MOBILE SOURCE AIR TOXICS

STATE ROUTE 85 EXPRESS LANES PROJECT, SANTA CLARA COUNTY, CALIFORNIA

PROJECT NO. 0400001163; EA 4A7900
SR 85 PM 0.0–24.1
US 101 PM 23.1–28.6
US 101 PM 47.9–52.0

Prepared for

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Appendix A MSAT Modeling Results

Chapter 1. Introduction and Project Description

1.1. Introduction

This report discusses Mobile Source Air Toxics (MSATs) emissions for the proposed State Route (SR) 85 Express Lanes Project (project). This information was prepared to support the project's environmental document's Federal requirements for an MSAT evaluation, as defined by the Federal Highway Administration's (FHWA's) interim guidance update memoranda issued in December 2012. Information from this MSAT evaluation is also summarized in the environmental document for this project (an Initial Study/Environmental Assessment [IS/EA]).

1.2. Project Description

The California Department of Transportation (Caltrans), in cooperation with the Santa Clara Valley Transportation Authority (VTA), proposes to convert the existing High-Occupancy Vehicle (HOV) lanes on State Route (SR) 85 to High-Occupancy Toll (HOT) lanes (hereafter known as express lanes). The conversion would allow single-occupant vehicles (SOVs) to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The express lanes would be implemented on northbound and southbound SR 85 from United States Highway 101 (US 101) in southern San Jose to US 101 in Mountain View in Santa Clara County (see Figures 1 and 2). The project would also include the continuation of the express lanes for 3.3 miles on US 101 in southern San Jose. The total project length is 33.7 miles. The project would be constructed entirely within the existing right-of-way.

The Build Alternative would convert the existing single HOV lanes into express lane facilities that would have one lane between US 101 in southern San Jose and SR 87, two lanes between SR 87 and I-280, and one lane between I-280 and US 101 in Mountain View. Conversion of the HOV lanes to express lanes would allow use by SOVs with active FasTrak accounts and toll tags.

In the segments of SR 85 between US 101 in southern San Jose and SR 87 and between I-280 and US 101 in Mountain View, the 2-foot-wide buffer would be created by reducing the width of the existing HOV lane and the adjacent general purpose lane from 12 feet to 11 feet. The rest of the general purpose lanes would remain 12 feet wide.

In the segment of SR 85 between SR 87 and I-280, where a second express lane would be added in each direction, pavement widening would be conducted in the median to accommodate the express lanes and buffer zones. The median would be paved and the existing thrie-beam barrier would be replaced with a Type 60 concrete barrier.

SR 85 bridge decks would be widened at Almaden Expressway (northbound side only), Camden Avenue, Oka Road, Pollard Road, and Saratoga Avenue, as well as at the San Tomas Aquino Creek and Saratoga Creek crossings. The existing gaps between the northbound and southbound bridges at these locations would be closed except at Almaden Expressway, where the northbound bridge would be widened on the inside (toward the median). Bridge widening work would take place along the banks of San Tomas Aquino and Saratoga creeks, but no in-water work is proposed.

An auxiliary lane would be added to a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard on-ramp and Stevens Creek Boulevard off-ramp. The purpose of the auxiliary lane is to improve traffic operations during peak periods. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, the existing embankments at the abutments of the South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be replaced with retaining walls. No culvert extensions, sound wall modifications, or additional right-of-way would be required.

Overhead signs and tolling devices would be mounted on cantilever structures supported on cast-in-drilled-hole or driven piles in the median. The piles for the overhead signs would be from 3 to 6 feet in diameter and extend to approximately 30 feet below ground surface. The piles for the tolling devices would be 1 to 2 feet in diameter and would extend to approximately 10 feet below ground surface.

Lighting would be installed on mast-arm lighting standards in the median of SR 85 as well as on overhead signs and tolling devices. The median lighting standards would be supported on cast-in-drilled-hole or driven piles of approximately 2.5 feet in diameter and 8 feet below ground surface. The actual spacing and number of lights in the project corridor will be determined during detailed project design in coordination with Caltrans Traffic Safety.

Some Traffic Operations Systems (TOS) equipment such as traffic monitoring stations, Closed Circuit Televisions, cabinets, and controllers would be installed along the outside edge of pavement within the existing right-of-way. Maintenance pullouts would be

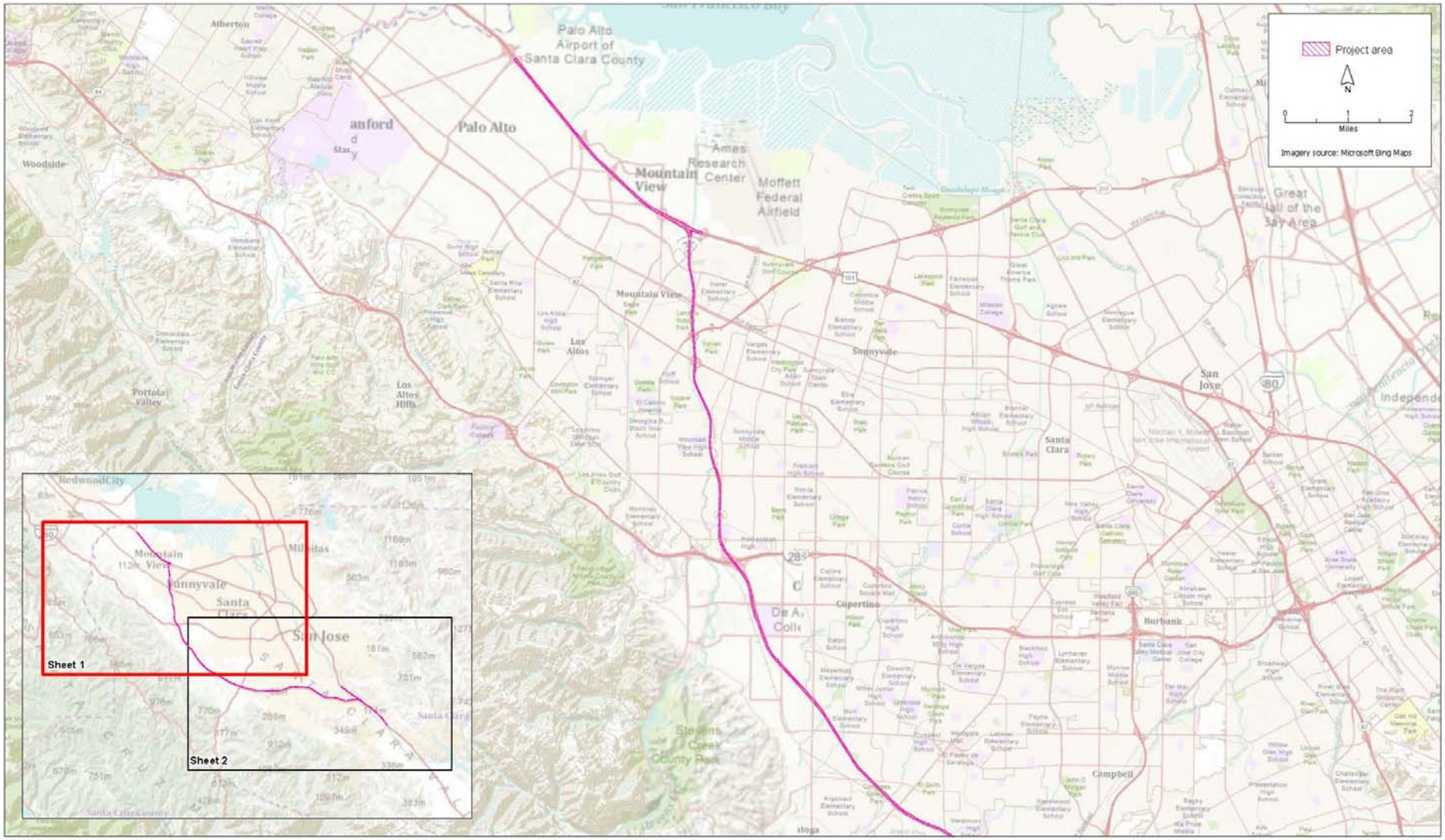
installed in shoulder areas to allow access to the TOS equipment. The specific locations of these features would be developed during final project design.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signage and tolling equipment.

Project construction would take place at night as well as on weekends and non-peak weekday hours. During construction, some lane closures could be required, but full freeway closures are not expected to be necessary.

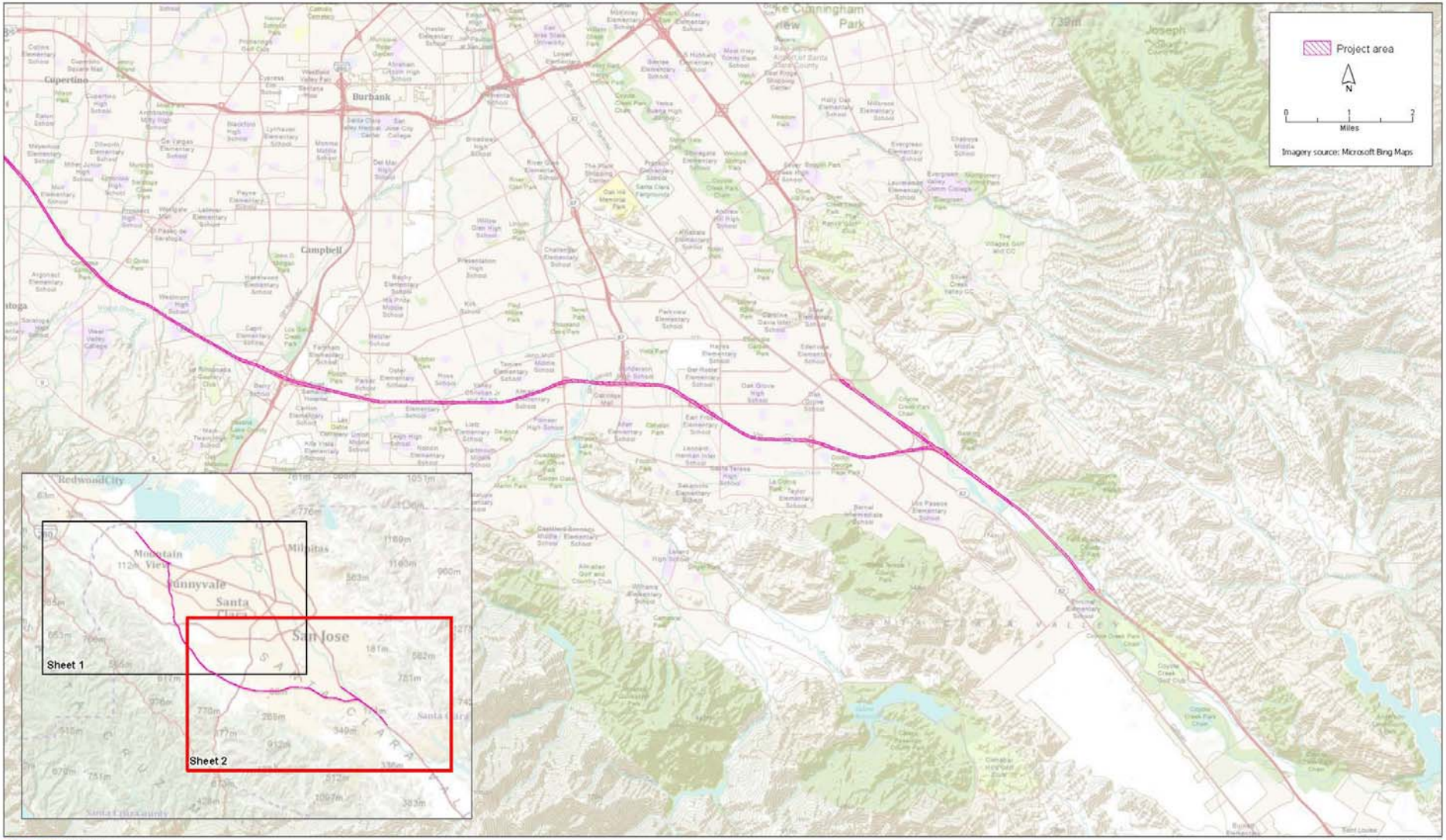
URS Caltrans
State Route 85 Express Lanes

Figure 1
Project Location and Regional Setting



URS Caltrans
State Route 85 Express Lanes

Figure 2, Sheet 1
Project area



URS Caltrans
State Route 85 Express Lanes

Figure 2, Sheet 2
Project area

Chapter 2. Mobile Source Air Toxics

2.1. Introduction

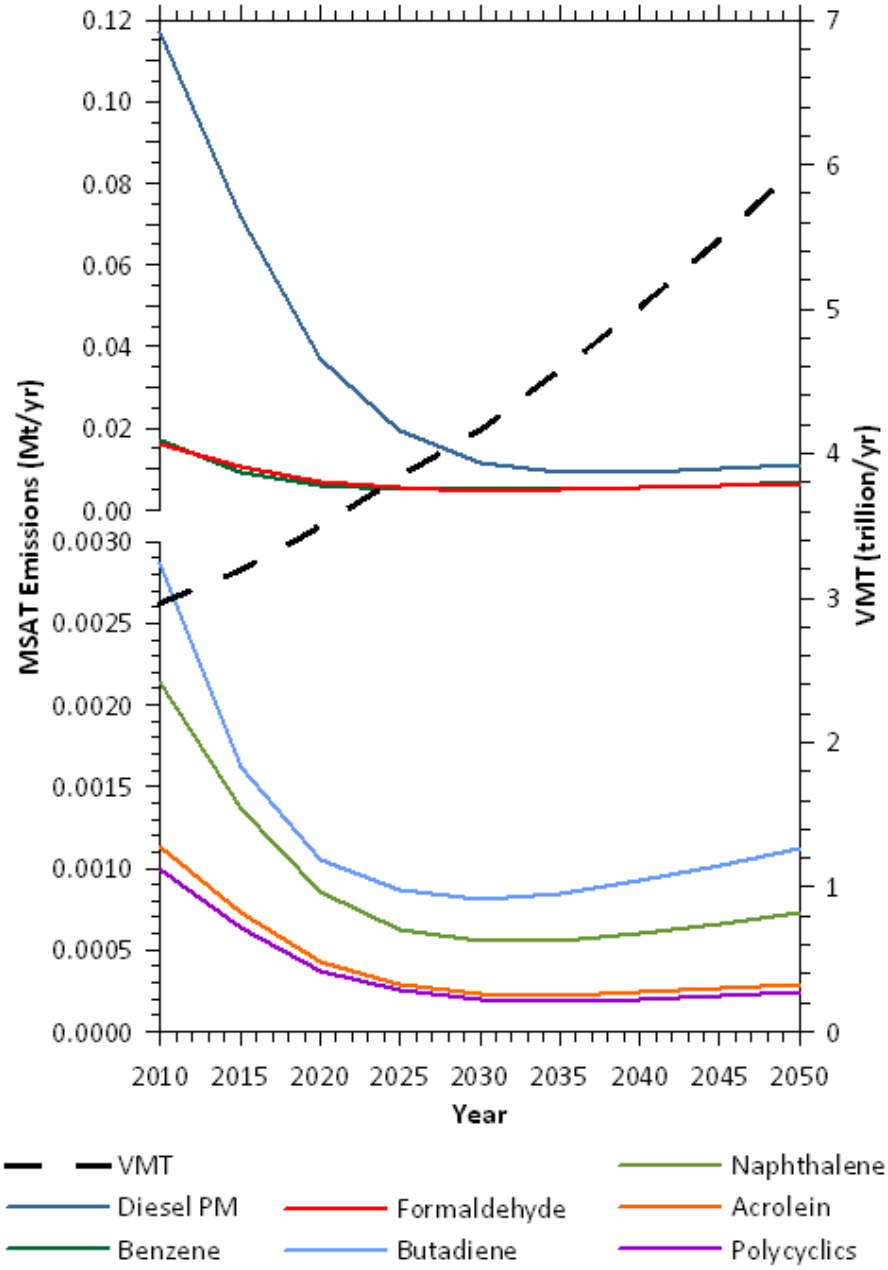
Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in Figure 3, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 3 Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA (EPA 2012b).

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

2.2. NEPA Context

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered in accordance with its environmental protection goals. The NEPA also requires Federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. The NEPA requires and FHWA is committed to the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in 23 CFR § 771.

2.3. Consideration of MSAT in NEPA Documents

The FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances:

1. No analysis for projects with no potential for meaningful MSAT effects;

2. Qualitative analysis for projects with low potential MSAT effects; or

3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

2.4. Section 1502.22 Incomplete or Unavailable Information

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

a. If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

b. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

    1. a statement that such information is incomplete or unavailable;

    2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;

    3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and

    4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

c. The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in

progress, agencies may choose to comply with the requirements of either the original or amended regulation.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are

encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA’s approach to addressing risk in its two step decision framework.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Chapter 3. Assessment / Discussion of Mobile Source Air Toxics

3.1. Introduction

As discussed in Chapter 2, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to assess the levels of future MSAT emissions by comparing the project alternatives.

The 2012 FHWA guidance suggests a three-tiered approach to analyzing the effects of a transportation project in terms of public exposure to MSAT emissions. The level of analysis is related to expected size and impact of the project, as follows:

1. No analysis for projects with no potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

3.2. MSAT Assessment

The project would convert the existing HOV lanes on SR 85 to express lanes. The express lanes would be implemented on northbound and southbound SR 85 from US 101 in southern San Jose to US 101 in Mountain View. The express lanes would continue for 3.3 miles on US 101 in southern San Jose. Express lane advance notification signage would also be added in a 4.1-mile segment of US 101 in Mountain View, for a total project length of 33.7 miles. The proposed express lane facility would have one lane between US 101 in southern San Jose and SR 87, two lanes between SR 87 and I-280, and one lane between I-280 and US 101 in Mountain View.

The 2012 FHWA guidance lists the following criteria for projects that have a higher potential for MSAT effects and that are in proximity to populated areas:[1]

[1] Interim Guidance Update on Mobile Source Air Toxics Analysis in NEPA Documents (December 6, 2012), "(3) Projects with Higher Potential MSAT effects" page 4.

- *Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects*

The project would not create or alter an intermodal freight facility.

- *Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year*[2].

And also

- *Proposed to be located in proximity to populated areas.*

The proposed project is adjacent to residential, commercial, and undeveloped land.

US 101 in the Mountain View segment of the project limits already has traffic volumes exceeding 150,000 Annual Average Daily Traffic (AADT), and SR 85 is projected to have volumes exceeding 150,000 by 2035. The project would convert the existing HOV lanes to an express facility. Therefore, a quantitative analysis was performed using the Caltrans program CT-EMFAC5 to identify and compare the potential differences among the priority MSAT emissions from the project alternatives. CT-EMFAC5 is a California-specific analysis tool for modeling MSAT emissions using the latest version of the California Mobile Source Emission and Inventory model, EMFAC2011. The CT-EMFAC5 model forecasts emissions for all of the priority MSATs. Modeling results are included in Appendix A.

To perform the CT-EMFAC5 modeling, composite emission factors for the project were obtained for Santa Clara County, using 2007 as the analysis year for existing conditions, 2015 for opening year and 2035 for design year. Total AM and PM peak period traffic data for existing conditions (2007), the projected opening year (2015) and the design year (2035) as well as the speed bin VMT distribution were obtained from CDM Smith. Based on these input parameters, CT-EMFAC5 was used to estimate DPM, benzene, acrolein,

[2] In California this AADT range is much smaller due to modeling conducted by ARB in their Land Use Handbook which specifies that freeways, urban non-freeways with AAADT>100,000, and rural non-freeways with AADT>50,000 are of serious concern for MSATs.

acetaldehyde, formaldehyde, 1,3-butadiene, naphthalene, and polycyclic organic matter (POM) emissions.

Table 3-1 shows the estimated MSAT levels in the project area for 2007, which represents the existing condition for purposes of the traffic analysis.

Table 3-1 MSAT Emissions for Existing Conditions (Tons per Day)

Scenario	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
Existing	2.76E-02	1.06E-02	1.67E-03	1.20E-02	3.69E-04	4.08E-03	7.23E-04	1.90E-04

Note:
DPM = diesel particulate matter
POM = polycyclic organic matter

Table 3-2 MSAT Emissions for No Build and Build Alternatives in Opening Year 2015 (Tons per Day)

Scenario	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
2015 No Build	8.32E-03	4.74E-03	7.69E-04	6.06E-03	1.72E-04	1.78E-03	3.67E-04	7.18E-05
2015 Build	8.46E-03	4.86E-03	7.89E-04	6.33E-03	1.76E-04	1.83E-03	3.84E-04	7.36E-05
% difference	2%	3%	3%	4%	3%	3%	4%	2%

Note:
DPM = diesel particulate matter
POM = polycyclic organic matter

For the Build and No Build alternatives considered in the IS/EA in both opening year and horizon year, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, if other variables such as fleet mix remain the same. The estimated VMT in the local area for the Build Alternative would be slightly higher because it includes an additional, or second, express lane for part of the project corridor.

As shown in Table 3-2, the increase in VMT would lead to slightly higher MSAT emissions for certain pollutants for the Build Alternative than for the No Build Alternative in the opening year. However, the project would not increase truck traffic or truck emissions because large trucks are prohibited on SR 85 between US 101 and I-280—more than 18 miles of the 24.1-mile SR 85 corridor—and the express lanes facility would not be open to trucks. The CT-EMFAC5 model shows that emissions with the Build Alternative would increase by 2 percent for DPM and POM; 3 percent for formaldehyde, butadiene, acrolein and acetaldehyde; and 4 percent for benzene and naphthalene in the opening year (2015).

As shown in Table 3-3, the increase in VMT would also lead to slightly higher MSAT emissions for the Build Alternative in the horizon year. Again, the project would not increase truck traffic or truck emissions because large trucks are prohibited on SR 85 between US 101 and I-280, and the express lanes would not be open to trucks. The CT-EMFAC5 model shows that emissions would increase by 5 percent for DPM, butadiene, and acrolein; 6 percent for formaldehyde, acetaldehyde, and POM; and 7 percent for benzene and naphthalene with the Build Alternative in the horizon year (2035).

Table 3-3 MSAT Emissions for No Build and Build Alternatives in Horizon Year 2035 (Tons per Day)

Scenario	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
2035 No Build	5.98E-03	3.03E-03	3.70E-04	3.31E-03	8.10E-05	1.24E-03	3.25E-04	6.24E-05
2035 Build	6.31E-03	3.21E-03	3.89E-04	3.55E-03	8.48E-05	1.31E-03	3.48E-04	6.59E-05
% difference	5%	6%	5%	7%	5%	6%	7%	6%

Note:
DPM = diesel particulate matter
POM = polycyclic organic matter

Emissions would be lower for both alternatives in the opening year (2015) and horizon year (2035) as compared to the existing condition (2007) as a result of EPA's national control programs, which are projected to reduce MSAT emissions by 72 percent by 2020. The magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases (see Figures 4 through 11 below).

Figure 4 Diesel Particulate Matter Emissions Comparison for 2007, 2015 and 2035

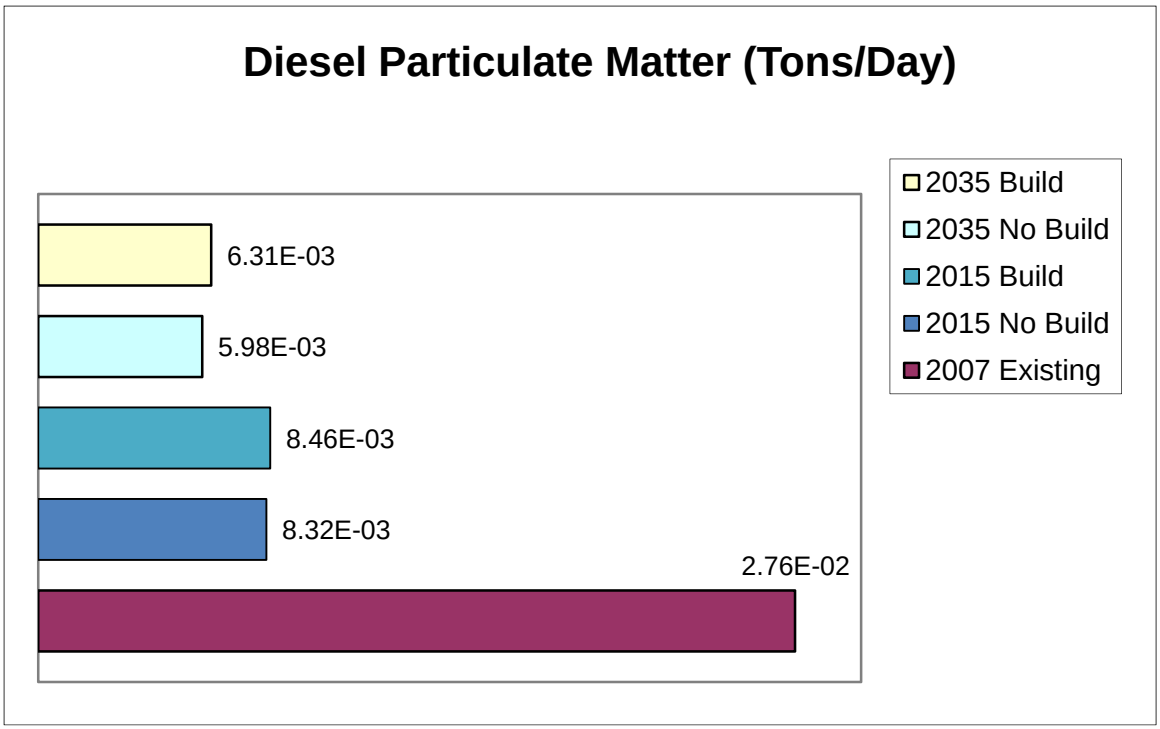


Figure 5 Formaldehyde Emissions Comparison for 2007, 2015 and 2035

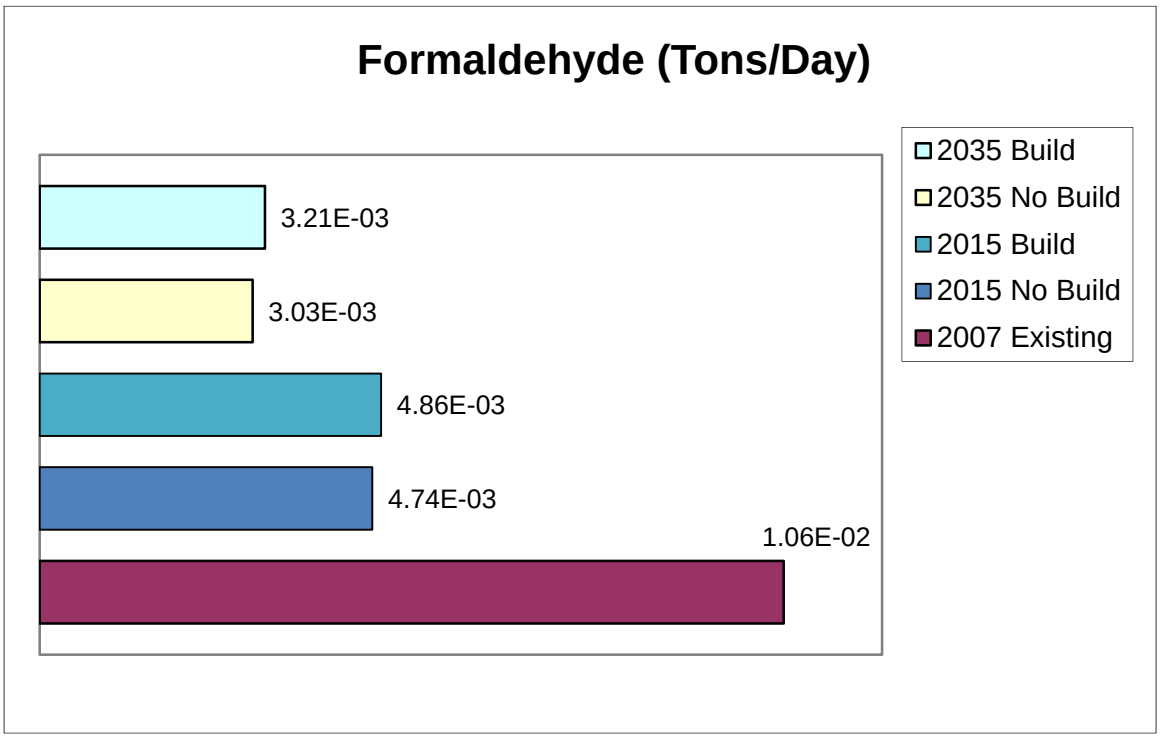


Figure 6 Butadiene Emissions Comparison for 2007, 2015 and 2035

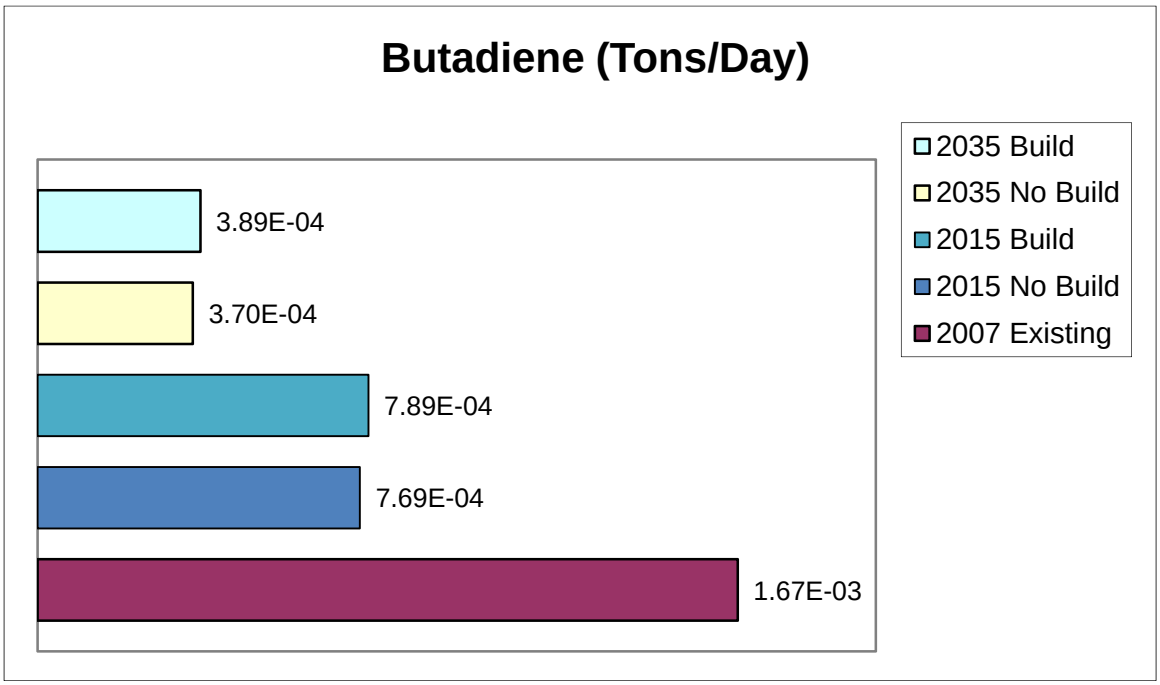


Figure 7 Benzene Emissions Comparison for 2007, 2015 and 2035

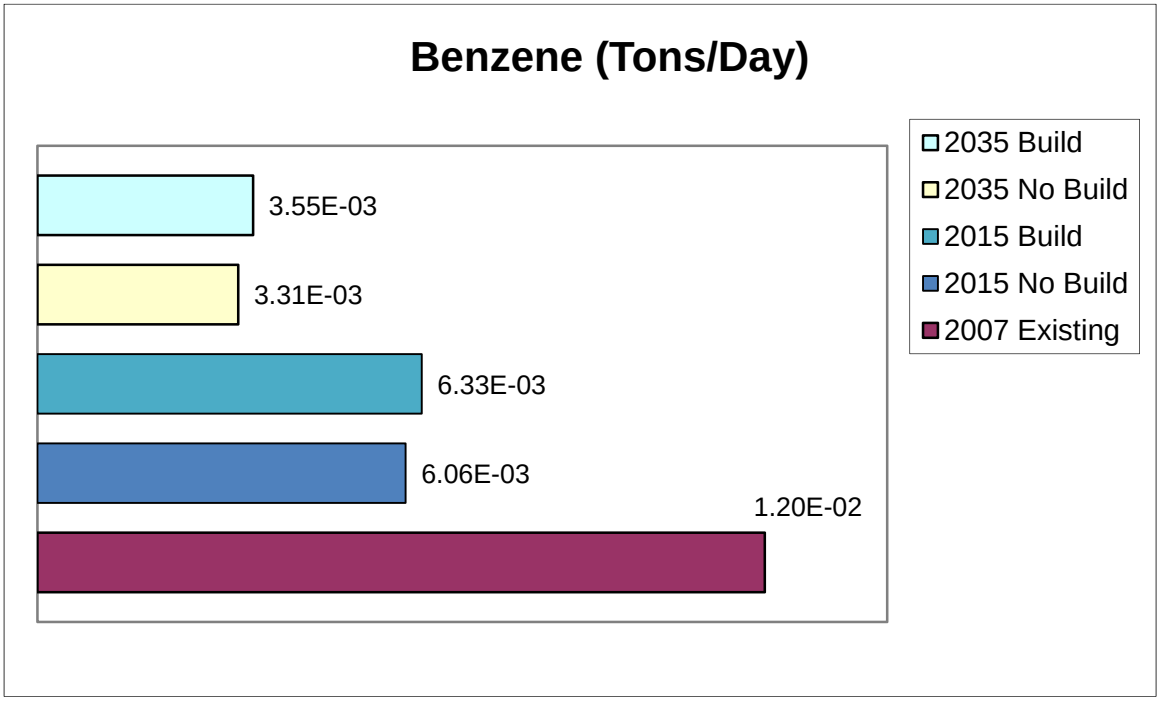


Figure 8 Acrolein Emissions Comparison for 2007, 2015 and 2035

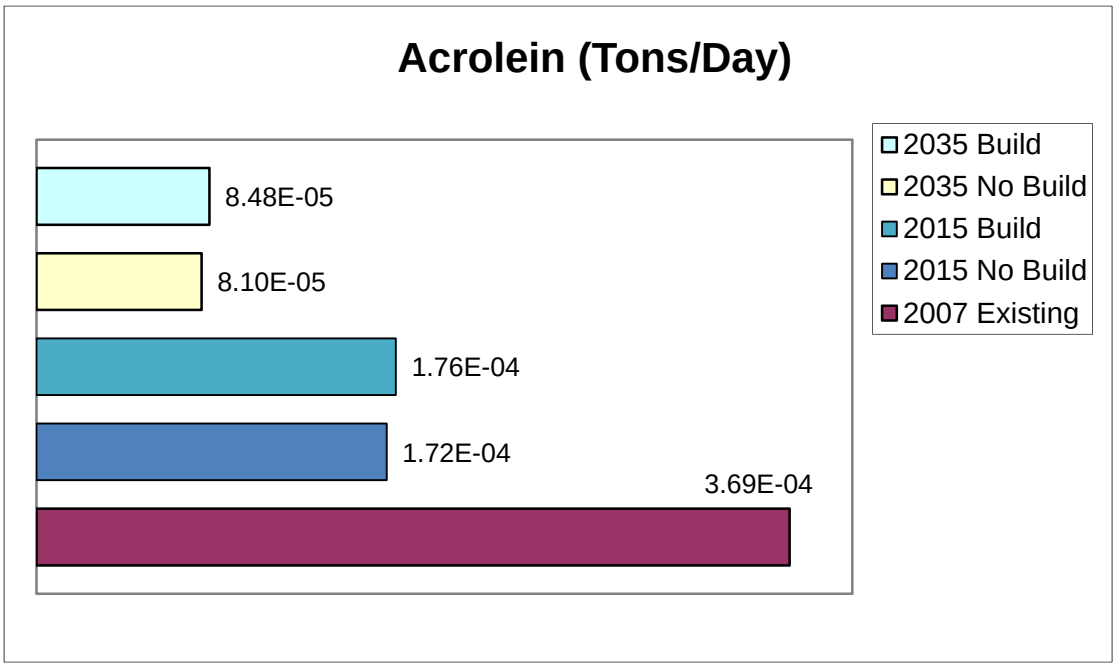


Figure 9 Acetaldehyde Emissions Comparison for 2007, 2015 and 2035

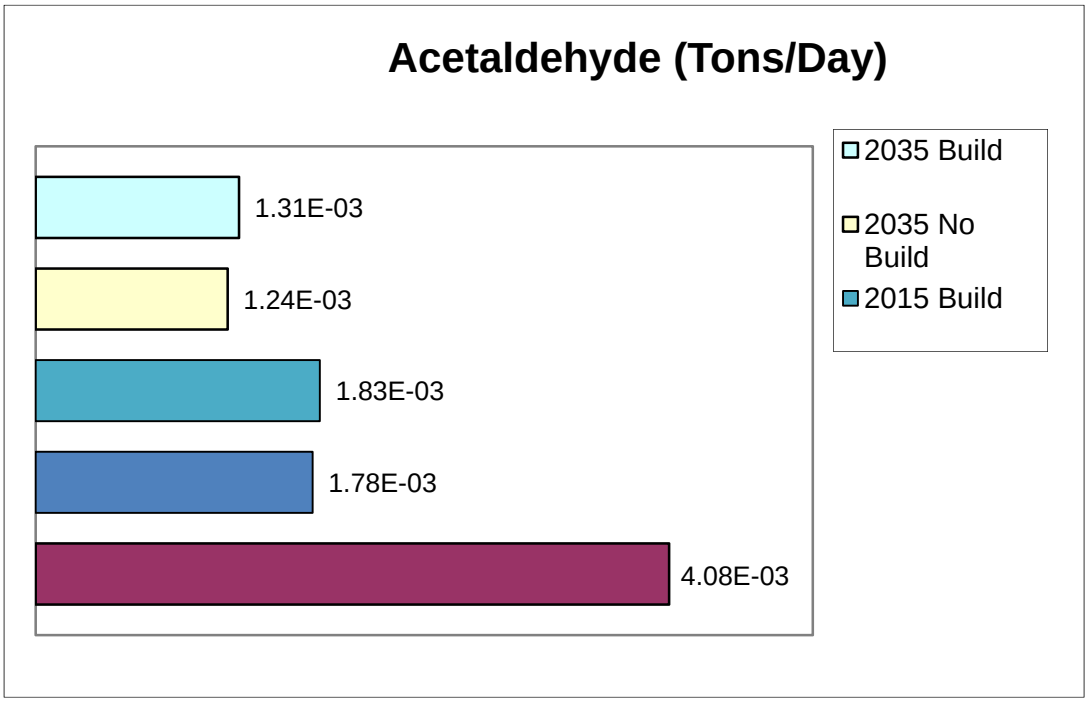


Figure 10 Naphthalene Emissions Comparison for 2007, 2015 and 2035

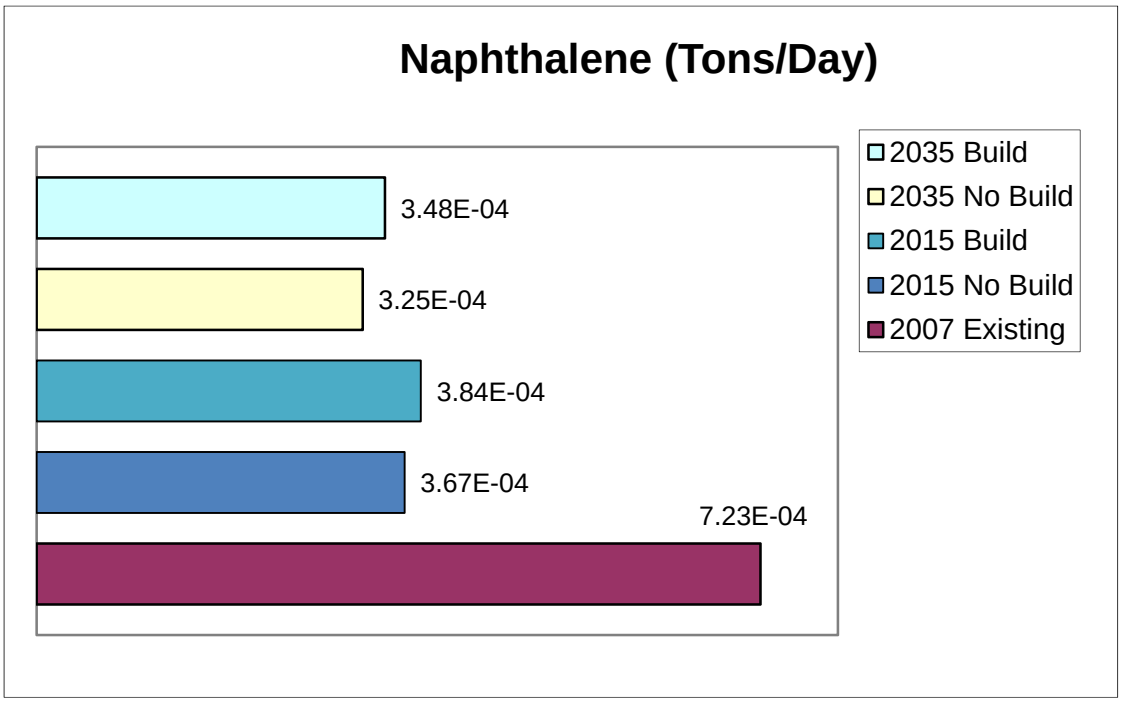
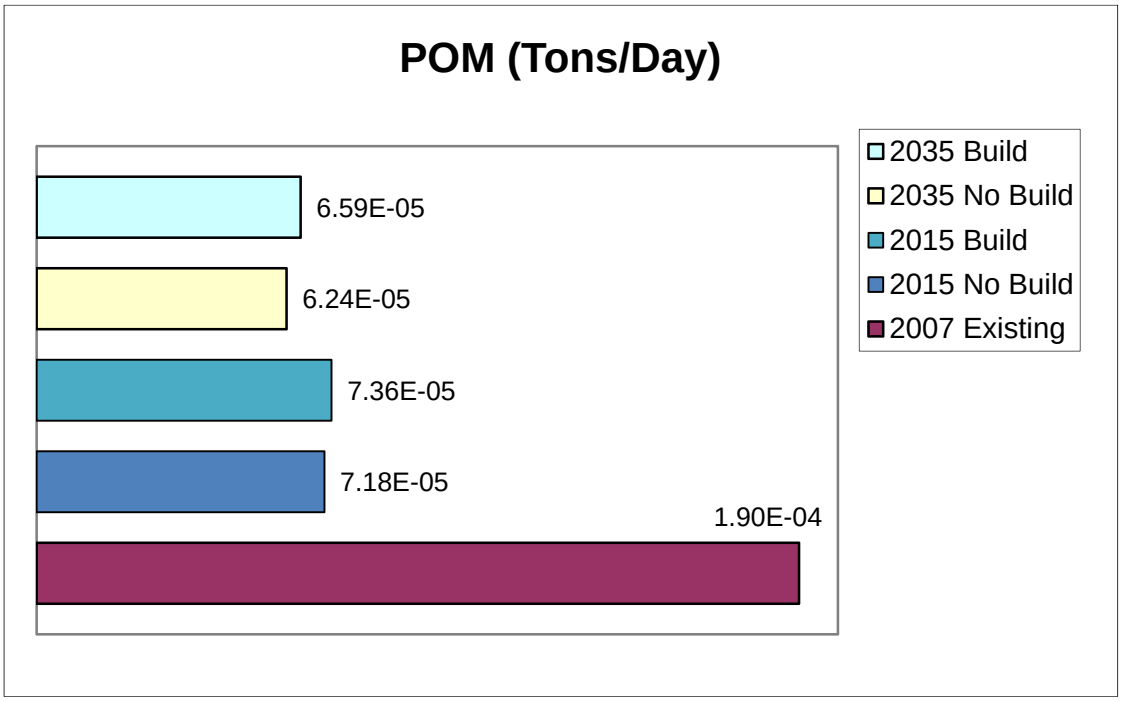


Figure 11 POM Emissions Comparison for 2007, 2015 and 2035



In conclusion, MSAT emissions for the Build Alternative would be slightly higher than for the No Build Alternative in both the opening year (2015) and the design year (2035). The emissions for both the Build Alternative and No Build Alternative in 2015 and 2035 are much less than for existing conditions, even with the increase in VMT. The results from the model runs show that the project would not have an adverse impact on, or a substantial increase in, MSAT emissions.

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Chapter 5. Preparers

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Appendix A
MSAT Modeling Results

SR85 EXPRESS LANES

	PCT. OF PEAK PERIOD VMT BY SPEED CATEGORY (EST.)									
Speed (up to)	2007 AM NOBUILD	2015 AM NOBUILD	2015 AM BUILD	2035 AM NOBUILD	2035 AM BUILD	2007 PM NOBUILD	2015 PM NOBUILD	2015 PM BUILD	2035 PM NOBUILD	2035 PM BUILD
5	0.0	0.00	0.00	0.00	0.00	0.000	0.0	0.00	0.0	0.00
10	0.0	0.00	0.00	0.00	0.00	0.000	0.0	0.00	0.0	0.00
15	0.0	7.58	0.16	7.58	0.16	0.000	0.0	0.76	0.0	0.76
20	0.0	2.32	2.67	2.32	2.67	0.000	0.0	0.84	0.0	0.84
25	5.6	10.29	9.85	10.29	9.85	0.000	0.0	5.36	0.0	5.36
30	2.4	10.93	3.66	10.93	3.66	0.000	0.0	1.51	0.0	1.51
35	7.7	6.20	7.18	6.20	7.18	0.000	1.88	7.34	1.88	7.34
40	9.1	8.62	5.11	8.62	5.11	0.000	4.15	8.83	4.15	8.83
45	10.0	7.57	9.52	7.57	9.52	0.000	1.86	8.50	1.86	8.50
50	6.7	8.89	9.74	8.89	9.74	0.000	8.66	9.95	8.66	9.95
55	10.6	8.54	8.25	8.54	8.25	7.366	13.39	11.95	13.39	11.95
60	17.2	15.72	25.05	15.72	25.05	6.476	22.59	10.60	22.59	10.60
65	30.7	13.33	18.82	13.33	18.82	86.158	47.46	34.35	47.46	34.35
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Peak Period VMT	477,166	560,528	614,301	627,818	696,801	799,162	862,317	904,361	896,589	983,208

2017	
VMT AM Northbound	334,894
VMT PM Northbound	308,024
VMT AM Southbound	142,272
VMT PM Southbound	491,137
Total AM Peak VMT	477,166
Total PM Peak VMT	799,162

2015

Performance Measure	**No Build**	**Build**	
AM Northbound			
Total Distance Traveled (VMT) (mi)	359,911	408,928	
Average Speed (mph)	37	53	
AM Southbound			
Total Distance Traveled (VMT) (mi)	200,617	205,373	
Average Speed (mph)	62	62	
PM Northbound			
Total Distance Traveled (VMT) (mi)	347,381	356,220	
Average Speed (mph)	58	59	
PM Southbound			
Total Distance Traveled (VMT) (mi)	514,936	548,141	
Average Speed (mph)	40	42	
Total peak VMT both directions	1,422,845	1,518,662	
Total daily VMT	2,811,947	3,001,308	
Total annual VMT	933,055,022	995,888,663	
Peak hour speed	38.5	47.5	Average of the primary travel direction in each peak
Total AM Peak VMT	560,528	614,301	
Total PM Peak VMT	862,317	904,361	

2035

Performance Measure	**No Build**	**Build**	
AM Northbound			
Total Distance Traveled (VMT) (mi)	367,024	418,602	
Average Speed (mph)	30	45	
AM Southbound			
Total Distance Traveled (VMT) (mi)	260,794	278,199	
Average Speed (mph)	58	60	
PM Northbound			
Total Distance Traveled (VMT) (mi)	398,216	436,357	
Average Speed (mph)	51	52	
PM Southbound			
Total Distance Traveled (VMT) (mi)	498,373	546,851	
Average Speed (mph)	29	30	
Total peak VMT both directions	1,524,407	1,680,009	
Total daily VMT	3,012,662	3,320,176	
Total annual VMT	999,656,046	1,101,694,727	
Peak hour speed	29.5	37.5	Average of the primary travel direction in each peak
Total AM Peak VMT	627,818	696,801	
Total PM Peak VMT	896,589	983,208	

Year	**Segments**	**Volume per hour**		Speed	
		No Build	**Build**	**No Build**	**Build**
2015	AM: SR 85 between Union on-ramp and Bascom off-ramp	7,145	8,083	16	61
	PM: SR 85 between Saratoga on-ramp and Winchester off-ramp	6,409	7,820	60	27
2035	AM: SR 85 between Union on-ramp and Bascom off-ramp	7,720	8,510	12	41
	PM: SR 85 between Saratoga on-ramp and Winchester off-ramp	6,738	8,155	9	11

PM	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
Existing	0.01824405	0.00679767	0.001072	0.0076164	0.00023694	0.00261624	0.00045386	0.00012342
2015 No Build	0.00521367	0.00258577	0.0004448	0.00356224	0.00009977	0.00095392	0.00020647	0.00004202
2015 Build	0.00508409	0.00287309	0.0004687	0.00376211	0.00010472	0.00107877	0.00022627	0.00004378
Delta 1	-2%	11%	5%	6%	5%	13%	10%	4%
2035 No Build	0.0038093	0.00156937	0.0002176	0.00192236	0.00004807	0.00061864	0.00017424	0.00003553
2035 Build	0.00375023	0.00186219	0.0002288	0.00208296	0.00005005	0.0007568	0.0002013	0.0000385
Delta 2	-2%	19%	5%	8%	4%	22%	16%	8%
AM	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
Existing	0.00934725	0.0038005	0.0005985	0.004367	0.00013233	0.0014597	0.00026884	0.00006688
2015 No Build	0.00310332	0.00215259	0.000324	0.00250217	0.00007194	0.00082852	0.00016093	0.00002981
2015 Build	0.00337326	0.00199067	0.0003207	0.00256916	0.0000715	0.0007502	0.0001573	0.00002981
Delta 1	9%	-8%	-1%	3%	-1%	-9%	-2%	0%
2035 No Build	0.00217426	0.0014652	0.0001529	0.00138424	0.00003289	0.00061655	0.00015125	0.00002684
2035 Build	0.00255772	0.00134783	0.0001598	0.00146993	0.00003476	0.00055209	0.00014652	0.00002739
Delta 2	18%	-8%	5%	6%	6%	-10%	-3%	2%
Combined	DPM	Formaldehyde	Butadiene	Benzene	Acrolein	Acetaldehyde	Naphthalene	POM
Existing	2.76E-02	1.06E-02	1.67E-03	1.20E-02	3.69E-04	4.08E-03	7.23E-04	1.90E-04
2015 No Build	8.32E-03	4.74E-03	7.69E-04	6.06E-03	1.72E-04	1.78E-03	3.67E-04	7.18E-05
2015 Build	8.46E-03	4.86E-03	7.89E-04	6.33E-03	1.76E-04	1.83E-03	3.84E-04	7.36E-05
Delta 1	2%	3%	3%	4%	3%	3%	4%	2%
2035 No Build	5.98E-03	3.03E-03	3.70E-04	3.31E-03	8.10E-05	1.24E-03	3.25E-04	6.24E-05
2035 Build	6.31E-03	3.21E-03	3.89E-04	3.55E-03	8.48E-05	1.31E-03	3.48E-04	6.59E-05
Delta 2	5%	6%	5%	7%	5%	6%	7%	6%
	-77%	-70%	-77%	-70%	-77%	-68%	-52%	-65%

File Name:	Santa Clara (SF) - 2007 - Annual_Existing_2007_AM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/12/2013 9:08
Area:	Santa Clara (SF)
Analysis Year:	2007
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.038	0.303
Truck 2	0.035	0.955
Non-Truck	0.927	0.005

==========

Road Length:	1	miles
Volume:	477166	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.00%
20	0.00%
25	5.60%
30	2.40%
35	7.70%
40	9.10%
45	10.00%
50	6.70%
55	10.60%
60	17.20%
65	30.70%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	72795.6	0	150526.3	-	223321.9	0.246
TOG	89971	0	150526.3	-	240497.3	0.265
CO	1694925.8	0	-	-	1694925.8	1.868
NOx	481948.5	0	-	-	481948.5	0.531
CO2	205073768.3	0	-	-	205073768.3	226.055
CO2 (Pavley I + LCFS)	205073768.3	0	-	-	205073768.3	226.055
PM10	10464.8	0	-	23374.9	33839.7	0.037
PM2.5	9599	0	-	9278.5	18877.5	0.021
Benzene	2465	0	1505	-	3970	0.004
Acrolein	120.3	0	0	-	120.3	<0.001
Acetaldehyde	1327	0	0	-	1327	0.001
Formaldehyde	3455	0	0	-	3455	0.004
Butadiene	544.1	0	0	-	544.1	<0.001
Naphthalene	184.3	0	60.1	-	244.4	<0.001
POM	60.8	0	-	-	60.8	<0.001
Diesel PM	8497.5	0	-	-	8497.5	0.009
DEOG	11804.7	0	-	-	11804.7	0.013

==========END==========

File Name:	Santa Clara (SF) - 2007 - Annual_Existing_2007.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/11/2013 17:49
Area:	Santa Clara (SF)
Analysis Year:	2007
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.038	0.303
Truck 2	0.035	0.955
Non-Truck	0.927	0.005

==========

Road Length:	1	miles
Volume:	799162	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.00%
20	0.00%
25	0.00%
30	0.00%
35	0.00%
40	0.00%
45	0.00%
50	0.00%
55	7.36%
60	6.48%
65	86.16%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	130344.3	0	252102.9	-	382447.2	0.422
TOG	159664.1	0	252102.9	-	411766.9	0.454
CO	2947054.3	0	-	-	2947054.3	3.249
NOx	840496.8	0	-	-	840496.8	0.926
CO2	361256781.9	0	-	-	361256781.9	398.217
CO2 (Pavley I + LCFS)	361256781.9	0	-	-	361256781.9	398.217
PM10	19882.7	0	-	39148.5	59031.3	0.065
PM2.5	18237.8	0	-	15539.7	33777.5	0.037
Benzene	4403.4	0	2520.6	-	6924	0.008
Acrolein	215.4	0	0	-	215.4	<0.001
Acetaldehyde	2378.4	0	0	-	2378.4	0.003
Formaldehyde	6179.7	0	0	-	6179.7	0.007
Butadiene	974.5	0	0	-	974.5	0.001
Naphthalene	311.9	0	100.7	-	412.6	<0.001
POM	112.2	0	-	-	112.2	<0.001
Diesel PM	16585.5	0	-	-	16585.5	0.018
DEOG	20982.2	0	-	-	20982.2	0.023

==========END==========

File Name:	Santa Clara (SF) - 2015 - Annual_NoBuild_AM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/12/2013 9:11
Area:	Santa Clara (SF)
Analysis Year:	2015
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.295
Truck 2	0.034	0.939
Non-Truck	0.932	0.005

==========

Road Length:	1	miles
Volume:	560528	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	7.58%
20	2.32%
25	10.29%
30	10.93%
35	6.20%
40	8.62%
45	7.57%
50	8.89%
55	8.54%
60	15.72%
65	13.34%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	41773.3	0	91622.8	-	133396.1	0.147
TOG	54026	0	91622.8	-	145648.8	0.161
CO	990770	0	-	-	990770	1.092
NOx	274248.6	0	-	-	274248.6	0.302
CO2	260110029.9	0	-	-	260110029.9	286.722
CO2 (Pavley I + LCFS)	232809383.7	0	-	-	232809383.7	256.628
PM10	4022	0	-	27274.7	31296.7	0.034
PM2.5	3695.5	0	-	10822.1	14517.7	0.016
Benzene	1358.3	0	916.5	-	2274.7	0.003
Acrolein	65.4	0	0	-	65.4	<0.001
Acetaldehyde	753.2	0	0	-	753.2	<0.001
Formaldehyde	1956.9	0	0	-	1956.9	0.002
Butadiene	294.5	0	0	-	294.5	<0.001
Naphthalene	109.3	0	37	-	146.3	<0.001
POM	27.1	0	-	-	27.1	<0.001
Diesel PM	2821.2	0	-	-	2821.2	0.003
DEOG	7165	0	-	-	7165	0.008

==========END==========

File Name:	Santa Clara (SF) - 2015 - Annual_NoBuild_2015_PM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/11/2013 17:56
Area:	Santa Clara (SF)
Analysis Year:	2015
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.295
Truck 2	0.034	0.939
Non-Truck	0.932	0.005

==========

Road Length:	1	miles
Volume:	862317	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.00%
20	0.00%
25	0.00%
30	0.00%
35	1.88%
40	4.15%
45	1.86%
50	8.66%
55	13.39%
60	22.59%
65	47.47%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	56247.9	0	140952.6	-	197200.5	0.217
TOG	71132.4	0	140952.6	-	212085	0.234
CO	1385913.8	0	-	-	1385913.8	1.528
NOx	409535.8	0	-	-	409535.8	0.451
CO2	366970445.5	0	-	-	366970445.5	404.516
CO2 (Pavley I + LCFS)	328278378	0	-	-	328278378	361.865
PM10	6155.9	0	-	41959.5	48115.4	0.053
PM2.5	5654.9	0	-	16648.8	22303.6	0.025
Benzene	1828.6	0	1409.9	-	3238.4	0.004
Acrolein	90.7	0	0	-	90.7	<0.001
Acetaldehyde	867.2	0	0	-	867.2	<0.001
Formaldehyde	2350.7	0	0	-	2350.7	0.003
Butadiene	404.4	0	0	-	404.4	<0.001
Naphthalene	130.8	0	56.9	-	187.7	<0.001
POM	38.2	0	-	-	38.2	<0.001
Diesel PM	4739.7	0	-	-	4739.7	0.005
DEOG	7368.7	0	-	-	7368.7	0.008

==========END==========

File Name:	Santa Clara (SF) - 2015 - Annual_Build_2015_AM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/12/2013 9:15
Area:	Santa Clara (SF)
Analysis Year:	2015
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.295
Truck 2	0.034	0.939
Non-Truck	0.932	0.005

==========

Road Length:	1	miles
Volume:	614301	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.16%
20	2.67%
25	9.85%
30	3.66%
35	7.18%
40	5.11%
45	9.52%
50	9.74%
55	8.25%
60	25.05%
65	18.81%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	40917.4	0	100412.4	-	141329.8	0.156
TOG	52439.5	0	100412.4	-	152851.9	0.168
CO	1024567.8	0	-	-	1024567.8	1.129
NOx	291524.1	0	-	-	291524.1	0.321
CO2	266153650.3	0	-	-	266153650.3	293.384
CO2 (Pavley I + LCFS)	238221200.4	0	-	-	238221200.4	262.594
PM10	4186.1	0	-	29891.3	34077.4	0.038
PM2.5	3845.8	0	-	11860.3	15706.1	0.017
Benzene	1331.2	0	1004.4	-	2335.6	0.003
Acrolein	65	0	0	-	65	<0.001
Acetaldehyde	682	0	0	-	682	<0.001
Formaldehyde	1809.7	0	0	-	1809.7	0.002
Butadiene	291.5	0	0	-	291.5	<0.001
Naphthalene	102.5	0	40.5	-	143	<0.001
POM	27.1	0	-	-	27.1	<0.001
Diesel PM	3066.6	0	-	-	3066.6	0.003
DEOG	6166	0	-	-	6166	0.007

==========END==========

File Name:	Santa Clara (SF) - 2015 - Annual_Build_2015_PM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/11/2013 17:58
Area:	Santa Clara (SF)
Analysis Year:	2015
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.295
Truck 2	0.034	0.939
Non-Truck	0.932	0.005

==========

Road Length:	1	miles
Volume:	904361	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.76%
20	0.84%
25	5.36%
30	1.51%
35	7.34%
40	8.83%
45	8.50%
50	9.95%
55	11.95%
60	10.60%
65	34.36%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	59725.4	0	147825	-	207550.4	0.229
TOG	76222.2	0	147825	-	224047.3	0.247
CO	1492381.5	0	-	-	1492381.5	1.645
NOx	427956.1	0	-	-	427956.1	0.472
CO2	388593064	0	-	-	388593064	428.351
CO2 (Pavley I + LCFS)	347766764.7	0	-	-	347766764.7	383.347
PM10	6214.1	0	-	44005.3	50219.4	0.055
PM2.5	5708.6	0	-	17460.5	23169.1	0.026
Benzene	1941.5	0	1478.6	-	3420.1	0.004
Acrolein	95.2	0	0	-	95.2	<0.001
Acetaldehyde	980.7	0	0	-	980.7	0.001
Formaldehyde	2611.9	0	0	-	2611.9	0.003
Butadiene	426.1	0	0	-	426.1	<0.001
Naphthalene	146	0	59.7	-	205.7	<0.001
POM	39.8	0	-	-	39.8	<0.001
Diesel PM	4621.9	0	-	-	4621.9	0.005
DEOG	8759.9	0	-	-	8759.9	0.01

==========END==========

File Name:	Santa Clara (SF) - 2035 - Annual_NoBuild_2035_AM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/12/2013 9:12
Area:	Santa Clara (SF)
Analysis Year:	2035
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.297
Truck 2	0.043	0.954
Non-Truck	0.923	0.005

==========

Road Length:	1	miles
Volume:	627818	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	7.58%
20	2.32%
25	10.29%
30	10.93%
35	6.20%
40	8.62%
45	7.57%
50	8.89%
55	8.54%
60	15.72%
65	13.34%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	22382.7	0	57705.9	-	80088.6	0.088
TOG	29480.2	0	57705.9	-	87186.1	0.096
CO	466348.1	0	-	-	466348.1	0.514
NOx	107456.8	0	-	-	107456.8	0.118
CO2	297980011.6	0	-	-	297980011.6	328.467
CO2 (Pavley I + LCFS)	205550853.2	0	-	-	205550853.2	226.581
PM10	3247.3	0	-	30810.8	34058	0.038
PM2.5	2997.3	0	-	12209.2	15206.5	0.017
Benzene	681.5	0	577	-	1258.4	0.001
Acrolein	29.9	0	0	-	29.9	<0.001
Acetaldehyde	560.5	0	0	-	560.5	<0.001
Formaldehyde	1332	0	0	-	1332	0.001
Butadiene	139	0	0	-	139	<0.001
Naphthalene	114.3	0	23.2	-	137.5	<0.001
POM	24.4	0	-	-	24.4	<0.001
Diesel PM	1976.6	0	-	-	1976.6	0.002
DEOG	6331.8	0	-	-	6331.8	0.007

==========END==========

File Name:	Santa Clara (SF) - 2035 - Annual_NoBuild_2035_PM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/11/2013 18:00
Area:	Santa Clara (SF)
Analysis Year:	2035
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.297
Truck 2	0.043	0.954
Non-Truck	0.923	0.005

==========

Road Length:	1	miles
Volume:	896589	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.00%
20	0.00%
25	0.00%
30	0.00%
35	1.88%
40	4.15%
45	1.86%
50	8.66%
55	13.39%
60	22.59%
65	47.47%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	30216.8	0	82410	-	112626.8	0.124
TOG	38401.2	0	82410	-	120811.2	0.133
CO	608424.1	0	-	-	608424.1	0.671
NOx	143058	0	-	-	143058	0.158
CO2	390076206.6	0	-	-	390076206.6	429.985
CO2 (Pavley I + LCFS)	268561421.1	0	-	-	268561421.1	296.038
PM10	4838	0	-	44001	48839	0.054
PM2.5	4461.5	0	-	17436	21897.5	0.024
Benzene	923.6	0	824	-	1747.6	0.002
Acrolein	43.7	0	0	-	43.7	<0.001
Acetaldehyde	562.4	0	0	-	562.4	<0.001
Formaldehyde	1426.7	0	0	-	1426.7	0.002
Butadiene	197.8	0	0	-	197.8	<0.001
Naphthalene	125.3	0	33.2	-	158.4	<0.001
POM	32.3	0	-	-	32.3	<0.001
Diesel PM	3463	0	-	-	3463	0.004
DEOG	5618.4	0	-	-	5618.4	0.006

==========END==========

File Name:	Santa Clara (SF) - 2035 - Annual_Build_2035_AM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/12/2013 9:14
Area:	Santa Clara (SF)
Analysis Year:	2035
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.297
Truck 2	0.043	0.954
Non-Truck	0.923	0.005

==========

Road Length:	1	miles
Volume:	696801	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.16%
20	2.67%
25	9.85%
30	3.66%
35	7.18%
40	5.11%
45	9.52%
50	9.74%
55	8.25%
60	25.05%
65	18.81%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	22795.5	0	64046.5	-	86842	0.096
TOG	29585.6	0	64046.5	-	93632.1	0.103
CO	491094.6	0	-	-	491094.6	0.541
NOx	113714.1	0	-	-	113714.1	0.125
CO2	308871652.2	0	-	-	308871652.2	340.473
CO2 (Pavley I + LCFS)	213093271.2	0	-	-	213093271.2	234.895
PM10	3513.6	0	-	34196.2	37709.8	0.042
PM2.5	3241.6	0	-	13550.7	16792.3	0.019
Benzene	695.9	0	640.4	-	1336.3	0.001
Acrolein	31.6	0	0	-	31.6	<0.001
Acetaldehyde	501.9	0	0	-	501.9	<0.001
Formaldehyde	1225.3	0	0	-	1225.3	0.001
Butadiene	145.3	0	0	-	145.3	<0.001
Naphthalene	107.4	0	25.8	-	133.2	<0.001
POM	24.9	0	-	-	24.9	<0.001
Diesel PM	2325.2	0	-	-	2325.2	0.003
DEOG	5412.6	0	-	-	5412.6	0.006

==========END==========

File Name:	Santa Clara (SF) - 2035 - Annual_Build_2035_PM_PEAK.EC
CT-EMFAC Version:	5.0.0.14319
Run Date:	9/11/2013 17:59
Area:	Santa Clara (SF)
Analysis Year:	2035
Season:	Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category
Truck 1	0.034	0.297
Truck 2	0.043	0.954
Non-Truck	0.923	0.005

==========

Road Length:	1	miles
Volume:	983208	vehicles per hour
Number of Hours:	1	hours
Avg. Idling Time:	0	minutes per vehicle
Tot. Idling Time:	0	hours

VMT Distribution by Speed (mph):

5	0.00%
10	0.00%
15	0.76%
20	0.84%
25	5.36%
30	1.51%
35	7.34%
40	8.83%
45	8.50%
50	9.95%
55	11.95%
60	10.60%
65	34.36%
70	0.00%
75	0.00%

==========

Summary of Project Emissions

Pollutant Name	Running Exhaust (grams)	Idling Exhaust (grams)	Running Loss (grams)	Tire/Brake Wear (grams)	Total (grams)	Total (US tons)
ROG	32449.2	0	90371.6	-	122820.8	0.135
TOG	41826.3	0	90371.6	-	132197.9	0.146
CO	686260.8	0	-	-	686260.8	0.756
NOx	158846.7	0	-	-	158846.7	0.175
CO2	432192320	0	-	-	432192320	476.41
CO2 (Pavley I + LCFS)	298038875.3	0	-	-	298038875.3	328.532
PM10	5027.8	0	-	48251.9	53279.7	0.059
PM2.5	4638.1	0	-	19120.4	23758.5	0.026
Benzene	990	0	903.6	-	1893.6	0.002
Acrolein	45.5	0	0	-	45.5	<0.001
Acetaldehyde	688	0	0	-	688	<0.001
Formaldehyde	1692.9	0	0	-	1692.9	0.002
Butadiene	208	0	0	-	208	<0.001
Naphthalene	146.6	0	36.4	-	183	<0.001
POM	35	0	-	-	35	<0.001
Diesel PM	3409.3	0	-	-	3409.3	0.004
DEOG	7301.4	0	-	-	7301.4	0.008

==========END==========