Air Quality Impacts Assessment Technical Report

U.S. Highway 290 (US 290) / State Highway (SH)
71 West from State Loop 1 (Mopac) to
Ranch-to-Market (RM) 1826 and SH 71 to
Silvermine Drive
Travis County, Texas
CSJ # 0113-08-060 and 0700-03-077
July 2018

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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1.0 Project Description

1.1 Introduction

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) are considering implementing mobility improvements to U.S. Highway 290 (US 290) / State Highway (SH) 71 West through Oak Hill (the Oak Hill Parkway). The project corridor extends along US 290 from State Loop 1 (Loop 1 or Mopac) to Ranch-to-Market Road (RM) 1826 for a distance of approximately 6.15 miles with a transition west to Circle Drive. The project also includes the interchange on SH 71 from US 290 to Silvermine Drive, a distance of approximately 1.31 miles. The proposed project corridor occurs within an area that includes the city of Austin, Texas, and its 2-mile extra-territorial jurisdiction (ETJ). The project location is shown on Figure 1.1-1.

In October of 2012, Notices of Intent were published in both the Federal Register and the Texas Register indicating TxDOT's intent to prepare a new Environmental Impact Statement (EIS) for the proposed project. Steady population growth in the Austin metropolitan area has caused congestion within the Oak Hill Parkway corridor. This congestion is causing unreliable traffic operations, travel time delays, and a poor level of service along the roadway. It may also affect emergency response and transit times, and connectivity of the project corridor to other Austin metropolitan area roadways and areas west and south of the project area. The purpose of the Oak Hill Parkway Project is to improve mobility and operational efficiency; facilitate long-term congestion management in the corridor; and improve safety, emergency response, and transit times.

Following several project team meetings and public involvement activities, several preliminary project design concepts were developed. These concepts were screened against the project's purpose and need and additional measureable elements, including displacements and traffic model peak-period travel times. After screening and evaluation, two project design concepts showing the greatest benefits and the lowest impacts were selected for development as project Build Alternatives. Alternatives A and C, in addition to the No Build Alternative, were carried forward for analysis in the Draft EIS (DEIS), released in April 2018. The Preferred Alternative—Alternative A—includes a combination of alternatives investigated during the study, as documented in the DEIS, and was selected based on its ability to best accomplish the need for and purpose of the transportation improvements while minimizing impacts to social, economic, and environmental resources. The following air quality analysis was conducted for the Preferred Alternative in order to document updated traffic volumes and minor project design revisions following the release of the DEIS in support of the Final EIS for the project.

1.2 Existing Facility

The existing facility is comprised of several functional classifications of roadways. SH 71 from the northwest and US 290 from the west converge at a junction, locally known as the "Y," and continue concurrently to Mopac and further east. The portion of US 290/SH 71 from just west of Old Fredericksburg Road to Mopac is a six-lane urban freeway section (three lanes in each direction) with grade-separated interchanges. Frontage roads in this section consist of four to eight lanes (two to four lanes in each direction). There are direct connector ramps connecting US 290/SH 71 mainlanes to the Mopac mainlanes. The US 290/71 mainlanes are 12 feet wide with 10-foot-wide shoulders, and the frontage road lane widths vary from 12 to 14 feet wide.

Between Old Fredericksburg Road and Joe Tanner Lane, US 290/SH 71 transitions from a freeway/frontage road facility to a four- and five-lane urban highway with a mix of curb-and- gutter and roadside ditch drainage features. These lanes are 11 to 12 feet wide and include an intermittent 12-foot center left-turn lane. The existing US 290 roadway section between SH 71 and RM 1826 consists of four 12-foot-wide lanes with turn lanes and 2-foot-wide shoulders.

The existing SH 71 facility is a four-lane rural highway section with two signalized intersections and left-turn lanes which provide access to shopping centers on both sides of the roadway. Lane widths are 12 feet with 2- to 4-foot shoulders within this area. A 12-foot-wide center turn lane occurs from the shopping center drive to south of Scenic Brook Drive.

Pedestrian facilities along this corridor occur intermittently and are absent in some areas. Drainage facilities vary from curb-and-gutter storm sewer systems to roadside ditches and culverts.

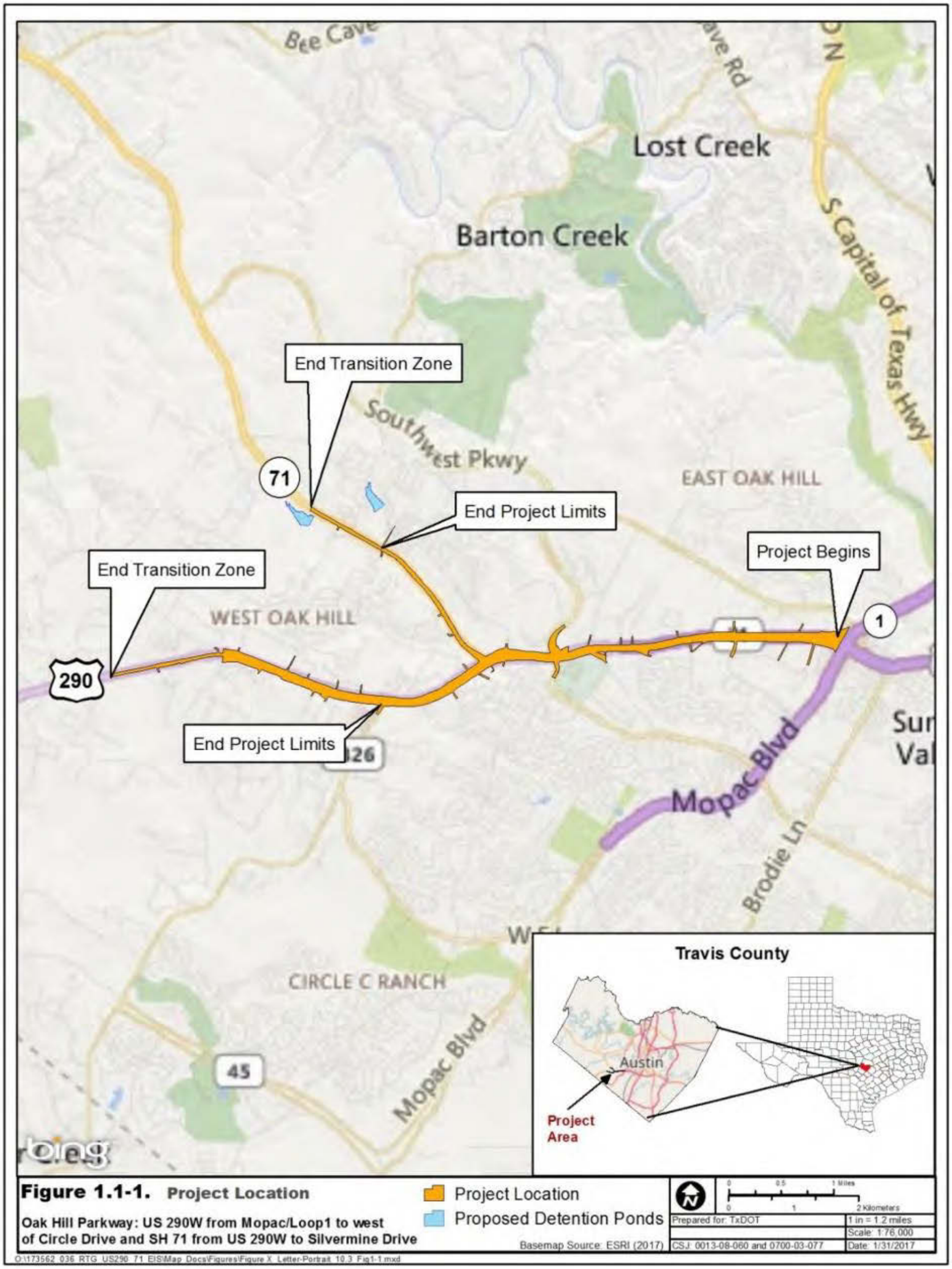

Figure 1.1-1 Project Location

1.3 Proposed Facility

The proposed alternative has been guided by the Capital Area Metropolitan Planning Organization (CAMPO) 2040 Regional Transportation Plan (RTP), the regional transportation plan covering the corridor (CAMPO 2015). The proposed project is included in the RTP as well as in CAMPO's fiscal year (FY) 2017–2020 Transportation Improvement Program (TIP) as a controlled access highway with frontage roads along US 290 and a divided highway with direct connecters along SH 71. The CAMPO 2040 RTP was locally adopted by the Transportation Policy Board on May 11, 2015 and the TIP with amendments was adopted on July 6, 2016. Both were modified on July 18, 2018 to reflect the non-tolled facility.

The Preferred Alternative is a conventional controlled-access highway with frontage roads. New construction on roadway improvements would begin just east of Joe Tanner Lane where the existing mainlanes transition to an urban highway. With the Preferred Alternative, the mainlanes would be elevated over William Cannon Drive, and the westbound mainlanes and frontage road would be located north of Williamson Creek. The mainlanes would be depressed under SH 71 and direct connectors would be provided, connecting eastbound SH 71 with US 290, and westbound US 290 to SH 71. Mainlanes would vary from four near William Cannon Drive to two near the western project limit. Grade-separated intersections would be constructed at Convict Hill Road, RM 1826, Scenic Brook Drive, and Circle Drive (Southview Road). Mainlanes would generally be 12 feet wide with 10-foot-wide shoulders. Texas turnarounds, which allow vehicles traveling on a frontage road to U-turn onto the opposite frontage road, would be constructed on US 290 frontage roads at Scenic Brook Drive, RM 1826, Convict Hill Drive, and William Cannon Drive.

Along SH 71, the direct connector ramps would extend past Scenic Brook Drive where the mainlanes would then transition to a five-lane (three lanes northbound, two lanes southbound) rural highway with Texas turnarounds. Bicycle and pedestrian facilities would be provided via a shared-use path which would be provided along the entire project length.

1.4 Summary of Purpose and Need

The purpose of the proposed project is to improve mobility and operational efficiency, facilitate long-term congestion management in the corridor by accommodating the movement of people and goods for multiple modes of travel, and to improve safety and emergency response within the corridor. The need for the proposed project stems from congestion within the corridor brought on by steady population growth in the Austin metropolitan area. This congestion is creating unreliable travel and emergency response times.

1.5 Objectives of this Report

The purpose of this technical report is to present the findings of the air quality assessment that was performed for the proposed project including documenting updated traffic volumes and minor project revisions since the release of the DEIS in April 2018. This analysis follows the TxDOT Air Quality Compliance Flowchart for Federal Highway Administration/Federal Transit Authority (FHWA/FTA) and State-only Projects (TxDOT, 2017).

2.0 Air Quality Assessment

2.1 Conformity to Transportation Plans

The proposed Oak Hill Parkway Project is located in the southwest portion of the Austin in the area known as Oak Hill. The proposed project is located within Travis County, which is designated as attainment or unclassified for all National Ambient Air Quality Standards (NAAQS). Therefore, the project is not subject to transportation conformity.

The proposed project is consistent with the CAMPO 2040 RTP and the 2017-2020 TIP (CAMPO 2015, 2016) (see Appendix A).

2.2 Carbon Monoxide Traffic Air Quality Analysis

As discussed in Section 1.3, the proposed project would add capacity to the facility. In addition, as shown in Table 2.2-1, the design-year average annual daily traffic (AADT) volumes would exceed 140,000 trips. Traffic for the estimated time of completion year 2024 and design year 2040 is estimated to be 146,000 vehicles per day and 184,000 vehicles per day, respectively; therefore triggering the need for a Carbon Monoxide Traffic Air Quality Analysis (CO TAQA). The traffic volumes included in Table 2.2-1, and those used in the CO TAQA modeling, were developed by Rodriguez Transportation Group (RTG) using the TxDOT Transportation Planning and Programming (TPP) Division approved 2040 CAMPO model.

To verify that the proposed project would not result in an exceedance of the 1-hr or 8-hr CO NAAQS, CO TAQA modeling was conducted for the No Build Alternative and the Preferred Alternative for both the opening-year-to-traffic (2024) and design-year (2040) conditions. The CO concentrations were modeled at two different locations to capture the peak traffic volumes in the project area (Loop 1/US290 Interchange) and the largest project related increase in traffic volumes (SH71/US290 Interchange). CO concentrations for the proposed action were modeled using CALINE3 and the TxDOT MOVES2014 emission rate lookup tables and factored in adverse meteorological conditions and sensitive receptors at the right-of-way line in accordance with the Standard Operating Procedure for Complying with CO TAQA Requirements (TxDOT, 2015). Local concentrations of carbon monoxide are not expected to exceed national standards at any time.

Table 2.2-1 2040 Daily Traffic Volumes

Roadway Link	No Build	Preferred Alternative
US 290		
West of Circle	41,850	70,640
Circle to Scenic Brook	43,700	70,180
Scenic Brook to RM1826	46,145	74,900
RM1826 to Convict Hill	45,110	99,870
Convict Hill to SH71	39,460	98,870
SH71 to William Canyon	58,270	144,280
William Canyon to Old Fredericksburg	78,100	155,510
Old Fredericksburg to Monterey Oaks	80,370	157,830
Monterey Oaks to Loop 1	86,850	159,300
Loop 1 to Brodie	91,140	142,980
East of Brodie	147,670	161,670
SH 71		
US290 to Scenic Brook	41,750	60,730
North of Scenic Brook	27,390	45,720
Loop 1		
North of US290	168,490	183,700

Source: RTG, 2018.

Table 2.2-2 lists the peak 1-hr and 8-hr CO concentrations expected within the project area. As shown, the No Build and the Preferred Alternative condition CO concentrations are far below the NAAQS of 35 parts per million (ppm) and 9 ppm, respectively. The modeling outputs, traffic volumes used in the modeling, and a figure showing the receptor locations are included in Appendix B.

Table 2.2-2 CO Concentrations (ppm)

	Alternative	1-hr	8-hr	Exceed NAAQS?	% of 1-hr NAAQS	% of 8-hr NAAQS
	Opening Year (2024)					
	No Build					
	Preferred	2.2	1.0	No	6.3	11.1
	Design Year (2040)					
	No Build					
	Preferred	1.5	0.6	No	4.3	6.7

Note: CO concentrations include the background concentrations of 1.2 ppm and 0.4 ppm for the 1-hr and 8-hr conditions, respectively.

2.3 Mobile Source Air Toxics

As discussed in Section 1.0, the proposed project would add capacity to the facility. In addition, as shown in Table 2.2-1, the design year AADT volumes would exceed 140,000 trips. Therefore, a mobile source air toxics (MSAT) conference call was initiated on April 13, 2017. It was determined at this meeting that a quantitative MSAT analysis would be required for the proposed project.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the 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/iris/). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA) (https://www.epa.gov/national-air-toxics-assessment). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, 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.

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activities developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. MOVES2014 incorporates the effects of three new federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse-gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light-duty greenhouse-gas regulations that phase in during model years 2017-2025 (79 FR 60344). Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide (EPA, 2015), EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in Figure 2.3-1, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSATs is projected for the same time period. Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

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 potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

The FHWA, the EPA, the Health Effects Institute (HEI), 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 field.

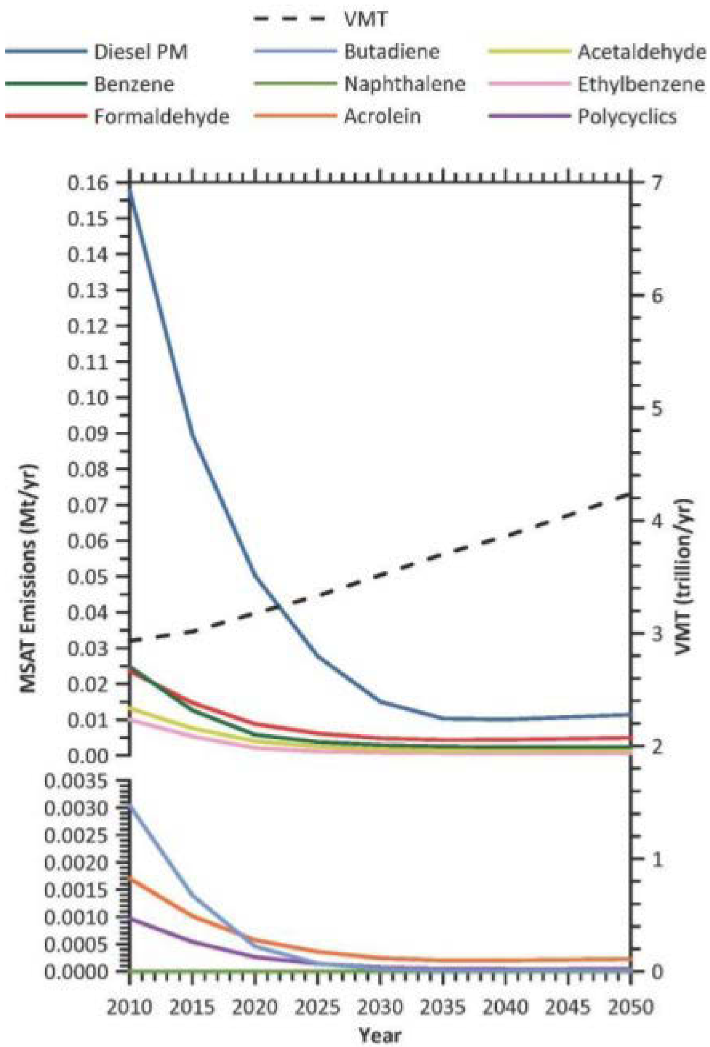

Figure 2.3-1 National MSAT Emissions Trends

Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.
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, meteorological, and other factors.

2.3.1 Project-Specific MSAT Information

For each alternative in this document, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Preferred Alternative is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2014 model, emissions of all of the priority MSAT decrease as speed increases. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050 (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016 – https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm). Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, 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.

The additional travel lanes contemplated as part of the Build Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under the Preferred Alternative there may be localized areas where ambient concentrations of MSAT could be higher than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built along Oak Hill Parkway.

However, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region- wide MSAT levels to be significantly lower than today.

2.3.2 Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts 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 MSATs. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, 2017). 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 MSATs, including the HEI. A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (FHWA, 2016). 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 or in the future as vehicle emissions substantially decrease (HEI, 2007).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts; in this approach, each step in the process builds 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 MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (HEI, 2007). 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 states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk" (EPA, 2017).

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 (US Court, 2008).

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 improving access for emergency response, that are better suited for quantitative analysis.

2.3.3 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

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

As indicated in Table 2.2-1, the traffic volumes along US 290 and Loop 1 within the project area have AADT trips exceeding 150,000. In addition, the project would substantially increase the capacity of the US 290 freeway in close proximity to populated areas. Consequently, this project is considered to have higher potential MSAT effects, and a quantitative analysis of MSAT emissions is required. The results of this analysis are summarized below.

2.3.4 Quantitative MSAT Analysis Methodology

The analysis of MSATs within the project study area considers the on- road sources for the nine priority MSATs: 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel PM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. This analysis is based on the approved CAMPO models for each of the analyzed years of 2015 and 2040. These models take into account all future projects expected to be completed by each year, as well as projected traffic for the Build Alternative. For the No Build Alternative, the proposed project was removed from the model to generate new projected traffic volumes. An affected transportation network was derived for each Build Alternative for the design year 2040 by comparing the No Build to Build Alternative road link ADTs to determine which roadway links in the model achieve a ±5 percent volume change due to the Build Alternative. The same roadway links identified through this process were used as the affected network links for the existing year of 2015 and design year of 2040. VMT was calculated by using the affected network links and the ADTs of those links for each modeled year. Speeds were modeled as average speeds for each link and type of roadway. The analysis used the TxDOT MOVES2014 emission rate lookup tables for each of the priority MSATs.

2.3.5 Quantitative MSAT Analysis Results

The resulting emission inventory compiled for the nine priority MSATs for the proposed project are summarized in Table 2.3-1 and Figure 2.3-2 for the Preferred Alternative.

Table 2.3-1 MSAT Emissions – Preferred Alternative (tons/year)

	Toxin	2015 Baseline	2040 No Build	2040 Build	Increase from 2015 Baseline	Increase from 2040 No Build
	Benzene	6.09	1.65	1.46	-4.63	-0.19
	Naphthalene					
	Butadiene	0.81	0.02	0.02	-0.79	0.00
	Formaldehyde					
	Acrolein	0.57	0.24	0.22	-0.35	-0.02
	DPM					
	POM	0.38	0.08	0.07	-0.31	-0.01
	Acetaldehyde					
	Ethylbenzene	2.99	1.37	1.20	-1.79	-0.16
	Total MSAT					
	Affected Network Daily VMT	5,131,929	10,314,669	10,378,677	5,246,748	64,008

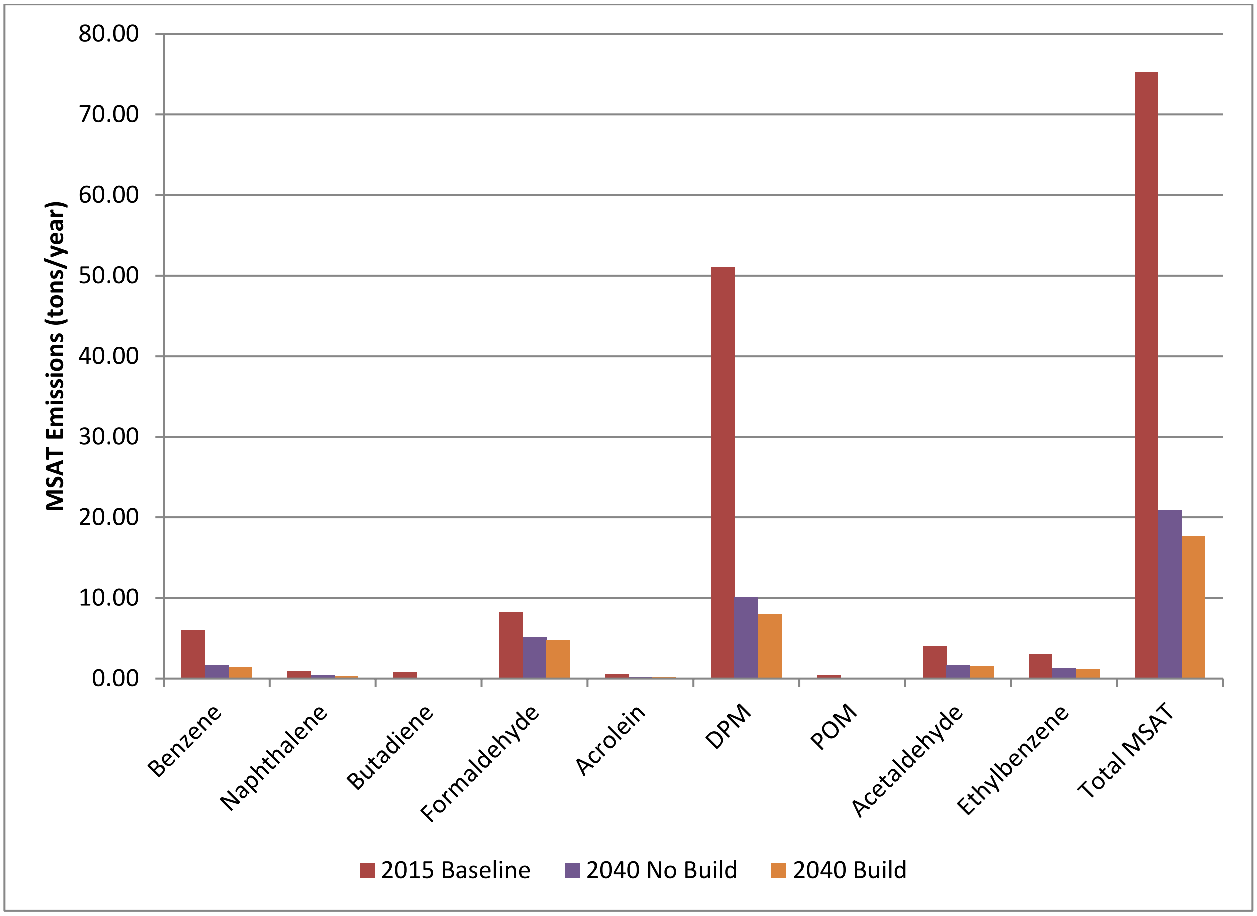

Figure 2.3-2 Projected Changes in MSAT Emissions over Time – Preferred Alternative

The analysis indicates that a decrease in MSAT emissions can be expected for both the Build and No Build Alternatives in 2040 when compared with the existing year of 2015. Under the Preferred Alternative, emissions of total MSAT are predicted to decrease by 76 percent from 2015 to 2040. This decrease is prevalent throughout the highest priority MSATs and the analyzed alternatives. This decrease is also consistent with the aforementioned EPA study that projects a substantial reduction in on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde between 2000 and 2050. In addition, as shown in Table 2.3-1, although the Build Alternative would increase the VMT by more than 64,000 when compared to the no build conditions, the total MSAT emissions decrease by 15 percent. As shown in Figure 2.3-3, if emissions are plotted over time, a decreasing level of MSAT emissions can be seen from the base year (2015), although overall VMT continues to rise.

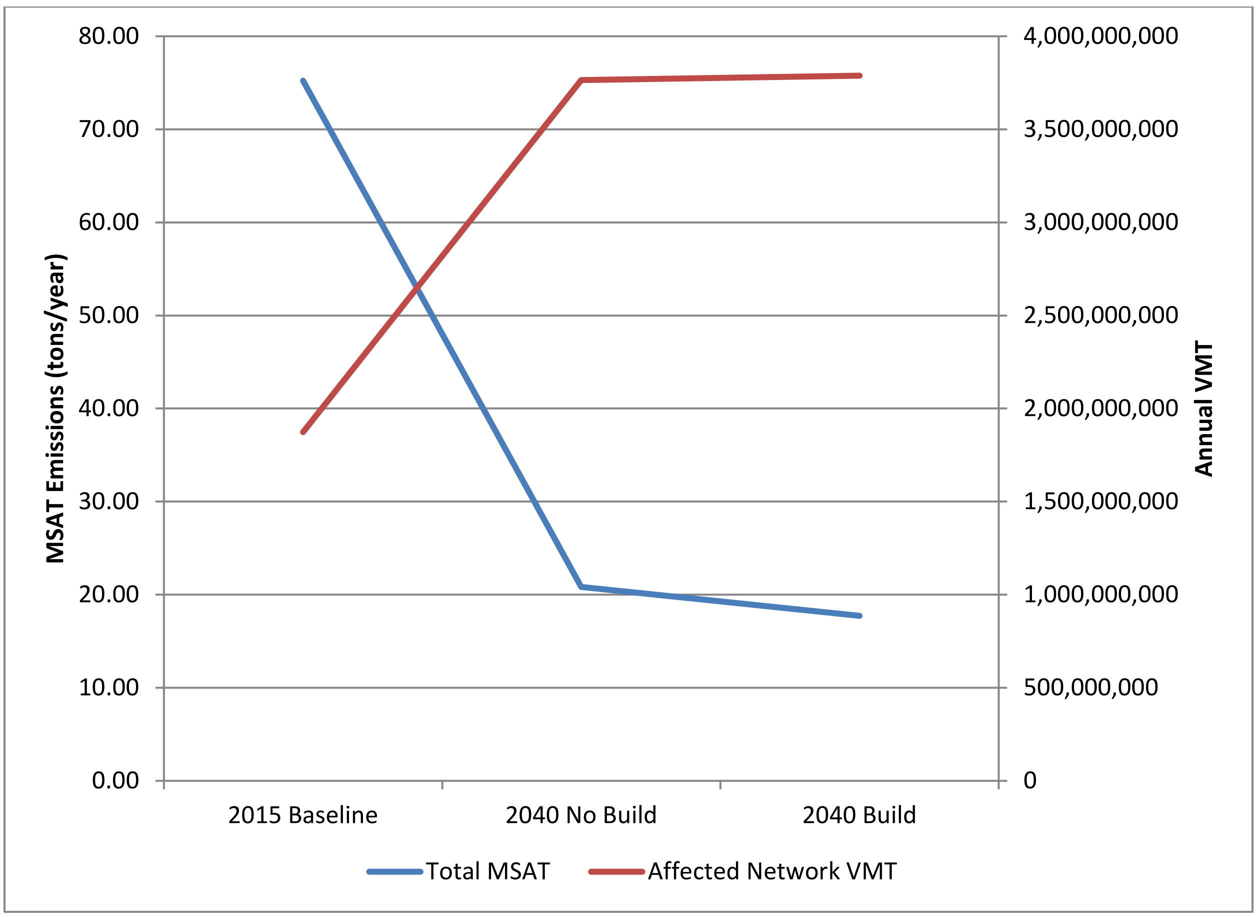

Figure 2.3-3 Comparison of MSAT Emissions vs. VMT – Preferred Alternative

2.4 Construction Emissions

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles.

The potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.texas.gov/airquality/terp/ .

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

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Appendix A
CAMPO RTP and TIP Listings

2019-2022 Transportation Improvement Program (TIP) and 2040 Regional Transportation Plan (RTP) Administrative Modification

Under the Administrative Policies of the 2019-2022 Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP), the following actions are classified as administrative modifications and do not require action by the Transportation Policy Board (TPB):

- Total Year of Expenditure cost increases that do not cause an increase of funds allocated by the TPB within the following limits:

Total Project Cost	Percent Increase in YOE
$0 - $249,000	25%
$250,000 - $999,999	20%
$1,000,000 - $2,999,999	15%
$3,000,000+	10%, capped at $5 million

- Decreases in federal or state funding
- Increases to local matches
- Changes in project sponsors if the sponsor or sponsors submit adequate documentation to CAMPO indicating that they have the funding needed to sponsor the project
- Modifications to TIP projects as long as the modifications do not materially change the project's intended function, nature, costs or environmental impact.
- Including a project as a phased improvement to a longer project, as long as the modifications do not materially change the project's intended function, nature, costs or environmental impact.
- Data entry or typographical errors.

Executive Director, CAMPO

2019-2022 Transportation Improvement Program (TIP) and 2040 Regional Transportation Plan (RTP)
Administrative Modification

MPO ID	Sponsor	County	Roadway	Limits (From)	Limits (To)	Description	FY	Total Cost	Amendment
51-00040-00	TxDOT	Travis	US 290 W	West of RM 1826	Loop 1	Construct six-lane controlled access highway with frontage roads	2019	$461,576,000.00	Amended Project Description, Sponsor, and Cost
51-00043-00	TxDOT	Travis	SH 71 W	US 290 W	Silvermine Dr.	Construct four-lane divided highway with direct connects	2019	$83,727,000.00	Amended Project Description, Sponsor, and Cost

Roadway Projects

MPO ID	Sponsor(s)	County	Roadway	Limits (From)	Limits (To)	Description	Let Year	Total Cost
51-00040-00	TxDOT	Travis	US 290 W	West of RM 1826	Loop 1	Construct six-lane controlled access highway and frontage roads	2019	$461,576,000.00
51-00041-00	Travis	Travis	US 290 W	RM 1826	Nutty Brown Rd	Widen to MAD-6	2040	$17,500,000.00
51-00042-00	CTRMA	Travis	Loop 1	Cesar Chavez	Slaughter.	2 Express Lanes in each direction - MoPac South	2020	$352,800,000.00
51-00043-00	TxDOT	Travis	SH 71 W	US 290 W	Silvermine Dr.	Construct four-lane divided highway with direct connects	2019	$83,727,000.00
51-00044-00	Travis	Travis	FM 812	FM 973 N	Maha Loop Rd	Improve to MAD-4	2038	$28,000,000.00
51-00045-00	Travis	Travis	FM 812	Maha Loop Rd	Travis County Line	Widen to MAD-4	2040	$11,300,000.00
51-00046-00	Travis	Travis	FM 969	FM 3177	Hunters Bend.	Improve to MAD-4	2017	$18,000,000.00
51-00047-00	Travis	Travis	FM 969	Hunters Bend	Webberville City Limit	Improve to MAD-4	2038	$49,700,000.00

Appendix B
CO TAQA

Loop1/290 Peak Hour Volumes

	2024		2040	
	NB	Build A	NB	Build A
NB Loop1-1	2913	2278	3670	2870
NB Loop1-2	3000	2960	3780	3730
SB Loop1-1	3230	4786	4070	6030
SB Loop1-2	4016	3627	5060	4570
EB290-1	1817	3056	2290	3850
EB290-2	2246	2698	2830	3400
WB290-1	2159	4476	2720	5640
WB290-2	2024	5659	2550	7130
NBFR-1	698	675	880	850
NBFR-2	1659	1341	2090	1690
SBFR-1	1738	1468	2190	1850
SBFR-2	675	881	850	1110
EBFR-1	492	460	620	580
EBFR-2	1635	1333	2060	1680
WBFR-1	2159	2032	2720	2560
WBFR-2	810	762	1020	960
N2E	905	698	1140	880
W2S	1770	1246	2230	1570
E2N	984	1381	1240	1740
S2W	984	2405	1240	3030

71/290 Peak Hour Volumes

	2024		2040	
	NB	Build A	NB	Build A
EB290-1	1183	3024	1490	3810
EB290-2	1730	4294	2180	5410
WB290-1	992	881	1250	1110
WB290-2	595	468	750	590
SB71	1048	532	1320	670
NB71	897	413	1130	520
EB290FR1		1302		1640
EB290FR2		1302		1640
WB290FR1		905		1140
WB290FR2		452		570
SB71FR		770		970
NB71FR		810		1020

Figure B-1: SH71/US290 Receptor Locations

Figure B-2: SH71/Loop 1 Receptor Locations

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1                     CALINE3              (DATED 12317)
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                    PAGE  1


      JOB: OHP                                                       RUN: 2024NB



        I.  SITE VARIABLES


       U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                    MIXH =  1000. M
     BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM



       II.  LINK VARIABLES


        LINK DESCRIPTION     *      LINK COORDINATES (M)      * LINK LENGTH  LINK
BRG   TYPE  VPH     EF     H    W
                             *   X1      Y1      X2      Y2   *     (M)       (DEG)
               (G/MI)  (M)  (M)

-------------------------*---------------------------------*-------------------------
------------------------------
    A. NB Loop 1             *  1475.      0.   1475.   1097. *     1097.       360.
    AG   2913.   1.5   0.0  18.0
    B. NB Loop 1             *  1475.   1097.   1475.   2194. *     1097.       360.
    AG   3000.   1.5   0.0  18.0
    C. SB Loop 1             *  1451.   2194.   1451.   1097. *     1097.       180.
    AG   3230.   1.5   0.0  18.0
    D. SB Loop 1             *  1451.   1097.   1451.      0. *     1097.       180.
    AG   4016.   1.5   0.0  18.0
    E. EB290                 *     0.   1082.   1463.   1082. *     1463.        90.
    AG   1817.   1.5   0.0  18.0
    F. EB290                 *  1463.   1082.   2682.   1082. *     1219.        90.
    AG   2246.   1.5   0.0  18.0
    G. WB290                 *  2682.   1112.   1463.   1112. *     1219.       270.
    AG   2159.   1.5   0.0  18.0
    H. WB290                 *  1463.   1112.      0.   1112. *     1463.       270.
    AG   2024.   1.5   0.0  18.0
    I. NBFR                  *  1527.      0.   1527.   1097. *     1097.       360.
    AG    698.   1.7   0.0  18.0
    J. NBFR                  *  1527.   1097.   1527.   2194. *     1097.       360.
    AG   1659.   1.7   0.0  18.0
    K. SBFR                  *  1399.      0.   1399.   1097. *     1097.       360.
    AG   1738.   1.7   0.0  18.0
    L. SBFR                  *  1399.   1097.   1399.   2194. *     1097.       360.
    AG    675.   1.7   0.0  18.0
    M. EBFR                  *     0.   1042.   1463.   1042. *     1463.        90.
    AG    492.   1.7   0.0  18.0
    N. EBFR                  *  1463.   1042.   2682.   1042. *     1219.        90.
    AG   1635.   1.7   0.0  18.0
    O. WBFR                  *  2682.   1152.   1463.   1152. *     1219.       270.
    AG   2159.   1.7   0.0  18.0
    P. WBFR                  *  1463.   1152.      0.   1152. *     1463.       270.
    AG    810.   1.7   0.0  18.0
    Q. N2E                   *  1475.    837.   1818.   1082. *      422.        54.
```

```
    AG    905.   1.6   0.0  13.0
    R. W2S                  *  1793.   1112.   1451.    862. *      424.      234.
    AG   1770.   1.6   0.0  13.0
    S. E2N                  *  1133.   1082.   1475.   1327. *      421.       54.
    AG    984.   1.6   0.0  13.0
    T. S2W                  *  1451.   1357.   1113.   1112. *      417.      234.
    AG    984.   1.6   0.0  13.0
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                         PAGE  2

      JOB: OHP                                                  RUN: 2022NB



        I.  SITE VARIABLES


        U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                    MIXH =  1000. M
     BRG = 270. DEGREES           Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM




      III.  RECEPTOR LOCATIONS AND MODEL RESULTS
```

RECEPTOR	X	Y	Z	TOTAL + AMB (PPM)
1. RECP. 1	500.	1039.	1.8	0.1
2. RECP. 2	948.	1039.	1.8	0.1
3. RECP. 3	1396.	1039.	1.8	0.2
4. RECP. 4	1396.	770.	1.8	0.0
5. RECP. 5	1396.	500.	1.8	0.0
6. RECP. 6	1530.	500.	1.8	0.2
7. RECP. 7	1530.	770.	1.8	0.2
8. RECP. 8	1680.	970.	1.8	0.2
9. RECP. 9	1856.	1039.	1.8	0.5
10. RECP.10	2182.	1039.	1.8	0.4
11. RECP.11	1530.	1694.	1.8	0.3
12. RECP.12	1530.	1425.	1.8	0.3
13. RECP.13	1530.	1155.	1.8	0.8
14. RECP.14	1856.	1155.	1.8	0.6
15. RECP.15	2182.	1155.	1.8	0.5
16. RECP.16	500.	1155.	1.8	0.2
17. RECP.17	948.	1155.	1.8	0.3
18. RECP.18	1280.	1260.	1.8	0.0
19. RECP.19	1396.	1425.	1.8	0.0
20. RECP.20	1396.	1694.	1.8	0.0

```
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                         PAGE  3

      JOB: OHP                                                  RUN: 2022NB
```

I. SITE VARIABLES

```
      U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                  MIXH =  1000. M
    BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM
```

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

CO/LINK (PPM)

RECEPTOR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. RECP. 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. RECP. 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. RECP. 3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. RECP. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. RECP. 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. RECP. 6	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. RECP. 7	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. RECP. 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
9. RECP. 9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
10. RECP.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
11. RECP.11	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. RECP.12	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. RECP.13	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0
14. RECP.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
15. RECP.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
16. RECP.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
17. RECP.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
18. RECP.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19. RECP.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
     20. RECP.20                  *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
```

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2024 A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES
MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB Loop 1	1475.	0.	1475.	1097.	1097.	360.	AG	2278.	1.5	0.0	18.0
B. NB Loop 1	1475.	1097.	1475.	2194.	1097.	360.	AG	2960.	1.5	0.0	18.0
C. SB Loop 1	1451.	2194.	1451.	1097.	1097.	180.	AG	4786.	1.5	0.0	18.0
D. SB Loop 1	1451.	1097.	1451.	0.	1097.	180.	AG	3627.	1.5	0.0	18.0
E. EB290	0.	1082.	1463.	1082.	1463.	90.	AG	3056.	1.5	0.0	18.0
F. EB290	1463.	1082.	2682.	1082.	1219.	90.	AG	2698.	1.5	0.0	18.0
G. WB290	2682.	1112.	1463.	1112.	1219.	270.	AG	4476.	1.5	0.0	18.0
H. WB290	1463.	1112.	0.	1112.	1463.	270.	AG	5659.	1.5	0.0	18.0
I. NBFR	1527.	0.	1527.	1097.	1097.	360.	AG	675.	1.7	0.0	18.0
J. NBFR	1527.	1097.	1527.	2194.	1097.	360.	AG	1341.	1.7	0.0	18.0
K. SBFR	1399.	0.	1399.	1097.	1097.	360.	AG	1468.	1.7	0.0	18.0
L. SBFR	1399.	1097.	1399.	2194.	1097.	360.	AG	881.	1.7	0.0	18.0
M. EBFR	0.	1042.	1463.	1042.	1463.	90.	AG	460.	1.7	0.0	18.0
N. EBFR	1463.	1042.	2682.	1042.	1219.	90.	AG	1333.	1.7	0.0	18.0
O. WBFR	2682.	1152.	1463.	1152.	1219.	270.	AG	2032.	1.7	0.0	18.0
P. WBFR	1463.	1152.	0.	1152.	1463.	270.	AG	762.	1.7	0.0	18.0
Q. N2E	1475.	837.	1818.	1082.	422.	54.					

```
    AG    698.   1.6   0.0  13.0
    R. W2S                  *  1793.   1112.   1451.    862. *      424.      234.
    AG   1246.   1.6   0.0  13.0
    S. E2N                  *  1133.   1082.   1475.   1327. *      421.       54.
    AG   1381.   1.6   0.0  13.0
    T. S2W                  *  1451.   1357.   1113.   1112. *      417.      234.
    AG   2405.   1.6   0.0  13.0
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                     PAGE  2

      JOB: OHP                                                RUN: 2024 A



        I.  SITE VARIABLES


       U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                   MIXH =  1000. M
     BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM




      III.  RECEPTOR LOCATIONS AND MODEL RESULTS


                             *                              *  TOTAL
                             *      COORDINATES (M)         *  + AMB
        RECEPTOR             *      X        Y        Z     *  (PPM)
    -------------------------*------------------------------*--------
     1. RECP. 1              *      500.    1039.      1.8  *   0.1
     2. RECP. 2              *      948.    1039.      1.8  *   0.3
     3. RECP. 3              *     1396.    1039.      1.8  *   0.3
     4. RECP. 4              *     1396.     770.      1.8  *   0.0
     5. RECP. 5              *     1396.     500.      1.8  *   0.0
     6. RECP. 6              *     1530.     500.      1.8  *   0.1
     7. RECP. 7              *     1530.     770.      1.8  *   0.1
     8. RECP. 8              *     1680.     970.      1.8  *   0.0
     9. RECP. 9              *     1856.    1039.      1.8  *   0.5
    10. RECP.10              *     2182.    1039.      1.8  *   0.6
    11. RECP.11              *     1530.    1694.      1.8  *   0.3
    12. RECP.12              *     1530.    1425.      1.8  *   0.3
    13. RECP.13              *     1530.    1155.      1.8  *   1.0
    14. RECP.14              *     1856.    1155.      1.8  *   0.7
    15. RECP.15              *     2182.    1155.      1.8  *   0.8
    16. RECP.16              *      500.    1155.      1.8  *   0.3
    17. RECP.17              *      948.    1155.      1.8  *   0.3
    18. RECP.18              *     1280.    1260.      1.8  *   0.0
    19. RECP.19              *     1396.    1425.      1.8  *   0.0
    20. RECP.20              *     1396.    1694.      1.8  *   0.0
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                     PAGE  3

      JOB: OHP                                                RUN: 2024 A
```

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

CO/LINK (PPM)

RECEPTOR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. RECP. 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. RECP. 2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. RECP. 3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. RECP. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. RECP. 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. RECP. 6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. RECP. 7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. RECP. 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9. RECP. 9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
10. RECP.10	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
11. RECP.11	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. RECP.12	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. RECP.13	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0
14. RECP.14	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
15. RECP.15	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
16. RECP.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
17. RECP.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
18. RECP.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19. RECP.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

20. RECP.20 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2040NB

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB Loop 1	1475.	0.	1475.	1097.	1097.	360.	AG	3670.	0.5	0.0	18.0
B. NB Loop 1	1475.	1097.	1475.	2194.	1097.	360.	AG	3780.	0.5	0.0	18.0
C. SB Loop 1	1451.	2194.	1451.	1097.	1097.	180.	AG	4070.	0.5	0.0	18.0
D. SB Loop 1	1451.	1097.	1451.	0.	1097.	180.	AG	5060.	0.5	0.0	18.0
E. EB290	0.	1082.	1463.	1082.	1463.	90.	AG	2290.	0.5	0.0	18.0
F. EB290	1463.	1082.	2682.	1082.	1219.	90.	AG	2830.	0.5	0.0	18.0
G. WB290	2682.	1112.	1463.	1112.	1219.	270.	AG	2720.	0.5	0.0	18.0
H. WB290	1463.	1112.	0.	1112.	1463.	270.	AG	2550.	0.5	0.0	18.0
I. NBFR	1527.	0.	1527.	1097.	1097.	360.	AG	880.	0.5	0.0	18.0
J. NBFR	1527.	1097.	1527.	2194.	1097.	360.	AG	2090.	0.5	0.0	18.0
K. SBFR	1399.	0.	1399.	1097.	1097.	360.	AG	2190.	0.5	0.0	18.0
L. SBFR	1399.	1097.	1399.	2194.	1097.	360.	AG	850.	0.5	0.0	18.0
M. EBFR	0.	1042.	1463.	1042.	1463.	90.	AG	620.	0.5	0.0	18.0
N. EBFR	1463.	1042.	2682.	1042.	1219.	90.	AG	2060.	0.5	0.0	18.0
O. WBFR	2682.	1152.	1463.	1152.	1219.	270.	AG	2720.	0.5	0.0	18.0
P. WBFR	1463.	1152.	0.	1152.	1463.	270.	AG	1020.	0.5	0.0	18.0
Q. N2E	1475.	837.	1818.	1082.	422.	54.					

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    AG   1140.   0.6   0.0  13.0
    R. W2S                  *  1793.   1112.   1451.    862. *      424.      234.
    AG   2230.   0.6   0.0  13.0
    S. E2N                  *  1133.   1082.   1475.   1327. *      421.       54.
    AG   1240.   0.6   0.0  13.0
    T. S2W                  *  1451.   1357.   1113.   1112. *      417.      234.
    AG   1240.   0.6   0.0  13.0
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                    PAGE  2

      JOB: OHP                                                  RUN: 2040NB


        I.  SITE VARIABLES


       U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                   MIXH =  1000. M
     BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM


      III.  RECEPTOR LOCATIONS AND MODEL RESULTS

                            *                                *  TOTAL
                            *        COORDINATES (M)         *  + AMB
        RECEPTOR            *      X         Y         Z     *  (PPM)
    ------------------------*--------------------------------*--------
     1. RECP. 1             *      500.    1039.      1.8    *   0.0
     2. RECP. 2             *      948.    1039.      1.8    *   0.0
     3. RECP. 3             *     1396.    1039.      1.8    *   0.0
     4. RECP. 4             *     1396.     770.      1.8    *   0.0
     5. RECP. 5             *     1396.     500.      1.8    *   0.0
     6. RECP. 6             *     1530.     500.      1.8    *   0.0
     7. RECP. 7             *     1530.     770.      1.8    *   0.0
     8. RECP. 8             *     1680.     970.      1.8    *   0.0
     9. RECP. 9             *     1856.    1039.      1.8    *   0.1
    10. RECP.10             *     2182.    1039.      1.8    *   0.1
    11. RECP.11             *     1530.    1694.      1.8    *   0.0
    12. RECP.12             *     1530.    1425.      1.8    *   0.0
    13. RECP.13             *     1530.    1155.      1.8    *   0.1
    14. RECP.14             *     1856.    1155.      1.8    *   0.2
    15. RECP.15             *     2182.    1155.      1.8    *   0.2
    16. RECP.16             *      500.    1155.      1.8    *   0.1
    17. RECP.17             *      948.    1155.      1.8    *   0.1
    18. RECP.18             *     1280.    1260.      1.8    *   0.0
    19. RECP.19             *     1396.    1425.      1.8    *   0.0
    20. RECP.20             *     1396.    1694.      1.8    *   0.0
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                    PAGE  3

      JOB: OHP                                                  RUN: 2040NB
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I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

CO/LINK (PPM)

RECEPTOR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. RECP. 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. RECP. 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. RECP. 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. RECP. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. RECP. 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. RECP. 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. RECP. 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. RECP. 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9. RECP. 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10. RECP.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
11. RECP.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. RECP.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. RECP.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
14. RECP.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
15. RECP.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
16. RECP.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
17. RECP.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
18. RECP.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19. RECP.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

20. RECP.20 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2040 A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB Loop 1	1475.	0.	1475.	1097.	1097.	360.	AG	2870.	0.5	0.0	18.0
B. NB Loop 1	1475.	1097.	1475.	2194.	1097.	360.	AG	3730.	0.5	0.0	18.0
C. SB Loop 1	1451.	2194.	1451.	1097.	1097.	180.	AG	6030.	0.5	0.0	18.0
D. SB Loop 1	1451.	1097.	1451.	0.	1097.	180.	AG	4570.	0.5	0.0	18.0
E. EB290	0.	1082.	1463.	1082.	1463.	90.	AG	3850.	0.5	0.0	18.0
F. EB290	1463.	1082.	2682.	1082.	1219.	90.	AG	3400.	0.5	0.0	18.0
G. WB290	2682.	1112.	1463.	1112.	1219.	270.	AG	5640.	0.5	0.0	18.0
H. WB290	1463.	1112.	0.	1112.	1463.	270.	AG	7130.	0.5	0.0	18.0
I. NBFR	1527.	0.	1527.	1097.	1097.	360.	AG	850.	0.5	0.0	18.0
J. NBFR	1527.	1097.	1527.	2194.	1097.	360.	AG	1690.	0.5	0.0	18.0
K. SBFR	1399.	0.	1399.	1097.	1097.	360.	AG	1850.	0.5	0.0	18.0
L. SBFR	1399.	1097.	1399.	2194.	1097.	360.	AG	1110.	0.5	0.0	18.0
M. EBFR	0.	1042.	1463.	1042.	1463.	90.	AG	580.	0.5	0.0	18.0
N. EBFR	1463.	1042.	2682.	1042.	1219.	90.	AG	1680.	0.5	0.0	18.0
O. WBFR	2682.	1152.	1463.	1152.	1219.	270.	AG	2560.	0.5	0.0	18.0
P. WBFR	1463.	1152.	0.	1152.	1463.	270.	AG	960.	0.5	0.0	18.0
Q. N2E	1475.	837.	1818.	1082.	422.	54.					

```
    AG    880.   0.6   0.0  13.0
    R. W2S                   *  1793.   1112.   1451.    862. *      424.      234.
    AG   1570.   0.6   0.0  13.0
    S. E2N                   *  1133.   1082.   1475.   1327. *      421.       54.
    AG   1740.   0.6   0.0  13.0
    T. S2W                   *  1451.   1357.   1113.   1112. *      417.      234.
    AG   3030.   0.6   0.0  13.0
0                             CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                     PAGE  2

      JOB: OHP                                                 RUN: 2040 A



        I.  SITE VARIABLES


       U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                  MIXH =  1000. M
     BRG = 270. DEGREES           Z0 = 100. CM        VD =   0.0 CM/S        AMB =
0.0 PPM



      III.  RECEPTOR LOCATIONS AND MODEL RESULTS


                             *                              *  TOTAL
                             *       COORDINATES (M)        *  + AMB
        RECEPTOR             *      X        Y        Z     *  (PPM)
    -------------------------*------------------------------*--------
     1. RECP. 1              *     500.    1039.      1.8   *   0.0
     2. RECP. 2              *     948.    1039.      1.8   *   0.0
     3. RECP. 3              *    1396.    1039.      1.8   *   0.0
     4. RECP. 4              *    1396.     770.      1.8   *   0.0
     5. RECP. 5              *    1396.     500.      1.8   *   0.0
     6. RECP. 6              *    1530.     500.      1.8   *   0.0
     7. RECP. 7              *    1530.     770.      1.8   *   0.0
     8. RECP. 8              *    1680.     970.      1.8   *   0.0
     9. RECP. 9              *    1856.    1039.      1.8   *   0.1
    10. RECP.10              *    2182.    1039.      1.8   *   0.1
    11. RECP.11              *    1530.    1694.      1.8   *   0.0
    12. RECP.12              *    1530.    1425.      1.8   *   0.0
    13. RECP.13              *    1530.    1155.      1.8   *   0.2
    14. RECP.14              *    1856.    1155.      1.8   *   0.3
    15. RECP.15              *    2182.    1155.      1.8   *   0.3
    16. RECP.16              *     500.    1155.      1.8   *   0.1
    17. RECP.17              *     948.    1155.      1.8   *   0.2
    18. RECP.18              *    1280.    1260.      1.8   *   0.0
    19. RECP.19              *    1396.    1425.      1.8   *   0.0
    20. RECP.20              *    1396.    1694.      1.8   *   0.0
0                             CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                     PAGE  3

      JOB: OHP                                                 RUN: 2040 A
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I. SITE VARIABLES

```
      U =  1.0 M/S            CLAS =    6  (F)        VS =    0.0 CM/S       ATIM =
60. MINUTES                  MIXH =  1000. M
    BRG = 270. DEGREES          Z0 = 100. CM          VD =    0.0 CM/S        AMB =
0.0 PPM
```

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

CO/LINK (PPM)

RECEPTOR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. RECP. 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. RECP. 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. RECP. 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. RECP. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. RECP. 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. RECP. 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. RECP. 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8. RECP. 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9. RECP. 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
10. RECP.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
11. RECP.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12. RECP.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13. RECP.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
14. RECP.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
15. RECP.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
16. RECP.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
17. RECP.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
18. RECP.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19. RECP.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

20. RECP.20 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2024NB

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	*	X1	Y1	X2	Y2	*	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB290 1	*	0.	144.	550.	144.	*	550.	90.	AG	1183.	1.5	0.0	18.0
B. EB290 2	*	550.	144.	1450.	144.	*	900.	90.	AG	1730.	1.5	0.0	18.0
C. WB290 1	*	1450.	156.	550.	156.	*	900.	270.	AG	992.	1.5	0.0	18.0
D. WB290 2	*	550.	156.	0.	156.	*	550.	270.	AG	595.	1.5	0.0	18.0
E. SB71	*	544.	750.	544.	150.	*	600.	180.	AG	1048.	1.5	0.0	18.0
F. NB71	*	556.	150.	556.	750.	*	600.	360.	AG	897.	1.5	0.0	18.0

LINK COORDINATES (M)

III. RECEPTOR LOCATIONS AND MODEL RESULTS

RECEPTOR	*	COORDINATES (M) X	Y	Z	*	TOTAL + AMB (PPM)	*	+ CO/LINK (PPM) A	B	C	D	E	F
1. RECP. 1	*	150.	55.	1.8	*	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0
2. RECP. 2	*	550.	80.	1.8	*	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0
3. RECP. 3	*	980.	65.	1.8	*	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0

4. RECP. 4	*	1260.	75.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
5. RECP. 5	*	95.	210.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
6. RECP. 6	*	360.	195.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
7. RECP. 7	*	815.	180.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
8. RECP. 8	*	1030.	180.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
9. RECP. 9	*	510.	650.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
10. RECP.10	*	505.	400.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
11. RECP.11	*	585.	650.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										
12. RECP.12	*	575.	400.	1.8	*	0.0	*	0.0	0.0	
0.0 0.0 0.0 0.0										

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2024 ALT A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB290 1	0.	144.	550.	144.	550.	90.	AG	3024.	1.5	0.0	18.0
B. EB290 2	550.	144.	1450.	100.	901.	93.	AG	4294.	1.5	0.0	18.0
C. WB290 1	1450.	200.	550.	156.	901.	267.	AG	881.	1.5	0.0	18.0
D. WB290 2	550.	156.	0.	156.	550.	270.	AG	468.	1.5	0.0	18.0
E. SB71	544.	750.	544.	150.	600.	180.	AG	532.	1.5	0.0	18.0
F. NB71	556.	150.	556.	750.	600.	360.	AG	413.	1.5	0.0	18.0
G. EB290FR 1	0.	100.	550.	100.	550.	90.	AG	1302.	1.5	0.0	18.0
H. EB290FR 2	550.	100.	1450.	100.	900.	90.	AG	1302.	1.5	0.0	18.0
I. WB290FR 1	1450.	200.	550.	200.	900.	270.	AG	905.	1.5	0.0	18.0
J. WB290FR 2	550.	200.	0.	200.	550.	270.	AG	452.	1.5	0.0	18.0
K. SB71 FR	524.	750.	524.	150.	600.	180.	AG	770.	1.5	0.0	18.0
L. NB71 FR	576.	150.	576.	750.	600.	360.	AG	810.	1.5	0.0	18.0

0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 2

JOB: OHP RUN: 2024 ALT A

I. SITE VARIABLES

```
      U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                  MIXH =  1000. M
    BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM
```

III. RECEPTOR LOCATIONS AND MODEL RESULTS

RECEPTOR	X	Y	Z	TOTAL + AMB (PPM)
1. RECP. 1	150.	55.	1.8	0.0
2. RECP. 2	550.	80.	1.8	0.1
3. RECP. 3	980.	65.	1.8	0.0
4. RECP. 4	1260.	75.	1.8	0.2
5. RECP. 5	95.	210.	1.8	0.0
6. RECP. 6	360.	195.	1.8	0.1
7. RECP. 7	815.	180.	1.8	0.1
8. RECP. 8	1030.	180.	1.8	0.3
9. RECP. 9	510.	650.	1.8	0.0
10. RECP.10	505.	400.	1.8	0.0
11. RECP.11	585.	650.	1.8	0.0
12. RECP.12	575.	400.	1.8	0.0

(COORDINATES (M) apply to X, Y, Z)

0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION PAGE 3

JOB: OHP RUN: 2024 ALT A

I. SITE VARIABLES

```
      U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                  MIXH =  1000. M
    BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM
```

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

```
                              *
+                                                     CO/LINK
                              *                        (PPM)
      RECEPTOR                *   A    B    C    D    E    F    G    H    I    J    K
   L
    --------------------------*
+
--------------------------------------------------------------
```

```
     1. RECP. 1             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     2. RECP. 2             *  0.0  0.0  0.0  0.0  0.0  0.0  0.1  0.0  0.0  0.0
0.0  0.0
     3. RECP. 3             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     4. RECP. 4             *  0.0  0.1  0.0  0.0  0.0  0.0  0.0  0.1  0.0  0.0
0.0  0.0
     5. RECP. 5             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     6. RECP. 6             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.1
0.0  0.0
     7. RECP. 7             *  0.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     8. RECP. 8             *  0.1  0.0  0.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     9. RECP. 9             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    10. RECP.10             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    11. RECP.11             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    12. RECP.12             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
```

```
1                     CALINE3              (DATED 12317)
0                            CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION                       PAGE  1

      JOB: OHP                                                       RUN: 2040NB



        I.  SITE VARIABLES


       U =  1.0 M/S            CLAS =   6  (F)        VS =   0.0 CM/S       ATIM =
60. MINUTES                   MIXH =  1000. M
     BRG = 270. DEGREES          Z0 = 100. CM         VD =   0.0 CM/S        AMB =
0.0 PPM


       II.  LINK VARIABLES


        LINK DESCRIPTION     *      LINK COORDINATES (M)      * LINK LENGTH  LINK
BRG   TYPE  VPH     EF     H    W
                             *   X1       Y1       X2       Y2   *     (M)       (DEG)
               (G/MI)  (M)  (M)

-------------------------*---------------------------------*-------------------------
------------------------------
    A. EB290 1               *     0.    144.    550.    144. *      550.        90.
    AG   1490.   0.5   0.0  18.0
    B. EB290 2               *   550.    144.   1450.    144. *      900.        90.
    AG   2180.   0.5   0.0  18.0
    C. WB290 1               *  1450.    156.    550.    156. *      900.       270.
    AG   1250.   0.5   0.0  18.0
    D. WB290 2               *   550.    156.      0.    156. *      550.       270.
    AG    750.   0.5   0.0  18.0
    E. SB71                  *   544.    750.    544.    150. *      600.       180.
    AG   1320.   0.5   0.0  18.0
    F. NB71                  *   556.    150.    556.    750. *      600.       360.
    AG   1130.   0.5   0.0  18.0

      III.  RECEPTOR LOCATIONS AND MODEL RESULTS


                             *                                * TOTAL *
+
CO/LINK
                             *        COORDINATES (M)         * + AMB *
(PPM)
        RECEPTOR             *      X         Y         Z      * (PPM) *   A    B    C
   D    E    F
    -------------------------*--------------------------------*-------*
+
--------------------------------
     1. RECP. 1              *      150.       55.       1.8    *  0.0   *  0.0  0.0
0.0  0.0  0.0  0.0
     2. RECP. 2              *      550.       80.       1.8    *  0.0   *  0.0  0.0
0.0  0.0  0.0  0.0
     3. RECP. 3              *      980.       65.       1.8    *  0.0   *  0.0  0.0
0.0  0.0  0.0  0.0
```

```
     4. RECP. 4              *     1260.       75.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
     5. RECP. 5              *       95.      210.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
     6. RECP. 6              *      360.      195.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
     7. RECP. 7              *      815.      180.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
     8. RECP. 8              *     1030.      180.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
     9. RECP. 9              *      510.      650.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
    10. RECP.10              *      505.      400.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
    11. RECP.11              *      585.      650.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
    12. RECP.12              *      575.      400.       1.8   *  0.0  *  0.0  0.0
0.0  0.0  0.0  0.0
```

1 CALINE3 (DATED 12317)
0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 1

JOB: OHP RUN: 2040 ALT A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM = 60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB = 0.0 PPM

II. LINK VARIABLES

LINK DESCRIPTION	*	X1	Y1	X2	Y2	*	LINK LENGTH (M)	LINK BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB290 1	*	0.	144.	550.	144.	*	550.	90.	AG	3610.	0.5	0.0	18.0
B. EB290 2	*	550.	144.	1450.	100.	*	901.	93.	AG	5410.	0.5	0.0	18.0
C. WB290 1	*	1450.	200.	550.	156.	*	901.	267.	AG	1110.	0.5	0.0	18.0
D. WB290 2	*	550.	156.	0.	156.	*	550.	270.	AG	590.	0.5	0.0	18.0
E. SB71	*	544.	750.	544.	150.	*	600.	180.	AG	670.	0.5	0.0	18.0
F. NB71	*	556.	150.	556.	750.	*	600.	360.	AG	520.	0.5	0.0	18.0
G. EB290FR 1	*	0.	100.	550.	100.	*	550.	90.	AG	1640.	0.5	0.0	18.0
H. EB290FR 2	*	550.	100.	1450.	100.	*	900.	90.	AG	1640.	0.5	0.0	18.0
I. WB290FR 1	*	1450.	200.	550.	200.	*	900.	270.	AG	1140.	0.5	0.0	18.0
J. WB290FR 2	*	550.	200.	0.	200.	*	550.	270.	AG	570.	0.5	0.0	18.0
K. SB71 FR	*	524.	750.	524.	150.	*	600.	180.	AG	970.	0.5	0.0	18.0
L. NB71 FR	*	576.	150.	576.	750.	*	600.	360.	AG	1020.	0.5	0.0	18.0

0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL - SEPTEMBER, 1979 VERSION PAGE 2

JOB: OHP RUN: 2040 ALT A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM =
60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB =
0.0 PPM

III. RECEPTOR LOCATIONS AND MODEL RESULTS

RECEPTOR	COORDINATES (M) X	Y	Z	TOTAL + AMB (PPM)
1. RECP. 1	150.	55.	1.8	0.0
2. RECP. 2	550.	80.	1.8	0.0
3. RECP. 3	980.	65.	1.8	0.0
4. RECP. 4	1260.	75.	1.8	0.0
5. RECP. 5	95.	210.	1.8	0.0
6. RECP. 6	360.	195.	1.8	0.0
7. RECP. 7	815.	180.	1.8	0.0
8. RECP. 8	1030.	180.	1.8	0.1
9. RECP. 9	510.	650.	1.8	0.0
10. RECP.10	505.	400.	1.8	0.0
11. RECP.11	585.	650.	1.8	0.0
12. RECP.12	575.	400.	1.8	0.0

0 CALINE3: CALIFORNIA LINE SOURCE DISPERSION MODEL -
SEPTEMBER, 1979 VERSION PAGE 3

JOB: OHP RUN: 2040 ALT A

I. SITE VARIABLES

U = 1.0 M/S CLAS = 6 (F) VS = 0.0 CM/S ATIM =
60. MINUTES MIXH = 1000. M
BRG = 270. DEGREES Z0 = 100. CM VD = 0.0 CM/S AMB =
0.0 PPM

IV. MODEL RESULTS (RECEPTOR-LINK MATRIX)

```
                             *
+                                                     CO/LINK
                             *                         (PPM)
      RECEPTOR               *   A    B    C    D    E    F    G    H    I    J    K
   L
    -------------------------*
+
--------------------------------------------------------------
```

```
     1. RECP. 1             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     2. RECP. 2             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     3. RECP. 3             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     4. RECP. 4             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     5. RECP. 5             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     6. RECP. 6             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     7. RECP. 7             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     8. RECP. 8             *  0.0  0.0  0.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
     9. RECP. 9             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    10. RECP.10             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    11. RECP.11             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
    12. RECP.12             *  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
0.0  0.0
```

Appendix C
MSAT Analysis

Alternative A

Existing VMT =	5,131,929
No Build VMT =	10,314,669
Build VMT =	10,378,677
Existing VHT =	119,416
No Build VHT =	302,388
Build VHT =	298,855
Existing Speed (mph) =	43.0
No Build Speed (mph) =	34.1
Build Speed (mph) =	34.7

Alternative A MSAT Emissions (Tons/year)

Toxic	2015 Baseline	2040 No Build	2040 Build	Increase Existing	Increase No Build
Benzene	6.09	1.65	1.46	-4.63	-0.19
Naphthalene	0.95	0.41	0.38	-0.57	-0.04
Butadiene	0.81	0.02	0.02	-0.79	0.00
Formaldehyde	8.30	5.22	4.76	-3.55	-0.46
Acrolein	0.57	0.24	0.22	-0.35	-0.02
DPM	51.06	10.15	8.08	-42.99	-2.08
POM	0.38	0.08	0.07	-0.31	-0.01
Acetaldehyde	4.09	1.70	1.55	-2.54	-0.16
Ethylbenzene	2.99	1.37	1.20	-1.79	-0.16
Total MSAT	75.23	20.84	17.73	-57.50	-3.11
Affected Network VMT	1,873,154,007	3,764,854,178	3,788,217,146	1,915,063,138	23,362,968
Daily VMT	5,131,929	10,314,669	10,378,677	5,246,748	64,008

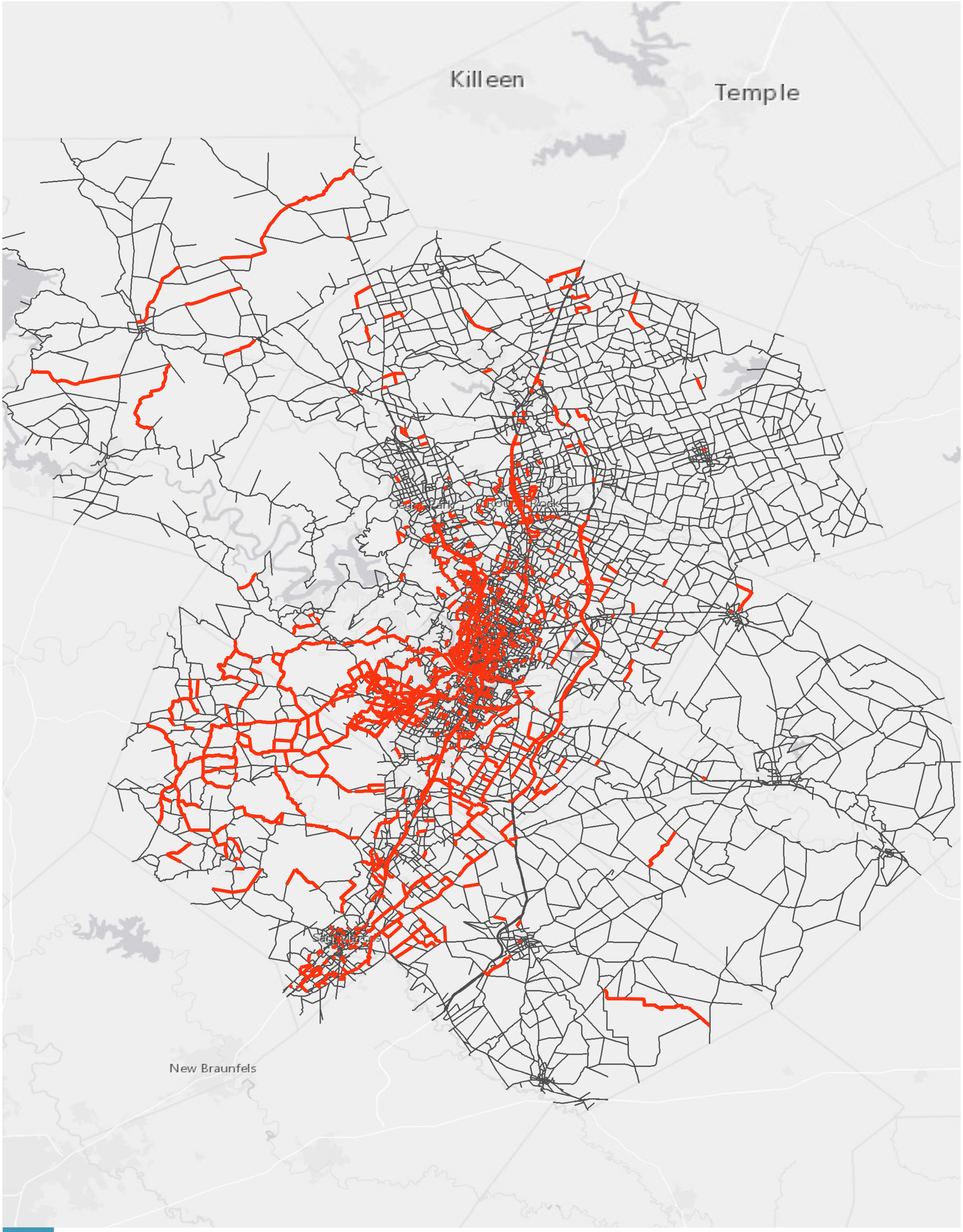

FIGURE C-1: EXISTING AFFECTED ENVIRONMENT - ALT A

HDR

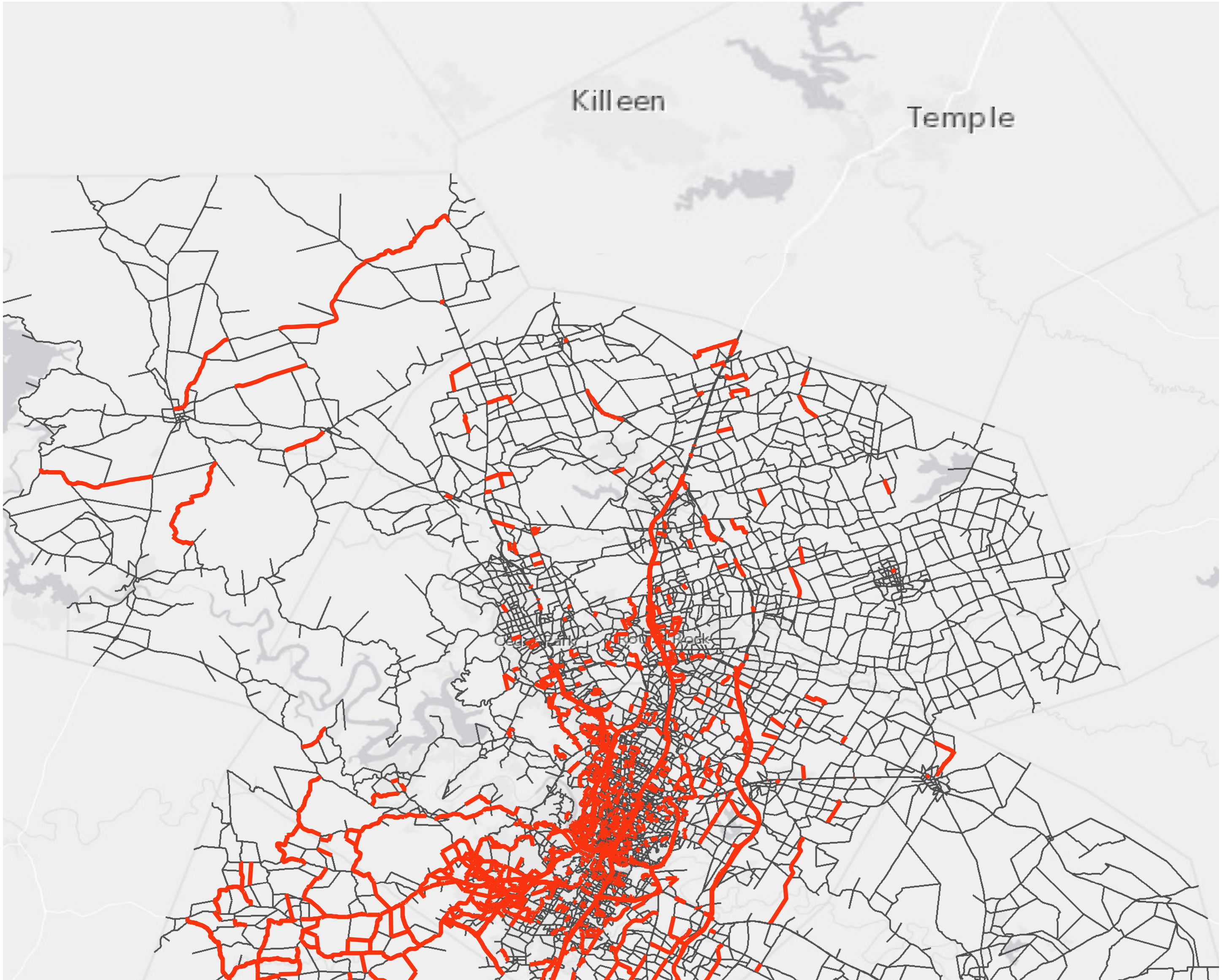

FIGURE C-2: 2040 AFFECTED ENVIRONMENT - ALT A