C-2 Freeway Health Risk Assessment

6220 West Yucca Street Mixed Use Project

Health Risk Assessment for Freeway Adjacent Projects

Prepared for
Champion Real Estate Company

April 2020

6220 West Yucca Street Mixed Use Project

Health Risk Assessment for Freeway Adjacent Projects

Prepared for
Champion Real Estate Company

April 2020

233 Wilshire Boulevard
Suite 150
Santa Monica, CA 90401
310.451.4488
www.pcrnet.com

ESA

Bend	Oakland	San Francisco
Camarillo	Orlando	Santa Monica
Delray Beach	Pasadena	Sarasota
Destin	Petaluma	Seattle
Irvine	Portland	Sunrise
Los Angeles	Sacramento	Tampa
Miami	San Diego	

DPCRE01.EP

TABLE OF CONTENTS

6220 West Yucca Street Mixed Use Project Health Risk Assessment for Freeway Adjacent Projects

Page

Appendices

Figures

Page

Tables

Acronyms and Abbreviations

Acronym	***Description***
AADT	annual average daily traffic volumes
AERMOD	AMS/EPA Regulatory Model
ASF	age sensitivity factor
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
Basin	South Coast Air Basin
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
City	City of Los Angeles
CPF	Cancer Potency Factor
DPM	diesel exhaust particulate matter
FAH	fraction of time at home
HARP	Hotspots Analysis and Reporting Program
HRA	Health Risk Assessment
MATES IV	Multiple Air Toxics Exposure Study, May 2015
MEI	Maximum Exposed Individual
MERV	Minimum Efficiency Reporting Value
OEHHA	Office of Environmental Health Hazard Assessment
PeMS	Performance Measurement System
SCAQMD	South Coast Air Quality Management District
TAC	toxic air contaminants
URF	unit risk factor
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

6220 West Yucca Street Mixed Use Project Health Risk Assessment for Freeway Adjacent Projects

The purpose of this Health Risk Assessment (HRA) is to assess and discuss the potential impacts from elevated toxic air contaminant (TAC) emissions from the Hollywood Freeway (US Route 101) that could impact future on-site residents at the proposed 6220 West Yucca Street Mixed Use Project. The City of Los Angeles Planning Commission has adopted an advisory notice to alert applicants to consider public health implications of freeway-adjacent projects.[1] As part of this advisory notice, the City Planning Commission advises that projects that locate sensitive receptors in close proximity (1,000 feet) to a freeway perform an HRA as a supplemental technical report. The results of the HRA would provide information to the City and applicant regarding health impacts and allow the applicant to make an informed decision about site planning and design. The Project Site is located less than 1,000 feet east of the Hollywood Freeway, which is within the Freeway Adjacent Advisory Notice area. As such, this HRA has been prepared for the Project included herein as a technical appendix to the Project's Draft EIR.

The approximately 1.16-acre project site is located in the Hollywood community of the City of Los Angeles. Overall, the project would include 210 multi-family residential units, 136 hotel rooms and approximately 12,570 square feet of commercial/restaurant uses. The project includes demolition of all existing on-site buildings and features, excavation for subterranean parking, and construction of buildings.

The HRA includes three separate components: 1) Emissions inventory; 2) Dispersion Modeling; and 3) Health Risk Calculations. Emissions from the US Route 101 Freeway were calculated using traffic data obtained from the California Department of Transportation (Caltrans) Performance Measurement System (PeMS) database and emission factors from the California Air Resources Board (CARB) EMFAC model. Dispersion modeling was performed using the US Environmental Protection Agency (USEPA) approved AMS/EPA Regulatory Model (AERMOD) model with meteorological data from the closest South Coast Air Quality Management District (SCAQMD) monitoring station. Sensitive receptors used for modeling were placed at the location of future residential buildings associated with the project. Health risk calculations were performed using a spreadsheet analysis tool consistent with the CARB Hotspots Analysis and Reporting Program (HARP), version 2 and South Coast Air Quality Management District

[1] City of Los Angeles, Zoning Information (Z.I.) No. 2427, Freeway Adjacent Advisory Notice for Sensitive Uses, Effective November 8, 2012, http://zimas.lacity.org/documents/zoneinfo/ZI2427.pdf. Accessed April 2020.

(SCAQMD) *Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, Attachment M* (Risk Assessment Procedures).[2] This is the most recent version of the SCAQMD's Risk Assessment Procedures that incorporates information from the Office of Environmental Health Hazard Assessment (OEHHA) *Guidance Manual for Preparation of Health Risk Assessments* (Guidance Manual)[3] that OEHHA adopted in March 2015. The SCAQMD uses the Risk Assessment Procedures for permit applications deemed complete on or after July 5, 2015.

The cancer risk at the maximum impacted receptor (closest to the US Route 101 Freeway) was calculated to be at 8.1 in one million, which is below the SCAQMD significance threshold of 10 in one million. For non-cancer chronic (annual) exposures, the maximum chronic (annual) health impact from vehicle emissions from the US Route 101 Freeway to future project site residents would be a Hazard Index of approximately 0.004 (respiratory irritant) compared to the threshold of 1.0. Therefore, impacts to on-site receptors were less than significant and no mitigation measures are required.

---

2 South Coast Air Quality Management District, Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, Attachment M, March 2016, http://www.aqmd.gov/docs/default-source/permitting/attachment-m.pdf?sfvrsn=4. Accessed April 2020.

3 Office of Environmental Health Hazard Assessment, Air Toxics Hotspots Program – Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed April 2020.

6220 West Yucca Street Mixed Use Project

Health Risk Assessment for Freeway Adjacent Projects

1. Introduction

The purpose of this Health Risk Assessment (HRA) is to assess and discuss the potential impacts from elevated toxic air contaminant (TAC) emissions from the Hollywood Freeway (US Route 101) that could impact future on-site residents at the proposed 6220 West Yucca Street Mixed Use Project. The City of Los Angeles Planning Commission has adopted an advisory notice to alert applicants to consider public health implications of freeway-adjacent projects.[4] As part of this advisory notice, the City Planning Commission advises that projects that locate sensitive receptors in close proximity (1,000 feet) to a freeway perform an HRA as a supplemental technical report. The results of the HRA would provide information to the City and applicant regarding health impacts and allow the applicant to make an informed decision about site planning and design. The Project Site is located less than 1,000 feet east of the Hollywood Freeway, which is within the Freeway Adjacent Advisory Notice area. As such, this HRA has been prepared for the Project included herein as a technical appendix to the Project's Draft EIR.

1.1 Existing Conditions

The approximately 1.16-acre project site is located on the south side of West Yucca Street between Argyle Avenue and North Vista Del Mar Avenue (addresses: 1756, 1760 North Argyle Avenue; 6210-6224 West Yucca Street; and 1765, 1771, 1777, and 1779 North Vista Del Mar Avenue) in the Hollywood community of the City of Los Angeles, approximately five miles northwest of Downtown Los Angeles. The project site is bounded by Yucca Street, the Argyle Hotel Project construction site, and 3-story residential lofts to the north; North Vista Del Mar Avenue and 1- and 2-story single-family residences and duplexes to the east; vacant land (former Little Country Church of Hollywood) and 1- and 2-story single-family residences and duplexes followed by a 5-story mixed-use residential and commercial development to the south; and Argyle Avenue and commercial uses to the west. The project site shown in **Figure 1,** *Vicinity Location Map.* The project vicinity is highly urbanized and generally built-out. The local vicinity is part of the active regional center of Hollywood with a mix of commercial, studio/production, office, entertainment, and residential uses. The Hollywood Freeway (US Route 101) is approximately 200 feet north of the project site at its closest point; Interstate 10 is approximately five miles to the south; Interstate 110 is approximately five miles to the southeast; Interstate 5 is

[4] City of Los Angeles, Zoning Information (Z.I.) No. 2427, Freeway Adjacent Advisory Notice for Sensitive Uses, Effective November 8, 2012, http://zimas.lacity.org/documents/zoneinfo/ZI2427.pdf. Accessed April 2020.

approximately five miles to the east; State Route 134 is approximately five miles to the north; and Interstate 405 is approximately eight miles to the southwest.

The project site is improved with one single-family residence, one duplex with a detached garage and studio apartment over garage, and three, two-story apartment buildings and associated carports and paved surface parking areas, all of which would be demolished and removed to support development of the project. **Figure 2**, *Aerial Photograph of Project Site and Vicinity*, shows the site and surrounding land uses. Overall, the site currently contains 43 total multi-family units (duplex = 2 units; 1 studio apartment over duplex garage, apartment buildings = 40 units) and one-single-family residence. Thus, there are a total of 44 residential units currently on the project site.

1.2 Project Description

The project would consist of two buildings, Buildings 1 and 2. Building 1 would include commercial/restaurant space and a lobby/leasing office for residents and hotel guests on the Ground Level hotel restaurant with outdoor dining, a pool/spa deck and fitness center, hotel rooms, and residential flats and suites. Building 2, located at the southwest corner of Yucca Street and Vista Del Mar Avenue, would include only residential uses. Overall, the project would include 210 multi-family residential units, 136 hotel rooms and approximately 12,570 square feet of commercial/restaurant uses. The Project would provide a total of 436 vehicle parking spaces in Buildings 1 and 2. Parking for Building 1 would provide 415 parking spaces (311 for residential uses, 79 for hotel uses, and 25 for commercial/restaurant uses) within a six-level parking structure housed within its podium [two subterranean levels (P2 and P3); two semi-subterranean levels (P1 and L1); and two fully above ground levels (L2 and L3)]. Parking for Building 2 would provide 21 parking spaces for residential uses and would be provided in its two-level podium structure within the semi-subterranean level (P1) and one subterranean level (P2).

1.3 Existing Air Quality Conditions

Between July 2012 and June 2013, the South Coast Air Quality Management District (SCAQMD) conducted the Multiple Air Toxics Exposure Study (MATES IV), which is a follow-up to previous air toxics studies conducted in the Air Basin. The MATES IV Final Report was issued in May 2015. The study concluded that the average of the modeled air toxics concentrations measured at each of the monitoring stations in the Air Basin equates to a background cancer risk from long-term inhalation exposure to TAC emissions of approximately 418 in one million based on the average of 10 fixed monitoring sites and 367 in one million based on a population-weighted average risk. The overall cancer risk was about 65 percent lower for the average of 10 fixed monitoring sites and 57 percent lower for the population-weighted risk than the previous MATES III cancer risks.[5]

5 South Coast Air Quality Management District, Final Report – Multiple Air Toxics Exposure Study in the South Coast Air Basin, (2015) ES-2-3. Available: http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv. Accessed April 2020.

Subsequent to the SCAQMD's risk calculations estimates performed for MATES IV, the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA) updated its methods for estimating cancer risks, which utilize higher estimates of cancer potency during early life exposures and uses different assumptions for breathing rates and length of residential exposures.[6] SCAQMD staff estimates that risks for the same long-term inhalation exposure level would be about 2.5 to 2.7 times higher using the updated methods, which would cause the average lifetime air toxics risk estimated from the monitoring sites data to change from 418 in one million to 1,023 in one million for the average of 10 fixed monitoring sites and from 367 in one million to 897 in one million for the population-weighted risk.[7] Under the updated OEHHA methodology, adopted by OEHHA in March of 2015, the relative reduction in the overall long-term inhalation cancer risk from the MATES IV results compared to MATES III would be the same (about 65 percent and 57 percent reduction in risk, respectively).

The SCAQMD has prepared a series of maps that show regional trends in estimated outdoor inhalation cancer risk from toxic emissions, as part of an ongoing effort to provide insight into relative risks. The maps represent the estimated potential cancer risk in one million associated with a lifetime of breathing air toxics (24 hours per day outdoors for 70 years). The background potential cancer risk in one million in the Project Site area using the updated OEHHA methodology is estimated at 1,150 in one million (compared to an overall South Coast Air Basin-wide risk of 1,023 in one million for the average of 10 fixed monitoring sites).[8] Generally, the risk from air toxics is lower near the coastline; increasing inland, with higher risks concentrated near large diesel sources (e.g., freeways, airports, and ports).

6 California Environmental Protection Agency, Office of Health Hazard Assessment, Air Toxics Hot Spots Program, Guidance Manual for Preparation of Health Risk Assessments, (2015). Available: http://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0. Accessed April 2020.

7 South Coast Air Quality Management District, Final Report – Multiple Air Toxics Exposure Study in the South Coast Air Basin, (2015) 2-11. Available: http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv. Accessed April 2020.

8 South Coast Air Quality Management District, Multiple Air Toxics Exposure Study, MATES IV Carcinogenic Risk Interactive Map, http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv. Accessed April 2020.

SOURCE: Open Street Map, 2017

6220 West Yucca Project

Figure 1

Vicinity Location Map

SOURCE: NAIP, 2016 (Aerial).

6220 West Yucca Project

Figure 2

Aerial Photograph of Project Site and Vicinity

2. Regulations and Significance Thresholds

2.1 Regulatory Setting

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment either directly or in reaction with other pollutants, due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified and regulated as part of the overall endeavor to prevent further deterioration and facilitate improvement in air quality. The SCAQMD periodically assesses levels of toxic air contaminants (TACs) in the Air Basin. A TAC is defined by California Health and Safety Code Section 39655:

> *"Toxic air contaminant" means an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)) is a toxic air contaminant.*

TACs refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs are different than "criteria" pollutants in that ambient air quality standards have not been established for TACs, largely because there are hundreds of air toxics, and their effects on health tend to be felt on a local scale rather than on a regional basis.

In 1998, the California Environmental Protection Agency (CalEPA) identified diesel exhaust particulate matter (DPM) as a toxic air contaminant based on its potential to cause cancer, premature death, and other health problems. The greatest potential for TAC emissions during construction is related to diesel particulate matter emissions associated with heavy-duty equipment. During long-term operations, sources of DPM may include heavy duty diesel trucks and stationary emergency generators.

In 2012, the City of Los Angeles Planning Commission issued a Freeway-Adjacent Advisory Notice for Sensitive Uses to project applicants regarding the need to consider the public health implications of certain freeway-adjacent projects.[9] The Advisory Notice is informational in nature and does not impose any additional land use or zoning regulations; it is not a prohibition on development near freeways. In preparing this Advisory Notice, Planning staff collected research and studies documenting health impacts to occupants living and/or working near freeways. As part of this Advisory Notice, the City Planning Commission advises that projects requiring an EIR that place sensitive receptors in close proximity (1,000 feet) to a freeway prepare a Health Risk Assessment (HRA) as a supplemental technical report. The results of the HRA would provide information to the City and applicant regarding health impacts and allow the applicant to

[9] City of Los Angeles, Zoning Information (Z.I.) No. 2427, Freeway Adjacent Advisory Notice for Sensitive Uses, Effective November 8, 2012, http://zimas.lacity.org/documents/zoneinfo/ZI2427.pdf. Accessed April 2020.

make an informed decision about site planning and design. Depending on the results of the HRA, the Commission may also consider requirements including enhanced filtration or adjustments to building orientation, operable windows and screening with vegetation. The southernmost portion of the Project Site, west of Valley Circle Boulevard, is directly north of and within 1,000 feet of the US-101 Freeway, which is within the Advisory Notice area where an HRA is recommended.

The Advisory Notice states that the City Planning Commission may, at its discretion, impose a requirement that any project proposing sensitive land uses within 1,000 feet of a freeway shall be required to install and maintain air filters meeting or exceeding the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 52.2 Minimum Efficiency Reporting Value (MERV) of 11 or higher. Subsequent to the issue date of this Advisory Notice, the City adopted a more stringent pollutant control requirement in Los Angeles Municipal Code (LAMC) Section 99.04.504, which requires MERV 13 in residential uses with mechanically ventilated buildings within 1,000 feet of a freeway. The MERV 13 requirement is incorporated into this analysis as regulatory compliance for residential uses with mechanically ventilated buildings.

The ASHRAE 52.5 standard provides removal efficiencies for mechanical filtration. According to the ASHRAE 52.2 standard, MERV 13 filters have reduction efficiencies of 50, 85, and 90 percent for particles with diameter ranges of 0.3 to 1.0 micrometers (µm), 1.0 to 3.0 µm, and 3.0 to 10.0 µm, respectively.[10] Use of the MERV 13 filters is assumed in the analysis to conservatively result in a 50 percent reduction efficiency for particles of this size range.

In order to determine the project's consistency with the City's Advisory Notice for Freeway-Adjacent projects and CARB's recommendations, this HRA has been prepared to assess the consistency of the proposed siting of new residential land uses in proximity to the Hollywood Freeway, a substantial existing source of TACs. The HRA Worksheets, included in Appendix A of this Technical Report, evaluate the chronic cancer risk and health effects of TACs associated with diesel-powered trucks emitting DPM along the Hollywood Freeway, in proximity to future residents of the project.

2.2 Significance Threshold

Although the City's Advisory Notice does not establish significance thresholds, the City of Los Angeles CEQA Thresholds Guide and the SCAQMD has established that a significant impact would occur if the project would expose sensitive receptors to toxic air contaminants resulting in an incremental cancer risk impact greater or equal to **10 in one million**.

[10] American Society of Heating, Refrigerating and Air-Conditioning Engineers, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size, 2015 Supplement, https://www.ashrae.org/File%20Library/Technical%20Resources/Standards%20and%20Guidelines/Standards%20Addenda/52_2_2012_2015Supplement.pdf. Accessed April 2020.

3. Methodology

3.1 Source Identification (Hollywood Freeway)

The California Department of Transportation (Caltrans) Performance Measurement System (PeMS) collects and maintains traffic volume counts for vehicles traversing the California state highway system. Consistent with SCAQMD recommendations, the roadway segment lengths analyzed in this study were determined based on freeway segments located within an approximate 0.25-mile radius of the project site boundaries. As shown in **Figure 3**, *Source Receptor Diagram*, a 0.25 mile radius was selected based on SCAQMD recommendations for siting sources of toxics in relation to sensitive receptors (schools, residential uses).[11] **Table 1,** *Freeway and Ramp Traffic Volumes*, presents the annual average daily traffic volumes (AADT) and peak hour traffic volumes for the freeway segments considered in this assessment. The traffic volumes represent the average volumes for the period of November 2016 through October 2017 based on Caltrans data for the freeway mainline for US Route 101 and years 2013 or 2014 for US Route 101 on- and off-ramps. To evaluate impacts to future project receptors, these traffic volumes were projected to years 2022 through 2051 with a 1 percent annual growth rate.

TABLE 1
FREEWAY AND RAMP TRAFFIC VOLUMES
(MAINLINE: NOVEMBER 2016 THROUGH OCTOBER 2017;
ON- AND OFF- RAMPS: 2013 OR 2014)

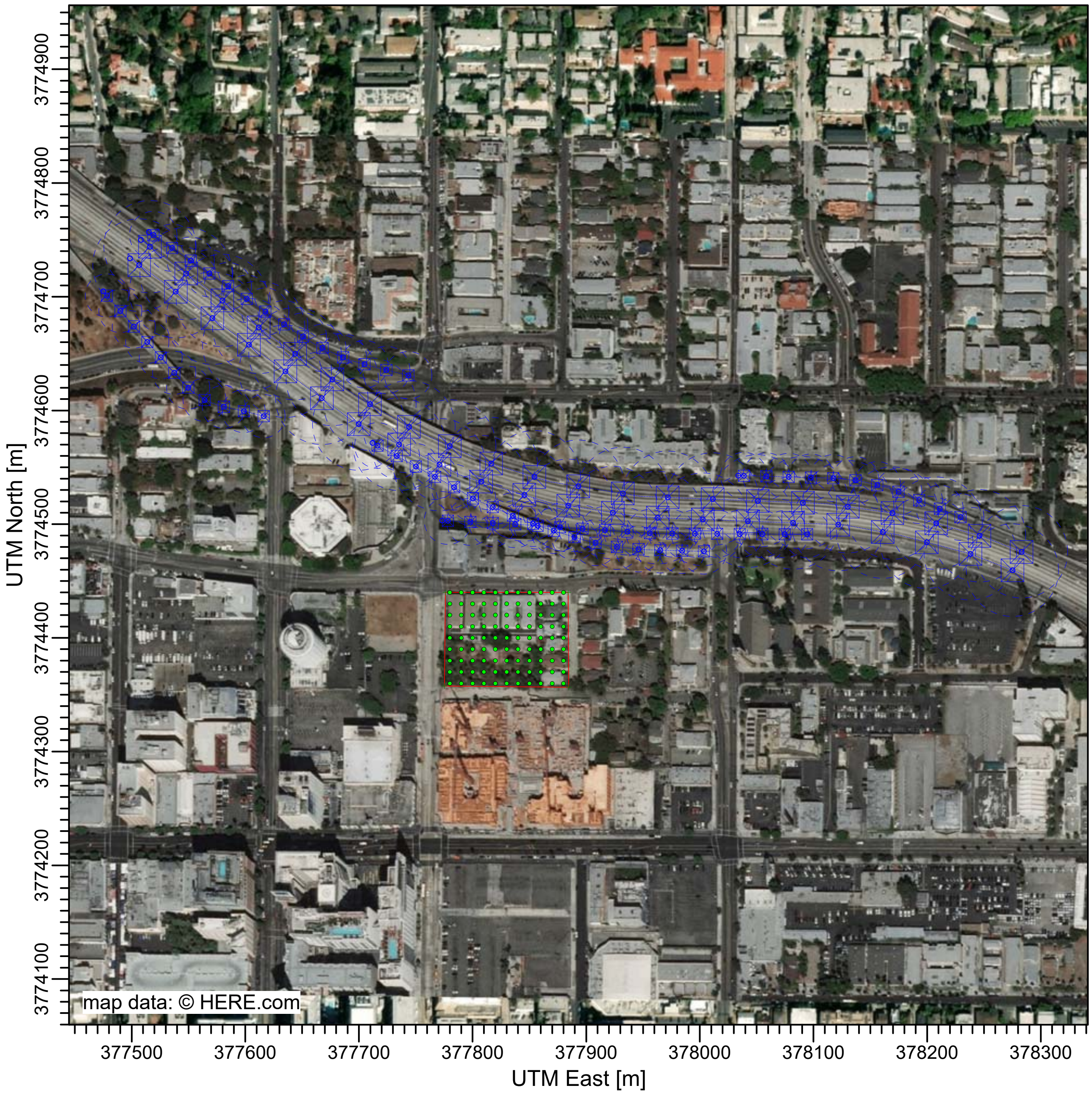
Sources/Freeway Segment	Post Mile	AADT	Peak Hour
Freeway - Main Segment			
1. US 101 Freeway North & South (0.53 miles)	North 7.72 South 6.99	190,659	10,698
Ramps			
2. US 101 South Freeway Off-Ramp to Vine Street (0.12 miles)	N/A	14,301	769
3. US 101 North Freeway On-Ramp from Argyle Avenue/Franklin Avenue (0.17 miles)	N/A	13,180	804
4. US 101 South Freeway Off-Ramp to Gower Street (0.20 miles)	N/A	6,701	360
5. US 101 South Freeway On-Ramp from Argyle Aveune (0.20 miles)	N/A	3,101	167
6. US 101 North Freeway Off-Ramp to Gower Street/Beachwood Drive (0.13 miles)	N/A	4,351	265

SOURCE: California Department of Transportation, Performance Measurement System (PeMS) and Traffic Counts, http://pems.dot.ca.gov, http://traffic-counts.dot.ca.gov, November 2016-October 2017.

11 South Coast Air Quality Management District, Air Quality Issues in School Site Selection, June 2005.

PROJECT TITLE:

6220 West Yucca Project
Freeway Health Risk Assessment



COMMENTS:	SOURCES: **7**	COMPANY NAME:	
	RECEPTORS: **103**	MODELER:	
		SCALE: 1:5,636 0 0.2 km	
			PROJECT NO.:

AERMOD View - Lakes Environmental Software

3.2 Emissions Calculations (Hollywood Freeway)

Vehicle traffic and speed data was obtained from the Caltrans PeMS database for the US Route 101 mainline. Vehicle traffic data for on-and off-ramps were obtained from Caltrans PeMS as well as from traffic count data from Caltrans Traffic Census Program. On- and off-ramp vehicle speeds were set at 15 miles per hour, which provides for a conservative (i.e., health protective) analysis since emissions factors are relatively high at this speed. Vehicle traffic data for the period of November 2016 through October 2017 was obtained for the segments of the US Route 101 mainline and years 2013 or 2014 for US Route 101 on- and off-ramps within 0.25 mile of the site. Hourly traffic data was also obtained to account for temporal variation of traffic flow. An annual traffic growth rate of one percent was applied to account for future traffic flow.

Emission factors were obtained from the CARB EMFAC2014 emissions model. EMFAC was run for 2022 through 2050 to identify the average DPM emission factors from heavy-duty diesel trucks typical of the US Route 101 over the lifetime of the project's operations. Vehicle emission factors were calculated assuming exposure duration of 30 years. Vehicle emissions were then calculated for each year from 2022 (the earliest year of project buildout and occupancy) through 2050 based on average traffic flow and vehicle speed along the study segment. Since EMFAC2014 does not have the option to model emissions factors for years past 2050, emission factors for 2050 were used to represent year 2051.

3.3 Dispersion Modeling (Hollywood Freeway)

Dispersion modeling was performed using the AERMOD, version 16216r using the urban dispersion modeling parameter consistent with SCAQMD recommendations. Meteorological data from the SCAQMD's University of Southern California/Downtown Los Angeles monitoring station was used to represent local weather conditions and prevailing winds data. Terrain data from U.S. Geological Survey (USGS) was used to assign elevations to sources and modeling receptors.

For modeling purposes, receptors were located on the project site. The dispersion modeling took into account variable traffic volumes at different times of day. Hourly emissions for freeway sources were calculated using hourly PeMS traffic data with corresponding emission factors based on hourly mean speed data (on- and off-ramps were conservatively set at a slower speed of 15 miles per hour).

With respect to nearby off-site stationary sources with active SCAQMD permits to operate, there are two emergency engines with active SCAQMD permits at the Capitol Records Tower building to the west of the project site and a gasoline dispensing facility on the north side of US Route 101. Emergency engines operate minimally for maintenance and testing purposes (typically a few hours per month) and therefore do not contribute substantially to on-site project risk. The gasoline dispensing facility is located more than 480 feet to the north of the project site, which exceeds the 50 feet and 300 feet siting distances for typical and large gasoline dispensing facilities in the CARB *Air Quality and Land Use Handbook* and therefore do not contribute substantially to on-site project risk.

3.4 Cancer Risk and Health Risk Calculations (Hollywood Freeway)

Cancer risk was calculated using the methodology and exposure parameters provided in the SCAQMD's *Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, Attachment M* (Risk Assessment Procedures).[12] This is the most recent version of the SCAQMD's Risk Assessment Procedures that incorporates information from the Office of Environmental Health Hazard Assessment (OEHHA) *Guidance Manual for Preparation of Health Risk Assessments* (Guidance Manual)[13] that OEHHA adopted in March 2015. The SCAQMD uses the Risk Assessment Procedures for permit applications deemed complete on or after July 5, 2015. The exposure duration was set at 30 years, which is the SCAQMD recommended duration for residential exposure.[14]

In performing health risk calculations, carcinogenic compounds are not considered to have threshold levels (i.e., dose levels below which there are no risks). Any exposure, therefore, will have some associated risk. Incremental health risks associated with exposure to carcinogenic compounds is defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. Under a deterministic approach (i.e., point estimate methodology), the cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF). The URF is a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$). The URFs utilized in the assessment and the corresponding cancer potency factors (CPF) were obtained principally from OEHHA Guidance Manual.

For the inhalation pathway, the cancer risk characterization procedure requires the incorporation of several discrete variables to effectively quantify dose. Once determined, contaminant dose is multiplied by the CPF in units of inverse dose expressed in milligrams per kilogram per day $(mg/kg/day)^{-1}$ and other exposure factors to derive the cancer risk estimate. Therefore, to accommodate the unique exposures associated with the proposed population, the following dose algorithm was utilized.

$$CDI = (C_{AIR} \times \{BR/BW\} \times A \times EF)$$

Where:

CDI = Chronic daily intake (mg/kg/day);

12 South Coast Air Quality Management District, Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, Attachment M, March 2016, http://www.aqmd.gov/docs/default-source/permitting/attachment-m.pdf?sfvrsn=4. Accessed April 2020.

13 Office of Environmental Health Hazard Assessment, Air Toxics Hotspots Program – Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed April 2020.

14 South Coast Air Quality Management District, Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, p. 19, June 5, 2015, http://www.aqmd.gov/docs/default-source/planning/risk-assessment/riskassprocjune15.pdf?sfvrsn=2. Accessed April 2020.

C_{AIR} = Concentration of contaminant in air (mg/m^3);
{BR/BW} = Daily Breathing Rate normalized to body weight (l/kg body weight-day);
EF = Exposure frequency (days/year);
A = Inhalation absorption factor (unitless).

SCAQMD recommended default values for the parameters listed above were used in the HRA analysis. The daily breathing rate {BR/BW} used in the analysis was based on was based on SCAQMD recommendations which vary depending on age which are shown in Error! Reference source not found., *SCAQMD Recommended Residential Daily Breathing Rates for Point Estimate Dose Calculations (L / kg body weight)*. The recommended exposure frequency (EF) is 350 days per year which is equivalent to 0.96 (350 days / 365 days a year). The inhalation absorption factor (A) is assumed to be 1 for inhalation based risk assessment.

TABLE 2
SCAQMD RECOMMENDED RESIDENTIAL DAILY BREATHING RATES FOR POINT ESTIMATE DOSE CALCULATIONS (L / KG BODY WEIGHT)

	3rd Trimester	0<2 Years	2<16 Years	16<30 Years
Daily Breathing Rate	361	1,090	572	261

SOURCE: SCAQMD, Permit Application Package "M," Version 8.0, p. 36, (2015), http://yourstory.aqmd.gov/docs/default-source/planning/risk-assessment/permit1401att-mjune15.pdf?sfvrsn=2. Accessed April 2020.

Once dose is calculated, cancer risk is calculated by accounting for cancer potency of the specific pollutant, age sensitivity, exposure duration, averaging time for lifetime cancer risk, and fraction of time spent at home (sensitive receptor). The CPF is specific for each pollutant and is determined through peer reviewed scientific studies. OEHHA has determined that DPM has a unit risk factor of 3.0E-4 $(ug/m^3)^{-1}$ and a slope factor of 1.1 $(mg/kg\text{-}day)^{-1}$.[15] The Age Sensitivity Factor (ASF) accounts for greater susceptibility in early life, starting from the 3rd trimester of pregnancy to 30 years. The fraction of time at home (FAH) takes into account the time actually residing at the sensitive receptor location. Fraction of time at home also takes into account time spent at time for various age groups. Exposure duration for purposes of this HRA was assumed to be 30 years, consistent with SCAQMD recommendations for residential exposure.

As shown in the equation below, the incremental increase in cancer risk is the product of the dose and the pollutant-specific CPF, ASF, ED, and FAH values. Cancer risk is calculated by multiplying the inhalation dose by the inhalation cancer potency factor to yield the potential inhalation excess cancer risk. The following equation illustrates the formula for calculating cancer risk. To convert this risk value to chances in one million of developing cancer, the potential cancer risk is multiplied by 10^6.

$$\text{Cancer Risk} = \text{Dose (mg/kg-day)} \times \text{CPF (mg/kg-day)}^{-1} \times \text{ASF} \times \text{ED/AT} \times \text{FAH}$$

15 Office of Environmental Health Hazard Assessment, Hot Spots Unit Risk and Cancer Potency Values, https://oehha.ca.gov/media/CPFs042909.pdf. Accessed April 2020.

Where:

Dose	=	Amount of a specific pollutant a person is exposed to (mg/kg-day)
CPF	=	Cancer Potency Factor, the cancer potency of a specific pollutant $(mg/kg\text{-}day)^{-1}$
ASF	=	Age Sensitivity Factor (unitless)
ED/AT	=	Exposure Duration, how long a person will be exposed to a specific pollutant in their lifetime (years)/Averaging Time, length of time over which the average dose is calculated (days)
FAH	=	Fraction of time at home (unitless)

As indicated in the equation above, each age group has different exposure parameters which require cancer risk to be calculated separately for each age group. FAH values are presented in **Table 3**, *SCAQMD Recommendations for Fraction of Time at Home (FAH) for Evaluating Residential Cancer Risk*. For the purposes of this assessment, conservative FAH values of 1.0 are used for the child age groups in order to provide a "worst-case" assessment.

TABLE 3
SCAQMD RECOMMENDATIONS FOR FRACTION OF TIME AT HOME (FAH) FOR EVALUATING RESIDENTIAL CANCER RISK

Age Range	Fraction of Time at Residence
3rd Trimester and 0<2 Years	0.85 (or 1.0) [a]
2<16 Years	0.72 (or 1.0) [a]
16-30 Years	0.73

[a] Use FAH = 1 if a school is within the 1×10^{-6} (or greater) cancer risk isopleth. For the purposes of this assessment, conservative FAH values of 1.0 are used for the child age groups in order to provide a "worst-case" assessment.

SOURCE: SCAQMD, Risk Assessment Procedures for Rules 1401, 1401.1, and 212, Version 8.0, p. 20, June 5, 2015, http://www.aqmd.gov/docs/default-source/planning/risk-assessment/riskassprocjune15.pdf?sfvrsn=2. Accessed April 2020.

Potential non-cancer effects of chronic (i.e., long term) exposures were evaluated using the Hazard Index approach as described in the OEHHA Guidance Manual. The Hazard Index is calculated by dividing the maximum modeled concentration of a TAC at the maximum impacted sensitive receptor by the Reference Exposure Level (REL). The REL is the concentration at or below which no adverse non-cancer health effects are known or expected to occur for that TAC. Therefore, a Hazard Index of less than 1.0 means that the maximum impacted sensitive receptor would be exposed to TAC concentrations at a level in which adverse non-cancer health effects would not be known or expected to occur. The chronic REL for DPM is 5 $\mu g/m^3$ and the chronic hazard index target organ for DPM is the respiratory system.[16]

[16] Office of Environmental Health Hazard Assessment/California Air Resources Board, Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values and OEHHA/ARB Approved Chronic Reference Exposure Levels and Target Organs, February 23, 2017, http://www.arb.ca.gov/toxics/healthval/healthval.htm. Accessed April 2020.

4. Impact Analysis

4.1 Cancer Risk

Health risk impacts (cancer risk) were assessed for future on-site residents. **Table 4**, *Summary of Carcinogenic Risks for On-Site Sensitive Receptors*, summarizes the carcinogenic risk for representative receptors located throughout the site. For carcinogenic exposures, the cancer risk from DPM emissions for the project site resulted in a maximum carcinogenic risk of 8.1 per one million for the 30-year residential exposure scenario. This scenario is based on a highly conservative 30-year, 24-hours-per-day, seven-days-per-week exposure. The 30-year lifetime exposure is the SCAQMD recommended default assumption for residential exposure and takes into account early life (infant and children) exposure. Cancer risk for on-site receptors which are further away from the freeway be less than 8.1 one million.

TABLE 4
SUMMARY OF CARCINOGENIC RISKS FOR ON-SITE SENSITIVE RECEPTORS

Risk Scenario	Carcinogenic Risk in One Million*
Maximum Exposed Individual (MEI) (closest to freeway)	8.1

See calculation worksheets presented in Appendix A.
* The significance threshold is 10 in one million.

SOURCE: ESA, 2020

The HRA worksheets (provided in Appendix A) provide a detailed breakdown of these calculations. In summary, the project site's worst-case location would not be exposed to cancer risk in excess of the SCAQMD significance threshold of 10 per one million. As a result, on-site residential uses would be provided an adequate health-based separation distance from the freeway and impacts would be considered less than significant.

It should be noted that the calculated cancer risk assumes no mitigation such as mechanical filtration and exposure with windows open. The City has adopted regulations regarding the filtration of outdoor air for indoor environments. Subsections 99.05.504.5.3 and 99.04.504.6 of the LAMC require that buildings located within 1,000 feet of a freeway provide regularly occupied areas of the building with air filtration media for outside and return air that meets or exceeds the ASHRAE Standard 52.2 MERV of 13, to the satisfaction of the City of Los Angeles Department of Building and Safety. Per ASHRAE Standard 52.2, MERV 13 would result in a removal efficiency of 50 percent for particles from 0.3 to 1.0 micrometers (μm), 85 percent for 1.0 to 3.0 μm, and 90 percent for 3.0 to 10.0 μm.[17] Thus, MERV 13 filters would reduce typical indoor PM10 and PM2.5 concentrations by at least 50 percent, with increasing reductions approaching 85 and 90 percent for particles with an aerodynamic diameter greater than 1.0 μm.

17 ASHRAE, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. https://www.ashrae.org/File%20Library/docLib/StdsAddenda/52_2_2012_2015Supplement.pdf. Accessed December 17, 2015.

Therefore, actual cancer risk impacts to on-site residents would be lower than those reported above.

4.2 Non-Cancer Risk

Table 5, *Summary of Non-Cancer Chronic Risks for On-Site Sensitive Receptors*, summarizes the carcinogenic risk for representative receptors located throughout the Project Site. For non-cancer chronic (annual) exposures, the maximum chronic (annual) health impact from vehicle emissions from the Hollywood Freeway to future Project Site residents would be a Hazard Index of approximately 0.004 (respiratory irritant) compared to the threshold of 1.0. As a result, on-site residential uses would be provided an adequate health-based separation distance from the freeway and non-cancer impacts would be less than significant.

TABLE 5
SUMMARY OF CANCER RISKS FOR ON-SITE SENSITIVE RECEPTORS

Risk Scenario	Chronic Hazard Index *
Maximum Exposed Individual (MEI) (closest to freeway)	0.00358 (respiratory irritant)

See calculation worksheets presented in Appendix A.
* The significance threshold is 1.0.

Source: ESA, 2020

5. Summary of Results

Based on a residential exposure duration of 30 years, the maximum health risk impacts to on-site residents due to TAC emissions from US Route 101 would be approximately 8.1 in one million, which would not exceed the significance threshold of 10 in one million. Impacts would be less than significant and no mitigation measures are required. Receptors located farther away from the Freeway would result in a smaller cancer risk impact. The project would comply with the City of Los Angeles Municipal Code which requires MERV 13 filtration, which would reduce indoor exposure to TAC emissions by at least 50 percent, with increasing reductions approaching 85 and 90 percent for particles with an aerodynamic diameter greater than 1.0 μm. Therefore, actual cancer risk impacts to on-site residents would be lower than those reported above. For non-cancer chronic (annual) exposures, the maximum chronic (annual) health impact from TAC emissions from US Route 101 to future Project Site residents would be a Hazard Index of approximately 0.004 (respiratory irritant) compared to the threshold of 1.0. As a result, on-site residential uses would be provided an adequate health-based separation distance from the freeway and non-cancer impacts would be less than significant. The project would be consistent with recommendations provided in the City's Advisory Notice for Freeway-Adjacent Projects.

APPENDIX A

Health Risk Assessment Worksheets and Output Files

6220 West Yucca Project

Caltrans Performance Measurement System (PeMS) Traffic Volume Counts - US 101 Mainline (Nov 2016-Oct 2017, Argyle)

Hour of Day	Average of Auto Flow (Veh/Hour) N	Average of Auto Flow (Veh/Hour) S	Average of Truck Flow (Veh/Hour) N	Average of Truck Flow (Veh/Hour) S	Average of Speed (mph) N	Average of Speed (mph) S
0:00:00	2,104	2,265	45	113	69	64
1:00:00	1,446	1,834	46	91	68	64
2:00:00	1,199	1,698	47	84	68	64
3:00:00	876	1,444	61	73	68	64
4:00:00	1,087	1,581	79	83	68	64
5:00:00	2,331	2,837	95	151	69	65
6:00:00	3,731	4,309	105	228	67	62
7:00:00	4,836	4,447	121	234	67	58
8:00:00	5,060	4,555	131	239	65	55
9:00:00	5,121	4,771	137	248	64	58
10:00:00	4,960	4,866	141	250	63	58
11:00:00	4,860	4,731	142	242	63	58
12:00:00	5,058	4,673	133	240	63	59
13:00:00	5,322	4,582	133	236	62	58
14:00:00	5,744	4,616	101	238	55	57
15:00:00	5,314	4,616	62	240	36	54
16:00:00	4,878	4,622	65	241	29	51
17:00:00	4,595	4,639	79	242	28	48
18:00:00	4,496	4,632	87	242	29	48
19:00:00	4,674	4,423	67	229	39	54
20:00:00	4,420	3,973	67	203	60	61
21:00:00	4,201	3,809	64	193	68	64
22:00:00	3,994	3,617	61	183	68	64
23:00:00	3,066	2,951	56	149	68	63
Total:	93,372	90,491	2,125	4,671		

Source: Caltrans, Performance Measurement System (PeMS), US 101-N Post Mile 7.21-Argyle, US 101-S Post Mile 6.99-Argyle, http://pems.dot.ca.gov/.

6220 West Yucca Project
Caltrans Traffic Volume Counts - US 101 On- and Off-Ramps (2013 and 2014, Near Argyle)

RAMP		Auto	Trucks	FWY	Notes
SB OFF TO VINE ST	14301	13811	490	US 101 S	http://traffic-counts.dot.ca.gov/docs/2013-ramp-vol-district07.pdf
NB ON FROM ARGYLE/FRANKLIN	13180	12729	451	US 101 N	2017 PeMS
SB OFF TO GOWER ST	6701	6472	229	US 101 S	http://traffic-counts.dot.ca.gov/docs/2013-ramp-vol-district07.pdf
SB ON FROM ARGYLE AVE	3101	2995	106	US 101 S	http://traffic-counts.dot.ca.gov/docs/2013-ramp-vol-district07.pdf
NB OFF TO GOWER/BEACHWOOD	4351	4202	149	US 101 N	http://traffic-counts.dot.ca.gov/docs/2013-ramp-vol-district07.pdf

* RAMPS are listed in order from North to South

% Auto	0.965756	Ratio between total auto flow and total flow (2014)
% Trucks	0.034244	Ratio between total truck flow count and total flow (2014)

Mainline Ratio for Ramp Hourly Flow Calculation

Sum of Average Hourly Traffic	**North**	**South**
Auto	93371.95	90491
Trucks	2124.789	4671.2

North Bound Ratio

Time of Day	**Auto**	**Trucks**
0:00:00	0.022534	0.0211
1:00:00	0.015483	0.0215
2:00:00	0.012842	0.0221
3:00:00	0.009383	0.0286
4:00:00	0.011641	0.0373
5:00:00	0.024965	0.0448
6:00:00	0.039957	0.0493
7:00:00	0.051789	0.0568
8:00:00	0.054196	0.0617
9:00:00	0.054844	0.0644
10:00:00	0.053124	0.0664
11:00:00	0.052049	0.0668
12:00:00	0.054175	0.0627
13:00:00	0.056997	0.0626
14:00:00	0.061516	0.0474
15:00:00	0.056912	0.0294
16:00:00	0.05224	0.0306
17:00:00	0.049211	0.0372
18:00:00	0.048149	0.0409
19:00:00	0.050054	0.0316
20:00:00	0.047341	0.0316
21:00:00	0.044992	0.0299
22:00:00	0.042773	0.0287
23:00:00	0.032832	0.0263

South Bound Ratio

Time of Day	**Auto**	**Trucks**
0:00:00	0.025035	0.0241
1:00:00	0.020262	0.0194
2:00:00	0.018761	0.0179
3:00:00	0.015962	0.0157
4:00:00	0.017475	0.0177
5:00:00	0.031346	0.0323
6:00:00	0.047617	0.0488
7:00:00	0.049147	0.0501
8:00:00	0.050341	0.0512
9:00:00	0.052723	0.0531
10:00:00	0.053777	0.0536
11:00:00	0.052276	0.0518
12:00:00	0.051641	0.0514
13:00:00	0.050632	0.0505
14:00:00	0.051009	0.0509
15:00:00	0.051015	0.0513
16:00:00	0.051076	0.0516
17:00:00	0.051264	0.0518
18:00:00	0.051185	0.0519
19:00:00	0.048876	0.049
20:00:00	0.043906	0.0435
21:00:00	0.042091	0.0413
22:00:00	0.039968	0.0392
23:00:00	0.032616	0.0318

*Ratio is average hourly flow divided by total flow

6220 West Yucca Project
EMFAC 2022 Emission Factors

Heavy Duty Vehicles PM10	
Speed	**Average of emission_rate (grams/mile)**
5	0.056067831
10	0.051211698
15	0.039110609
20	0.048220043
25	0.015197584
30	0.013526549
35	0.012424027
40	0.011756046
45	0.01119794
50	0.010742913
55	0.011626797
60	0.011781452
65	0.011830479
70	0.01468251

Light Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	0.234601281
10	0.153246664
15	0.103667345
20	0.078665806
25	0.053526217
30	0.041978982
35	0.034563791
40	0.030441831
45	0.028275668
50	0.027375344
55	0.02811157
60	0.029955086
65	0.033586835
70	0.033448563

Heavy Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	3.663902403
10	3.017773751
15	1.207346399
20	1.012352909
25	0.197521817
30	0.146636566
35	0.145759217
40	0.105493484
45	0.079110715
50	0.053987523
55	0.044946749
60	0.043039861
65	0.045467392
70	0.056397752

Source: EMFAC2014

6220 West Yucca Project
EMFAC 2022-2023 Emission Factors

Heavy Duty Vehicles PM10

Speed	Average of emission_rate (grams/mile)
5	0.045630262
10	0.043212725
15	0.033342669
20	0.043578976
25	0.012632077
30	0.011101918
35	0.010093952
40	0.009405374
45	0.008845399
50	0.008515268
55	0.008955135
60	0.009327271
65	0.009687966
70	0.011748715

Light Duty Vehicles TOG

Speed	Average of emission_rate (grams/mile)
5	0.228718377
10	0.149322033
15	0.100983713
20	0.076567319
25	0.052145992
30	0.040880038
35	0.03363859
40	0.029608958
45	0.027494484
50	0.026608217
55	0.027313274
60	0.029118831
65	0.032626887
70	0.032390263

Heavy Duty Vehicles TOG

Speed	Average of emission_rate (grams/mile)
5	3.408508374
10	2.838213664
15	1.10909744
20	0.945224799
25	0.176722996
30	0.130227209
35	0.132887648
40	0.094833304
45	0.070478189
50	0.047462568
55	0.038446763
60	0.03756367
65	0.040596637
70	0.049613441

Source: EMFAC2014

6220 West Yucca Project
EMFAC 2024-2037 Emission Factors

Heavy Duty Vehicles PM10	
Speed	**Average of emission_rate (grams/mile)**
5	0.018249052
10	0.016896303
15	0.013607456
20	0.016475332
25	0.006611292
30	0.005960139
35	0.005546359
40	0.005227547
45	0.004924048
50	0.004736117
55	0.004810777
60	0.005034519
65	0.005315579
70	0.005910815

Light Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	0.170993311
10	0.11021948
15	0.075492002
20	0.054733064
25	0.03965529
30	0.030955989
35	0.025320599
40	0.022152662
45	0.020532413
50	0.019822055
55	0.020277352
60	0.021925413
65	0.02433178
70	0.023169168

Heavy Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	2.519108274
10	2.015570886
15	0.742731255
20	0.554474673
25	0.146690494
30	0.106770895
35	0.114430768
40	0.079879861
45	0.05710903
50	0.036076797
55	0.026869509
60	0.025229806
65	0.026515051
70	0.030474593

Source: EMFAC2014

6220 West Yucca Project
EMFAC 2038-2051 Emission Factors

Heavy Duty Vehicles PM10	
Speed	**Average of emission_rate (grams/mile)**
5	0.010086332
10	0.008653118
15	0.007147457
20	0.00569138
25	0.004879862
30	0.004551078
35	0.004322229
40	0.004175099
45	0.00399682
50	0.003804013
55	0.003897794
60	0.003895309
65	0.003873658
70	0.004150531

Light Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	0.138149239
10	0.088257356
15	0.060933148
20	0.043240153
25	0.032247282
30	0.025127978
35	0.020491808
40	0.017929017
45	0.016587931
50	0.015999347
55	0.016425789
60	0.017933327
65	0.019880032
70	0.018270858

Heavy Duty Vehicles TOG	
Speed	**Average of emission_rate (grams/mile)**
5	2.021758835
10	1.697611048
15	0.603959109
20	0.371278353
25	0.143645525
30	0.103897521
35	0.111608214
40	0.076950593
45	0.054137903
50	0.033319073
55	0.024119119
60	0.021473166
65	0.021243956
70	0.023511896

Source: EMFAC2014

6220 West Yucca Project
Emissions Calculations

On/Off-Ramps	
Annual Growth Rate:	1%
Traffic Data Year:	2013
Analysis Start Year:	2022
Analysis End Year:	2023
Averaging Period:	2 years
Analysis Start Year:	2024
Analysis End Year:	2037
Averaging Period:	14 years
Analysis Start Year:	2038
Analysis End Year:	2051
Averaging Period:	14 years

Freeway Traffic	
Annual Growth Rate:	1%
Traffic Data Year:	2017
Analysis Start Year:	2022
Analysis End Year:	2023
Averaging Period:	2 years
Analysis Start Year:	2024
Analysis End Year:	2037
Averaging Period:	14 years
Analysis Start Year:	2038
Analysis End Year:	2051
Averaging Period:	14 years

EMISSION FACTORS (grams/mile)

Mainline North														2022			2022-2023			2024-2037			2038-2051		
Time	Length (mi)	2017 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2017 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.530	2,104	2,211	2,222	2,408	2,768	45	47	48	52	59	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
1:00:00	0.530	1,446	1,520	1,527	1,655	1,903	46	48	49	53	61	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
2:00:00	0.530	1,199	1,260	1,266	1,372	1,578	47	49	50	54	62	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
3:00:00	0.530	876	921	925	1,003	1,153	61	64	64	70	80	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
4:00:00	0.530	1,087	1,142	1,148	1,244	1,430	79	83	83	90	104	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
5:00:00	0.530	2,331	2,450	2,462	2,668	3,067	95	100	100	109	125	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
6:00:00	0.530	3,731	3,921	3,941	4,271	4,909	105	110	111	120	138	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
7:00:00	0.530	4,836	5,083	5,108	5,536	6,363	121	127	128	139	159	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
8:00:00	0.530	5,060	5,318	5,345	5,792	6,658	131	138	138	150	172	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
9:00:00	0.530	5,121	5,382	5,409	5,862	6,738	137	144	145	157	180	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
10:00:00	0.530	4,960	5,213	5,239	5,678	6,526	141	148	149	161	186	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
11:00:00	0.530	4,860	5,108	5,133	5,563	6,395	142	149	150	163	187	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
12:00:00	0.530	5,058	5,316	5,343	5,790	6,655	133	140	140	152	175	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
13:00:00	0.530	5,322	5,593	5,621	6,092	7,003	133	140	140	152	175	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
14:00:00	0.530	5,744	6,037	6,067	6,575	7,558	101	106	107	116	133	55	55	0.0281	0.0116	0.0449	0.0273	0.0090	0.0384	0.0203	0.0048	0.0269	0.0164	0.0039	0.0241
15:00:00	0.530	5,314	5,585	5,613	6,083	6,992	62	65	65	71	82	35	35	0.0346	0.0124	0.1458	0.0336	0.0101	0.1329	0.0253	0.0055	0.1144	0.0205	0.0043	0.1116
16:00:00	0.530	4,878	5,127	5,152	5,584	6,418	65	68	69	74	86	30	30	0.0420	0.0135	0.1466	0.0409	0.0111	0.1302	0.0310	0.0060	0.1068	0.0251	0.0046	0.1039
17:00:00	0.530	4,595	4,829	4,854	5,260	6,046	79	83	83	90	104	30	30	0.0420	0.0135	0.1466	0.0409	0.0111	0.1302	0.0310	0.0060	0.1068	0.0251	0.0046	0.1039
18:00:00	0.530	4,496	4,725	4,749	5,147	5,916	87	91	92	100	114	30	30	0.0420	0.0135	0.1466	0.0409	0.0111	0.1302	0.0310	0.0060	0.1068	0.0251	0.0046	0.1039
19:00:00	0.530	4,674	4,912	4,937	5,350	6,150	67	70	71	77	88	40	40	0.0304	0.0118	0.1055	0.0296	0.0094	0.0948	0.0222	0.0052	0.0799	0.0179	0.0042	0.0770
20:00:00	0.530	4,420	4,645	4,669	5,060	5,816	67	70	71	77	88	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
21:00:00	0.530	4,201	4,415	4,437	4,809	5,528	64	67	68	73	84	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
22:00:00	0.530	3,994	4,198	4,219	4,572	5,255	61	64	64	70	80	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241
23:00:00	0.530	3,066	3,222	3,239	3,510	4,034	56	59	59	64	74	70	55	0.0334	0.0116	0.0449	0.0324	0.0090	0.0384	0.0232	0.0048	0.0269	0.0183	0.0039	0.0241

Mainline South														2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2017 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2017 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.531	2,265	2,381	2,392	2,593	2,980	113	119	119	129	149	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
1:00:00	0.531	1,834	1,928	1,937	2,099	2,413	91	96	96	104	120	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
2:00:00	0.531	1,698	1,785	1,794	1,944	2,234	84	88	89	96	111	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
3:00:00	0.531	1,444	1,518	1,525	1,653	1,900	73	77	77	84	96	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
4:00:00	0.531	1,581	1,662	1,670	1,810	2,080	83	87	88	95	109	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
5:00:00	0.531	2,837	2,982	2,997	3,247	3,733	151	159	159	173	199	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
6:00:00	0.531	4,309	4,529	4,551	4,932	5,670	228	240	241	261	300	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
7:00:00	0.531	4,447	4,674	4,697	5,090	5,851	234	246	247	268	308	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
8:00:00	0.531	4,555	4,787	4,811	5,214	5,993	239	251	252	274	314	55	55	0.0281	0.0116	0.0449	0.0273	0.0090	0.0384	0.0203	0.0048	0.0269	0.0164	0.0039	0.0241
9:00:00	0.531	4,771	5,014	5,039	5,461	6,278	248	261	262	284	326	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
10:00:00	0.531	4,866	5,114	5,140	5,570	6,403	250	263	264	286	329	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
11:00:00	0.531	4,731	4,972	4,997	5,416	6,225	242	254	256	277	318	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
12:00:00	0.531	4,673	4,911	4,936	5,349	6,149	240	252	254	275	316	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
13:00:00	0.531	4,582	4,816	4,840	5,245	6,029	236	248	249	270	311	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
14:00:00	0.531	4,616	4,851	4,876	5,284	6,074	238	250	251	272	313	55	55	0.0281	0.0116	0.0449	0.0273	0.0090	0.0384	0.0203	0.0048	0.0269	0.0164	0.0039	0.0241
15:00:00	0.531	4,616	4,851	4,876	5,284	6,074	240	252	254	275	316	55	55	0.0281	0.0116	0.0449	0.0273	0.0090	0.0384	0.0203	0.0048	0.0269	0.0164	0.0039	0.0241
16:00:00	0.531	4,622	4,858	4,882	5,291	6,082	241	253	255	276	317	50	50	0.0274	0.0107	0.0540	0.0266	0.0085	0.0475	0.0198	0.0047	0.0361	0.0160	0.0038	0.0333
17:00:00	0.531	4,639	4,876	4,900	5,310	6,104	242	254	256	277	318	50	50	0.0274	0.0107	0.0540	0.0266	0.0085	0.0475	0.0198	0.0047	0.0361	0.0160	0.0038	0.0333
18:00:00	0.531	4,632	4,868	4,893	5,302	6,095	242	254	256	277	318	50	50	0.0274	0.0107	0.0540	0.0266	0.0085	0.0475	0.0198	0.0047	0.0361	0.0160	0.0038	0.0333
19:00:00	0.531	4,423	4,649	4,672	5,063	5,820	229	241	242	262	301	55	55	0.0281	0.0116	0.0449	0.0273	0.0090	0.0384	0.0203	0.0048	0.0269	0.0164	0.0039	0.0241
20:00:00	0.531	3,973	4,176	4,197	4,548	5,228	203	213	214	232	267	60	55	0.0300	0.0116	0.0449	0.0291	0.0090	0.0384	0.0219	0.0048	0.0269	0.0179	0.0039	0.0241
21:00:00	0.531	3,809	4,003	4,023	4,360	5,012	193	203	204	221	254	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
22:00:00	0.531	3,617	3,802	3,821	4,140	4,759	183	192	193	209	241	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241
23:00:00	0.531	2,951	3,102	3,117	3,378	3,883	149	157	157	171	196	65	55	0.0336	0.0116	0.0449	0.0326	0.0090	0.0384	0.0243	0.0048	0.0269	0.0199	0.0039	0.0241

EMISSIONS RATES (grams/second)												SCALAR VALUES FOR AERMOD											
2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
1.09E-02	8.05E-05	3.11E-04	1.06E-02	6.33E-05	2.72E-04	8.22E-03	3.68E-05	2.06E-04	7.45E-03	3.39E-05	2.10E-04	0.3436	0.3154	0.1583	0.3417	0.3200	0.1540	0.3228	0.3190	0.1309	0.3136	0.3155	0.1201
7.49E-03	8.22E-05	3.18E-04	7.29E-03	6.46E-05	2.77E-04	5.65E-03	3.76E-05	2.10E-04	5.12E-03	3.50E-05	2.17E-04	0.2362	0.3221	0.1617	0.2348	0.3267	0.1572	0.2218	0.3252	0.1334	0.2156	0.3262	0.1242
6.21E-03	8.39E-05	3.24E-04	6.04E-03	6.60E-05	2.83E-04	4.68E-03	3.83E-05	2.14E-04	4.25E-03	3.56E-05	2.20E-04	0.1958	0.3289	0.1650	0.1947	0.3333	0.1605	0.1839	0.3313	0.1359	0.1788	0.3316	0.1263
4.54E-03	1.10E-04	4.24E-04	4.41E-03	8.44E-05	3.62E-04	3.42E-03	4.96E-05	2.77E-04	3.10E-03	4.59E-05	2.84E-04	0.1431	0.4295	0.2156	0.1423	0.4267	0.2054	0.1344	0.4294	0.1762	0.1306	0.4278	0.1629
5.63E-03	1.42E-04	5.50E-04	5.48E-03	1.09E-04	4.70E-04	4.25E-03	6.38E-05	3.56E-04	3.85E-03	5.97E-05	3.69E-04	0.1775	0.5570	0.2796	0.1766	0.5533	0.2663	0.1667	0.5521	0.2265	0.1620	0.5561	0.2118
1.21E-02	1.71E-04	6.62E-04	1.17E-02	1.32E-04	5.66E-04	9.11E-03	7.72E-05	4.31E-04	8.25E-03	7.18E-05	4.44E-04	0.3808	0.6711	0.3368	0.3786	0.6667	0.3209	0.3576	0.6687	0.2743	0.3475	0.6684	0.2545
1.94E-02	1.88E-04	7.28E-04	1.89E-02	1.46E-04	6.29E-04	1.53E-02	8.50E-05	4.75E-04	1.44E-02	7.92E-05	4.90E-04	0.6119	0.7383	0.3705	0.6105	0.7400	0.3562	0.6012	0.7362	0.3020	0.6051	0.7380	0.2810
2.51E-02	2.18E-04	8.41E-04	2.45E-02	1.69E-04	7.25E-04	1.98E-02	9.85E-05	5.50E-04	1.86E-02	9.13E-05	5.65E-04	0.7932	0.8523	0.4278	0.7913	0.8533	0.4108	0.7793	0.8528	0.3498	0.7844	0.8503	0.3238
2.63E-02	2.36E-04	9.14E-04	2.57E-02	1.82E-04	7.82E-04	2.08E-02	1.06E-04	5.94E-04	1.95E-02	9.88E-05	6.11E-04	0.8299	0.9262	0.4648	0.8280	0.9200	0.4428	0.8153	0.9202	0.3775	0.8207	0.9198	0.3503
2.66E-02	2.47E-04	9.53E-04	2.60E-02	1.91E-04	8.21E-04	2.10E-02	1.11E-04	6.21E-04	1.97E-02	1.03E-04	6.39E-04	0.8399	0.9664	0.4850	0.8379	0.9667	0.4653	0.8251	0.9632	0.3951	0.8306	0.9626	0.3665
2.58E-02	2.53E-04	9.80E-04	2.52E-02	1.97E-04	8.44E-04	2.04E-02	1.14E-04	6.37E-04	1.91E-02	1.07E-04	6.61E-04	0.8135	0.9933	0.4985	0.8116	0.9933	0.4781	0.7992	0.9877	0.4052	0.8045	0.9947	0.3788
2.53E-02	2.55E-04	9.86E-04	2.47E-02	1.98E-04	8.49E-04	1.99E-02	1.16E-04	6.45E-04	1.87E-02	1.07E-04	6.64E-04	0.7971	1.0000	0.5019	0.7952	1.0000	0.4814	0.7831	1.0000	0.4102	0.7883	1.0000	0.3808
2.63E-02	2.40E-04	9.27E-04	2.57E-02	1.85E-04	7.93E-04	2.08E-02	1.08E-04	6.02E-04	1.95E-02	1.00E-04	6.22E-04	0.8296	0.9396	0.4716	0.8277	0.9333	0.4493	0.8150	0.9325	0.3825	0.8204	0.9358	0.3564
2.47E-02	2.40E-04	9.27E-04	2.41E-02	1.85E-04	7.93E-04	1.97E-02	1.08E-04	6.02E-04	1.85E-02	1.00E-04	6.22E-04	0.7784	0.9396	0.4716	0.7771	0.9333	0.4493	0.7727	0.9325	0.3825	0.7787	0.9358	0.3564
2.50E-02	1.82E-04	7.02E-04	2.44E-02	1.41E-04	6.06E-04	1.96E-02	8.22E-05	4.59E-04	1.83E-02	7.64E-05	4.73E-04	0.7885	0.7114	0.3570	0.7868	0.7133	0.3434	0.7713	0.7117	0.2919	0.7698	0.7112	0.2708
2.84E-02	1.19E-04	1.40E-03	2.78E-02	9.66E-05	1.27E-03	2.27E-02	5.80E-05	1.20E-03	2.11E-02	5.22E-05	1.35E-03	0.8969	0.4662	0.7100	0.8965	0.4884	0.7210	0.8910	0.5022	0.7609	0.8884	0.4863	0.7727
3.17E-02	1.35E-04	1.47E-03	3.10E-02	1.13E-04	1.32E-03	2.55E-02	6.50E-05	1.16E-03	2.38E-02	5.77E-05	1.32E-03	1.0000	0.5309	0.7473	1.0000	0.5703	0.7500	1.0000	0.5625	0.7400	1.0000	0.5370	0.7544
2.99E-02	1.65E-04	1.79E-03	2.92E-02	1.36E-04	1.59E-03	2.40E-02	7.90E-05	1.42E-03	2.24E-02	6.97E-05	1.59E-03	0.9419	0.6481	0.9121	0.9422	0.6860	0.9022	0.9420	0.6841	0.9000	0.9420	0.6494	0.9123
2.92E-02	1.81E-04	1.97E-03	2.86E-02	1.50E-04	1.76E-03	2.35E-02	8.78E-05	1.57E-03	2.19E-02	7.64E-05	1.74E-03	0.9216	0.7105	1.0000	0.9218	0.7604	1.0000	0.9217	0.7601	1.0000	0.9218	0.7118	1.0000
2.20E-02	1.21E-04	1.09E-03	2.15E-02	9.84E-05	9.92E-04	1.75E-02	5.93E-05	9.06E-04	1.62E-02	5.41E-05	9.97E-04	0.6948	0.4750	0.5534	0.6941	0.4971	0.5620	0.6856	0.5133	0.5761	0.6837	0.5041	0.5717
2.05E-02	1.20E-04	4.63E-04	2.00E-02	9.37E-05	4.02E-04	1.63E-02	5.46E-05	3.05E-04	1.54E-02	5.05E-05	3.13E-04	0.6465	0.4698	0.2358	0.6455	0.4733	0.2278	0.6418	0.4724	0.1938	0.6467	0.4706	0.1792
2.18E-02	1.15E-04	4.44E-04	2.12E-02	8.97E-05	3.85E-04	1.64E-02	5.17E-05	2.89E-04	1.49E-02	4.82E-05	2.98E-04	0.6861	0.4497	0.2257	0.6824	0.4533	0.2182	0.6446	0.4479	0.1837	0.6263	0.4492	0.1711
2.07E-02	1.10E-04	4.24E-04	2.01E-02	8.44E-05	3.62E-04	1.56E-02	4.96E-05	2.77E-04	1.41E-02	4.59E-05	2.84E-04	0.6524	0.4295	0.2156	0.6488	0.4267	0.2054	0.6128	0.4294	0.1762	0.5954	0.4278	0.1629
1.59E-02	1.01E-04	3.91E-04	1.55E-02	7.78E-05	3.34E-04	1.20E-02	4.54E-05	2.53E-04	1.09E-02	4.25E-05	2.63E-04	0.5007	0.3960	0.1987	0.4981	0.3933	0.1893	0.4705	0.3926	0.1611	0.4570	0.3957	0.1507
3.17E-02	**2.55E-04**	**1.97E-03**	**3.10E-02**	**1.98E-04**	**1.76E-03**	**2.55E-02**	**1.16E-04**	**1.57E-03**	**2.38E-02**	**1.07E-04**	**1.74E-03**												
Maximum																							

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
1.18E-02	2.04E-04	7.89E-04	1.15E-02	1.57E-04	6.75E-04	9.31E-03	9.16E-05	5.12E-04	8.74E-03	8.57E-05	5.30E-04	0.5220	0.4525	0.3900	0.5214	0.4508	0.3765	0.5166	0.4510	0.3468	0.5159	0.4529	0.3392
9.56E-03	1.65E-04	6.37E-04	9.33E-03	1.27E-04	5.45E-04	7.54E-03	7.38E-05	4.12E-04	7.08E-03	6.90E-05	4.27E-04	0.4227	0.3650	0.3147	0.4222	0.3636	0.3038	0.4182	0.3636	0.2796	0.4178	0.3647	0.2732
8.85E-03	1.51E-04	5.84E-04	8.64E-03	1.18E-04	5.05E-04	6.98E-03	6.82E-05	3.81E-04	6.55E-03	6.38E-05	3.95E-04	0.3914	0.3346	0.2884	0.3911	0.3371	0.2816	0.3873	0.3357	0.2581	0.3868	0.3374	0.2527
7.52E-03	1.32E-04	5.11E-04	7.34E-03	1.02E-04	4.37E-04	5.94E-03	5.96E-05	3.33E-04	5.57E-03	5.52E-05	3.42E-04	0.3328	0.2928	0.2524	0.3324	0.2917	0.2436	0.3293	0.2937	0.2259	0.3289	0.2918	0.2185
8.24E-03	1.49E-04	5.77E-04	8.04E-03	1.16E-04	4.99E-04	6.50E-03	6.74E-05	3.77E-04	6.10E-03	6.27E-05	3.88E-04	0.3644	0.3308	0.2852	0.3640	0.3333	0.2785	0.3606	0.3322	0.2554	0.3601	0.3313	0.2481
1.48E-02	2.73E-04	1.05E-03	1.44E-02	2.10E-04	9.02E-04	1.17E-02	1.23E-04	6.86E-04	1.10E-02	1.14E-04	7.08E-04	0.6538	0.6046	0.5212	0.6533	0.6023	0.5031	0.6469	0.6049	0.4652	0.6463	0.6049	0.4530
2.00E-02	4.12E-04	1.59E-03	1.96E-02	3.18E-04	1.37E-03	1.60E-02	1.85E-04	1.03E-03	1.50E-02	1.73E-04	1.07E-03	0.8856	0.9125	0.7867	0.8854	0.9129	0.7626	0.8855	0.9126	0.7018	0.8855	0.9119	0.6829
2.07E-02	4.22E-04	1.63E-03	2.02E-02	3.26E-04	1.40E-03	1.65E-02	1.90E-04	1.06E-03	1.55E-02	1.77E-04	1.10E-03	0.9140	0.9354	0.8063	0.9138	0.9356	0.7816	0.9138	0.9371	0.7206	0.9138	0.9362	0.7011
1.99E-02	4.31E-04	1.66E-03	1.94E-02	3.33E-04	1.43E-03	1.56E-02	1.95E-04	1.09E-03	1.45E-02	1.81E-04	1.12E-03	0.8785	0.9544	0.8227	0.8780	0.9545	0.7974	0.8657	0.9580	0.7367	0.8573	0.9544	0.7148
2.22E-02	4.48E-04	1.73E-03	2.17E-02	3.46E-04	1.49E-03	1.77E-02	2.02E-04	1.13E-03	1.66E-02	1.88E-04	1.16E-03	0.9804	0.9924	0.8555	0.9804	0.9924	0.8290	0.9804	0.9930	0.7636	0.9805	0.9909	0.7421
2.26E-02	4.51E-04	1.74E-03	2.21E-02	3.49E-04	1.50E-03	1.80E-02	2.03E-04	1.13E-03	1.69E-02	1.89E-04	1.17E-03	1.0000	1.0000	0.8620	1.0000	1.0000	0.8354	1.0000	1.0000	0.7690	1.0000	1.0000	0.7489
2.20E-02	4.36E-04	1.68E-03	2.15E-02	3.38E-04	1.45E-03	1.75E-02	1.97E-04	1.10E-03	1.65E-02	1.83E-04	1.13E-03	0.9722	0.9658	0.8325	0.9722	0.9697	0.8100	0.9724	0.9685	0.7448	0.9722	0.9666	0.7239
2.17E-02	4.32E-04	1.67E-03	2.12E-02	3.36E-04	1.44E-03	1.73E-02	1.95E-04	1.09E-03	1.63E-02	1.82E-04	1.12E-03	0.9603	0.9582	0.8260	0.9603	0.9621	0.8037	0.9603	0.9615	0.7394	0.9603	0.9605	0.7193
2.13E-02	4.26E-04	1.64E-03	2.08E-02	3.29E-04	1.41E-03	1.70E-02	1.92E-04	1.07E-03	1.60E-02	1.79E-04	1.11E-03	0.9417	0.9430	0.8129	0.9416	0.9432	0.7879	0.9417	0.9441	0.7260	0.9416	0.9453	0.7079
2.01E-02	4.29E-04	1.66E-03	1.97E-02	3.32E-04	1.42E-03	1.58E-02	1.93E-04	1.08E-03	1.47E-02	1.80E-04	1.11E-03	0.8902	0.9506	0.8194	0.8898	0.9508	0.7942	0.8773	0.9510	0.7313	0.8689	0.9514	0.7125
2.01E-02	4.32E-04	1.67E-03	1.97E-02	3.36E-04	1.44E-03	1.58E-02	1.95E-04	1.09E-03	1.47E-02	1.82E-04	1.12E-03	0.8902	0.9582	0.8260	0.8898	0.9621	0.8037	0.8773	0.9615	0.7394	0.8689	0.9605	0.7193
1.96E-02	4.01E-04	2.02E-03	1.92E-02	3.20E-04	1.79E-03	1.55E-02	1.93E-04	1.47E-03	1.44E-02	1.78E-04	1.56E-03	0.8681	0.8888	0.9961	0.8679	0.9185	0.9961	0.8588	0.9501	0.9964	0.8474	0.9403	0.9969
1.97E-02	4.03E-04	2.02E-03	1.92E-02	3.22E-04	1.79E-03	1.55E-02	1.94E-04	1.47E-03	1.44E-02	1.79E-04	1.56E-03	0.8713	0.8924	1.0000	0.8711	0.9221	1.0000	0.8619	0.9535	1.0000	0.8505	0.9433	1.0000
1.97E-02	4.03E-04	2.02E-03	1.92E-02	3.22E-04	1.79E-03	1.55E-02	1.94E-04	1.47E-03	1.44E-02	1.79E-04	1.56E-03	0.8699	0.8924	1.0000	0.8699	0.9221	1.0000	0.8606	0.9535	1.0000	0.8492	0.9433	1.0000
1.93E-02	4.14E-04	1.60E-03	1.88E-02	3.20E-04	1.37E-03	1.52E-02	1.86E-04	1.04E-03	1.41E-02	1.73E-04	1.07E-03	0.8531	0.9163	0.7899	0.8526	0.9167	0.7657	0.8407	0.9161	0.7045	0.8325	0.9149	0.6852
1.85E-02	3.65E-04	1.41E-03	1.80E-02	2.83E-04	1.21E-03	1.47E-02	1.65E-04	9.20E-04	1.38E-02	1.54E-04	9.50E-04	0.8166	0.8099	0.6982	0.8165	0.8106	0.6771	0.8165	0.8112	0.6238	0.8165	0.8116	0.6078
1.98E-02	3.48E-04	1.35E-03	1.94E-02	2.70E-04	1.16E-03	1.57E-02	1.57E-04	8.76E-04	1.47E-02	1.46E-04	9.04E-04	0.8777	0.7719	0.6654	0.8770	0.7727	0.6455	0.8687	0.7727	0.5942	0.8677	0.7720	0.5782
1.88E-02	3.29E-04	1.27E-03	1.84E-02	2.55E-04	1.10E-03	1.49E-02	1.48E-04	8.29E-04	1.40E-02	1.39E-04	8.58E-04	0.8336	0.7300	0.6293	0.8329	0.7311	0.6107	0.8248	0.7308	0.5620	0.8239	0.7325	0.5486
1.54E-02	2.69E-04	1.04E-03	1.50E-02	2.07E-04	8.91E-04	1.21E-02	1.21E-04	6.78E-04	1.14E-02	1.13E-04	6.98E-04	0.6801	0.5970	0.5146	0.6795	0.5947	0.4968	0.6730	0.5979	0.4598	0.6723	0.5957	0.4462
2.26E-02	**4.51E-04**	**2.02E-03**	**2.21E-02**	**3.49E-04**	**1.79E-03**	**1.80E-02**	**2.03E-04**	**1.47E-03**	**1.69E-02**	**1.89E-04**	**1.56E-03**												
Maximum																							

On and Off Ramps * Ratio Applied from US101 Ramps tab

SB OFF TO VINE ST

													2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2013 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2013 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.118	346	378	380	412	474	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
1:00:00	0.118	280	306	308	334	383	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
2:00:00	0.118	259	283	285	309	355	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
3:00:00	0.118	220	241	242	262	301	8	9	9	10	11	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
4:00:00	0.118	241	264	265	287	330	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
5:00:00	0.118	433	474	476	516	593	16	17	18	19	22	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
6:00:00	0.118	658	720	723	784	901	24	26	26	29	33	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
7:00:00	0.118	679	743	746	809	930	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
8:00:00	0.118	695	760	764	828	952	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
9:00:00	0.118	728	796	800	867	997	26	28	29	31	36	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
10:00:00	0.118	743	813	817	885	1,017	26	28	29	31	36	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
11:00:00	0.118	722	790	794	860	989	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
12:00:00	0.118	713	780	784	849	976	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
13:00:00	0.118	699	764	768	833	957	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
14:00:00	0.118	705	771	775	840	965	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
15:00:00	0.118	705	771	775	840	965	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
16:00:00	0.118	705	771	775	840	965	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
17:00:00	0.118	708	774	778	843	969	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
18:00:00	0.118	707	773	777	842	968	25	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
19:00:00	0.118	675	738	742	804	924	24	26	26	29	33	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
20:00:00	0.118	606	663	666	722	830	21	23	23	25	29	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
21:00:00	0.118	581	635	639	692	796	20	22	22	24	27	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
22:00:00	0.118	552	604	607	658	756	19	21	21	23	26	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
23:00:00	0.118	450	492	495	536	616	16	17	18	19	22	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040

NB ON FROM ARGYLE/FRANKLIN * Based on 2017 PeMS data

													2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2013 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2013 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.167	287	302	303	329	378	10	11	11	11	13	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
1:00:00	0.167	197	207	208	226	259	10	11	11	11	13	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
2:00:00	0.167	163	171	172	187	214	10	11	11	11	13	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
3:00:00	0.167	119	125	126	136	157	13	14	14	15	17	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
4:00:00	0.167	148	156	156	169	195	17	18	18	19	22	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
5:00:00	0.167	318	334	336	364	418	20	21	21	23	26	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
6:00:00	0.167	509	535	538	583	670	22	23	23	25	29	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
7:00:00	0.167	659	693	696	754	867	26	27	27	30	34	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
8:00:00	0.167	690	725	729	790	908	28	29	30	32	37	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
9:00:00	0.167	698	734	737	799	918	29	30	31	33	38	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
10:00:00	0.167	676	710	714	774	889	30	32	32	34	39	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
11:00:00	0.167	663	697	700	759	872	30	32	32	34	39	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
12:00:00	0.167	690	725	729	790	908	28	29	30	32	37	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
13:00:00	0.167	725	762	766	830	954	28	29	30	32	37	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
14:00:00	0.167	783	823	827	896	1,030	21	22	22	24	28	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
15:00:00	0.167	724	761	765	829	953	13	14	14	15	17	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
16:00:00	0.167	665	699	702	761	875	14	15	15	16	18	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
17:00:00	0.167	626	658	661	717	824	17	18	18	19	22	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
18:00:00	0.167	613	644	647	702	807	18	19	19	21	24	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
19:00:00	0.167	637	669	673	729	838	14	15	15	16	18	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
20:00:00	0.167	603	634	637	690	793	14	15	15	16	18	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
21:00:00	0.167	573	602	605	656	754	14	15	15	16	18	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
22:00:00	0.167	544	572	575	623	716	13	14	14	15	17	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
23:00:00	0.167	418	439	442	478	550	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040

SB OFF TO GOWER ST

													2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2013 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2013 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.197	162	177	178	193	222	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
1:00:00	0.197	131	143	144	156	179	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
2:00:00	0.197	121	132	133	144	166	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
3:00:00	0.197	103	113	113	123	141	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
4:00:00	0.197	113	124	124	135	155	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
5:00:00	0.197	203	222	223	242	278	7	8	8	8	10	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
6:00:00	0.197	308	337	339	367	422	11	12	12	13	15	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
7:00:00	0.197	318	348	350	379	435	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
8:00:00	0.197	326	357	358	388	446	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
9:00:00	0.197	341	373	375	406	467	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
10:00:00	0.197	348	381	383	415	476	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
11:00:00	0.197	338	370	372	403	463	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
12:00:00	0.197	334	365	367	398	457	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
13:00:00	0.197	328	359	361	391	449	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
14:00:00	0.197	330	361	363	393	452	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
15:00:00	0.197	330	361	363	393	452	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
16:00:00	0.197	331	362	364	394	453	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
17:00:00	0.197	332	363	365	395	455	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
18:00:00	0.197	331	362	364	394	453	12	13	13	14	16	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
19:00:00	0.197	316	346	347	376	433	11	12	12	13	15	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
20:00:00	0.197	284	311	312	338	389	10	11	11	12	14	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
21:00:00	0.197	272	297	299	324	372	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
22:00:00	0.197	259	283	285	309	355	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
23:00:00	0.197	211	231	232	251	289	7	8	8	8	10	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
1.29E-03	1.67E-05	5.15E-04	1.26E-03	1.42E-05	4.73E-04	1.02E-03	6.25E-06	3.41E-04	9.48E-04	3.75E-06	3.17E-04	0.4649	0.4643	0.4643	0.4651	0.4483	0.4483	0.4655	0.4516	0.4516	0.4661	0.4444	0.4444
1.04E-03	1.28E-05	3.96E-04	1.02E-03	1.09E-05	3.64E-04	8.28E-04	4.91E-06	2.68E-04	7.66E-04	2.82E-06	2.38E-04	0.3764	0.3571	0.3571	0.3770	0.3448	0.3448	0.3774	0.3548	0.3548	0.3766	0.3333	0.3333
9.63E-04	1.28E-05	3.96E-04	9.45E-04	1.09E-05	3.64E-04	7.66E-04	4.91E-06	2.68E-04	7.10E-04	2.82E-06	2.38E-04	0.3481	0.3571	0.3571	0.3488	0.3448	0.3448	0.3492	0.3548	0.3548	0.3491	0.3333	0.3333
8.20E-04	1.16E-05	3.57E-04	8.02E-04	9.85E-06	3.28E-04	6.49E-04	4.47E-06	2.44E-04	6.02E-04	2.58E-06	2.18E-04	0.2964	0.3214	0.3214	0.2962	0.3103	0.3103	0.2960	0.3226	0.3226	0.2960	0.3056	0.3056
8.98E-04	1.28E-05	3.96E-04	8.79E-04	1.09E-05	3.64E-04	7.11E-04	4.91E-06	2.68E-04	6.60E-04	2.82E-06	2.38E-04	0.3247	0.3571	0.3571	0.3244	0.3448	0.3448	0.3243	0.3548	0.3548	0.3245	0.3333	0.3333
1.61E-03	2.18E-05	6.74E-04	1.58E-03	1.97E-05	6.55E-04	1.28E-03	8.49E-06	4.63E-04	1.19E-03	5.16E-06	4.36E-04	0.5830	0.6071	0.6071	0.5826	0.6207	0.6207	0.5831	0.6129	0.6129	0.5831	0.6111	0.6111
2.45E-03	3.34E-05	1.03E-03	2.40E-03	2.85E-05	9.47E-04	1.94E-03	1.30E-05	7.07E-04	1.80E-03	7.74E-06	6.54E-04	0.8856	0.9286	0.9286	0.8849	0.8966	0.8966	0.8859	0.9355	0.9355	0.8859	0.9167	0.9167
2.53E-03	3.47E-05	1.07E-03	2.47E-03	2.96E-05	9.83E-04	2.00E-03	1.34E-05	7.31E-04	1.86E-03	7.98E-06	6.74E-04	0.9139	0.9643	0.9643	0.9131	0.9310	0.9310	0.9141	0.9677	0.9677	0.9145	0.9444	0.9444
2.59E-03	3.47E-05	1.07E-03	2.53E-03	2.96E-05	9.83E-04	2.05E-03	1.34E-05	7.31E-04	1.90E-03	7.98E-06	6.74E-04	0.9348	0.9643	0.9643	0.9351	0.9310	0.9310	0.9356	0.9677	0.9677	0.9361	0.9444	0.9444
2.71E-03	3.60E-05	1.11E-03	2.65E-03	3.17E-05	1.06E-03	2.15E-03	1.38E-05	7.56E-04	1.99E-03	8.45E-06	7.14E-04	0.9791	1.0000	1.0000	0.9792	1.0000	1.0000	0.9797	1.0000	1.0000	0.9803	1.0000	1.0000
2.77E-03	3.60E-05	1.11E-03	2.71E-03	3.17E-05	1.06E-03	2.19E-03	1.38E-05	7.56E-04	2.03E-03	8.45E-06	7.14E-04	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2.69E-03	3.47E-05	1.07E-03	2.63E-03	2.96E-05	9.83E-04	2.13E-03	1.34E-05	7.31E-04	1.98E-03	7.98E-06	6.74E-04	0.9717	0.9643	0.9643	0.9718	0.9310	0.9310	0.9718	0.9677	0.9677	0.9725	0.9444	0.9444
2.65E-03	3.47E-05	1.07E-03	2.60E-03	2.96E-05	9.83E-04	2.10E-03	1.34E-05	7.31E-04	1.95E-03	7.98E-06	6.74E-04	0.9594	0.9643	0.9643	0.9596	0.9310	0.9310	0.9593	0.9677	0.9677	0.9597	0.9444	0.9444
2.60E-03	3.47E-05	1.07E-03	2.55E-03	2.96E-05	9.83E-04	2.06E-03	1.34E-05	7.31E-04	1.91E-03	7.98E-06	6.74E-04	0.9397	0.9643	0.9643	0.9400	0.9310	0.9310	0.9412	0.9677	0.9677	0.9410	0.9444	0.9444
2.62E-03	3.47E-05	1.07E-03	2.57E-03	2.96E-05	9.83E-04	2.08E-03	1.34E-05	7.31E-04	1.93E-03	7.98E-06	6.74E-04	0.9483	0.9643	0.9643	0.9486	0.9310	0.9310	0.9492	0.9677	0.9677	0.9489	0.9444	0.9444
2.62E-03	3.47E-05	1.07E-03	2.57E-03	2.96E-05	9.83E-04	2.08E-03	1.34E-05	7.31E-04	1.93E-03	7.98E-06	6.74E-04	0.9483	0.9643	0.9643	0.9486	0.9310	0.9310	0.9492	0.9677	0.9677	0.9489	0.9444	0.9444
2.62E-03	3.47E-05	1.07E-03	2.57E-03	2.96E-05	9.83E-04	2.08E-03	1.34E-05	7.31E-04	1.93E-03	7.98E-06	6.74E-04	0.9483	0.9643	0.9643	0.9486	0.9310	0.9310	0.9492	0.9677	0.9677	0.9489	0.9444	0.9444
2.63E-03	3.47E-05	1.07E-03	2.58E-03	2.96E-05	9.83E-04	2.09E-03	1.34E-05	7.31E-04	1.94E-03	7.98E-06	6.74E-04	0.9520	0.9643	0.9643	0.9523	0.9310	0.9310	0.9525	0.9677	0.9677	0.9528	0.9444	0.9444
2.63E-03	3.47E-05	1.07E-03	2.58E-03	2.96E-05	9.83E-04	2.09E-03	1.34E-05	7.31E-04	1.94E-03	7.98E-06	6.74E-04	0.9508	0.9643	0.9643	0.9510	0.9310	0.9310	0.9514	0.9677	0.9677	0.9518	0.9444	0.9444
2.51E-03	3.34E-05	1.03E-03	2.46E-03	2.85E-05	9.47E-04	1.99E-03	1.30E-05	7.07E-04	1.85E-03	7.74E-06	6.54E-04	0.9077	0.9286	0.9286	0.9082	0.8966	0.8966	0.9085	0.9355	0.9355	0.9086	0.9167	0.9167
2.26E-03	2.95E-05	9.12E-04	2.21E-03	2.52E-05	8.37E-04	1.79E-03	1.12E-05	6.10E-04	1.66E-03	6.80E-06	5.75E-04	0.8155	0.8214	0.8214	0.8152	0.7931	0.7931	0.8158	0.8065	0.8065	0.8161	0.8056	0.8056
2.16E-03	2.82E-05	8.72E-04	2.12E-03	2.41E-05	8.01E-04	1.72E-03	1.07E-05	5.85E-04	1.59E-03	6.34E-06	5.35E-04	0.7811	0.7857	0.7857	0.7821	0.7586	0.7586	0.7819	0.7742	0.7742	0.7827	0.7500	0.7500
2.06E-03	2.70E-05	8.32E-04	2.01E-03	2.30E-05	7.65E-04	1.63E-03	1.03E-05	5.61E-04	1.51E-03	6.10E-06	5.16E-04	0.7429	0.7500	0.7500	0.7430	0.7241	0.7241	0.7435	0.7419	0.7419	0.7434	0.7222	0.7222
1.67E-03	2.18E-05	6.74E-04	1.64E-03	1.97E-05	6.55E-04	1.33E-03	8.49E-06	4.63E-04	1.23E-03	5.16E-06	4.36E-04	0.6052	0.6071	0.6071	0.6059	0.6207	0.6207	0.6056	0.6129	0.6129	0.6057	0.6111	0.6111
2.77E-03	**3.60E-05**	**1.11E-03**	**2.71E-03**	**3.17E-05**	**1.06E-03**	**2.19E-03**	**1.38E-05**	**7.56E-04**	**2.03E-03**	**8.45E-06**	**7.14E-04**												
Maximum																							

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
1.45E-03	1.99E-05	6.15E-04	1.42E-03	1.70E-05	5.65E-04	1.15E-03	6.93E-06	3.78E-04	1.07E-03	4.30E-06	3.64E-04	0.3670	0.3438	0.3438	0.3664	0.3438	0.3438	0.3672	0.3235	0.3235	0.3670	0.3333	0.3333
9.94E-04	1.99E-05	6.15E-04	9.73E-04	1.70E-05	5.65E-04	7.90E-04	6.93E-06	3.78E-04	7.31E-04	4.30E-06	3.64E-04	0.2515	0.3438	0.3438	0.2515	0.3438	0.3438	0.2522	0.3235	0.3235	0.2515	0.3333	0.3333
8.21E-04	1.99E-05	6.15E-04	8.05E-04	1.70E-05	5.65E-04	6.54E-04	6.93E-06	3.78E-04	6.04E-04	4.30E-06	3.64E-04	0.2078	0.3438	0.3438	0.2080	0.3438	0.3438	0.2087	0.3235	0.3235	0.2078	0.3333	0.3333
6.00E-04	2.54E-05	7.83E-04	5.89E-04	2.16E-05	7.19E-04	4.76E-04	9.46E-06	5.16E-04	4.43E-04	5.63E-06	4.76E-04	0.1519	0.4375	0.4375	0.1524	0.4375	0.4375	0.1518	0.4412	0.4412	0.1524	0.4359	0.4359
7.49E-04	3.26E-05	1.01E-03	7.30E-04	2.78E-05	9.25E-04	5.91E-04	1.20E-05	6.54E-04	5.50E-04	7.28E-06	6.16E-04	0.1896	0.5625	0.5625	0.1886	0.5625	0.5625	0.1886	0.5588	0.5588	0.1893	0.5641	0.5641
1.60E-03	3.80E-05	1.17E-03	1.57E-03	3.24E-05	1.08E-03	1.27E-03	1.45E-05	7.91E-04	1.18E-03	8.61E-06	7.27E-04	0.4058	0.6563	0.6563	0.4063	0.6563	0.6563	0.4063	0.6765	0.6765	0.4058	0.6667	0.6667
2.57E-03	4.17E-05	1.29E-03	2.52E-03	3.55E-05	1.18E-03	2.04E-03	1.58E-05	8.60E-04	1.89E-03	9.60E-06	8.11E-04	0.6501	0.7188	0.7188	0.6505	0.7188	0.7188	0.6507	0.7353	0.7353	0.6505	0.7436	0.7436
3.33E-03	4.89E-05	1.51E-03	3.26E-03	4.17E-05	1.39E-03	2.64E-03	1.89E-05	1.03E-03	2.45E-03	1.13E-05	9.51E-04	0.8420	0.8438	0.8438	0.8416	0.8438	0.8438	0.8415	0.8824	0.8824	0.8417	0.8718	0.8718
3.48E-03	5.25E-05	1.62E-03	3.41E-03	4.63E-05	1.54E-03	2.76E-03	2.02E-05	1.10E-03	2.56E-03	1.23E-05	1.04E-03	0.8809	0.9063	0.9063	0.8815	0.9375	0.9375	0.8817	0.9412	0.9412	0.8816	0.9487	0.9487
3.53E-03	5.44E-05	1.68E-03	3.45E-03	4.79E-05	1.59E-03	2.79E-03	2.08E-05	1.14E-03	2.59E-03	1.26E-05	1.06E-03	0.8919	0.9375	0.9375	0.8912	0.9688	0.9688	0.8917	0.9706	0.9706	0.8913	0.9744	0.9744
3.41E-03	5.80E-05	1.79E-03	3.34E-03	4.94E-05	1.64E-03	2.71E-03	2.14E-05	1.17E-03	2.51E-03	1.29E-05	1.09E-03	0.8627	1.0000	1.0000	0.8634	1.0000	1.0000	0.8638	1.0000	1.0000	0.8631	1.0000	1.0000
3.35E-03	5.80E-05	1.79E-03	3.27E-03	4.94E-05	1.64E-03	2.65E-03	2.14E-05	1.17E-03	2.46E-03	1.29E-05	1.09E-03	0.8469	1.0000	1.0000	0.8464	1.0000	1.0000	0.8471	1.0000	1.0000	0.8466	1.0000	1.0000
3.48E-03	5.25E-05	1.62E-03	3.41E-03	4.63E-05	1.54E-03	2.76E-03	2.02E-05	1.10E-03	2.56E-03	1.23E-05	1.04E-03	0.8809	0.9063	0.9063	0.8815	0.9375	0.9375	0.8817	0.9412	0.9412	0.8816	0.9487	0.9487
3.66E-03	5.25E-05	1.62E-03	3.58E-03	4.63E-05	1.54E-03	2.90E-03	2.02E-05	1.10E-03	2.69E-03	1.23E-05	1.04E-03	0.9259	0.9063	0.9063	0.9262	0.9375	0.9375	0.9263	0.9412	0.9412	0.9262	0.9487	0.9487
3.95E-03	3.99E-05	1.23E-03	3.87E-03	3.40E-05	1.13E-03	3.13E-03	1.51E-05	8.26E-04	2.91E-03	9.27E-06	7.83E-04	1.0000	0.6875	0.6875	1.0000	0.6875	0.6875	1.0000	0.7059	0.7059	1.0000	0.7179	0.7179
3.65E-03	2.54E-05	7.83E-04	3.58E-03	2.16E-05	7.19E-04	2.90E-03	9.46E-06	5.16E-04	2.69E-03	5.63E-06	4.76E-04	0.9247	0.4375	0.4375	0.9250	0.4375	0.4375	0.9252	0.4412	0.4412	0.9252	0.4359	0.4359
3.36E-03	2.72E-05	8.39E-04	3.28E-03	2.32E-05	7.71E-04	2.66E-03	1.01E-05	5.51E-04	2.47E-03	5.96E-06	5.04E-04	0.8493	0.4688	0.4688	0.8489	0.4688	0.4688	0.8493	0.4706	0.4706	0.8495	0.4615	0.4615
3.16E-03	3.26E-05	1.01E-03	3.09E-03	2.78E-05	9.25E-04	2.51E-03	1.20E-05	6.54E-04	2.33E-03	7.28E-06	6.16E-04	0.7995	0.5625	0.5625	0.7993	0.5625	0.5625	0.8002	0.5588	0.5588	0.8000	0.5641	0.5641
3.09E-03	3.44E-05	1.06E-03	3.03E-03	2.93E-05	9.76E-04	2.46E-03	1.32E-05	7.23E-04	2.28E-03	7.95E-06	6.72E-04	0.7825	0.5938	0.5938	0.7823	0.5938	0.5938	0.7835	0.6176	0.6176	0.7835	0.6154	0.6154
3.21E-03	2.72E-05	8.39E-04	3.15E-03	2.32E-05	7.71E-04	2.55E-03	1.01E-05	5.51E-04	2.37E-03	5.96E-06	5.04E-04	0.8129	0.4688	0.4688	0.8138	0.4688	0.4688	0.8136	0.4706	0.4706	0.8136	0.4615	0.4615
3.04E-03	2.72E-05	8.39E-04	2.98E-03	2.32E-05	7.71E-04	2.41E-03	1.01E-05	5.51E-04	2.24E-03	5.96E-06	5.04E-04	0.7704	0.4688	0.4688	0.7703	0.4688	0.4688	0.7701	0.4706	0.4706	0.7699	0.4615	0.4615
2.89E-03	2.72E-05	8.39E-04	2.83E-03	2.32E-05	7.71E-04	2.29E-03	1.01E-05	5.51E-04	2.13E-03	5.96E-06	5.04E-04	0.7315	0.4688	0.4688	0.7316	0.4688	0.4688	0.7321	0.4706	0.4706	0.7320	0.4615	0.4615
2.75E-03	2.54E-05	7.83E-04	2.69E-03	2.16E-05	7.19E-04	2.18E-03	9.46E-06	5.16E-04	2.02E-03	5.63E-06	4.76E-04	0.6950	0.4375	0.4375	0.6953	0.4375	0.4375	0.6953	0.4412	0.4412	0.6951	0.4359	0.4359
2.11E-03	2.36E-05	7.27E-04	2.07E-03	2.01E-05	6.68E-04	1.67E-03	8.83E-06	4.82E-04	1.55E-03	5.30E-06	4.48E-04	0.5334	0.4063	0.4063	0.5345	0.4063	0.4063	0.5335	0.4118	0.4118	0.5340	0.4103	0.4103
3.95E-03	**5.80E-05**	**1.79E-03**	**3.87E-03**	**4.94E-05**	**1.64E-03**	**3.13E-03**	**2.14E-05**	**1.17E-03**	**2.91E-03**	**1.29E-05**	**1.09E-03**												
Maximum																							

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
1.00E-03	1.50E-05	4.62E-04	9.83E-04	1.28E-05	4.24E-04	7.96E-04	5.21E-06	2.84E-04	7.39E-04	3.13E-06	2.64E-04	0.4646	0.5385	0.5385	0.4648	0.5385	0.5385	0.4651	0.5000	0.5000	0.4664	0.5000	0.5000
8.10E-04	8.55E-06	2.64E-04	7.95E-04	7.29E-06	2.43E-04	6.44E-04	3.72E-06	2.03E-04	5.96E-04	1.95E-06	1.65E-04	0.3753	0.3077	0.3077	0.3760	0.3077	0.3077	0.3759	0.3571	0.3571	0.3761	0.3125	0.3125
7.48E-04	8.55E-06	2.64E-04	7.34E-04	7.29E-06	2.43E-04	5.94E-04	3.72E-06	2.03E-04	5.53E-04	1.95E-06	1.65E-04	0.3465	0.3077	0.3077	0.3473	0.3077	0.3077	0.3470	0.3571	0.3571	0.3487	0.3125	0.3125
6.40E-04	8.55E-06	2.64E-04	6.24E-04	7.29E-06	2.43E-04	5.08E-04	3.72E-06	2.03E-04	4.70E-04	1.95E-06	1.65E-04	0.2966	0.3077	0.3077	0.2950	0.3077	0.3077	0.2964	0.3571	0.3571	0.2962	0.3125	0.3125
7.03E-04	8.55E-06	2.64E-04	6.84E-04	7.29E-06	2.43E-04	5.57E-04	3.72E-06	2.03E-04	5.16E-04	1.95E-06	1.65E-04	0.3255	0.3077	0.3077	0.3238	0.3077	0.3077	0.3253	0.3571	0.3571	0.3256	0.3125	0.3125
1.26E-03	1.71E-05	5.28E-04	1.23E-03	1.46E-05	4.85E-04	9.99E-04	5.95E-06	3.25E-04	9.26E-04	3.91E-06	3.30E-04	0.5827	0.6154	0.6154	0.5822	0.6154	0.6154	0.5831	0.5714	0.5714	0.5840	0.6250	0.6250
1.91E-03	2.57E-05	7.92E-04	1.87E-03	2.19E-05	7.28E-04	1.51E-03	9.67E-06	5.28E-04	1.41E-03	5.86E-06	4.95E-04	0.8845	0.9231	0.9231	0.8851	0.9231	0.9231	0.8843	0.9286	0.9286	0.8866	0.9375	0.9375
1.97E-03	2.78E-05	8.58E-04	1.93E-03	2.37E-05	7.88E-04	1.56E-03	1.04E-05	5.68E-04	1.45E-03	6.25E-06	5.28E-04	0.9134	1.0000	1.0000	0.9138	1.0000	1.0000	0.9133	1.0000	1.0000	0.9139	1.0000	1.0000
2.02E-03	2.78E-05	8.58E-04	1.98E-03	2.37E-05	7.88E-04	1.60E-03	1.04E-05	5.68E-04	1.49E-03	6.25E-06	5.28E-04	0.9370	1.0000	1.0000	0.9347	1.0000	1.0000	0.9349	1.0000	1.0000	0.9370	1.0000	1.0000
2.11E-03	2.78E-05	8.58E-04	2.07E-03	2.37E-05	7.88E-04	1.68E-03	1.04E-05	5.68E-04	1.56E-03	6.25E-06	5.28E-04	0.9790	1.0000	1.0000	0.9791	1.0000	1.0000	0.9783	1.0000	1.0000	0.9811	1.0000	1.0000
2.16E-03	2.78E-05	8.58E-04	2.11E-03	2.37E-05	7.88E-04	1.71E-03	1.04E-05	5.68E-04	1.59E-03	6.25E-06	5.28E-04	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2.10E-03	2.78E-05	8.58E-04	2.05E-03	2.37E-05	7.88E-04	1.66E-03	1.04E-05	5.68E-04	1.54E-03	6.25E-06	5.28E-04	0.9711	1.0000	1.0000	0.9713	1.0000	1.0000	0.9711	1.0000	1.0000	0.9727	1.0000	1.0000
2.07E-03	2.78E-05	8.58E-04	2.03E-03	2.37E-05	7.88E-04	1.64E-03	1.04E-05	5.68E-04	1.52E-03	6.25E-06	5.28E-04	0.9580	1.0000	1.0000	0.9582	1.0000	1.0000	0.9590	1.0000	1.0000	0.9601	1.0000	1.0000
2.03E-03	2.78E-05	8.58E-04	1.99E-03	2.37E-05	7.88E-04	1.61E-03	1.04E-05	5.68E-04	1.50E-03	6.25E-06	5.28E-04	0.9423	1.0000	1.0000	0.9426	1.0000	1.0000	0.9422	1.0000	1.0000	0.9433	1.0000	1.0000
2.05E-03	2.78E-05	8.58E-04	2.00E-03	2.37E-05	7.88E-04	1.62E-03	1.04E-05	5.68E-04	1.51E-03	6.25E-06	5.28E-04	0.9475	1.0000	1.0000	0.9478	1.0000	1.0000	0.9470	1.0000	1.0000	0.9496	1.0000	1.0000
2.05E-03	2.78E-05	8.58E-04	2.00E-03	2.37E-05	7.88E-04	1.62E-03	1.04E-05	5.68E-04	1.51E-03	6.25E-06	5.28E-04	0.9475	1.0000	1.0000	0.9478	1.0000	1.0000	0.9470	1.0000	1.0000	0.9496	1.0000	1.0000
2.05E-03	2.78E-05	8.58E-04	2.01E-03	2.37E-05	7.88E-04	1.63E-03	1.04E-05	5.68E-04	1.51E-03	6.25E-06	5.28E-04	0.9501	1.0000	1.0000	0.9504	1.0000	1.0000	0.9494	1.0000	1.0000	0.9517	1.0000	1.0000
2.06E-03	2.78E-05	8.58E-04	2.01E-03	2.37E-05	7.88E-04	1.63E-03	1.04E-05	5.68E-04	1.52E-03	6.25E-06	5.28E-04	0.9528	1.0000	1.0000	0.9530	1.0000	1.0000	0.9518	1.0000	1.0000	0.9559	1.0000	1.0000
2.05E-03	2.78E-05	8.58E-04	2.01E-03	2.37E-05	7.88E-04	1.63E-03	1.04E-05	5.68E-04	1.51E-03	6.25E-06	5.28E-04	0.9501	1.0000	1.0000	0.9504	1.0000	1.0000	0.9494	1.0000	1.0000	0.9517	1.0000	1.0000
1.96E-03	2.57E-05	7.92E-04	1.92E-03	2.19E-05	7.28E-04	1.55E-03	9.67E-06	5.28E-04	1.44E-03	5.86E-06	4.95E-04	0.9081	0.9231	0.9231	0.9060	0.9231	0.9231	0.9060	0.9286	0.9286	0.9097	0.9375	0.9375
1.76E-03	2.35E-05	7.26E-04	1.72E-03	2.00E-05	6.67E-04	1.39E-03	8.93E-06	4.87E-04	1.30E-03	5.47E-06	4.62E-04	0.8163	0.8462	0.8462	0.8146	0.8462	0.8462	0.8145	0.8571	0.8571	0.8172	0.8750	0.8750
1.68E-03	2.14E-05	6.60E-04	1.65E-03	1.82E-05	6.06E-04	1.34E-03	8.18E-06	4.47E-04	1.24E-03	4.69E-06	3.96E-04	0.7795	0.7692	0.7692	0.7807	0.7692	0.7692	0.7807	0.7857	0.7857	0.7815	0.7500	0.7500
1.60E-03	2.14E-05	6.60E-04	1.57E-03	1.82E-05	6.06E-04	1.28E-03	8.18E-06	4.47E-04	1.18E-03	4.69E-06	3.96E-04	0.7428	0.7692	0.7692	0.7441	0.7692	0.7692	0.7446	0.7857	0.7857	0.7458	0.7500	0.7500
1.31E-03	1.71E-05	5.28E-04	1.28E-03	1.46E-05	4.85E-04	1.04E-03	5.95E-06	3.25E-04	9.63E-04	3.91E-06	3.30E-04	0.6063	0.6154	0.6154	0.6057	0.6154	0.6154	0.6048	0.5714	0.5714	0.6071	0.6250	0.6250
2.16E-03	**2.78E-05**	**8.58E-04**	**2.11E-03**	**2.37E-05**	**7.88E-04**	**1.71E-03**	**1.04E-05**	**5.68E-04**	**1.59E-03**	**6.25E-06**	**5.28E-04**												
Maximum																							

SB ON FROM ARGYLE AVE															2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2013 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2013 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.203	75	82	82	89	103	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
1:00:00	0.203	61	67	67	73	84	2	2	2	2	3	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
2:00:00	0.203	56	61	62	67	77	2	2	2	2	3	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
3:00:00	0.203	48	52	53	57	66	2	2	2	2	3	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
4:00:00	0.203	52	57	57	62	71	2	2	2	2	3	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
5:00:00	0.203	94	103	103	112	129	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
6:00:00	0.203	143	156	157	170	196	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
7:00:00	0.203	147	161	162	175	201	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
8:00:00	0.203	151	165	166	180	207	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
9:00:00	0.203	158	173	174	188	216	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
10:00:00	0.203	161	176	177	192	220	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
11:00:00	0.203	157	172	173	187	215	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
12:00:00	0.203	155	170	170	185	212	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
13:00:00	0.203	152	166	167	181	208	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
14:00:00	0.203	153	167	168	182	209	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
15:00:00	0.203	153	167	168	182	209	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
16:00:00	0.203	153	167	168	182	209	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
17:00:00	0.203	154	168	169	183	211	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
18:00:00	0.203	153	167	168	182	209	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
19:00:00	0.203	146	160	160	174	200	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
20:00:00	0.203	131	143	144	156	179	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
21:00:00	0.203	126	138	138	150	173	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
22:00:00	0.203	120	131	132	143	164	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
23:00:00	0.203	98	107	108	117	134	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040

NB OFF TO GOWER/BEACHWOOD															2022			2022-2023			2024-2037			2022-2051		
Time	Length (mi)	2013 Auto Flow (vehicle/hr)	2022 Auto Flow (vehicle/hr)	2022-2023 Average Auto Flow (vehicle/hr)	2024-2037 Average Auto Flow (vehicle/hr)	2038-2051 Average Auto Flow (vehicle/hr)	2013 Truck Flow (vehicle/hr)	2022 Truck Flow (vehicle/hr)	2022-2023 Average Truck Flow (vehicle/hr)	2024-2037 Average Truck Flow (vehicle/hr)	2038-2051 Average Truck Flow (vehicle/hr)	Auto Speed (mph)	Truck Speed (mph)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)	Auto TOG EF (Gas) (g/mi)	Truck PM10 EF (Dsl) (g/mi)	Truck TOG EF (Dsl) (g/mi)
0:00:00	0.128	95	104	104	113	130	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
1:00:00	0.128	65	71	71	77	89	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
2:00:00	0.128	54	59	59	64	74	3	3	3	4	4	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
3:00:00	0.128	39	43	43	46	53	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
4:00:00	0.128	49	54	54	58	67	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
5:00:00	0.128	105	115	115	125	144	7	8	8	8	10	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
6:00:00	0.128	168	184	185	200	230	7	8	8	8	10	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
7:00:00	0.128	218	238	240	260	298	8	9	9	10	11	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
8:00:00	0.128	228	249	251	272	312	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
9:00:00	0.128	230	252	253	274	315	10	11	11	12	14	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
10:00:00	0.128	223	244	245	266	305	10	11	11	12	14	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
11:00:00	0.128	219	240	241	261	300	10	11	11	12	14	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
12:00:00	0.128	228	249	251	272	312	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
13:00:00	0.128	240	262	264	286	329	9	10	10	11	12	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
14:00:00	0.128	258	282	284	307	353	7	8	8	8	10	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
15:00:00	0.128	239	261	263	285	327	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
16:00:00	0.128	220	241	242	262	301	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
17:00:00	0.128	207	226	228	247	283	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
18:00:00	0.128	202	221	222	241	277	6	7	7	7	8	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
19:00:00	0.128	210	230	231	250	288	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
20:00:00	0.128	199	218	219	237	272	5	5	5	6	7	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
21:00:00	0.128	189	207	208	225	259	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
22:00:00	0.128	180	197	198	214	246	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040
23:00:00	0.128	138	151	152	164	189	4	4	4	5	5	15	15	0.1037	0.0391	1.2073	0.1010	0.0333	1.1091	0.0755	0.0136	0.7427	0.0609	0.0071	0.6040

Source: ESA, 2020.

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
4.79E-04	6.61E-06	2.04E-04	4.67E-04	5.64E-06	1.88E-04	3.79E-04	3.07E-06	1.67E-04	3.54E-04	1.61E-06	1.36E-04	0.4659	0.4286	0.4286	0.4633	0.4286	0.4286	0.4635	0.5714	0.5714	0.4682	0.5000	0.5000
3.91E-04	4.41E-06	1.36E-04	3.81E-04	3.76E-06	1.25E-04	3.11E-04	1.53E-06	8.37E-05	2.88E-04	1.21E-06	1.02E-04	0.3807	0.2857	0.2857	0.3785	0.2857	0.2857	0.3802	0.2857	0.2857	0.3818	0.3750	0.3750
3.56E-04	4.41E-06	1.36E-04	3.53E-04	3.76E-06	1.25E-04	2.85E-04	1.53E-06	8.37E-05	2.64E-04	1.21E-06	1.02E-04	0.3466	0.2857	0.2857	0.3503	0.2857	0.2857	0.3490	0.2857	0.2857	0.3500	0.3750	0.3750
3.04E-04	4.41E-06	1.36E-04	3.02E-04	3.76E-06	1.25E-04	2.42E-04	1.53E-06	8.37E-05	2.27E-04	1.21E-06	1.02E-04	0.2955	0.2857	0.2857	0.2994	0.2857	0.2857	0.2969	0.2857	0.2857	0.3000	0.3750	0.3750
3.33E-04	4.41E-06	1.36E-04	3.24E-04	3.76E-06	1.25E-04	2.64E-04	1.53E-06	8.37E-05	2.44E-04	1.21E-06	1.02E-04	0.3239	0.2857	0.2857	0.3220	0.2857	0.2857	0.3229	0.2857	0.2857	0.3227	0.3750	0.3750
6.02E-04	6.61E-06	2.04E-04	5.86E-04	5.64E-06	1.88E-04	4.76E-04	3.07E-06	1.67E-04	4.43E-04	1.61E-06	1.36E-04	0.5852	0.4286	0.4286	0.5819	0.4286	0.4286	0.5833	0.5714	0.5714	0.5864	0.5000	0.5000
9.11E-04	1.10E-05	3.40E-04	8.93E-04	9.40E-06	3.13E-04	7.23E-04	4.60E-06	2.51E-04	6.73E-04	2.82E-06	2.38E-04	0.8864	0.7143	0.7143	0.8870	0.7143	0.7143	0.8854	0.8571	0.8571	0.8909	0.8750	0.8750
9.41E-04	1.10E-05	3.40E-04	9.22E-04	9.40E-06	3.13E-04	7.45E-04	4.60E-06	2.51E-04	6.90E-04	2.82E-06	2.38E-04	0.9148	0.7143	0.7143	0.9153	0.7143	0.7143	0.9115	0.8571	0.8571	0.9136	0.8750	0.8750
9.64E-04	1.10E-05	3.40E-04	9.45E-04	9.40E-06	3.13E-04	7.66E-04	4.60E-06	2.51E-04	7.11E-04	2.82E-06	2.38E-04	0.9375	0.7143	0.7143	0.9379	0.7143	0.7143	0.9375	0.8571	0.8571	0.9409	0.8750	0.8750
1.01E-03	1.54E-05	4.76E-04	9.90E-04	1.32E-05	4.38E-04	8.00E-04	5.37E-06	2.93E-04	7.42E-04	3.22E-06	2.72E-04	0.9830	1.0000	1.0000	0.9831	1.0000	1.0000	0.9792	1.0000	1.0000	0.9818	1.0000	1.0000
1.03E-03	1.54E-05	4.76E-04	1.01E-03	1.32E-05	4.38E-04	8.17E-04	5.37E-06	2.93E-04	7.55E-04	3.22E-06	2.72E-04	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.00E-03	1.54E-05	4.76E-04	9.85E-04	1.32E-05	4.38E-04	7.96E-04	5.37E-06	2.93E-04	7.38E-04	3.22E-06	2.72E-04	0.9773	1.0000	1.0000	0.9774	1.0000	1.0000	0.9740	1.0000	1.0000	0.9773	1.0000	1.0000
9.93E-04	1.10E-05	3.40E-04	9.67E-04	9.40E-06	3.13E-04	7.87E-04	4.60E-06	2.51E-04	7.28E-04	2.82E-06	2.38E-04	0.9659	0.7143	0.7143	0.9605	0.7143	0.7143	0.9635	0.8571	0.8571	0.9636	0.8750	0.8750
9.70E-04	1.10E-05	3.40E-04	9.50E-04	9.40E-06	3.13E-04	7.70E-04	4.60E-06	2.51E-04	7.14E-04	2.82E-06	2.38E-04	0.9432	0.7143	0.7143	0.9435	0.7143	0.7143	0.9427	0.8571	0.8571	0.9455	0.8750	0.8750
9.76E-04	1.10E-05	3.40E-04	9.56E-04	9.40E-06	3.13E-04	7.74E-04	4.60E-06	2.51E-04	7.18E-04	2.82E-06	2.38E-04	0.9489	0.7143	0.7143	0.9492	0.7143	0.7143	0.9479	0.8571	0.8571	0.9500	0.8750	0.8750
9.76E-04	1.10E-05	3.40E-04	9.56E-04	9.40E-06	3.13E-04	7.74E-04	4.60E-06	2.51E-04	7.18E-04	2.82E-06	2.38E-04	0.9489	0.7143	0.7143	0.9492	0.7143	0.7143	0.9479	0.8571	0.8571	0.9500	0.8750	0.8750
9.76E-04	1.10E-05	3.40E-04	9.56E-04	9.40E-06	3.13E-04	7.74E-04	4.60E-06	2.51E-04	7.18E-04	2.82E-06	2.38E-04	0.9489	0.7143	0.7143	0.9492	0.7143	0.7143	0.9479	0.8571	0.8571	0.9500	0.8750	0.8750
9.81E-04	1.10E-05	3.40E-04	9.62E-04	9.40E-06	3.13E-04	7.79E-04	4.60E-06	2.51E-04	7.25E-04	2.82E-06	2.38E-04	0.9545	0.7143	0.7143	0.9548	0.7143	0.7143	0.9531	0.8571	0.8571	0.9591	0.8750	0.8750
9.76E-04	1.54E-05	4.76E-04	9.56E-04	1.32E-05	4.38E-04	7.74E-04	5.37E-06	2.93E-04	7.18E-04	3.22E-06	2.72E-04	0.9489	1.0000	1.0000	0.9492	1.0000	1.0000	0.9479	1.0000	1.0000	0.9500	1.0000	1.0000
9.35E-04	1.10E-05	3.40E-04	9.11E-04	9.40E-06	3.13E-04	7.40E-04	4.60E-06	2.51E-04	6.87E-04	2.82E-06	2.38E-04	0.9091	0.7143	0.7143	0.9040	0.7143	0.7143	0.9063	0.8571	0.8571	0.9091	0.8750	0.8750
8.35E-04	1.10E-05	3.40E-04	8.19E-04	9.40E-06	3.13E-04	6.64E-04	4.60E-06	2.51E-04	6.15E-04	2.82E-06	2.38E-04	0.8125	0.7143	0.7143	0.8136	0.7143	0.7143	0.8125	0.8571	0.8571	0.8136	0.8750	0.8750
8.06E-04	8.82E-06	2.72E-04	7.85E-04	7.52E-06	2.50E-04	6.38E-04	3.83E-06	2.09E-04	5.94E-04	2.01E-06	1.70E-04	0.7841	0.5714	0.5714	0.7797	0.5714	0.5714	0.7813	0.7143	0.7143	0.7864	0.6250	0.6250
7.65E-04	8.82E-06	2.72E-04	7.51E-04	7.52E-06	2.50E-04	6.08E-04	3.83E-06	2.09E-04	5.63E-04	2.01E-06	1.70E-04	0.7443	0.5714	0.5714	0.7458	0.5714	0.5714	0.7448	0.7143	0.7143	0.7455	0.6250	0.6250
6.25E-04	6.61E-06	2.04E-04	6.15E-04	5.64E-06	1.88E-04	4.98E-04	3.07E-06	1.67E-04	4.60E-04	1.61E-06	1.36E-04	0.6080	0.4286	0.4286	0.6102	0.4286	0.4286	0.6094	0.5714	0.5714	0.6091	0.5000	0.5000
1.03E-03	**1.54E-05**	**4.76E-04**	**1.01E-03**	**1.32E-05**	**4.38E-04**	**8.17E-04**	**5.37E-06**	**2.93E-04**	**7.55E-04**	**3.22E-06**	**2.72E-04**												
Maximum																							

2022			2022-2023			2024-2037			2038-2051			2022			2022-2023			2024-2037			2038-2051		
Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Emissions (g/s)	Truck PM Emissions (g/s)	Truck TOG Emissions (g/s)	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar	Auto TOG Scalar	Truck PM Scalar	Truck TOG Scalar
3.84E-04	4.18E-06	1.29E-04	3.74E-04	3.56E-06	1.19E-04	3.04E-04	1.94E-06	1.06E-04	2.82E-04	1.02E-06	8.61E-05	0.3688	0.2727	0.2727	0.3662	0.2727	0.2727	0.3681	0.3333	0.3333	0.3683	0.2857	0.2857
2.62E-04	4.18E-06	1.29E-04	2.55E-04	3.56E-06	1.19E-04	2.07E-04	1.94E-06	1.06E-04	1.93E-04	1.02E-06	8.61E-05	0.2518	0.2727	0.2727	0.2500	0.2727	0.2727	0.2508	0.3333	0.3333	0.2521	0.2857	0.2857
2.18E-04	4.18E-06	1.29E-04	2.12E-04	3.56E-06	1.19E-04	1.72E-04	1.94E-06	1.06E-04	1.61E-04	1.02E-06	8.61E-05	0.2092	0.2727	0.2727	0.2077	0.2727	0.2727	0.2085	0.3333	0.3333	0.2096	0.2857	0.2857
1.59E-04	5.57E-06	1.72E-04	1.55E-04	4.75E-06	1.58E-04	1.24E-04	2.42E-06	1.32E-04	1.15E-04	1.27E-06	1.08E-04	0.1525	0.3636	0.3636	0.1514	0.3636	0.3636	0.1498	0.4167	0.4167	0.1501	0.3571	0.3571
1.99E-04	9.75E-06	3.01E-04	1.94E-04	8.31E-06	2.77E-04	1.56E-04	3.39E-06	1.85E-04	1.45E-04	2.04E-06	1.72E-04	0.1915	0.6364	0.6364	0.1901	0.6364	0.6364	0.1889	0.5833	0.5833	0.1898	0.5714	0.5714
4.25E-04	1.11E-05	3.44E-04	4.14E-04	9.50E-06	3.16E-04	3.36E-04	3.88E-06	2.12E-04	3.13E-04	2.55E-06	2.15E-04	0.4078	0.7273	0.7273	0.4049	0.7273	0.7273	0.4072	0.6667	0.6667	0.4079	0.7143	0.7143
6.80E-04	1.11E-05	3.44E-04	6.66E-04	9.50E-06	3.16E-04	5.38E-04	3.88E-06	2.12E-04	4.99E-04	2.55E-06	2.15E-04	0.6525	0.7273	0.7273	0.6514	0.7273	0.7273	0.6515	0.6667	0.6667	0.6516	0.7143	0.7143
8.79E-04	1.25E-05	3.87E-04	8.63E-04	1.07E-05	3.56E-04	6.99E-04	4.85E-06	2.65E-04	6.47E-04	2.80E-06	2.37E-04	0.8440	0.8182	0.8182	0.8451	0.8182	0.8182	0.8469	0.8333	0.8333	0.8442	0.7857	0.7857
9.20E-04	1.39E-05	4.30E-04	9.03E-04	1.19E-05	3.95E-04	7.32E-04	5.33E-06	2.91E-04	6.77E-04	3.06E-06	2.58E-04	0.8830	0.9091	0.9091	0.8838	0.9091	0.9091	0.8860	0.9167	0.9167	0.8839	0.8571	0.8571
9.31E-04	1.53E-05	4.73E-04	9.10E-04	1.31E-05	4.35E-04	7.37E-04	5.82E-06	3.18E-04	6.84E-04	3.56E-06	3.01E-04	0.8936	1.0000	1.0000	0.8908	1.0000	1.0000	0.8925	1.0000	1.0000	0.8924	1.0000	1.0000
9.01E-04	1.53E-05	4.73E-04	8.81E-04	1.31E-05	4.35E-04	7.15E-04	5.82E-06	3.18E-04	6.62E-04	3.56E-06	3.01E-04	0.8652	1.0000	1.0000	0.8627	1.0000	1.0000	0.8664	1.0000	1.0000	0.8640	1.0000	1.0000
8.86E-04	1.53E-05	4.73E-04	8.67E-04	1.31E-05	4.35E-04	7.02E-04	5.82E-06	3.18E-04	6.51E-04	3.56E-06	3.01E-04	0.8511	1.0000	1.0000	0.8486	1.0000	1.0000	0.8502	1.0000	1.0000	0.8499	1.0000	1.0000
9.20E-04	1.39E-05	4.30E-04	9.03E-04	1.19E-05	3.95E-04	7.32E-04	5.33E-06	2.91E-04	6.77E-04	3.06E-06	2.58E-04	0.8830	0.9091	0.9091	0.8838	0.9091	0.9091	0.8860	0.9167	0.9167	0.8839	0.8571	0.8571
9.68E-04	1.39E-05	4.30E-04	9.50E-04	1.19E-05	3.95E-04	7.69E-04	5.33E-06	2.91E-04	7.14E-04	3.06E-06	2.58E-04	0.9291	0.9091	0.9091	0.9296	0.9091	0.9091	0.9316	0.9167	0.9167	0.9320	0.8571	0.8571
1.04E-03	1.11E-05	3.44E-04	1.02E-03	9.50E-06	3.16E-04	8.26E-04	3.88E-06	2.12E-04	7.66E-04	2.55E-06	2.15E-04	1.0000	0.7273	0.7273	1.0000	0.7273	0.7273	1.0000	0.6667	0.6667	1.0000	0.7143	0.7143
9.64E-04	5.57E-06	1.72E-04	9.46E-04	4.75E-06	1.58E-04	7.66E-04	2.42E-06	1.32E-04	7.10E-04	1.27E-06	1.08E-04	0.9255	0.3636	0.3636	0.9261	0.3636	0.3636	0.9283	0.4167	0.4167	0.9263	0.3571	0.3571
8.90E-04	6.97E-06	2.15E-04	8.71E-04	5.94E-06	1.98E-04	7.05E-04	2.91E-06	1.59E-04	6.53E-04	1.78E-06	1.51E-04	0.8546	0.4545	0.4545	0.8521	0.4545	0.4545	0.8534	0.5000	0.5000	0.8527	0.5000	0.5000
8.35E-04	9.75E-06	3.01E-04	8.20E-04	8.31E-06	2.77E-04	6.64E-04	3.39E-06	1.85E-04	6.14E-04	2.04E-06	1.72E-04	0.8014	0.6364	0.6364	0.8028	0.6364	0.6364	0.8046	0.5833	0.5833	0.8017	0.5714	0.5714
8.16E-04	9.75E-06	3.01E-04	7.99E-04	8.31E-06	2.77E-04	6.48E-04	3.39E-06	1.85E-04	6.01E-04	2.04E-06	1.72E-04	0.7837	0.6364	0.6364	0.7817	0.6364	0.6364	0.7850	0.5833	0.5833	0.7847	0.5714	0.5714
8.49E-04	6.97E-06	2.15E-04	8.31E-04	5.94E-06	1.98E-04	6.72E-04	2.91E-06	1.59E-04	6.25E-04	1.78E-06	1.51E-04	0.8156	0.4545	0.4545	0.8134	0.4545	0.4545	0.8143	0.5000	0.5000	0.8159	0.5000	0.5000
8.05E-04	6.97E-06	2.15E-04	7.88E-04	5.94E-06	1.98E-04	6.37E-04	2.91E-06	1.59E-04	5.90E-04	1.78E-06	1.51E-04	0.7730	0.4545	0.4545	0.7711	0.4545	0.4545	0.7720	0.5000	0.5000	0.7705	0.5000	0.5000
7.64E-04	5.57E-06	1.72E-04	7.48E-04	4.75E-06	1.58E-04	6.05E-04	2.42E-06	1.32E-04	5.62E-04	1.27E-06	1.08E-04	0.7340	0.3636	0.3636	0.7324	0.3636	0.3636	0.7329	0.4167	0.4167	0.7337	0.3571	0.3571
7.28E-04	5.57E-06	1.72E-04	7.12E-04	4.75E-06	1.58E-04	5.76E-04	2.42E-06	1.32E-04	5.34E-04	1.27E-06	1.08E-04	0.6986	0.3636	0.3636	0.6972	0.3636	0.3636	0.6971	0.4167	0.4167	0.6969	0.3571	0.3571
5.58E-04	5.57E-06	1.72E-04	5.47E-04	4.75E-06	1.58E-04	4.41E-04	2.42E-06	1.32E-04	4.10E-04	1.27E-06	1.08E-04	0.5355	0.3636	0.3636	0.5352	0.3636	0.3636	0.5342	0.4167	0.4167	0.5354	0.3571	0.3571
1.04E-03	**1.53E-05**	**4.73E-04**	**1.02E-03**	**1.31E-05**	**4.35E-04**	**8.26E-04**	**5.82E-06**	**3.18E-04**	**7.66E-04**	**3.56E-06**	**3.01E-04**												
Maximum																							

6220 West Yucca Project
Freeway Health Risk Assessment for Future Project Residents

Maximum Individual Cancer Risk Calculations - Sensitive Receptors (Maximum Impacted Residential Receptor)

Cancer Risk Calculations

	Parameter	Age Bins: 3rd Trimester	0 < 2	2 < 16	16 < 30	Total 30 Year Exposure
DBR	Daily Breathing Rate (L/kg (body weight) per day)	361	1090	572	261	
A	Inhalation absorption factor (default = 1).	1	1	1	1	
EF	Exposure Frequency (days/year)	350	350	350	350	
ED	Exposure Duration (years)	0.25	2	14	14	**30.25**
FAH	Fraction of Time at Home [a]	1.00	1.00	1.00	0.73	
AT	Averaged Exposure Time Period (days)	25550	25550	25550	25550	
ASF	Age Sensitvity Factor	10	10	3	1	
CONC	Toxic Air Contaminant Concentration ($\mu g/m^3$)	1.79E-02	1.43E-02	7.93E-03	6.88E-03	
DOSE	*[= CONC × DBR × A × EF × ED × FAH / AT]* (mg/kg-d)	2.21E-02	4.26E-01	8.70E-01	2.51E-01	
CPF	Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$					
	Diesel Particulate Matter	1.1	1.1	1.1	1.1	
RISK	Cancer Risk (in one million) [= *DOSE × CPF × ASF*]	2.43E-01	4.68E+00	2.87E+00	2.77E-01	**8.07**

Note:

a. FAH values of 1.0 for the child age groups are conservatively used.

Sources:

OEHHA, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (2015), https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed January 2018.

SCAQMD, Permit Application Package “M,” Version 8.0, p. 36, (2015), http://yourstory.aqmd.gov/docs/default-source/planning/risk-assessment/permit1401att-mjune15.pdf?sfvrsn=2. Accessed January 2018.

ESA, 2020.

6220 West Yucca Project
Freeway Health Risk Assessment for Future Project Residents

Maximum Non-cancer Chronic Hazards / Toxicological Endpoints*

Receptor Group	Pollutant	CREL[1]	CONC	WFrac	$CONC_{WF}$	HI	ALIM	BN	CVS	DEV	ENDC	EYE	HEM	IMMUN	KIDN	NS	REPRO	RESP	SK	Threshold	Over?
Project:																					
MEI - Residential	DPM	5.00E+00	1.79E-02	1.00E+00	1.79E-02	3.58E-03	-	-	-	-	-	-	-	-	-	-	-	3.58E-03	-	1.0	NO

Notes:

1. OEHHA/CARB, "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values" and "OEHHA/ARB Approved Chronic Reference Exposure Levels and Target Organs," http://www.arb.ca.gov/toxics/healthval/healthval.htm.

Source: ESA 2018

Where:

$CONC_{WF}$	Pollutant Concentration (μg/m^3) multiplied by the weight fraction
CREL	Chronic Reference Exposure Level
HI	Hazard Index
MEI	Maximally Exposed Individual
WFrac	Weight fraction of speciated component

* Key to Toxicological Endpoints

ALIM	Alimentary Tract	EYE	Eye	NS	Nervous System
BN	Bone	HEM	Hematologic System	REPRO	Reproductive System
CVS	Cardiovascular System	IMMUN	Immune System	RESP	Respiratory System
DEV	Developmental System	KIDN	Kidney	SK	Skin
ENDC	Endocrine System				