than 1.0 for non-cancer risk hazards. Cumulative exposure is assessed by combining the risks and annual $PM_{2.5}$ concentrations for all sources within 1,000 feet of a project. The thresholds for cumulative exposure are an excess cancer risk of 100 in one million, annual $PM_{2.5}$ concentrations of 0.8 $\mu g/m^3$, and a hazard index greater than 10.0.

Exposure of Sensitive Receptors to Toxic Air Contaminants and PM2.5

The project would include sensitive receptors. Substantial sources of air pollution can adversely affect sensitive receptors proposed as part of new projects. A review of the area indicates that traffic on State Route (S.R.) 87, Almaden Expressway, and Curtner Avenue along with the Caltrain rail line could adversely affect project receptors. Screening analyses were conducted to identify if any of these sources had potentially significant impacts. A refined analysis was conducted for S.R.

[6] Bay Area Air Quality Management District. 2011. *BAAQMD CEQA Air Quality Guidelines*. May.

87 traffic impacts since the screening assessment indicated potentially significant impacts. This analysis included traffic emissions estimation, dispersion modeling with historical meteorological data, and cancer risk calculations.

<u>Roadway TAC Sources</u>

Local Roadways – Almaden Expressway and Curtner Avenue

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 a proposed project. Two adjustments were made to the cancer risk predictions made by this calculator: (1) adjustment for latest vehicle emissions rates predicted using EMFAC2014 and (2) adjustment of cancer risk to reflect new Office of Environmental Health Hazard Assessment (OEHHA) guidance (see Attachment 1).

The calculator uses EMFAC2011 emission rates for the year 2014. Overall, emission rates will decrease by the time the project is constructed and occupied. The project would not be occupied prior to at least 2018. In addition, a new version of the emissions factor model, EMFAC2014 is available. This version predicts lower emission rates. An adjustment factor of 0.5 was developed by comparing emission rates of total organic gases (TOG) for running exhaust and running losses developed using EMFAC2011 for year 2014 and those from EMFAC2014 for 2018.

The predicted cancer risk was then adjusted using a factor of 1.3744 to account for new OEHHA guidance. This factor was provided by BAAQMD for use with their CEQA screening tools that are used to predict cancer risk. The roadway screening modeling results can be found in *Attachment 2.*

The average daily traffic (ADT) on Curtner Avenue near the project site was estimated to be approximately 18,297 vehicles based on the City's ADT volume count.[7] Using the BAAQMD Roadway Screening Analysis Calculator for Santa Clara County for an east-west directional roadway and at a distance of approximately 700 feet north of the roadway, estimated cancer risk at the closest portion of the project site would be 1.3 per million and $PM_{2.5}$ concentration would be 0.03 $\mu g/m^3$, which would not exceed BAAQMD significance thresholds. Chronic or acute HI for the roadway would be below 0.03.

Since screening computations indicate increases in excess cancer risk at the project dwelling units closest to Almaden Expressway that would exceed significance thresholds, a refined analysis of the impacts of TACs and $PM_{2.5}$ to new sensitive receptors is necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from Almaden Expressway. Refined modeling of local roadways provides more accurate results because project specific information is used in the modeling. This includes roadway orientation with respect to receptors (i.e., where dwelling units would be located with respect to traffic), emission estimates (i.e., based on traffic speeds and traffic mix), and meteorological conditions near the project.

---

[7] City of San Jose, "Average Daily Traffic Volumes 2005 – 2015". Accessed August 2, 2018: https://data.sanjoseca.gov//dataviews/226261/average-daily-traffic-volume-2005-2015/

Traffic Emissions Modeling

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on Almaden Expressway using the CARB EMFAC2014 emission factor model and a local traffic volume of 56,680 ADT based on the City's ADT volume count data.[8] A truck mix of 3.51 percent was assumed based on BAAQMD recommendations for truck percentages on non-highway roads in Santa Clara County.[9] One-third of the trucks were assumed to be heavy duty trucks and two-thirds were assumed to be medium duty trucks. DPM emissions are projected to decrease in the future and are reflected in the EMFAC2014 emissions data.

Residential occupation of the project was assumed to begin in 2019 or later. In order to estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating increased cancer risks to new residents from traffic on Almaden Expressway, the EMFAC2014 model was used to develop vehicle emission factors for the year 2020. Year 2020 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years), since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions will decrease in the future. Default EMFAC2014 vehicle model fleet age distributions for Santa Clara County were assumed. Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[10] which were then applied to the average daily traffic volumes to obtain estimated hourly traffic volumes and emissions for Almaden Expressway. An average travel speed of 50 mph was used for all hours except two hours in the morning and evening peak periods. Based on traffic data from the Santa Clara Valley Transportation Authority's 2016 Conformance Monitoring Program report, traffic speeds during the peak a.m. and p.m. periods were assumed to be 25 mph.[11]

Emissions of total organic gases (TOG) were also calculated for 2020 using the EMFAC2014 model. These TOG emissions were then used in modeling the organic TACs (i.e., TACs associated with motor vehicle exhaust and evaporative emissions). TOG emissions from exhaust and for running evaporative loses from gasoline vehicles were calculated using EMFAC2014 default model values for Santa Clara County along with the traffic volumes and vehicle mixes.

$PM_{2.5}$ emissions for vehicles traveling on Almaden Expressway were modeled using the same basic approach that was used for assessing TAC emissions. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included in these emissions.

[8] City of San Jose, "Average Daily Traffic Volumes 2005 – 2015". Accessed August 2, 2018: https://data.sanjoseca.gov//dataviews/226261/average-daily-traffic-volume-2005-2015/

[9] BAAQMD. 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May.

[10] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2011 does not include Burden type output with hour by hour traffic volume information.

[11] Santa Clara Valley Transportation Authority. *2016 CMP Monitoring and Conformance Report. 2017.*

The assessment involved, first, calculating $PM_{2.5}$ emission rates from traffic traveling on the roadway. These emissions were calculated using the EMFAC2014 model and traffic volumes and were calculated in the same manner as discussed above. $PM_{2.5}$ re-entrained dust emissions from vehicles traffic were calculated using CARB emission calculation procedures.[12]

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD model, which is recommended by the BAAQMD for this type of analysis. North- and south-bound traffic on Almaden Expressway within about 1,000 feet of the project site was evaluated with the model. A five-year data set (2006-2010) of hourly meteorological data from the San Jose Airport prepared by the BAAQMD for use with the AERMOD model was used. Other inputs to the model included road geometry and elevations, hourly traffic emissions, and receptor locations.

The modeling used a grid of receptors spaced every 9.1 meters (30 feet) within the area of the proposed new residential units. Receptor heights of 1.5 meters (4.9 feet) were used to represent the breathing heights of future residents. Figure 1 shows the project site area, roadway segments modeled and residential receptor locations used in the modeling.

The maximum modeled TAC and $PM_{2.5}$ concentrations from Almaden Expressway occurred at a residential unit in the eastern portion of the project residential area closest to Almaden Expressway. TAC and $PM_{2.5}$ concentrations from Almaden Expressway traffic at the project site will decrease with distance from the roadway.

Computed Cancer and Non-Cancer Health Impacts

The maximum increased lifetime cancer risk and annual $PM_{2.5}$ concentrations for new residents at the project site are shown in Table 1 and were computed using modeled TAC and $PM_{2.5}$ concentrations and BAAQMD recommended methods and exposure parameters described in *Attachment 1*. The maximum cancer risk and non-cancer health impacts (hazard index) are below their respective BAAQMD significance thresholds. However, the maximum $PM_{2.5}$ concentration is above the BAAQMD significance threshold. The location of the maximally exposed individual (MEI) where the maximum TAC and $PM_{2.5}$ impacts from Almaden Expressway traffic occurred is shown in Figure 1. The modeling results and health risk calculations from Almaden Expressway traffic are provided in *Attachment 3*.

[12] CARB, 2014. *Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust*. Revised and updated, April 2014.

Figure 1. Project Site, Roadway Segments Modeled, and Locations of On-Site Receptors and Maximum TAC Impacts from Almaden Expressway and S.R. 87

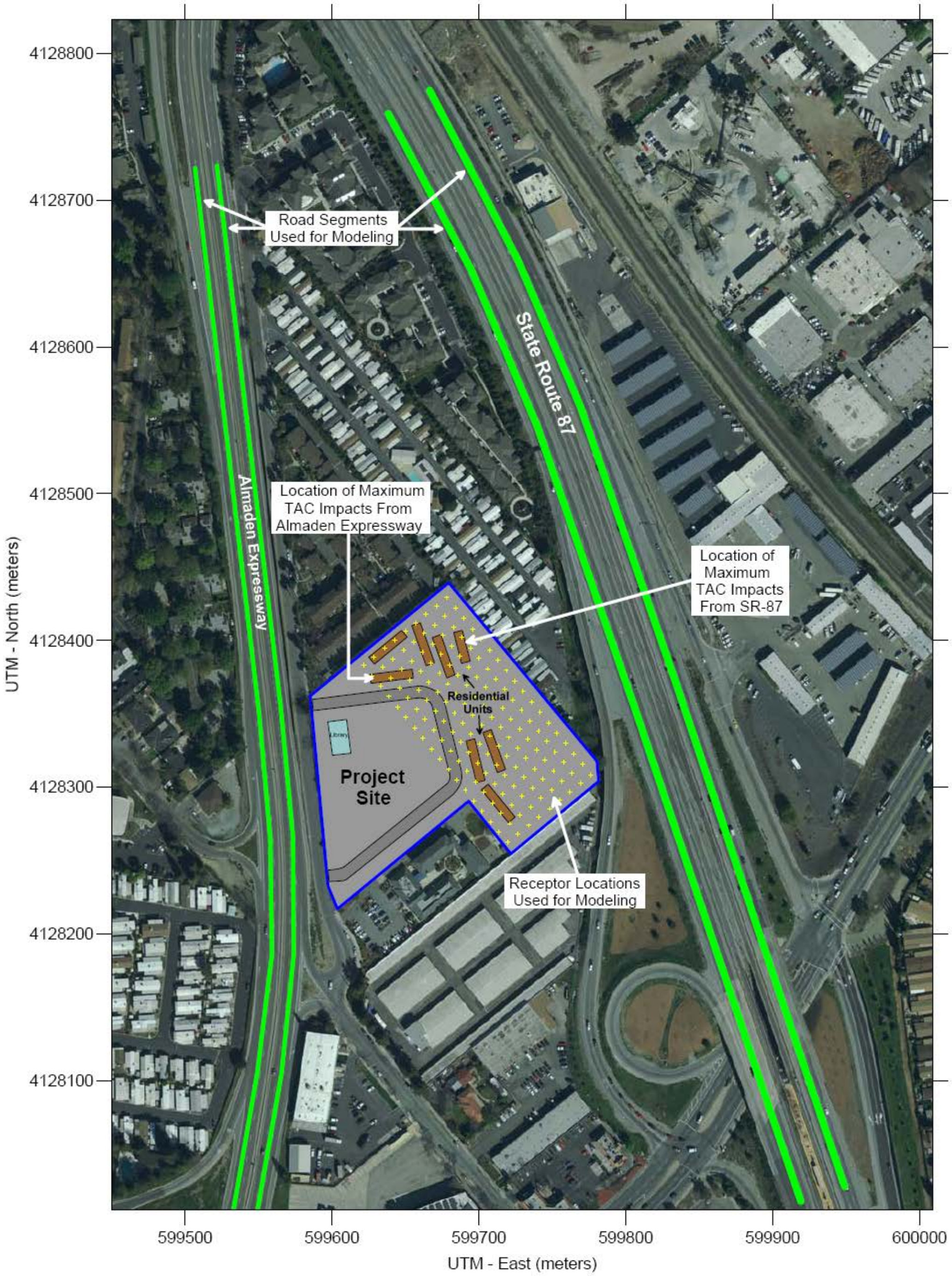


Table 1. Maximum Health Risk Impacts from Almaden Expressway Traffic

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Chronic Hazard Index
Almaden Expressway			
Maximum Residential Impact:	5.2	**0.47**	<0.01
BAAQMD Thresholds	*10.0*	*0.3*	*1.0*

Note: **Bold** denotes levels above single-source thresholds.

State Route 87

A refined analysis of the impacts of TACs and $PM_{2.5}$ to new sensitive receptors is necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from S.R. 87. A review of the traffic information reported by the California Department of Transportation (Caltrans) indicates that S.R. 87 traffic includes 128,000 annual average vehicles per day[13] that are about 2.56 percent trucks[14], of which of which 0.72 percent are considered heavy duty trucks and 1.84 percent are medium duty trucks.

Traffic Emissions Modeling

Emission factors for DPM ($PM_{2.5}$ exhaust from diesel vehicles) were developed for the year 2020 using the calculated mix of cars and trucks on S.R. 87 using the CARB EMFAC2014 vehicle emissions model. Default EMFAC2014 vehicle model fleet age distributions for Santa Clara County were assumed. Average daily traffic volumes truck percentages were based on Caltrans data for S.R. 87. Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[15] which were then applied to the average daily traffic volumes to obtain estimated hourly traffic volumes and emissions for S.R. 87. Year 2020 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years), since overall vehicle emissions, and in particular diesel truck emissions will decrease in the future.

Emissions of total organic gases (TOG) were also calculated for 2020 using the EMFAC2014 model. These TOG emissions were then used in the modeling the organic TACs. TOG emissions from exhaust and for running evaporative loses from gasoline vehicles were calculated using EMFAC2014 default model values for Santa Clara County along with the traffic volumes and vehicle mixes for S.R. 87.

$PM_{2.5}$ emissions for vehicles traveling on S.R. 87 were modeled using the same basic approach that was used for assessing TAC emissions. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included in these emissions. The assessment involved, first, calculating $PM_{2.5}$ emission rates from traffic traveling on the roadway. These emissions were calculated using the EMFAC2014 model and traffic volumes and were calculated in the same manner as discussed above. $PM_{2.5}$ re-entrained dust emissions from vehicles traffic were calculated using CARB emission calculation procedures.[16]

---

[13] Caltrans, 2016b. *2016 Traffic Volumes on the California State Highway System.* Available: http://www.dot.ca.gov/trafficops/census/docs/2016_aadt_volumes.pdf

[14] California Department of Transportation. 2016a. *2016 Annual Average Daily Truck Traffic on the California State Highway System*: http://www.dot.ca.gov/trafficops/census/docs/2016_aadt_truck.pdf

[15] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2011 does not include Burden type output with hour by hour traffic volume information.

[16] CARB, 2014. *Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust*. Revised and updated, April

For all hours of the day, other than during peak a.m. and p.m. periods, an average speed of 65 mph was assumed for all vehicles other than trucks which were assumed to travel at a speed of 60 mph.. Based on traffic data from the Santa Clara Valley Transportation Authority's 2016 Conformance Monitoring Program report, traffic speeds during the peak a.m. and p.m. periods were identified.[17] For a 2-hour period during the peak a.m. period an average travel speed of 10 mph was used for northbound traffic and the average free-flow travel speed was used for southbound traffic. For the peak p.m. period, the average free-flow travel speed was used for northbound traffic and an average travel speed of 50 mph was used for southbound traffic

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD model, which is recommended by the BAAQMD for this type of analysis. North- and south-bound traffic on S.R. 87 within about 1,000 feet of the project site was evaluated with the model. A five-year data set (2006-2010) of hourly meteorological data from the San Jose Airport prepared by the BAAQMD for use with the AERMOD model was used. Other inputs to the model included road geometry and elevations, hourly traffic emissions, and receptor locations.

The modeling used a grid of receptors spaced every 9.1 meters (30 feet) within the area of the proposed new residential units. Receptor heights of 1.5 meters (4.9 feet) were used to represent the breathing heights of future residents. Figure 1 shows the project site area, roadway segments modeled and residential receptor locations used in the modeling.

The maximum modeled TAC and $PM_{2.5}$ concentrations from S.R. 87 occurred at a residential unit in the northern portion of the project residential area closest to S.R. 87. TAC and $PM_{2.5}$ concentrations from S.R. 87 traffic at the project site will decrease with distance from the roadway.

Computed Cancer Risk

The maximum increased lifetime cancer risk and annual $PM_{2.5}$ concentrations for new residents at the project site are shown in Table 2 and were computed using modeled TAC and $PM_{2.5}$ concentrations and BAAQMD recommended methods and exposure parameters described in *Attachment 1*. The maximum cancer risk, maximum $PM_{2.5}$ concentration, and non-cancer health impacts (hazard index) are below their respective BAAQMD significance thresholds. The location of the maximally exposed individual (MEI) where the maximum TAC and $PM_{2.5}$ impacts from S.R. 87 traffic occurred is shown in Figure 1. The modeling results and health risk calculations from S.R. 87 traffic are provided in *Attachment 4*.

2014.

[17] Santa Clara Valley Transportation Authority. *2016 CMP Monitoring and Conformance Report. 2017.*

Table 2. Maximum Health Risk Impacts from State Route 87 Traffic

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Chronic Hazard Index
State Route 87 Maximum Residential Impact:	4.5	0.29	<0.01
BAAQMD Thresholds	*10.0*	*0.3*	*1.0*

Note: **Bold** denotes levels above single-source thresholds.

Caltrain & Union Pacific Railroad TAC Impacts

A Caltrain/Union Pacific rail line is located about 800 feet east of the site, running northwest to southeast. This line carries Caltrain and Amtrak passenger trains and Union Pacific freight trains that are powered by diesel locomotives. Due to the proximity of the rail line to new project residences, potential health risks to future residents from DPM emissions from diesel locomotive engines were evaluated. Impacts from this portion of the rail line were evaluated in the Environmental Impact Report (EIR) for the Communications Hill Project that was certified by the San José City Council on September 30, 2014 with the adoption of Resolution No. 77172. Appendix E of the Draft EIR (DEIR) is the air quality study that includes this analysis.[18] That analysis evaluated rail line impacts for the project and reported maximum impacts that occurred at a receptor about 130 feet from the rail line (see Table 1). These levels, at 130 feet from the rail line, did not exceed the BAAQMD thresholds. Therefore, the project receptors, located approximately 800 feet from the rail line would have lower impacts.

Stationary TAC Sources

The BAAQMD *Stationary Source Risk & Hazard Analysis* Tool, a Google Earth mapping tool, was used to identify the location of stationary sources and their estimated hazard impacts. Plant # 14445 and 10012 were identified with the tool. However, no permitted stationary sources of air pollution were above the significance threshold and would be considered a *less-than-significant* impact

Combined Community Source Levels

The combination of exposures from nearby traffic and the rail line were evaluated by simply adding up the maximum impacts from each source. This provides an overestimate of cumulative risk, since the maximum impact from each source would occur at different locations across the project site. Table 3 shows the combined source levels and compares them to the cumulative community source thresholds.

[18] See http://www.sanjoseca.gov/communicationshill, accessed on May 20, 2015

Table 3. Community Risk to Project Sensitive Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Acute or Chronic Hazard Index
Maximum Single Source Impacts			
State Route 87 – 128,000 ADT	4.5	0.29	<0.01
Caltrain and Union Pacific Railroad at 130 feet	<5.0	<0.01	<0.01
Almaden Expressway – 56,680 ADT	5.2	**0.47**	<0.01
Curtner Avenue – 18,297 ADT at 700 feet	1.3	0.03	<0.01
BAAQMD Single Source Threshold	*>10.0*	*>0.3*	*>1.0*
Significant?	No	**Yes**	No
Cumulative Level (at Maximum Exposed Individual - MEI Receptor)			
Almaden Expressway – 56,680 ADT	5.2	**0.47**	<0.01
Caltrain and Union Pacific Railroad at 130 feet	<5.0	<0.01	<0.01
State Route 87 Traffic on Almaden Expressway MEI	2.4	0.15	<0.01
Curtner Avenue – 18,297 ADT at 700 feet	1.3	0.03	<0.01
Cumulative Sources Total	*<13.9*	*0.66*	*<0.04*
BAAQMD Cumulative Source Threshold	*>100*	*>0.8*	*>10.0*
Significant?	*No*	*No*	*No*

Summary of Impacts

Portions of the project site would have annual PM2.5 concentrations that exceed the single-source thresholds recommended by BAAQMD. These areas are depicted in Figure 2 (Figure 2a), where annual PM2.5 concentrations exceed 0.3$\mu g/m^3$.

Figure 1 Uncontrolled Community Risk from Almaden Expressway Traffic

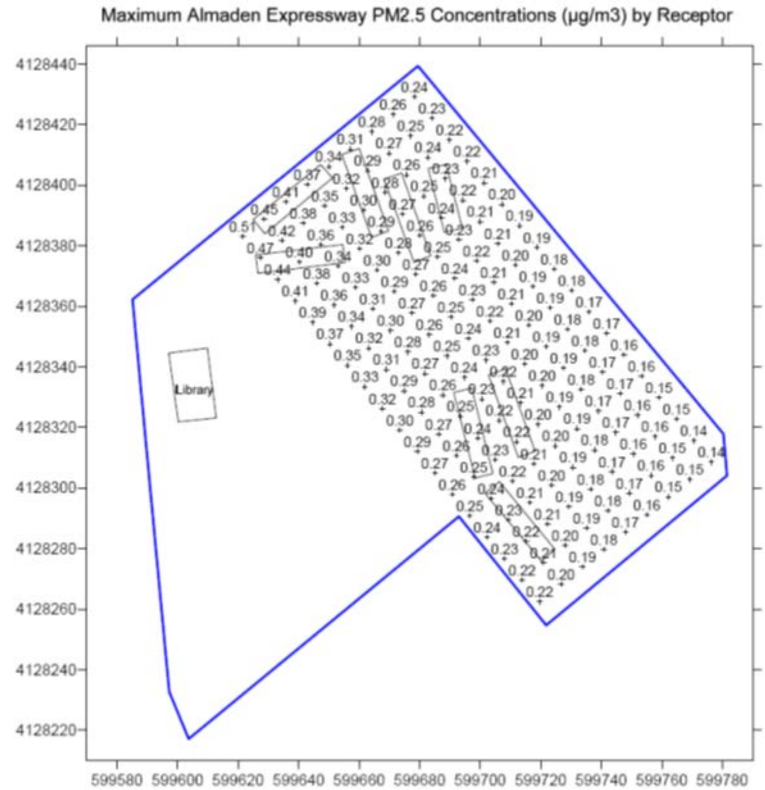


Figure 2a. Increased $PM_{2.5}$ Concentrations (µg/m^3)

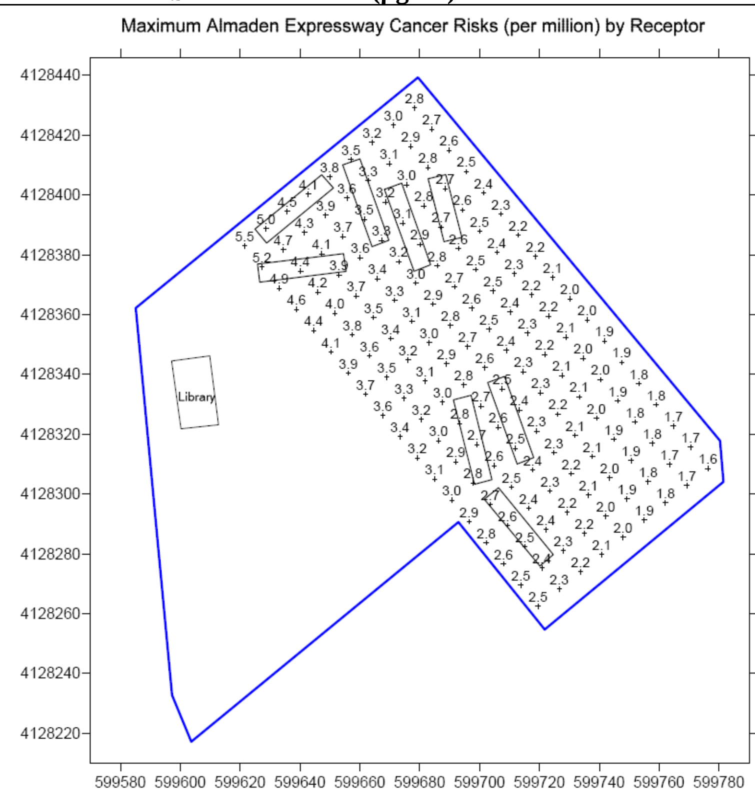


Figure 2b. Increased Cancer Risks (per million)

Recommended Mitigation

The BAAQMD CEQA Air Quality Guidelines recommend as mitigation that projects install and maintain air filtration systems of fresh air supply. These systems should be installed on either an individual unit-by-unit basis, with individual air intake and exhaust ducts ventilating each unit separately, or through a centralized building ventilation system. The ventilation system should be certified to achieve certain effectiveness. To reduce significant PM2.5 exposure, future residential development shall implement the following measures for portions of the site that have annual PM2.5 concentrations in excess of 0.3µg/m^3, as identified using Figure 2.:

- Install and maintain air filtration systems, rated MERV-13 or higher. A maintenance plan for the air filtration system shall be implemented that includes scheduled replacement of air filters.
- Trees and/or vegetation shall be planted between sensitive receptors and pollution sources, if feasible. Trees that are best suited to trapping particulate matter shall be planted, including the following: Pine (Pinus nigra var. maritime), Cypress (X Cupressocyparis leylandii), Hybrid poplar (Populus deltoids X trichocarpa), and Redwoods (Sequoia sempervirens).
- Residential dwelling units shall be designed to locate sensitive receptors as far as possible from any the roadway.

Effectiveness

A properly installed and operated ventilation system with MERV13 filters should achieve reductions of 80 percent for interior spaces with doors and windows closed. Increased $PM_{2.5}$ exposures for MERV13 filtration cases were calculated assuming a combination of outdoor and indoor exposure. For use of MERV13 filtration systems, without the additional use of sealed, inoperable widows and no balconies, three hours of outdoor exposure to ambient $PM_{2.5}$ concentrations and 21 hours of indoor exposure to filtered air was assumed. In this case, the effective control efficiency using a MERV13 filtration system is about 70 percent for $PM_{2.5}$ exposure. This would reduce the maximum annual PM2.5 concentration below 0.3 µg/m^3.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[19] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[20] This HRA used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[21] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend

---

[19] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[20] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[21] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity that would have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized as follows:

Parameter	***Exposure Type →***	**Infant**		**Child**		**Adult**
	Age Range →	**3rd Trimester**	**0<2**	**2 < 9**	**2 < 16**	**16 - 30**
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	631	572	261
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults.

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 2: Screening Community Risk Calculations

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	East-West	
Side of the Roadway	North	
Distance from Roadway	700	feet
Annual Average Daily Traffic (ADT)	18,297	

Results

Santa Clara County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.033 (µg/m^3)

Cancer Risk

1.82 (per million)

Almaden Expressway

Cumulative plus project volumes from traffic report

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

1.25

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	North-South	
Side of the Roadway	East	
Distance from Roadway	190	feet
Annual Average Daily Traffic (ADT)	56,680	

Results

Santa Clara County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.393 (µg/m^3)

Cancer Risk

16.82 (per million)

Almaden Expressway

Cumulative plus project volumes from traffic report

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

11.56

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Attachment 3: Almaden Expressway Emissions and Risk Calculations

Evans Lane, San Jose, CA
Almaden Expressway
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2020

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-Almaden Expy	Northbound Almaden Expy	N	3	809	56	17.0	3.4	563	variable
SB-Almaden Expy	Southboudn Almaden Expy	S	3	803	56	17.0	3.4	563	variable

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.58%	15	0.0312	9	7.42%	42	0.0233	17	7.24%	41	0.0245
2	2.19%	12	0.0266	10	6.64%	37	0.0296	18	5.71%	32	0.0195
3	1.74%	10	0.0152	11	5.46%	31	0.0275	19	3.10%	17	0.0185
4	0.68%	4	0.0291	12	6.21%	35	0.0289	20	2.29%	13	0.0157
5	0.70%	4	0.0244	13	5.87%	33	0.0289	21	3.51%	20	0.0219
6	1.39%	8	0.0393	14	5.78%	33	0.0281	22	4.67%	26	0.0270
7	4.50%	25	0.0288	15	6.91%	39	0.0242	23	3.83%	22	0.0233
8	5.29%	30	0.0210	16	5.84%	33	0.0214	24	0.47%	3	0.0244
								Total		563	

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.58%	15	0.0312	9	7.42%	42	0.0233	17	7.24%	41	0.0245
2	2.19%	12	0.0266	10	6.64%	37	0.0296	18	5.71%	32	0.0195
3	1.74%	10	0.0152	11	5.46%	31	0.0275	19	3.10%	17	0.0185
4	0.68%	4	0.0291	12	6.21%	35	0.0289	20	2.29%	13	0.0157
5	0.70%	4	0.0244	13	5.87%	33	0.0289	21	3.51%	20	0.0219
6	1.39%	8	0.0393	14	5.78%	33	0.0281	22	4.67%	26	0.0829
7	4.50%	25	0.0288	15	6.91%	39	0.0242	23	3.83%	22	0.0233
8	5.29%	30	0.0210	16	5.84%	33	0.0214	24	0.47%	3	0.0244
								Total		563	

Evans Lane, San Jose, CA
Almaden Expressway
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-Almaden Expy	Northbound Almaden Expy	N	3	809	56	17.0	1.3	29,474	variable
SB-Almaden Expy	Southboudn Almaden Expy	S	3	803	56	17.0	1.3	29,474	variable

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	320	0.0221	9	7.08%	2088	0.0210	17	7.40%	2182	0.0207
2	0.37%	109	0.0248	10	4.28%	1262	0.0215	18	8.30%	2447	0.0204
3	0.29%	86	0.0216	11	4.60%	1355	0.0206	19	5.80%	1708	0.0196
4	0.16%	47	0.0240	12	5.85%	1725	0.0207	20	4.37%	1288	0.0195
5	0.44%	129	0.0205	13	6.18%	1821	0.0203	21	3.28%	968	0.0199
6	0.81%	238	0.0231	14	6.04%	1780	0.0204	22	3.31%	976	0.0205
7	3.75%	1106	0.0205	15	7.09%	2090	0.0201	23	2.48%	731	0.0203
8	7.89%	2326	0.0202	16	7.23%	2132	0.0198	24	1.89%	558	0.0193
								Total		29,474	

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	320	0.0221	9	7.08%	2088	0.0210	17	7.40%	2182	0.0207
2	0.37%	109	0.0248	10	4.28%	1262	0.0215	18	8.30%	2447	0.0204
3	0.29%	86	0.0216	11	4.60%	1355	0.0206	19	5.80%	1708	0.0196
4	0.16%	47	0.0240	12	5.85%	1725	0.0207	20	4.37%	1288	0.0195
5	0.44%	129	0.0205	13	6.18%	1821	0.0203	21	3.28%	968	0.0199
6	0.81%	238	0.0231	14	6.04%	1780	0.0204	22	3.31%	976	0.0237
7	3.75%	1106	0.0205	15	7.09%	2090	0.0201	23	2.48%	731	0.0203
8	7.89%	2326	0.0202	16	7.23%	2132	0.0198	24	1.89%	558	0.0193
								Total		29,474	

Evans Lane, San Jose, CA
Almaden Expressway
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-Almaden Expy	Northbound Almaden Expy	N	3	809	56	17.0	1.3	29,474	variable
SB-Almaden Expy	Southboudn Almaden Expy	S	3	803	56	17.0	1.3	29,474	variable

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	320	0.0153	9	7.08%	2088	0.0153	17	7.40%	2182	0.0153
2	0.37%	109	0.0153	10	4.28%	1262	0.0153	18	8.30%	2447	0.0153
3	0.29%	86	0.0153	11	4.60%	1355	0.0153	19	5.80%	1708	0.0153
4	0.16%	47	0.0153	12	5.85%	1725	0.0153	20	4.37%	1288	0.0153
5	0.44%	129	0.0153	13	6.18%	1821	0.0153	21	3.28%	968	0.0153
6	0.81%	238	0.0153	14	6.04%	1780	0.0153	22	3.31%	976	0.0153
7	3.75%	1106	0.0153	15	7.09%	2090	0.0153	23	2.48%	731	0.0153
8	7.89%	2326	0.0153	16	7.23%	2132	0.0153	24	1.89%	558	0.0153
								Total		29,474	

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-Almaden Expy

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	320	0.0153	9	7.08%	2088	0.0153	17	7.40%	2182	0.0153
2	0.37%	109	0.0153	10	4.28%	1262	0.0153	18	8.30%	2447	0.0153
3	0.29%	86	0.0153	11	4.60%	1355	0.0153	19	5.80%	1708	0.0153
4	0.16%	47	0.0153	12	5.85%	1725	0.0153	20	4.37%	1288	0.0153
5	0.44%	129	0.0153	13	6.18%	1821	0.0153	21	3.28%	968	0.0153
6	0.81%	238	0.0153	14	6.04%	1780	0.0153	22	3.31%	976	0.0153
7	3.75%	1106	0.0153	15	7.09%	2090	0.0153	23	2.48%	731	0.0153
8	7.89%	2326	0.0153	16	7.23%	2132	0.0153	24	1.89%	558	0.0153
								Total		29,474	

Evans Lane, San Jose, CA
Almaden Expressway Traffic Data and PM2.5 & TOG Emission Factors - 50 mph

Analysis Year = *2020*

Vehicle Type	2016 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	33,334	34,668	1.09%	377	50	0.0103	0.0190	0.0013	0.0122	0.051
LDT	21,356	22,210	0.17%	39	50	0.0069	0.0190	0.0012	0.0141	0.071
MDT	1,326	1,379	10.35%	143	50	0.0118	0.0241	0.0034	0.0277	0.152
HDT	663	690	82.31%	568	50	0.0393	0.1110	0.0329	0.0856	0.108
Total	56,680	58,947	-	1,126	50	-	-		-	-
Mix Avg Emission Factor						**0.02497**	**0.02020**	**0.00168**	**0.01340**	**0.06125**
Increase From 2016		1.04								
Vehicles/Direction		29,474		563						
Avg Vehicles/Hour/Direction		**1,228**		**23**						

Traffic Data Year = *2016*

	Total	Total Truck	Truck by Axle: 2	3	4	5
Almaden Expressway	56,680	1,989	1,326	221	221	221
			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

Traffic Increase per Year (%) = *1.00%*

Evans Lane, San Jose, CA
Almaden Expressway Traffic Data and PM2.5 & TOG Emission Factors - 30 mph

Analysis Year = *2020*

Vehicle Type	2016 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	33,334	34,668	1.09%	377	30	0.0136	0.0198	0.0020	0.0192	0.051
LDT	21,356	22,210	0.17%	39	30	0.0093	0.0197	0.0019	0.0224	0.071
MDT	1,326	1,379	10.35%	143	30	0.0130	0.0233	0.0026	0.0390	0.152
HDT	663	690	82.31%	568	30	0.0357	0.1074	0.0294	0.1330	0.108
Total	56,680	58,947	-	1,126	30	-	-		-	-
Mix Avg Emission Factor						**0.02453**	**0.02083**	**0.00230**	**0.02108**	**0.06125**
Increase From 2016		1.04								
Vehicles/Direction		29,474		563						
Avg Vehicles/Hour/Direction		**1,228**		**23**						

Traffic Data Year = *2016*

	Total	Total* Truck	Truck by Axle: 2	3	4	5
Almaden Expressway	56,680	1,989	1,326	221	221	221
			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

Traffic Increase per Year (%) = *1.00%*

Evans Lane, San Jose, CA
Almaden Expressway Traffic Data and PM2.5 & TOG Emission Factors - 20 mph

Analysis Year = ***2020***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	**2016 Caltrans Number Vehicles (veh/day)**	**2020 Number Vehicles (veh/day)**	**2020 Percent Diesel**	**Number Diesel Vehicles (veh/day)**	**Vehicle Speed (mph)**	**Vehicles DPM (g/VMT)**	**Total PM2.5 (g/VMT)**	**Exhaust PM2.5 (g/VMT)**	**Exhaust TOG (g/VMT)**	**Running TOG (g/VMT)**
LDA	33,334	34,668	1.09%	377	20	0.0198	0.0212	0.0034	0.0329	0.051
LDT	21,356	22,210	0.17%	39	20	0.0132	0.0210	0.0033	0.0382	0.071
MDT	1,326	1,379	10.35%	143	20	0.0232	0.0299	0.0092	0.0820	0.152
HDT	663	690	82.31%	568	20	0.1295	0.1799	0.1018	0.4189	0.108
Total	56,680	58,947	-	1,126	20	-	-	-	-	-
Mix Avg Emission Factor						**0.07532**	**0.02319**	**0.00466**	**0.03681**	**0.06125**
Increase From 2016		1.04								
Vehicles/Direction		29,474		563						
Avg Vehicles/Hour/Direction		**1,228**		**23**						

Traffic Data Year = ***2016***

		Total	Truck by Axle			
	Total	Truck	2	3	4	5
Almaden Expressway	56,680	1,989	1,326	221	221	221
			66.67%	11.11%	11.11%	11.11%
Percent of Total Vehicles		3.51%	2.34%	0.39%	0.39%	0.39%

Traffic Increase per Year (%) = ***1.00%***

Evans Lane, San Jose, CA
Almaden Expressway Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5}$ = $PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10} \times (0.0686/0.4572) = 1.0 \times 0.15 = 0.15$ g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	**Silt Loading (g/m^2)**	**Average Weight (tons)**	**County**	**No. Days ppt > 0.01"**	**$PM_{2.5}$ Emission Factor (g/VMT)**
Major	0.032	2.4	Santa Clara	64	0.01528

SFBAAB[a]

Road Type	**Silt Loading (g/m^2)**
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	**>0.01 inch precipitation**
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Evans Lane, San Jose, CA - Almaden Expressway Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Maximum Residential Receptor (MEI) - 1.5 meter receptor height

Emissions Year	2020
Receptor Information	
Number of Receptors	162
Receptor Height =	1.5 meters above ground level
Receptor distances =	30 foot (9.1 meters) grid in project residential area

Meteorological Conditions	
BAAQMD San Jose Airport Met Data	2006-2010
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological Data Years	Concentration ($\mu g/m^3$)		
	DPM	Exhaust TOG	Evaporative TOG
2006-2010	0.00555	0.2041	0.8110

Meteorological Data Years	PM2.5 Concentrations ($\mu g/m^3$)		
	Total PM2.5	Road Dust PM2.5	Vehicle PM2.5
2006-2010	0.4711	0.2025	0.2685

Evans Lane, San Jose, CA - Almaden Expressway Traffic -Maximum Cancer Risks
On-Site Maximum Residential Receptor (MEI) - 1.5 meter receptor height
30-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - <2**	**2 - <16**	**16 - 30**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
		Exposure		Age	Annual TAC Conc (ug/m3)						
Exposure		Duration		Sensitivity		Exhaust	Evaporative		Exhaust	Evaporative	
Year	Year	(years)	Age	Factor	DPM	TOG	TOG	DPM	TOG	TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0056	0.2041	0.8110	0.075	0.016	0.004	0.10
1	2020	1	1	10	0.0056	0.2041	0.8110	0.91	0.191	0.045	1.15
2	2021	1	2	10	0.0056	0.2041	0.8110	0.91	0.191	0.045	1.15
3	2022	1	3	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
4	2023	1	4	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
5	2024	1	5	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
6	2025	1	6	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
7	2026	1	7	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
8	2027	1	8	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
9	2028	1	9	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
10	2029	1	10	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
11	2030	1	11	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
12	2031	1	12	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
13	2032	1	13	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
14	2033	1	14	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
15	2034	1	15	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
16	2035	1	16	3	0.0056	0.2041	0.8110	0.14	0.030	0.007	0.18
17	2036	1	17	1	0.0056	0.2041	0.8110	0.02	0.0033	0.001	0.020
18	2037	1	18	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
19	2038	1	19	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
20	2039	1	20	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
21	2040	1	21	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
22	2041	1	22	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
23	2042	1	23	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
24	2043	1	24	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
25	2044	1	25	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
26	2045	1	26	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
27	2046	1	27	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
28	2047	1	28	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
29	2048	1	29	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
30	2049	1	30	1	0.0056	0.2041	0.8110	0.02	0.003	0.001	0.020
Total Increased Cancer Risk			**Total**					4.13	0.867	0.203	**5.2**

* Third trimester of pregnancy

Evans Lane, San Jose, CA - Almaden Expressway Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
Impact from Almaden on SR-87 On-Site MEI Residential Receptor (Receptor #134)

Emissions Year 2020

Receptor Information

Number of Receptors	162
Receptor Height =	1.5 meters above ground level
Receptor distances =	30 foot (9.1 meters) grid in project residential area

Meteorological Conditions

BAAQMD San Jose Airport Met Data	2006-2010
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological	Concentration ($\mu g/m^3$)		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2006-2010	0.00286	0.1002	0.3981

Meteorological	PM2.5 Concentrations ($\mu g/m^3$)		
Data Years	Total PM2.5	Road Dust PM2.5	Vehicle PM2.5
2006-2010	0.2314	0.0995	0.1318

Evans Lane, San Jose, CA - Almaden Expressway Traffic -Maximum Cancer Risks
Impact from Almaden on SR-87 On-Site MEI Residential Receptor (Receptor #134)
30-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

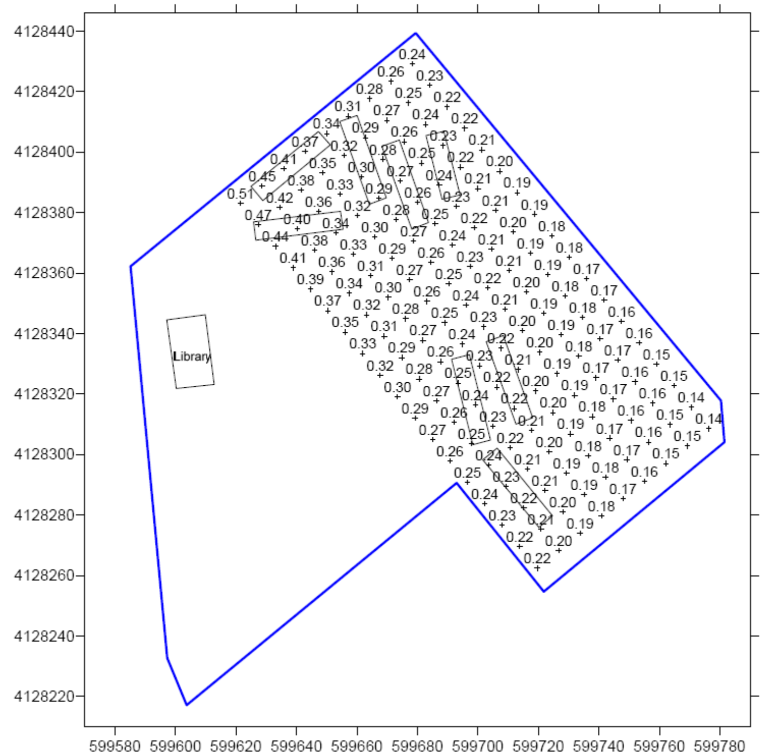
* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

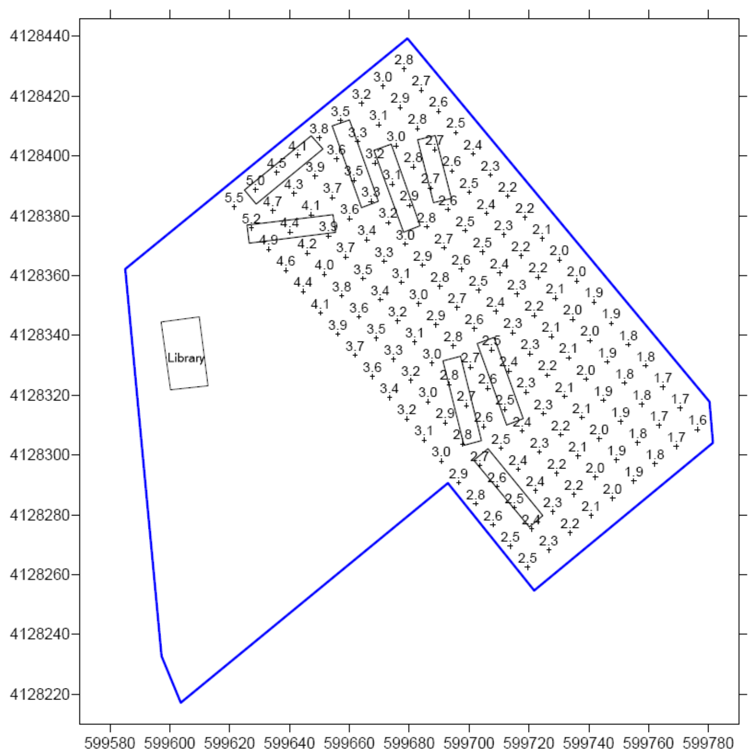
				Maximum - Exposure Information				Cancer Risk (per million)			
		Exposure		Age	Annual TAC Conc (ug/m3)						
Exposure		Duration		Sensitivity		Exhaust	Evaporative		Exhaust	Evaporative	
Year	Year	(years)	Age	Factor	DPM	TOG	TOG	DPM	TOG	TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0029	0.1002	0.3981	0.039	0.008	0.002	0.05
1	2020	1	1	10	0.0029	0.1002	0.3981	0.47	0.094	0.022	0.59
2	2021	1	2	10	0.0029	0.1002	0.3981	0.47	0.094	0.022	0.59
3	2022	1	3	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
4	2023	1	4	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
5	2024	1	5	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
6	2025	1	6	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
7	2026	1	7	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
8	2027	1	8	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
9	2028	1	9	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
10	2029	1	10	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
11	2030	1	11	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
12	2031	1	12	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
13	2032	1	13	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
14	2033	1	14	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
15	2034	1	15	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
16	2035	1	16	3	0.0029	0.1002	0.3981	0.07	0.015	0.003	0.09
17	2036	1	17	1	0.0029	0.1002	0.3981	0.01	0.0016	0.000	0.010
18	2037	1	18	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
19	2038	1	19	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
20	2039	1	20	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
21	2040	1	21	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
22	2041	1	22	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
23	2042	1	23	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
24	2043	1	24	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
25	2044	1	25	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
26	2045	1	26	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
27	2046	1	27	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
28	2047	1	28	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
29	2048	1	29	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
30	2049	1	30	1	0.0029	0.1002	0.3981	0.01	0.002	0.000	0.010
Total Increased Cancer Risk			**Total**					2.13	0.426	0.100	**2.7**

* Third trimester of pregnancy

Maximum Almaden Expressway PM2.5 Concentrations (µg/m3) by Receptor



Maximum Almaden Expressway Cancer Risks (per million) by Receptor



Attachment 4: State Route 87 Modeling Analysis Information

Evans Lane, San Jose, CA
SR-87
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2020

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB SR-87	Northbound SR-87	N	3	799	56	17.0	3.4	1,085	variable
SB SR-87	Southbound SR-87	S	3	793	56	17.0	3.4	1,085	variable

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.21%	24	0.0332	9	7.34%	80	0.0380	17	6.68%	72	0.0218
2	1.67%	18	0.0254	10	3.78%	41	0.0369	18	5.87%	64	0.0162
3	1.97%	21	0.0226	11	7.20%	78	0.0223	19	5.29%	57	0.0153
4	1.70%	18	0.0403	12	7.51%	81	0.0229	20	4.40%	48	0.0126
5	1.24%	13	0.0330	13	7.00%	76	0.0225	21	1.70%	18	0.0340
6	1.60%	17	0.0431	14	7.05%	76	0.0222	22	2.18%	24	0.0374
7	2.95%	32	0.0420	15	6.51%	71	0.0212	23	1.35%	15	0.0327
8	6.35%	69	0.0358	16	5.96%	65	0.0190	24	0.51%	6	0.0309
								Total		1,085	

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.21%	24	0.0332	9	7.34%	80	0.0220	17	6.68%	72	0.0151
2	1.67%	18	0.0254	10	3.78%	41	0.0369	18	5.87%	64	0.0126
3	1.97%	21	0.0226	11	7.20%	78	0.0223	19	5.29%	57	0.0153
4	1.70%	18	0.0403	12	7.51%	81	0.0229	20	4.40%	48	0.0126
5	1.24%	13	0.0330	13	7.00%	76	0.0225	21	1.70%	18	0.0340
6	1.60%	17	0.0431	14	7.05%	76	0.0222	22	2.18%	24	0.0374
7	2.95%	32	0.0420	15	6.51%	71	0.0212	23	1.35%	15	0.0327
8	6.35%	69	0.0207	16	5.96%	65	0.0190	24	0.51%	6	0.0309
								Total		1,085	

Evans Lane, San Jose, CA
SR-87
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB SR-87	Northbound SR-87	N	3	799	56	17.0	1.3	66,560	variable
SB SR-87	Southbound SR-87	S	3	793	56	17.0	1.3	66,560	variable

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.08%	718	0.0209	9	7.07%	4707	0.0257	17	7.40%	4924	0.0197
2	0.36%	238	0.0216	10	4.25%	2827	0.0203	18	8.31%	5533	0.0196
3	0.29%	194	0.0221	11	4.59%	3055	0.0200	19	5.82%	3873	0.0195
4	0.17%	116	0.0288	12	5.84%	3885	0.0200	20	4.38%	2916	0.0195
5	0.44%	296	0.0214	13	6.18%	4110	0.0198	21	3.29%	2190	0.0197
6	0.81%	536	0.0219	14	6.03%	4014	0.0198	22	3.31%	2200	0.0199
7	3.76%	2502	0.0202	15	7.09%	4719	0.0197	23	2.47%	1647	0.0197
8	7.93%	5276	0.0254	16	7.24%	4820	0.0196	24	1.90%	1264	0.0195
								Total		66,560	

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.08%	718	0.0209	9	7.07%	4707	0.0199	17	7.40%	4924	0.0194
2	0.36%	238	0.0216	10	4.25%	2827	0.0203	18	8.31%	5533	0.0193
3	0.29%	194	0.0221	11	4.59%	3055	0.0200	19	5.82%	3873	0.0195
4	0.17%	116	0.0288	12	5.84%	3885	0.0200	20	4.38%	2916	0.0195
5	0.44%	296	0.0214	13	6.18%	4110	0.0198	21	3.29%	2190	0.0197
6	0.81%	536	0.0219	14	6.03%	4014	0.0198	22	3.31%	2200	0.0199
7	3.76%	2502	0.0202	15	7.09%	4719	0.0197	23	2.47%	1647	0.0197
8	7.93%	5276	0.0196	16	7.24%	4820	0.0196	24	1.90%	1264	0.0195
								Total		66,560	

Evans Lane, San Jose, CA
SR-87
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB SR-87	Northbound SR-87	N	3	799	56	17.0	1.3	66,560	variable
SB SR-87	Southbound SR-87	S	3	793	56	17.0	1.3	66,560	variable

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.08%	718	0.0100	9	7.07%	4707	0.0100	17	7.40%	4924	0.0100
2	0.36%	238	0.0100	10	4.25%	2827	0.0100	18	8.31%	5533	0.0100
3	0.29%	194	0.0100	11	4.59%	3055	0.0100	19	5.82%	3873	0.0100
4	0.17%	116	0.0100	12	5.84%	3885	0.0100	20	4.38%	2916	0.0100
5	0.44%	296	0.0100	13	6.18%	4110	0.0100	21	3.29%	2190	0.0100
6	0.81%	536	0.0100	14	6.03%	4014	0.0100	22	3.31%	2200	0.0100
7	3.76%	2502	0.0100	15	7.09%	4719	0.0100	23	2.47%	1647	0.0100
8	7.93%	5276	0.0100	16	7.24%	4820	0.0100	24	1.90%	1264	0.0100
								Total		66,560	

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB SR-87

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.08%	718	0.0100	9	7.07%	4707	0.0100	17	7.40%	4924	0.0100
2	0.36%	238	0.0100	10	4.25%	2827	0.0100	18	8.31%	5533	0.0100
3	0.29%	194	0.0100	11	4.59%	3055	0.0100	19	5.82%	3873	0.0100
4	0.17%	116	0.0100	12	5.84%	3885	0.0100	20	4.38%	2916	0.0100
5	0.44%	296	0.0100	13	6.18%	4110	0.0100	21	3.29%	2190	0.0100
6	0.81%	536	0.0100	14	6.03%	4014	0.0100	22	3.31%	2200	0.0100
7	3.76%	2502	0.0100	15	7.09%	4719	0.0100	23	2.47%	1647	0.0100
8	7.93%	5276	0.0100	16	7.24%	4820	0.0100	24	1.90%	1264	0.0100
								Total		66,560	

Evans Lane, San Jose, CA
SR-87 Traffic Data and PM2.5 & TOG Emission Factors - 63 mph

Analysis Year = *2020*

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	2016 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Vehicles DPM (g/VMT)	Total PM2.5 (g/VMT)	Exhaust PM2.5 (g/VMT)	Exhaust TOG (g/VMT)	Running TOG (g/VMT)
LDA	90,396	94,012	1.06%	999	65	0.0101	0.0193	0.0015	0.0158	0.044
LDT	34,327	35,700	0.17%	62	65	0.0143	0.0193	0.0015	0.0243	0.096
MDT	2,353	2,447	9.92%	243	60	0.0130	0.0228	0.0021	0.0449	0.185
HDT	924	961	90.12%	866	60	0.0431	0.0881	0.0382	0.1025	0.110
Total	128,000	133,120	-	2,170	62.5	-	-		-	-
Mix Avg Emission Factor						**0.02369**	**0.01984**	**0.00180**	**0.01868**	**0.06046**
Increase From 2016		1.04								
Vehicles/Direction		66,560		1,085						
Avg Vehicles/Hour/Direction		**2,773**		**45**						

Traffic Data Year = *2016*

Caltrans AADT & Truck AADT		Total	Truck by Axle			
	Total	Truck	2	3	4	5
SR-87 A Curtner Ave	128,000	3,277	2,353	426	111	387
SR-87 A Almaden Expressway		2.56%	71.80%	13.00%	3.40%	11.80%
	Percent of Total Vehicles	2.56%	1.84%	0.33%	0.09%	0.30%

Traffic Increase per Year (%) = *1.00%*

Evans Lane, San Jose, CA
SR-87 Traffic Data and PM2.5 & TOG Emission Factors - 50 mph

Analysis Year = *2020*

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	2016 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Vehicles DPM (g/VMT)	Total PM2.5 (g/VMT)	Exhaust PM2.5 (g/VMT)	Exhaust TOG (g/VMT)	Running TOG (g/VMT)
LDA	90,396	94,012	1.06%	999	50	0.0085	0.0190	0.0012	0.0129	0.044
LDT	34,327	35,700	0.17%	62	50	0.0117	0.0190	0.0012	0.0201	0.096
MDT	2,353	2,447	9.92%	243	50	0.0157	0.0252	0.0045	0.0442	0.185
HDT	924	961	90.12%	866	50	0.0263	0.0741	0.0242	0.1114	0.110
Total	128,000	133,120	-	2,170	50	-	-		-	-
Mix Avg Emission Factor						**0.01649**	**0.01950**	**0.00146**	**0.01549**	**0.06046**
Increase From 2016		1.04								
Vehicles/Direction		66,560		1,085						
Avg Vehicles/Hour/Direction		**2,773**		**45**						

Traffic Data Year = *2016*

Caltrans AADT & Truck AADT		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
SR-87 A Curtner Ave	128,000	3,277	2,353	426	111	387
SR-87 A Almaden Expressway		2.56%	71.80%	13.00%	3.40%	11.80%
	Percent of Total Vehicles	2.56%	1.84%	0.33%	0.09%	0.30%

Traffic Increase per Year (%) = *1.00%*

Evans Lane, San Jose, CA
SR-87 Traffic Data and PM2.5 & TOG Emission Factors - 10 mph

Analysis Year = ***2020***

Vehicle Type	2016 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	90,396	94,012	1.06%	999	10	0.0271	0.0248	0.0070	0.0739	0.044
LDT	34,327	35,700	0.17%	62	10	0.0383	0.0248	0.0071	0.1113	0.096
MDT	2,353	2,447	9.92%	243	10	0.0524	0.0463	0.0256	0.2514	0.185
HDT	924	961	90.12%	866	10	0.0502	0.0929	0.0430	0.5029	0.110
Total	128,000	133,120	-	2,170	10	-	-	-	-	-
Mix Avg Emission Factor						**0.03944**	**0.02567**	**0.00763**	**0.08741**	**0.06046**
Increase From 2016		1.04								
Vehicles/Direction		66,560		1,085						
Avg Vehicles/Hour/Direction		**2,773**		**45**						

Traffic Data Year = ***2016***

Caltrans AADT & Truck AADT	Total	Total Truck	Truck by Axle: 2	3	4	5
SR-87 A Curtner Ave	128,000	3,277	2,353	426	111	387
SR-87 A Almaden Expressway		2.56%	71.80%	13.00%	3.40%	11.80%
Percent of Total Vehicles		2.56%	1.84%	0.33%	0.09%	0.30%

Traffic Increase per Year (%) = ***1.00%***

Evans Lane, San Jose, CA
SR-87 Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5} = PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10} \times (0.0686/0.4572) = 1.0 \times 0.15 = 0.15$ g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)
Freeway	0.02	2.4	Santa Clara	64	0.00996

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Evans Lane, San Jose, CA - State Route 87 Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site Maximum Residential Receptor (MEI) - 1.5 meter receptor height

<u>Emissions Year</u>	2020
<u>Receptor Information</u>	
Number of Receptors	162
Receptor Height =	1.5 meters above ground level
Receptor distances =	30 foot (9.1 meters) grid in project residential area
<u>Meteorological Conditions</u>	
BAAQMD San Jose Airport Met Data	2006-2010
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological	Concentration (µg/m^3)		
Data Years	**DPM**	**Exhaust TOG**	**Evaporative TOG**
2006-2010	0.00454	0.2231	0.5916

Meteorological	PM2.5 Concentrations (µg/m^3)		
Data Years	**Total PM2.5**	**Road Dust PM2.5**	**Vehicle PM2.5**
2006-2010	0.2885	0.0945	0.1940

Evans Lane, San Jose, CA - State Route 87 Traffic -Maximum Cancer Risks
On-Site Maximum Residential Receptor (MEI) - 1.5 meter receptor height
30-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual TAC Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0045	0.2231	0.5916	0.062	0.017	0.003	0.08
1	2020	1	1	10	0.0045	0.2231	0.5916	0.75	0.209	0.033	0.99
2	2021	1	2	10	0.0045	0.2231	0.5916	0.75	0.209	0.033	0.99
3	2022	1	3	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
4	2023	1	4	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
5	2024	1	5	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
6	2025	1	6	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
7	2026	1	7	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
8	2027	1	8	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
9	2028	1	9	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
10	2029	1	10	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
11	2030	1	11	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
12	2031	1	12	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
13	2032	1	13	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
14	2033	1	14	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
15	2034	1	15	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
16	2035	1	16	3	0.0045	0.2231	0.5916	0.12	0.033	0.005	0.16
17	2036	1	17	1	0.0045	0.2231	0.5916	0.01	0.0037	0.001	0.017
18	2037	1	18	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
19	2038	1	19	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
20	2039	1	20	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
21	2040	1	21	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
22	2041	1	22	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
23	2042	1	23	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
24	2043	1	24	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
25	2044	1	25	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
26	2045	1	26	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
27	2046	1	27	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
28	2047	1	28	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
29	2048	1	29	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
30	2049	1	30	1	0.0045	0.2231	0.5916	0.01	0.004	0.001	0.017
Total Increased Cancer Risk			**Total**					3.379	0.948	0.148	**4.5**

* Third trimester of pregnancy

Evans Lane, San Jose, CA - State Route 87 Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
Impact from SR-87on Almaden On-Site MEI Residential Receptor (Receptor #145)

Emissions Year	2020
Receptor Information	
Number of Receptors	162
Receptor Height =	1.5 meters above ground level
Receptor distances =	30 foot (9.1 meters) grid in project residential area

Meteorological Conditions

BAAQMD San Jose Airport Met Data	2006-2010
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological	Concentration (µg/m^3)		
Data Years	DPM	Exhaust TOG	Evaporative TOG
2006-2010	0.00250	0.1176	0.3120

Meteorological	PM2.5 Concentrations (µg/m^3)		
Data Years	Total PM2.5	Road Dust PM2.5	Vehicle PM2.5
2006-2010	0.1520	0.0498	0.1023

Evans Lane, San Jose, CA - State Route 87 Traffic -Maximum Cancer Risks
Impact from SR-87on Almaden On-Site MEI Residential Receptor (Receptor #145)
30-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

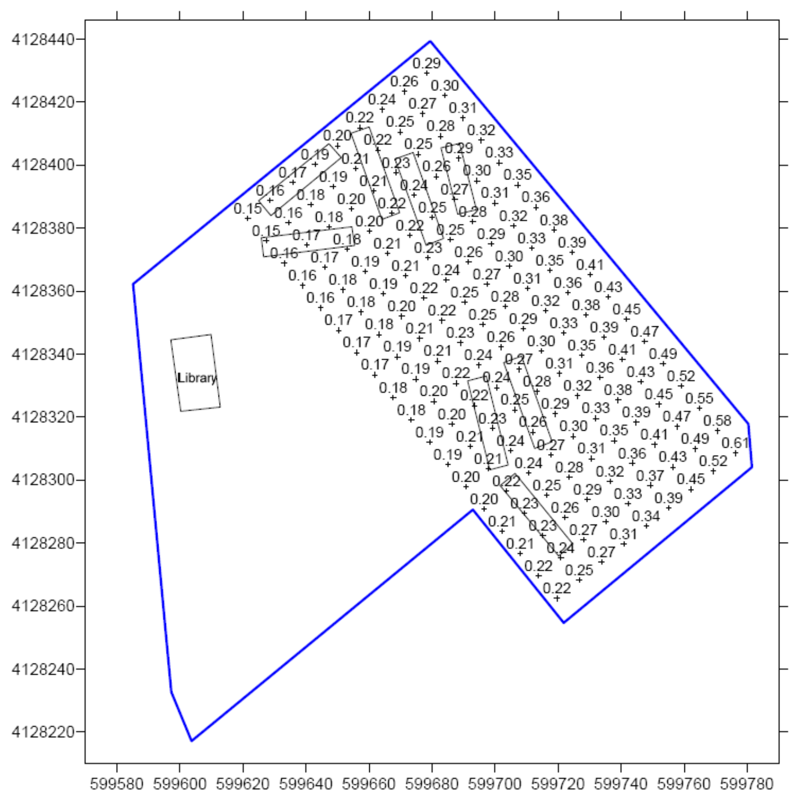
* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
		Exposure		Age	Annual TAC Conc (ug/m3)						
Exposure		Duration		Sensitivity		Exhaust	Evaporative		Exhaust	Evaporative	
Year	Year	(years)	Age	Factor	DPM	TOG	TOG	DPM	TOG	TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0025	0.1176	0.3120	0.034	0.009	0.001	0.04
1	2020	1	1	10	0.0025	0.1176	0.3120	0.41	0.110	0.017	0.54
2	2021	1	2	10	0.0025	0.1176	0.3120	0.41	0.110	0.017	0.54
3	2022	1	3	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
4	2023	1	4	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
5	2024	1	5	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
6	2025	1	6	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
7	2026	1	7	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
8	2027	1	8	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
9	2028	1	9	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
10	2029	1	10	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
11	2030	1	11	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
12	2031	1	12	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
13	2032	1	13	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
14	2033	1	14	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
15	2034	1	15	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
16	2035	1	16	3	0.0025	0.1176	0.3120	0.06	0.017	0.003	0.08
17	2036	1	17	1	0.0025	0.1176	0.3120	0.01	0.0019	0.000	0.009
18	2037	1	18	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
19	2038	1	19	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
20	2039	1	20	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
21	2040	1	21	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
22	2041	1	22	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
23	2042	1	23	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
24	2043	1	24	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
25	2044	1	25	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
26	2045	1	26	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
27	2046	1	27	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
28	2047	1	28	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
29	2048	1	29	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
30	2049	1	30	1	0.0025	0.1176	0.3120	0.01	0.002	0.000	0.009
Total Increased Cancer Risk			**Total**					1.861	0.500	0.078	**2.4**

* Third trimester of pregnancy

Maximum SR-87 PM2.5 Concentrations (µg/m3) by Receptor



Maximum SR-87 Cancer Risks (per million) by Receptor