APPENDIX A

Health Risk Assessment – October 2013

NORTH CENTRAL AVENUE APARTMENTS PROJECT

HEALTH RISK ASSESSMENT

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1.0 INTRODUCTION

In 2005, the California Air Resources Board (ARB) promulgated an advisory recommendation to avoid siting sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day. According to the ARB, the increased cancer risk is 300 to 1,700 per million within this domain. The strongest association of traffic related emissions with adverse health outcomes was seen within 300 feet of roadways with high truck densities. Notwithstanding, the ARB notes that a site specific analysis would be required to determine the actual risk near a particular land use and should consider factors such as prevailing wind direction, local topography and climate.

Additionally, the California Code of Regulations, Title 14, Section 15126.2(a) recommends that significant environmental effects of a project be assessed when a project brings development and people into an affected area. For the proposed project, adjoining freeway emissions are a potential concern and relevant thresholds and standards exist to determine the impact of vehicular emissions on an exposed population. As such, a health risk assessment was prepared to assess the impact of these emissions on individuals residing at the proposed project site. The analysis also serves to provide a nexus between identified impacts and the effectiveness of available mitigation measures.

In consideration of the above referenced requirement, the assessment and dispersion modeling methodologies used in the preparation of this report were composed of all relevant and appropriate procedures presented by the U.S. Environmental Protection Agency, California Environmental Protection Agency and South Coast Air Quality Management District (SCAQMD). The methodologies and assumptions offered under this regulatory guidance were used to ensure that the assessment effectively quantified residential exposures associated with the generation of contaminant emissions from adjacent mobile source activity.

This report summarizes the protocol used to evaluate contaminant exposures and presents the results of the health risk assessment.

2.0 SITE DESCRIPTION

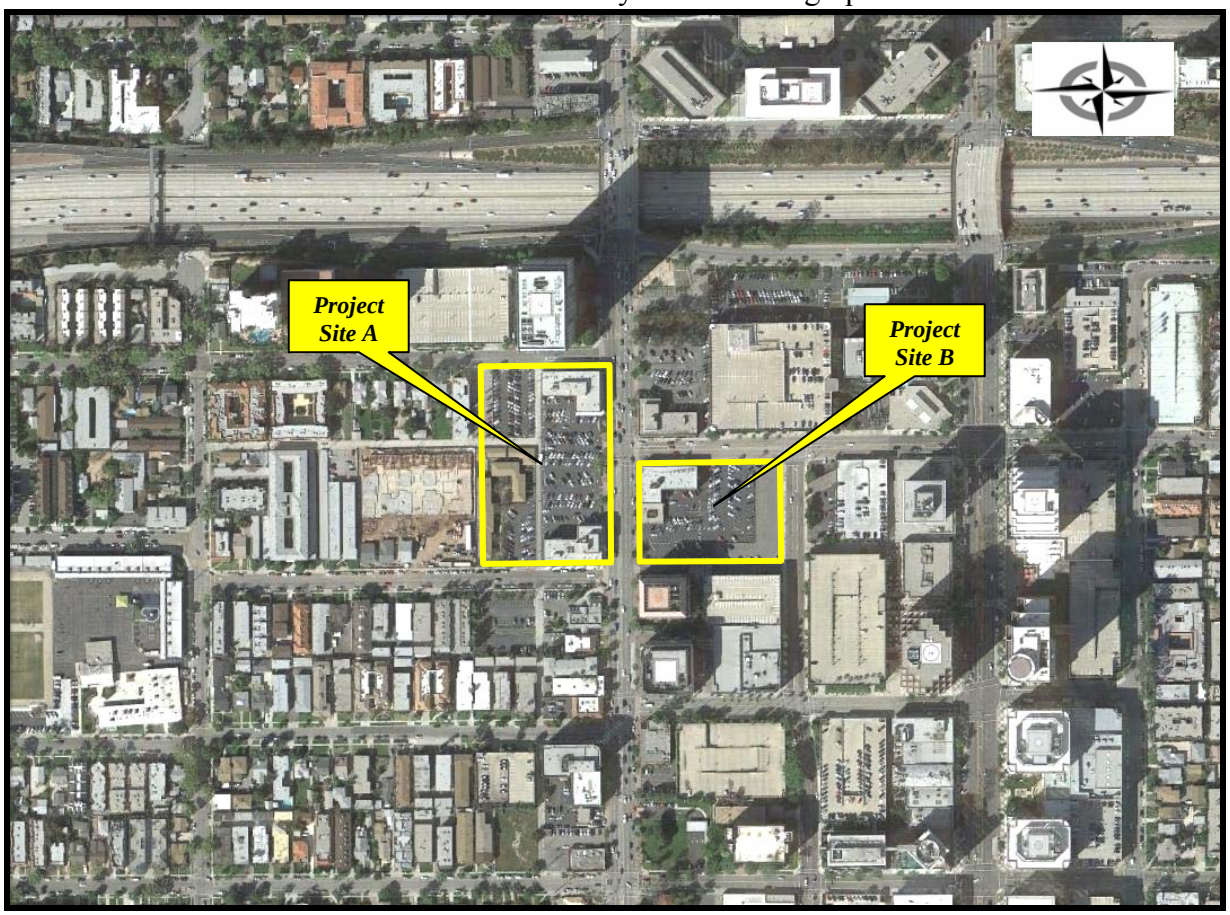
The proposed project consists of the construction of 507 multi-family residential units located on two sites (Site A and B) adjoining Central Avenue in the City of Glendale. Both developments are at grade with multi-level residential apartments and associated above ground parking.

Site A is 3.46 acres (150,703 square feet) and currently developed with two 3-story medical office buildings, surface parking lots and a 2-story multifamily residential apartment. Located in the 600 block of North Central Avenue, the site is bound by Pioneer Drive to the north, Doran Street to the south, Central Avenue to the east and the Doran Gardens residential project/park and a three story multi-family structure to the west.

Site B is approximately 2.0 acres (88,139 SF) and is developed with a 3-story medical office building and a large surface parking lot. The site is located in the 500 block of North Central Avenue and bound by Doran Street to the north, a mid-rise office tower and parking garage to the south, Orange Street to the east and Central Avenue to the west.

The current Glendale General Plan land use designation for the project site is Downtown Specific Plan (DSP). A variety of land uses surround the site with high-rise towers and adjoining low to mid-rise parking structures along Central Avenue. Figure 1 presents an aerial photograph of the proposed project location and adjoining community.

Figure 1
Site Location /Vicinity Aerial Photograph



3.0 SOURCE IDENTIFICATION

The California Department of Transportation (Caltrans), Traffic and Vehicle Data Systems Unit collects and maintains traffic volume counts for vehicles traversing the California state highway system. Discrete data sets are available for main highway segments and adjoining freeway ramp volumes. Table 1 presents the annual average daily traffic volumes (AADT) for the roadway segments considered in the assessment.

Table 1
Freeway Traffic Volumes

Roadway Segment	Postmile	Annual Average Daily Traffic (AADT)
Route 134	6.574	228,000
EB On / Pacific Avenue	6.866	11,100
WB Off / Pacific Avenue	6.858	8,400
WB On / Central Avenue	6.709	16,600
EB Off / Central Avenue	6.690	16,400
EB On / Brand Boulevard	7.255	17,700
WB Off / Brand Boulevard	7.254	17,500

Source: California Department of Transportation, 2013. Traffic and Vehicle Data Systems Unit. Website: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/.

4.0 SOURCE CHARACTERIZATION

In urban communities, vehicle emissions contribute significantly to localized concentrations of air contaminants. Typically, emissions generated from these sources are characterized by vehicle mix, the rate pollutants are generated during the course of travel and the number of vehicles traversing the roadway network.

Currently, emission factors are generated from a series of computer based programs to produce a composite emission rate for vehicles traveling at various speeds within a defined geographical area or along a discrete roadway segment. To account for the emission standards imposed on the California fleet, the ARB has developed the EMFAC2011 emission factor model. EMFAC2011 was utilized to identify pollutant emission rates for total organic gases (TOG), diesel particulates, particulates (PM_{10} and $PM_{2.5}$), carbon monoxide (CO) and nitrogen oxide (NO_x) compounds. To produce a representative vehicle fleet distribution, the assessment utilized ARB's Los Angeles County population estimates for the 2015 calendar year. This approach provides an estimate of vehicle mix associated with operational profiles at the link or intersection level. Table 2 lists the identified fleet mix considered in the assessment.

Table 2
Vehicle Fleet Mix Profile

Vehicle Class	Los Angeles County		
	Fuel	Population	Percent
LDA	Diesel	13034.3	0.20
LDA	Gas	3632354.5	55.19
LDT1	Diesel	591.5	0.01
LDT1	Gas	402070.9	6.11
LDT2	Diesel	543.2	0.01
LDT2	Gas	1145799.5	17.41
LHD1	Diesel	37203.3	0.57
LHD1	Gas	158255.3	2.40
LHD2	Diesel	14129.4	0.21
LHD2	Gas	17778.7	0.27
MCY	Gas	123606.5	1.88
MDV	Diesel	954.7	0.01
MDV	Gas	868644.4	13.20
MH	Diesel	4203.2	0.06
MH	Gas	31433.3	0.48
T6	Diesel	49220.7	0.75
T6	Gas	14934.2	0.23
T7	Diesel	45841.4	0.70
T7	Gas	1051.6	0.02
OBUS	Diesel	4380.3	0.07
OBUS	Gas	4955.1	0.08
SBUS	Diesel	2681.1	0.04
SBUS	Gas	807.6	0.01
UBUS	Diesel	5596.9	0.09
UBUS	Gas	970.1	0.01

Note: Vehicle category descriptions can be found on the California Air Resources Board website at http://www.arb.ca.gov/msei/modeling.htm.

Based upon the freeway traffic volumes and population profiles noted above, discrete traffic counts were identified for each roadway segment. Diesel vehicles account for 2.71 percent of the on-road mobile fleet. For chronic (long term) and acute (e.g., 1-hour) exposures, AADT values were averaged to produce representative hourly traffic volumes. Table 3 presents the hourly traffic volumes considered in the assessment.

Table 3
Hourly Freeway Traffic Volumes

Roadway Segment	Average Traffic Volumes		
	All	Gas	Diesel
Route 134	9,500.0	9,242.5	257.5
EB On / Pacific Avenue	462.5	450.0	12.5
WB Off / Pacific Avenue	350.0	340.5	9.5
WB On / Central Avenue	691.7	672.9	18.7
EB Off / Central Avenue	683.3	664.8	18.5
EB On / Brand Boulevard	737.5	717.5	20.0
WB Off / Brand Boulevard	729.2	709.4	19.8

Posted route speeds were assumed for vehicles traversing the main highway link (Route 134). Emissions associated with acceleration and deceleration (i.e., on/off ramps) were based upon vehicle speeds of 45 and 5 miles per hour, respectively. These values were subsequently adjusted utilizing the modal algorithms presented in the California Line Source Dispersion Model (Caline4).

For particulates (PM_{10} and $PM_{2.5}$), emissions were quantified through the reentrainment of paved roadway dust. The predictive emission equation developed by the U.S. Environmental Protection Agency (AP-42, Section 13.2.1) was utilized to generate particulate source strength. To account for the mass rate of emissions entrained from the roadway surface, the contribution from exhaust, break and tire wear were added to the AP-42 emission factor equation.

A list of compounds associated with mobile source emissions is presented in Table 4. Appendix B presents the on-road emission rate calculation worksheets for the freeway segments considered in the assessment.

Table 4
Compounds Emitted From On-Road Mobile Source Activity

Source	Pollutant
Route 134	Benzene Formaldehyde 1,3-Butadiene Acetaldehyde Acrolein Diesel Particulates Reentrained Particulates (PM_{10}, $PM_{2.5}$) Carbon Monoxide Nitrogen Dioxide

5.0 EXPOSURE QUANTIFICATION

In order to assess the impact of emitted compounds on individuals who reside at the proposed apartment complex, air quality modeling utilizing the AMS/EPA Regulatory Model AERMOD was performed to assess the downwind extent of mobile source emissions located within a ¼ mile radius of the project site. AERMOD's air dispersion algorithms are based upon a planetary boundary layer turbulence structure and scaling concepts, including the treatment of surface and elevated sources in simple and complex terrain.

The model offers additional flexibility by allowing the user to assign initial vertical and lateral dispersion parameters for sources representative of a localized mobile fleet. For this assessment, the volume source algorithm was utilized to model the emissions generated from on-road mobile source activity. Although the freeway is located predominantly below grade, the assessment followed guidance promulgated by the U.S. Environmental Protection Agency (U.S. EPA, 2009) whereby the model was programmed to assume flat, level terrain. This was done to avoid underestimating pollutant concentrations for conditions involving low-level, non-buoyant sources in up-sloping terrain. Notwithstanding, to account for the discrepancy in terrain elevation, vertical (sigma z) dispersion parameters were developed for each source location by approximating mixing zone residence time and quantifying the initial vertical term as performed in the California Line Source Dispersion Model Caline3. The horizontal (sigma y) parameters were generated by dividing the source separation distance by a standard deviation of 2.15.

For PM_{10} and $PM_{2.5}$, plume depletion due to dry removal mechanisms was assumed (i.e., DRYDPLT). Entrained or fugitive PM_{10} emissions were separated into three aerodynamic diameter sizes of 1.0, 2.5 and 10 microns (μm) with weight fractions of 0.0787, 0.1292, and 0.7922, respectively. Fugitive $PM_{2.5}$ emissions were separated into two particle sizes of 1.0 and 2.5 μm with corresponding weight fractions of 0.3785 and 0.6215. Diesel particulate emissions were assigned particle size bins of 2.5 and 10 μm with corresponding weight fractions of 0.92 and 0.08. A particle density of 2.3 grams per cubic centimeter was assigned to all size bins.

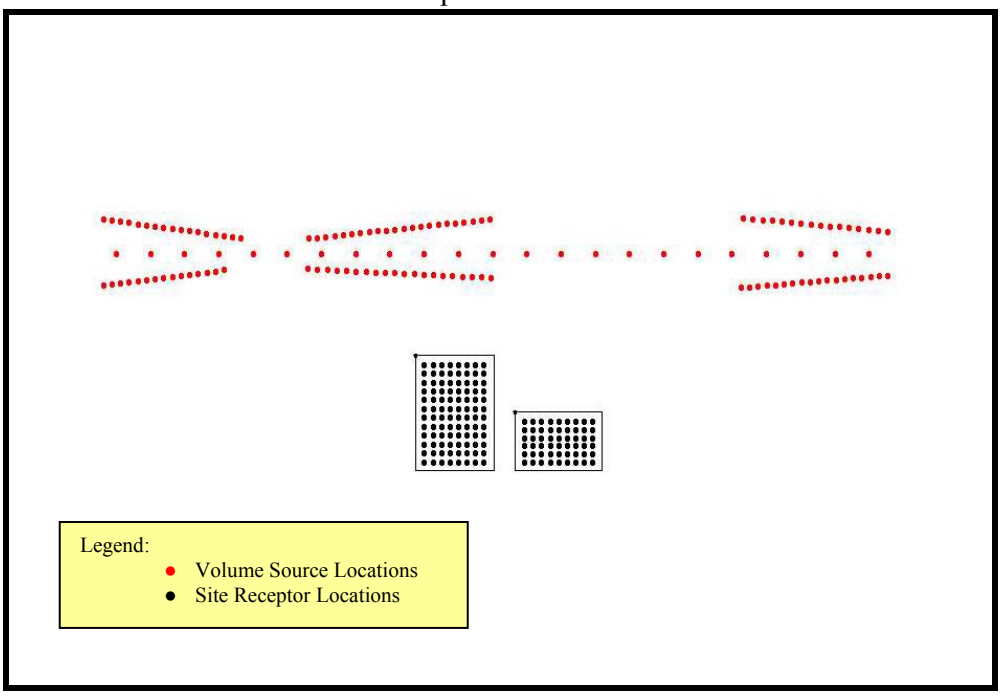
The model incorporates two methodologies to perform the NO_x to NO_2 conversion. In a recent clarification memorandum (U.S. EPA, 2011), the Office of Air Quality Planning and Standards provides guidance on the use and performance of the two algorithms referred to as the ozone limiting (OLM) and plume volume molar ratio (PVMRM) methods. Based upon this guidance, the OLM algorithm with the OLMGROUP ALL option was identified as the preferred method to perform the analysis.

Air dispersion models require additional input parameters including pollutant emission data and local meteorology. Due to the their sensitivity to individual meteorological parameters such as wind speed and direction, the U.S. Environmental Protection Agency recommends

that meteorological data used as input into dispersion models be selected on the basis of relative spatial and temporal conditions that exist in the area of concern. In response to this recommendation, meteorological data from the SCAQMD Burbank monitoring station (Source Receptor Area 7) was used to represent local weather conditions and prevailing winds. For short duration exposures, five years (2005-2009) of available AERMOD meteorological data was reviewed to identify the calendar years which produced the highest pollutant concentrations. Based on this review, the 2007 data set was identified as producing the highest pollutant concentrations for averaging periods from 1 to 8-hours. For 24-hour and annual averaging times, the 2006 data set was utilized. For chronic exposures, maximum concentrations were produced by incorporating all five years of available data.

The modeling analysis also considered the spatial distribution of mobile source activity traversing the freeway in relation to the proposed site. To accommodate a Cartesian grid format, direction dependent calculations were obtained by identifying the universal transverse mercator (UTM) coordinates for each volume source location. On-site receptors were uniformly placed to provide coverage across the identified project boundary. No flagpole receptor heights were assumed. A graphical representation of the source-receptor grid network is presented in Figure 2.

Figure 2
Source-Receptor Grid Network



A dispersion model input summary table is provided in Appendix C. A complete listing of model input/output files are provided in electronic format in Appendix D.

6.0 RISK CHARACTERIZATION

6.1 Carcinogenic Chemical Risk

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. As a result, the State of California has established a threshold of one in one hundred thousand (1.0E-05) as a level posing no significant risk for exposures to carcinogens regulated under the Safe Drinking Water and Toxic Enforcement Act (Proposition 65). This threshold is also consistent with the maximum incremental cancer risk established by the SCAQMD for projects prepared under the auspices of the California Environmental Quality Act (CEQA).

Health risks associated with exposure to carcinogenic compounds can be 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 ($\mu g/m^3$) over a 70 year lifetime. The URF's utilized in the assessment and corresponding cancer potency factors were obtained from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values*.

To effectively quantify dose, the procedure requires the incorporation of several discrete exposure variates. Once determined, contaminant dose is multiplied by the cancer potency factor (CPF) in units of inverse dose expressed in milligrams per kilogram per day $(mg/kg/day)^{-1}$ to derive the cancer risk estimate. Therefore, to assess exposures associated with the proposed residential population, the following dose algorithm was utilized.

$$CDI = (C_{air} \times EF \times ED \times IR) / (BW \times AT)$$

Where:

CDI = chronic daily intake (mg/kg/day)
C_{air} = concentration of contaminant in air (mg/m^3)
EF = exposure frequency (days/year)
ED = exposure duration (years)
IR = inhalation rate (m^3/day)
BW = body weight (kg)
AT = averaging time (days)

To represent residential exposures, the assessment employed the U.S. Environmental Protection Agency's guidance to develop viable dose estimates based on reasonable maximum exposures (RME). Specifically, activity patterns for population mobility recommended by the U.S. Environmental Protection Agency and presented in the *Exposure Factors Handbook* were utilized. As a result, lifetime risk values for residents were adjusted to account for an exposure duration of 350 days per year for 30 years (i.e., 95^{th} percentile). A

9 year exposure duration was additionally assessed to identify risk estimates associated with the average time individuals are reported to reside at a given residence. These values are consistent with the California Environmental Quality Act which considers the evaluation of environmental effects of proposed projects in a manner that reflects both reasonable and feasible assumptions. For body weight and inhalation, the assessment employed average adult values of 70 kilograms and 20 cubic meters per day, respectively.

Appendix A, Tables A1 and A2, columns f-g, present the URF's and corresponding cancer potency factors for carcinogens considered in the assessment. The cancer risk attributed to each compound and summation of those risks are presented in column h.

6.2 Noncarcinogenic Hazards

An evaluation of the potential noncancer effects of contaminant exposures was also conducted. Under the point estimate approach, adverse health effects are evaluated by comparing the concentration of each compound with the appropriate Reference Exposure Level (REL). Available REL's presented in the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* were considered in the assessment.

To quantify noncarcinogenic impacts, the hazard index approach was used. The hazard index assumes that subthreshold exposures adversely affect a specific organ or organ system (i.e., toxicological endpoint). For each discrete pollutant exposure, target organs presented in regulatory guidance were utilized.

To calculate the hazard index, the pollutant concentration or dose is divided by the appropriate toxicity value. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds one (i.e., unity), a health hazard is presumed to exist. For chronic exposures, REL's were converted to units expressed in mg/kg/day to accommodate the above referenced intake algorithm. To assess acute noncancer impacts, the maximum pollutant concentration is divided by the REL for the corresponding averaging time (e.g., 1-hour). No exposure adjustments are considered for short duration exposures.

Appendix A, Tables A1 and A2, columns i-j, present the REL's and corresponding reference dose values used in the evaluation of chronic noncarcinogenic exposures. The noncancer hazard quotient for identified compounds generated from each source and a summation for each toxicological endpoint are presented in columns k-r. Tables A3 through A4, column e present the REL's for the assessment of acute exposures. Columns f-m identify each compound's hazard quotient and corresponding index for each endpoint.

6.3 Criteria Pollutant Exposures

The State of California has promulgated strict ambient air quality standards for various pollutants. These standards were established to safeguard the public's health and welfare with specific emphasis on protecting those individuals susceptible to respiratory distress, such as asthmatics, the young, the elderly and those with existing conditions which may be affected by increased pollutant concentrations. However, recent research has shown that unhealthful respiratory responses occur with exposures to pollutants at levels that only marginally exceed clean air standards. Table 5 presents the California Ambient Air Quality Standards (CAAQS) for the criteria pollutants considered in the assessment.

Table 5
California Ambient Air Quality Standards

Pollutant	Standard	Health Effects
Particulates (PM_{10})	>50 µg/m3 (24 hr avg.) >20 µg/m3 (Annual)	1) Excess deaths from short-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory disease. 2) Excess seasonal declines in pulmonary function especially in children.
Particulates ($PM_{2.5}$)	>12 µg/m3 (Annual)	1) Excess deaths and illness from long-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory and cardio pulmonary disease.
Carbon Monoxide (CO)	>9.0 ppm (8 hr avg.) >20.0 ppm (1 hr avg.)	1) Aggravation of angina pectoris and other aspects of coronary heart disease. 2) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease. 3) Impairment of central nervous system functions. 4) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	>0.18 ppm (1 hr avg.)	1) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups. 2) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes.

Abbreviations: ppm: parts per million; µg/m^3: micrograms per cubic meter.
Source: California Code of Regulations, Title 17, Section 70200.

Pollutant emissions are considered to have a significant effect on the environment if they result in concentrations that create either a violation of an ambient air quality standard, contribute to an existing air quality violation or expose sensitive receptors to substantive pollutant concentrations. Should ambient air quality already exceed existing standards, the SCAQMD has established significance criteria for selected compounds to account for the continued degradation of local air quality. Background concentrations are based upon the highest observed value for the most recent three year period.

For PM_{10} emissions, background concentrations representative of the project area exceed the CAAQS for the 24-hour and annual averaging times. As a result, a significant impact is achieved when pollutant concentrations produce a measurable change over existing background levels. Although background concentrations exceed the CAAQS annual

averaging time for fine particulates, no measurable change criteria currently exists. As a result, the SCAQMD significance threshold of 2.5 $\mu g/m^3$ for the 24-hour averaging time is used to assess $PM_{2.5}$ impacts.

For the CO 1 and 8-hour averaging times and NO_2 1-hour averaging time, background concentrations are below the current air quality standards. As such, significance is achieved when pollutant concentrations add to existing levels and create an exceedance of the CAAQS. Table 6 shows the pollutant concentrations collected at the East San Fernando Valley Monitoring Station (Source-Receptor Area 7) for the last three years of available data. Table 7 outlines the relevant significance thresholds considered to affect local air quality.

Table 6
East San Fernando Valley Monitoring Summary / Source-Receptor Area 7

Pollutant/ Averaging Time	Year			
	2010	2011	2012	Maximum
Particulates (PM_{10}) 24-Hour	51	61	55	61
Particulates ($PM_{2.5}$) 24-Hour	43.7	47.8	54.2	54.2
Particulates (PM_{10}) Annual	29.6	28.4	25.8	29.6
Carbon Monoxide (CO) 1-Hour 8-Hour	3.0 2.4	2.8 2.4	2.8 2.4	3.0 2.4
Nitrogen Dioxide (NO_2) 1-Hour	0.082	0.068	0.080	0.082

Note: PM_{10} concentrations are expressed in micrograms per cubic meter ($\mu g/m^3$). All others are expressed in parts per million (ppm).
Source: South Coast Air Quality Management District , U.S Environmental Protection Agency and California Air Resources Board.

Table 7
SCAQMD Air Quality Significance Thresholds

Pollutant	Averaging Time	Pollutant Concentration
Particulates (PM_{10}) Particulates ($PM_{2.5}$)	24-Hours	2.5 µg/m3 (operation)
Particulates (PM_{10})	Annual	1.0 µg/m3
Carbon Monoxide (CO)	1/8-Hours	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standards 20 ppm (1-hour) and 9 ppm (8-hour).
Nitrogen Dioxide (NO_2)	1-Hour	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standard 0.18 ppm.

Abbreviations: ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
Source: South Coast Air Quality Management District.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM_{10} concentrations of 5.86092 $\mu g/m^3$ and 2.25681 $\mu g/m^3$ for the 24-hour and annual averaging times. These values exceed the SCAQMD significance thresholds of 2.5 $\mu g/m^3$ and 1.0 $\mu g/m^3$, respectively. For $PM_{2.5}$, a maximum 24-hour average concentration of 2.26001 $\mu g/m^3$ was predicted. This value does not exceed the identified significance threshold of 2.5 $\mu g/m^3$.

The maximum modeled 1-hour average concentration for CO of 0.34711 parts per million (ppm) (397.50532 $\mu g/m^3$) when added to an existing background concentration of 3.0 ppm, will not cause an exceedance of the CAAQS of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.21668 ppm, (248.14504 $\mu g/m^3$) when added to an existing background level of 2.4 ppm, does not cause an exceedance of the CAAQS of 9 ppm.

For NO_2, a maximum one hour concentration of 0.03042 ppm (57.23445 $\mu g/m^3$) was predicted. This concentration, when added to a background concentration of 0.082 ppm, will not cause an exceedance of the CAAQS of 0.18 ppm.

7.0 CONCLUSION

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 1.1E-05 (1.1 in one hundred thousand) for the 30 year and 3.4E-06 (3.4 in one million) for the 9 year exposure scenarios. In comparison to the threshold level referenced in Section 6.1, carcinogenic risks exceed the level posing no significant risk for the 30 year exposure scenario. Particulate emissions from trucks and related diesel fueled vehicles contribute to more than 75 percent of the identified risk value.

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the 30 year and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed unity. Therefore, noncarcinogenic hazards were predicted to be within acceptable limits.

For criteria pollutants, the assessment revealed that PM_{10} emissions generated from the adjacent freeway produce an exceedance of the 24-hour and annual significance thresholds. $PM_{2.5}$ concentrations were also predicted to exceed the 24-hour significance threshold. Without mitigation, these emissions may impact the health of sensitive individuals. For CO and NO_2, maximum predicted concentrations are within acceptable limits.

8.0 MITIGATION OF PARTICULATE IMPACTS

Please note, short duration (i.e., 1 and 8-hour) exposures associated with both toxic and criteria pollutants are within acceptable limits. As such, no impacts are anticipated to residents who access and utilize amenities such as a pool and related courtyard locations. Exceedance of the identified significance thresholds are associated with particulate exposures

from diesel exhaust and the reentrainment of paved roadway dust. As a result, mitigation of particulate impacts may be accomplished by reducing pollutant concentrations within residential occupancies. By restricting the rate of infiltration, pollutant exposures can be controlled to reduce carcinogenic risk estimates to within acceptable limits, as well as reduce particulate exposures below SCAQMD significance thresholds.

Limiting particulate infiltration can be accomplished by installing and maintaining air filtration systems with efficiencies equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 13 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2.

With the implementation of the above measure, both toxic and particulate exposures will be reduced to a level of insignificance.

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APPENDIX A

Risk Calculation Worksheets

Table A1
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
30 Year Exposure Scenario

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
					URF	CPF	RISK	REL	RfD	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
	(ug/m3)	(mg/m3)			(ug/m3)	(mg/kg/day)		(ug/m3)	(mg/kg/day)								
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
Freeway	0.19160	1.9E-04	4.67E-01	Benzene	2.9E-05	1.0E-01	1.1E-06	6.0E+01	1.7E-02		1.4E-03	1.4E-03				1.4E-03	
			3.28E-01	Formaldehyde	6.0E-06	2.1E-02	1.5E-07	9.0E+00	2.6E-03	6.7E-03							
			1.06E-01	1,3-Butadiene	1.7E-04	6.0E-01	1.4E-06	2.0E+00	5.7E-04							9.7E-03	
			7.40E-02	Acetaldehyde	2.7E-06	1.0E-02	1.7E-08	1.4E+02	4.0E-02	9.7E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	1.3E-02							
	0.07000	7.0E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	8.6E-06	5.0E+00	1.4E-03	1.3E-02							
Total							1.1E-05			3.3E-02	1.4E-03	1.4E-03	0.0E+00	0.0E+00	0.0E+00	1.1E-02	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	30
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	10950

Table A2
Quantification of Carcinogenic Risks and Noncarcinogenic Hazards
9 Year Exposure Scenario

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
					URF	CPF	RISK	REL	RfD	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
	(ug/m3)	(mg/m3)			(ug/m3)	(mg/kg/day)		(ug/m3)	(mg/kg/day)								
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
Freeway	0.19160	1.9E-04	4.67E-01	Benzene	2.9E-05	1.0E-01	3.2E-07	6.0E+01	1.7E-02		1.4E-03	1.4E-03				1.4E-03	
			3.28E-01	Formaldehyde	6.0E-06	2.1E-02	4.6E-08	9.0E+00	2.6E-03	6.7E-03							
			1.06E-01	1,3-Butadiene	1.7E-04	6.0E-01	4.3E-07	2.0E+00	5.7E-04							9.7E-03	
			7.40E-02	Acetaldehyde	2.7E-06	1.0E-02	5.0E-09	1.4E+02	4.0E-02	9.7E-05							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	1.3E-02							
	0.07000	7.0E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	2.6E-06	5.0E+00	1.4E-03	1.3E-02							
Total							3.4E-06			3.3E-02	1.4E-03	1.4E-03	0.0E+00	0.0E+00	0.0E+00	1.1E-02	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	350
exposure duration (years)	9
inhalation rate (m3/day)	20
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	3285

Table A3
Quantification of Noncarcinogenic Acute Hazards
1-Hour Exposure Scenario

Source	Concentration (ug/m3)	Weight Fraction	Contaminant	Noncarcinogenic Hazards / Toxicological Endpoints*								
				REL (ug/m3)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Freeway	1.33567	4.67E-01	Benzene	1.3E+03			4.8E-04	4.8E-04			4.8E-04	
TOG		3.28E-01	Formaldehyde	5.5E+01								8.0E-03
		1.06E-01	1,3-Butadiene	6.6E+02							2.1E-04	
		7.40E-02	Acetaldehyde	4.7E+02	2.1E-04							2.1E-04
		2.50E-02	Acrolein	2.5E+00	1.3E-02							1.3E-02
Freeway	0.28926	8.20E-02	Benzene	1.3E+03			1.8E-05	1.8E-05			1.8E-05	
Diesel/TOG		6.07E-01	Formaldehyde	5.5E+01								3.2E-03
		8.00E-03	1,3-Butadiene	6.6E+02							3.5E-06	
		3.03E-01	Acetaldehyde	4.7E+02	1.9E-04							1.9E-04
Total					1.4E-02	0.0E+00	5.0E-04	5.0E-04	0.0E+00	0.0E+00	7.2E-04	2.5E-02

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

Table A4
Quantification of Noncarcinogenic Acute Hazards
8-Hour Exposure Scenario

Source	Concentration (ug/m3)	Weight Fraction	Contaminant	Noncarcinogenic Hazards / Toxicological Endpoints*								
				REL (ug/m3)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Freeway	0.85574	3.28E-01	Formaldehyde	9.0E+00	3.1E-02							
TOG		1.06E-01	1,3-Butadiene	9.0E+00							1.0E-02	
		7.40E-02	Acetaldehyde	3.0E+02	2.1E-04							
		2.50E-02	Acrolein	7.0E-01	3.1E-02							
Freeway	0.20464	6.07E-01	Formaldehyde	9.0E+00	1.4E-02							
Diesel/TOG		8.00E-03	1,3-Butadiene	9.0E+00							1.8E-04	
		3.03E-01	Acetaldehyde	3.0E+02	2.1E-04							
Total					7.6E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-02	0.0E+00

* Key to Toxocological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

APPENDIX B

On-Road Emission Rate Calculations

EMFAC2011 Worksheet
(5 mph)

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	5	13034.30446	0.0020	0.816453848	0.00161706	0.732410401	0.00145060	0.092280093	0.00018277	0.007999958	0.00001584	0.036749815	0.000072786
Los Angeles	2015	Annual	LDA	GAS	Aggregated	5	3632354.501	0.5519	2.625880605	1.44933426	0.193136868	0.10660038	0.011118539	0.00613679	0.007999958	0.00441551	0.036749814	0.020283772
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	5	591.4512001	0.0001	1.440027311	0.00012942	1.043101972	0.00009375	0.202717103	0.00001822	0.007999959	0.00000072	0.036749815	0.000003303
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	5	402070.8846	0.0611	7.603948936	0.46456573	0.642164122	0.03923323	0.026682911	0.00163020	0.007999959	0.00048876	0.036749815	0.002245242
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	5	543.2155753	0.0001	1.085395236	0.00008959	0.985734115	0.00008136	0.129015389	0.00001065	0.007999959	0.00000066	0.036749815	0.000003033
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	5	1145799.537	0.1741	3.700901988	0.64434963	0.399476413	0.06955128	0.012344321	0.00214922	0.007999958	0.00139284	0.036749812	0.006398367
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	5	37203.30707	0.0057	3.779508223	0.02136595	5.83751465	0.03300007	0.119580075	0.00067600	0.011999938	0.00006784	0.076439601	0.000432121
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	5	158255.2792	0.0240	9.173729908	0.22060203	0.457298663	0.01099673	0.009347189	0.00022477	0.007999958	0.00019238	0.036749816	0.000883728
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	5	14129.39809	0.0021	3.562317527	0.00764824	5.552516113	0.01192117	0.116523237	0.00025017	0.011999938	0.00002576	0.089179533	0.000191467
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	5	17778.71294	0.0027	7.75343448	0.02094594	0.415279635	0.00112188	0.008455075	0.00002284	0.007999958	0.00002161	0.036749815	0.000099280
Los Angeles	2015	Annual	MCY	GAS	Aggregated	5	123606.4671	0.0188	27.48167927	0.51616650	1.17881083	0.02214067	0.001067789	0.00002006	0.007999747	0.00015025	0.036748494	0.000690218
Los Angeles	2015	Annual	MDV	DSL	Aggregated	5	954.7119921	0.0001	0.749601002	0.00010874	0.635745787	0.00009223	0.093142538	0.00001351	0.007999958	0.00000116	0.036749816	0.000005331
Los Angeles	2015	Annual	MDV	GAS	Aggregated	5	868644.3715	0.1320	5.411145948	0.71422758	0.636788224	0.08405090	0.013613772	0.00179691	0.007999958	0.00105593	0.036749816	0.004850679
Los Angeles	2015	Annual	MH	DSL	Aggregated	5	4203.216625	0.0006	2.658107235	0.00169769	18.32037	0.01170096	0.578776281	0.00036966	0.011999938	0.00000766	0.130339319	0.000083246
Los Angeles	2015	Annual	MH	GAS	Aggregated	5	31433.31319	0.0048	27.18977008	0.12986767	0.701714538	0.00335163	0.014232812	0.00006798	0.007999958	0.00003821	0.036749815	0.000175530
Los Angeles	2015	Annual	T6	DSL	Aggregated	5	49220.73829	0.0075	3.320285645	0.02483299	13.67344674	0.10226605	0.336655842	0.00251791	0.011999937	0.00008975	0.130339319	0.000974830
Los Angeles	2015	Annual	T6	GAS	Aggregated	5	14934.2283	0.0023	19.84300961	0.04502935	1.053871038	0.00239153	0.007482588	0.00001698	0.007999958	0.00001815	0.036749813	0.000083396
Los Angeles	2015	Annual	T7	DSL	Aggregated	5	45841.37834	0.0070	6.784853091	0.04726106	22.21754436	0.15476013	0.282535407	0.00196805	0.03530888	0.00024595	0.060554729	0.000421804
Los Angeles	2015	Annual	T7	GAS	Aggregated	5	1051.567972	0.0002	124.6186856	0.01991250	3.542602717	0.00056606	0.003115185	0.00000050	0.007999959	0.00000128	0.036749816	0.000005872
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	5	4380.289427	0.0007	4.281700662	0.00284987	22.74104161	0.01513626	0.337522296	0.00022465	0.011999937	0.00000799	0.130339319	0.000086753
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	5	4955.072356	0.0008	12.08898587	0.00910218	0.867118256	0.00065288	0.004318589	0.00000325	0.007999958	0.00000602	0.036749814	0.000027670
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	5	2681.093253	0.0004	2.135640854	0.00087005	28.56008872	0.01163528	0.427921458	0.00017433	0.011999937	0.00000489	0.744796108	0.000303427
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	5	807.5800559	0.0001	69.76889526	0.00856156	1.792683601	0.00021999	0.028411064	0.00000349	0.007999958	0.00000098	0.036749815	0.000004510
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	5	5596.94204	0.0009	11.79183638	0.01002854	31.34085801	0.02665429	0.774296149	0.00065851	0.007999958	0.00000680	0.841815648	0.000715934
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	5	970.1442521	0.0001	61.72021789	0.00909849	2.825189458	0.00041648	0.016463227	0.00000243	0.007999958	0.00000118	0.036749814	0.000005417
							6581041.7	1.0		4.370		0.710		0.019		0.008		0.039

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	GAS	Aggregated	5	3632354.501	0.5673	0.274898446	0.1560
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	5	402070.8846	0.0628	0.695208609	0.0437
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	5	1145799.537	0.1790	0.379744375	0.0680
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	5	158255.2792	0.0247	0.932300883	0.0230
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	5	17778.71294	0.0028	0.709619071	0.0020
Los Angeles	2015	Annual	MCY	GAS	Aggregated	5	123606.4671	0.0193	5.295269488	0.1022
Los Angeles	2015	Annual	MDV	GAS	Aggregated	5	868644.3715	0.1357	0.603772729	0.0819
Los Angeles	2015	Annual	MH	GAS	Aggregated	5	31433.31319	0.0049	1.403186195	0.0069
Los Angeles	2015	Annual	T6	GAS	Aggregated	5	14934.2283	0.0023	1.641291701	0.0038
Los Angeles	2015	Annual	T7	GAS	Aggregated	5	1051.567972	0.0002	4.663237249	0.0008
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	5	4955.072356	0.0008	1.040122826	0.0008
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	5	807.5800559	0.0001	6.104657002	0.0008
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	5	970.1442521	0.0002	8.916457563	0.0014
							6402661.7	1.0		0.491

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.084897692	0.000168147	0.00199999	0.000003961	0.015749919	0.000031194
0.010207252	0.005633813	0.00199999	0.001103879	0.01574992	0.008693045
0.186499753	0.000016761	0.00199999	0.000000180	0.015749919	0.000001415
0.02452897	0.001498605	0.00199999	0.000122190	0.01574992	0.000962246
0.118694162	0.000009797	0.00199999	0.000000165	0.01574992	0.000001300
0.011349941	0.001976094	0.00199999	0.000348210	0.01574992	0.002742157
0.110013673	0.000621919	0.002999985	0.000016959	0.032759827	0.000185195
0.008619413	0.000207272	0.00199999	0.000048094	0.01574992	0.000378741
0.107201378	0.000230160	0.002999985	0.000006441	0.038219796	0.000082057
0.007744072	0.000020921	0.00199999	0.000005403	0.01574992	0.000042548
0.000870145	0.000016343	0.001999937	0.000037563	0.015749353	0.000295808
0.085691138	0.000012431	0.00199999	0.000000290	0.01574992	0.000002285
0.01254042	0.001655234	0.00199999	0.000263982	0.01574992	0.002078862
0.532474174	0.000340084	0.002999985	0.000001916	0.055859693	0.000035677
0.012764905	0.000060970	0.00199999	0.000009553	0.01574992	0.000075227
0.309723375	0.002316474	0.002999984	0.000022437	0.055859708	0.000417784
0.006734157	0.000015282	0.00199999	0.000004539	0.01574992	0.000035741
0.259932574	0.001810605	0.00882722	0.000061488	0.025952027	0.000180773
0.002745112	0.000000439	0.00199999	0.000000320	0.01574992	0.000002517
0.310520512	0.000206680	0.002999984	0.000001997	0.055859708	0.000037180
0.003975333	0.000002993	0.00199999	0.000001506	0.015749919	0.000011859
0.393687741	0.000160387	0.002999984	0.000001222	0.319198332	0.000130040
0.025378372	0.000003114	0.00199999	0.000000245	0.01574992	0.000001933
0.712352522	0.000605830	0.00199999	0.000001701	0.360778106	0.000306829
0.014737678	0.000002173	0.00199999	0.000000295	0.01574992	0.000002322
	0.018		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	5	13034.30446	0.0731	0.141103069	0.0103
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	5	591.4512001	0.0033	0.275768144	0.0009
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	5	543.2155753	0.0030	0.18344088	0.0006
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	5	37203.30707	0.2086	0.623652098	0.1301
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	5	14129.39809	0.0792	0.578079716	0.0458
Los Angeles	2015	Annual	MDV	DSL	Aggregated	5	954.7119921	0.0054	0.129512786	0.0007
Los Angeles	2015	Annual	MH	DSL	Aggregated	5	4203.216625	0.0236	1.994549999	0.0470
Los Angeles	2015	Annual	T6	DSL	Aggregated	5	49220.73829	0.2759	2.407729944	0.6644
Los Angeles	2015	Annual	T7	DSL	Aggregated	5	45841.37834	0.2570	4.049518069	1.0407
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	5	4380.289427	0.0246	2.873110412	0.0706
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	5	2681.093253	0.0150	1.862821117	0.0280
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	5	5596.94204	0.0314	2.069240258	0.0649
							178380.0	1.0		2.104

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	5	13034.30446	0.0731	0.092280093	0.0067
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	5	591.4512001	0.0033	0.202717103	0.0007
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	5	543.2155753	0.0030	0.129015389	0.0004
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	5	37203.30707	0.2086	0.119580075	0.0249
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	5	14129.39809	0.0792	0.116523237	0.0092
Los Angeles	2015	Annual	MDV	DSL	Aggregated	5	954.7119921	0.0054	0.093142538	0.0005
Los Angeles	2015	Annual	MH	DSL	Aggregated	5	4203.216625	0.0236	0.578776281	0.0136
Los Angeles	2015	Annual	T6	DSL	Aggregated	5	49220.73829	0.2759	0.336655842	0.0929
Los Angeles	2015	Annual	T7	DSL	Aggregated	5	45841.37834	0.2570	0.282535407	0.0726
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	5	4380.289427	0.0246	0.337522296	0.0083
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	5	2681.093253	0.0150	0.427921458	0.0064
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	5	5596.94204	0.0314	0.774296149	0.0243
							178380.0	1.0		0.261

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	45	13034.30446	0.0020	0.174648515	0.00034591	0.444995219	0.00088135	0.026598569	0.00005268	0.007999958	0.00001584	0.036749815	0.000072786
Los Angeles	2015	Annual	LDA	GAS	Aggregated	45	3632354.501	0.5519	1.116771233	0.61639315	0.10456508	0.05771388	0.001370463	0.00075642	0.007999958	0.00441551	0.036749814	0.020283772
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	45	591.4512001	0.0001	0.28972572	0.00002604	0.632648369	0.00005686	0.057326964	0.00000515	0.007999959	0.00000072	0.036749815	0.000003303
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	45	402070.8846	0.0611	3.015278787	0.18421944	0.3121337	0.01906991	0.003628776	0.00022170	0.007999959	0.00048876	0.036749815	0.002245242
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	45	543.2155753	0.0001	0.224728099	0.00001855	0.599842907	0.00004951	0.036660939	0.00000303	0.007999959	0.00000066	0.036749815	0.000003033
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	45	1145799.537	0.1741	1.620998563	0.28222575	0.198862092	0.03462310	0.001501937	0.00026150	0.007999958	0.00139284	0.036749812	0.006398367
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	45	37203.30707	0.0057	0.708192073	0.00400348	3.42403123	0.01935640	0.03336199	0.00018860	0.011999938	0.00006784	0.076439601	0.000432121
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	45	158255.2792	0.0240	1.641143672	0.03946482	0.626596353	0.01506785	0.001078928	0.00002595	0.007999958	0.00019238	0.036749816	0.000883728
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	45	14129.39809	0.0021	0.667101696	0.00143226	3.256013768	0.00699061	0.032474954	0.00006972	0.011999938	0.00002576	0.089179533	0.000191467
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	45	17778.71294	0.0027	1.39093773	0.00375762	0.571042876	0.00154267	0.000977108	0.00000264	0.007999958	0.00002161	0.036749815	0.000099280
Los Angeles	2015	Annual	MCY	GAS	Aggregated	45	123606.4671	0.0188	20.29998068	0.38127838	1.201086292	0.02255905	0.000512318	0.00000962	0.007999747	0.00015025	0.036748494	0.000690218
Los Angeles	2015	Annual	MDV	DSL	Aggregated	45	954.7119921	0.0001	0.167577961	0.00002431	0.399751468	0.00005799	0.026866991	0.00000390	0.007999958	0.00000116	0.036749816	0.000005331
Los Angeles	2015	Annual	MDV	GAS	Aggregated	45	868644.3715	0.1320	2.331423303	0.30772905	0.313543756	0.04138524	0.001691201	0.00022322	0.007999958	0.00105593	0.036749816	0.004850679
Los Angeles	2015	Annual	MH	DSL	Aggregated	45	4203.216625	0.0006	0.543563179	0.00034717	6.544152109	0.00417966	0.154318212	0.00009856	0.011999938	0.00000766	0.130339319	0.000083246
Los Angeles	2015	Annual	MH	GAS	Aggregated	45	31433.31319	0.0048	4.967045877	0.02372432	0.961350715	0.00459174	0.001666596	0.00000796	0.007999958	0.00003821	0.036749815	0.000175530
Los Angeles	2015	Annual	T6	DSL	Aggregated	45	49220.73829	0.0075	0.552480114	0.00413209	4.007799627	0.02997502	0.093603687	0.00070008	0.011999937	0.00008975	0.130339319	0.000974830
Los Angeles	2015	Annual	T6	GAS	Aggregated	45	14934.2283	0.0023	3.542787608	0.00803958	1.44042318	0.00326872	0.000862673	0.00000196	0.007999958	0.00001815	0.036749813	0.000083396
Los Angeles	2015	Annual	T7	DSL	Aggregated	45	45841.37834	0.0070	1.194740675	0.00832217	6.540680531	0.04556024	0.098306662	0.00068477	0.03530888	0.00024595	0.060554729	0.000421804
Los Angeles	2015	Annual	T7	GAS	Aggregated	45	1051.567972	0.0002	22.21252779	0.00354928	4.816553459	0.00076962	0.000357746	0.00000006	0.007999959	0.00000128	0.036749816	0.000005872
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	45	4380.289427	0.0007	0.721605345	0.00048029	6.677581244	0.00444455	0.081184593	0.00005404	0.011999937	0.00000799	0.130339319	0.000086753
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	45	4955.072356	0.0008	2.112997622	0.00159094	1.162970718	0.00087564	0.000496127	0.00000037	0.007999958	0.00000602	0.036749814	0.000027670
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	45	2681.093253	0.0004	0.411290748	0.00016756	9.028771675	0.00367829	0.075845019	0.00003090	0.011999937	0.00000489	0.744796108	0.000303427
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	45	807.5800559	0.0001	12.54942106	0.00153998	2.486089943	0.00030508	0.003279582	0.00000040	0.007999958	0.00000098	0.036749815	0.000004510
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	45	5596.94204	0.0009	1.579972459	0.00134371	14.20611592	0.01208180	0.163625373	0.00013916	0.007999958	0.00000680	0.841815648	0.000715934
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	45	970.1442521	0.0001	11.10046435	0.00163637	3.899281692	0.00057481	0.001900404	0.00000028	0.007999958	0.00000118	0.036749814	0.000005417
							6581041.7	1.0		1.876		0.330		0.004		0.008		0.039

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	GAS	Aggregated	45	3632354.501	0.5673	0.037052986	0.0210
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	45	402070.8846	0.0628	0.101746992	0.0064
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	45	1145799.537	0.1790	0.04968845	0.0089
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	45	158255.2792	0.0247	0.106708131	0.0026
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	45	17778.71294	0.0028	0.081664802	0.0002
Los Angeles	2015	Annual	MCY	GAS	Aggregated	45	123606.4671	0.0193	2.340020232	0.0452
Los Angeles	2015	Annual	MDV	GAS	Aggregated	45	868644.3715	0.1357	0.078095341	0.0106
Los Angeles	2015	Annual	MH	GAS	Aggregated	45	31433.31319	0.0049	0.162375966	0.0008
Los Angeles	2015	Annual	T6	GAS	Aggregated	45	14934.2283	0.0023	0.188108294	0.0004
Los Angeles	2015	Annual	T7	GAS	Aggregated	45	1051.567972	0.0002	0.529696052	0.0001
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	45	4955.072356	0.0008	0.116966382	0.0001
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	45	807.5800559	0.0001	0.703380461	0.0001
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	45	970.1442521	0.0002	1.029255878	0.0002
							6402661.7	1.0		0.097

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.024470685	0.000048466	0.00199999	0.000003961	0.015749919	0.000031194
0.00125019	0.000690033	0.00199999	0.001103879	0.01574992	0.008693045
0.052740812	0.000004740	0.00199999	0.000000180	0.015749919	0.000001415
0.00332325	0.000203035	0.00199999	0.000122190	0.01574992	0.000962246
0.033728066	0.000002784	0.00199999	0.000000165	0.01574992	0.000001300
0.001373828	0.000239192	0.00199999	0.000348210	0.01574992	0.002742157
0.030693031	0.000173511	0.002999985	0.000016959	0.032759827	0.000185195
0.000994922	0.000023925	0.00199999	0.000048094	0.01574992	0.000378741
0.029876958	0.000064145	0.002999985	0.000006441	0.038219796	0.000082057
0.000894953	0.000002418	0.00199999	0.000005403	0.01574992	0.000042548
0.000412236	0.000007743	0.001999937	0.000037563	0.015749353	0.000295808
0.024717636	0.000003586	0.00199999	0.000000290	0.01574992	0.000002285
0.001551339	0.000204764	0.00199999	0.000263982	0.01574992	0.002078862
0.141972758	0.000090676	0.002999985	0.000001916	0.055859693	0.000035677
0.001493879	0.000007135	0.00199999	0.000009553	0.01574992	0.000075227
0.086115392	0.000644072	0.002999984	0.000022437	0.055859708	0.000417784
0.000776431	0.000001762	0.00199999	0.000004539	0.01574992	0.000035741
0.090442129	0.000629990	0.00882722	0.000061488	0.025952027	0.000180773
0.000315034	0.000000050	0.00199999	0.000000320	0.01574992	0.000002517
0.074689825	0.000049713	0.002999984	0.000001997	0.055859708	0.000037180
0.000456728	0.000000344	0.00199999	0.000001506	0.015749919	0.000011859
0.069777417	0.000028427	0.002999984	0.000001222	0.319198332	0.000130040
0.002929509	0.000000359	0.00199999	0.000000245	0.01574992	0.000001933
0.150535353	0.000128025	0.00199999	0.000001701	0.360778106	0.000306829
0.001701218	0.000000251	0.00199999	0.000000295	0.01574992	0.000002322
	0.003		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	45	13034.30446	0.0731	0.040627693	0.0030
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	45	591.4512001	0.0033	0.078168063	0.0003
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	45	543.2155753	0.0030	0.052305266	0.0002
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	45	37203.30707	0.2086	0.174404406	0.0364
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	45	14129.39809	0.0792	0.161507973	0.0128
Los Angeles	2015	Annual	MDV	DSL	Aggregated	45	954.7119921	0.0054	0.037500885	0.0002
Los Angeles	2015	Annual	MH	DSL	Aggregated	45	4203.216625	0.0236	0.138153098	0.0033
Los Angeles	2015	Annual	T6	DSL	Aggregated	45	49220.73829	0.2759	0.133424724	0.0368
Los Angeles	2015	Annual	T7	DSL	Aggregated	45	45841.37834	0.2570	0.255111751	0.0656
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	45	4380.289427	0.0246	0.162386875	0.0040
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	45	2681.093253	0.0150	0.116705777	0.0018
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	45	5596.94204	0.0314	0.437274831	0.0137
							178380.0	1.0		0.178

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	45	13034.30446	0.0731	0.026598569	0.0019
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	45	591.4512001	0.0033	0.057326964	0.0002
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	45	543.2155753	0.0030	0.036660939	0.0001
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	45	37203.30707	0.2086	0.03336199	0.0070
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	45	14129.39809	0.0792	0.032474954	0.0026
Los Angeles	2015	Annual	MDV	DSL	Aggregated	45	954.7119921	0.0054	0.026866991	0.0001
Los Angeles	2015	Annual	MH	DSL	Aggregated	45	4203.216625	0.0236	0.154318212	0.0036
Los Angeles	2015	Annual	T6	DSL	Aggregated	45	49220.73829	0.2759	0.093603687	0.0258
Los Angeles	2015	Annual	T7	DSL	Aggregated	45	45841.37834	0.2570	0.098306662	0.0253
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	45	4380.289427	0.0246	0.081184593	0.0020
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	45	2681.093253	0.0150	0.075845019	0.0011
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	45	5596.94204	0.0314	0.163625373	0.0051
							178380.0	1.0		0.075

EMFAC2011 Worksheet
(65 mph)

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	65	13034.30446	0.0020	0.190838867	0.00037797	0.699795074	0.00138600	0.024645584	0.00004881	0.007999958	0.00001584	0.036749815	0.000072786
Los Angeles	2015	Annual	LDA	GAS	Aggregated	65	3632354.501	0.5519	1.049207541	0.57910190	0.119131601	0.06575376	0.001631583	0.00090054	0.007999958	0.00441551	0.036749814	0.020283772
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	65	591.4512001	0.0001	0.326746346	0.00002937	1.029628692	0.00009253	0.049800541	0.00000448	0.007999959	0.00000072	0.036749815	0.000003303
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	65	402070.8846	0.0611	2.952157494	0.18036302	0.388743342	0.02375040	0.00408862	0.00024980	0.007999959	0.00048876	0.036749815	0.002245242
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	65	543.2155753	0.0001	0.250067622	0.00002064	0.968460497	0.00007994	0.03261114	0.00000269	0.007999959	0.00000066	0.036749815	0.000003033
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	65	1145799.537	0.1741	1.429058493	0.24880781	0.230174812	0.04007484	0.001771393	0.00030841	0.007999958	0.00139284	0.036749812	0.006398367
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	65	37203.30707	0.0057	0.783447648	0.00442891	5.847892477	0.03305874	0.027305152	0.00015436	0.011999938	0.00006784	0.076439601	0.000432121
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	65	158255.2792	0.0240	2.276971972	0.05475468	0.722430757	0.01737240	0.000885907	0.00002130	0.007999958	0.00019238	0.036749816	0.000883728
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	65	14129.39809	0.0021	0.744233435	0.00159786	5.569060274	0.01195669	0.026907528	0.00005777	0.011999938	0.00002576	0.089179533	0.000191467
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	65	17778.71294	0.0027	1.954863561	0.00528107	0.665819183	0.00179871	0.000804581	0.00000217	0.007999958	0.00002161	0.036749815	0.000099280
Los Angeles	2015	Annual	MCY	GAS	Aggregated	65	123606.4671	0.0188	54.97824116	1.03261254	1.456157672	0.02734985	0.001019376	0.00001915	0.007999747	0.00015025	0.036748494	0.000690218
Los Angeles	2015	Annual	MDV	DSL	Aggregated	65	954.7119921	0.0001	0.180476821	0.00002618	0.614093396	0.00008909	0.025263594	0.00000366	0.007999958	0.00000116	0.036749816	0.000005331
Los Angeles	2015	Annual	MDV	GAS	Aggregated	65	868644.3715	0.1320	2.135803039	0.28190876	0.367843032	0.04855231	0.001986283	0.00026217	0.007999958	0.00105593	0.036749816	0.004850679
Los Angeles	2015	Annual	MH	DSL	Aggregated	65	4203.216625	0.0006	0.55107459	0.00035196	6.777822638	0.00432890	0.253104245	0.00016165	0.011999938	0.00000766	0.130339319	0.000083246
Los Angeles	2015	Annual	MH	GAS	Aggregated	65	31433.31319	0.0048	7.240529137	0.03458325	1.114576892	0.00532360	0.001399555	0.00000668	0.007999958	0.00003821	0.036749815	0.000175530
Los Angeles	2015	Annual	T6	DSL	Aggregated	65	49220.73829	0.0075	0.627827968	0.00469563	4.097362395	0.03064488	0.163823887	0.00122527	0.011999937	0.00008975	0.130339319	0.000974830
Los Angeles	2015	Annual	T6	GAS	Aggregated	65	14934.2283	0.0023	4.973809209	0.01128697	1.668312953	0.00378587	0.00070724	0.00000160	0.007999958	0.00001815	0.036749813	0.000083396
Los Angeles	2015	Annual	T7	DSL	Aggregated	65	45841.37834	0.0070	1.405767531	0.00979212	6.600774098	0.04597883	0.165225178	0.00115090	0.03530888	0.00024595	0.060554729	0.000421804
Los Angeles	2015	Annual	T7	GAS	Aggregated	65	1051.567972	0.0002	30.90947136	0.00493895	5.537349952	0.00088480	0.000291743	0.00000005	0.007999959	0.00000128	0.036749816	0.000005872
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	65	4380.289427	0.0007	0.819515964	0.00054546	6.837298079	0.00455085	0.140215744	0.00009333	0.011999937	0.00000799	0.130339319	0.000086753
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	65	4955.072356	0.0008	2.855476062	0.00214998	1.309182194	0.00098572	0.000404743	0.00000030	0.007999958	0.00000602	0.036749814	0.000027670
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	65	2681.093253	0.0004	0.368503506	0.00015013	9.306323419	0.00379136	0.091752219	0.00003738	0.011999937	0.00000489	0.744796108	0.000303427
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	65	807.5800559	0.0001	18.66520628	0.00229047	3.03622115	0.00037258	0.003192692	0.00000039	0.007999958	0.00000098	0.036749815	0.000004510
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	65	5596.94204	0.0009	1.687698966	0.00143533	21.2544995	0.01807620	0.145581712	0.00012381	0.007999958	0.00000680	0.841815648	0.000715934
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	65	970.1442521	0.0001	13.00610511	0.00191729	4.824118702	0.00071115	0.001267475	0.00000019	0.007999958	0.00000118	0.036749814	0.000005417
							6581041.7	1.0		2.463		0.391		0.005		0.008		0.039

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	GAS	Aggregated	65	3632354.501	0.5673	0.045090733	0.0256
Los Angeles	2015	Annual	LDT1	GAS	Aggregated	65	402070.8846	0.0628	0.117391759	0.0074
Los Angeles	2015	Annual	LDT2	GAS	Aggregated	65	1145799.537	0.1790	0.058594545	0.0105
Los Angeles	2015	Annual	LHD1	GAS	Aggregated	65	158255.2792	0.0247	0.084449631	0.0021
Los Angeles	2015	Annual	LHD2	GAS	Aggregated	65	17778.71294	0.0028	0.065762109	0.0002
Los Angeles	2015	Annual	MCY	GAS	Aggregated	65	123606.4671	0.0193	4.754912925	0.0918
Los Angeles	2015	Annual	MDV	GAS	Aggregated	65	868644.3715	0.1357	0.09137334	0.0124
Los Angeles	2015	Annual	MH	GAS	Aggregated	65	31433.31319	0.0049	0.133992396	0.0007
Los Angeles	2015	Annual	T6	GAS	Aggregated	65	14934.2283	0.0023	0.15193324	0.0004
Los Angeles	2015	Annual	T7	GAS	Aggregated	65	1051.567972	0.0002	0.42175512	0.0001
Los Angeles	2015	Annual	OBUS	GAS	Aggregated	65	4955.072356	0.0008	0.09154374	0.0001
Los Angeles	2015	Annual	SBUS	GAS	Aggregated	65	807.5800559	0.0001	0.650110399	0.0001
Los Angeles	2015	Annual	UBUS	GAS	Aggregated	65	970.1442521	0.0002	0.708603975	0.0001
							6402661.7	1.0		0.151

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.022673939	0.000044908	0.00199999	0.000003961	0.015749919	0.000031194
0.00148567	0.000820004	0.00199999	0.001103879	0.01574992	0.008693045
0.045816502	0.000004118	0.00199999	0.000000180	0.015749919	0.000001415
0.003736216	0.000228265	0.00199999	0.000122190	0.01574992	0.000962246
0.030002249	0.000002476	0.00199999	0.000000165	0.01574992	0.000001300
0.001617662	0.000281645	0.00199999	0.000348210	0.01574992	0.002742157
0.02512074	0.000142010	0.002999985	0.000016959	0.032759827	0.000185195
0.00081693	0.000019645	0.00199999	0.000048094	0.01574992	0.000378741
0.024754927	0.000053148	0.002999985	0.000006441	0.038219796	0.000082057
0.000736958	0.000001991	0.00199999	0.000005403	0.01574992	0.000042548
0.000819661	0.000015395	0.001999937	0.000037563	0.015749353	0.000295808
0.023242509	0.000003372	0.00199999	0.000000290	0.01574992	0.000002285
0.001819465	0.000240155	0.00199999	0.000263982	0.01574992	0.002078862
0.232855914	0.000148722	0.002999985	0.000001916	0.055859693	0.000035677
0.001253441	0.000005987	0.00199999	0.000009553	0.01574992	0.000075227
0.150717976	0.001127246	0.002999984	0.000022437	0.055859708	0.000417784
0.000636587	0.000001445	0.00199999	0.000004539	0.01574992	0.000035741
0.152007164	0.001058832	0.00882722	0.000061488	0.025952027	0.000180773
0.000256675	0.000000041	0.00199999	0.000000320	0.01574992	0.000002517
0.128998484	0.000085860	0.002999984	0.000001997	0.055859708	0.000037180
0.000372641	0.000000281	0.00199999	0.000001506	0.015749919	0.000011859
0.084412041	0.000034389	0.002999984	0.000001222	0.319198332	0.000130040
0.002782473	0.000000341	0.00199999	0.000000245	0.01574992	0.000001933
0.133935181	0.000113907	0.00199999	0.000001701	0.360778106	0.000306829
0.001115194	0.000000164	0.00199999	0.000000295	0.01574992	0.000002322
	0.004		0.002		0.017

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	65	13034.30446	0.0731	0.038300939	0.0028
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	65	591.4512001	0.0033	0.069217186	0.0002
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	65	543.2155753	0.0030	0.047849338	0.0001
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	65	37203.30707	0.2086	0.13895499	0.0290
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	65	14129.39809	0.0792	0.13027907	0.0103
Los Angeles	2015	Annual	MDV	DSL	Aggregated	65	954.7119921	0.0054	0.036431854	0.0002
Los Angeles	2015	Annual	MH	DSL	Aggregated	65	4203.216625	0.0236	0.154719646	0.0036
Los Angeles	2015	Annual	T6	DSL	Aggregated	65	49220.73829	0.2759	0.139679837	0.0385
Los Angeles	2015	Annual	T7	DSL	Aggregated	65	45841.37834	0.2570	0.226229264	0.0581
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	65	4380.289427	0.0246	0.167114383	0.0041
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	65	2681.093253	0.0150	0.118383633	0.0018
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	65	5596.94204	0.0314	0.386694145	0.0121
							178380.0	1.0		0.161

EMFAC2011 Emission Rates
Region Type: County
Region: Los Angeles
Calendar Year: 2015
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
Los Angeles	2015	Annual	LDA	DSL	Aggregated	65	13034.30446	0.0731	0.024645584	0.0018
Los Angeles	2015	Annual	LDT1	DSL	Aggregated	65	591.4512001	0.0033	0.049800541	0.0002
Los Angeles	2015	Annual	LDT2	DSL	Aggregated	65	543.2155753	0.0030	0.03261114	0.0001
Los Angeles	2015	Annual	LHD1	DSL	Aggregated	65	37203.30707	0.2086	0.027305152	0.0057
Los Angeles	2015	Annual	LHD2	DSL	Aggregated	65	14129.39809	0.0792	0.026907528	0.0021
Los Angeles	2015	Annual	MDV	DSL	Aggregated	65	954.7119921	0.0054	0.025263594	0.0001
Los Angeles	2015	Annual	MH	DSL	Aggregated	65	4203.216625	0.0236	0.253104245	0.0060
Los Angeles	2015	Annual	T6	DSL	Aggregated	65	49220.73829	0.2759	0.163823887	0.0452
Los Angeles	2015	Annual	T7	DSL	Aggregated	65	45841.37834	0.2570	0.165225178	0.0425
Los Angeles	2015	Annual	OBUS	DSL	Aggregated	65	4380.289427	0.0246	0.140215744	0.0034
Los Angeles	2015	Annual	SBUS	DSL	Aggregated	65	2681.093253	0.0150	0.091752219	0.0014
Los Angeles	2015	Annual	UBUS	DSL	Aggregated	65	5596.94204	0.0314	0.145581712	0.0046
							178380.0	1.0		0.113

Emission Factor Rate Adjustment Worksheet

CO Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	1.876
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	4.462

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	4.370
Emfac (gr/mi)	6.555

NOX Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.33
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.785

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.710
Emfac (gr/mi)	1.065

Emission Factor Rate Adjustment Worksheet

PM10 Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.004
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.010

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.019
Emfac (gr/mi)	0.029

PM2.5 Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.003
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.007

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.018
Emfac (gr/mi)	0.027

Emission Factor Rate Adjustment Worksheet

TOG GAS Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.097
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.231

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.491
Emfac (gr/mi)	0.737

TOG DSL Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.178
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.423

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	2.104
Emfac (gr/mi)	3.156

Emission Factor Rate Adjustment Worksheet

DSL Particulate Emissions

Acceleration / On-Ramp (15 - 45 mph)

Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)

emfac at link speed	0.075
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50
Emfac (gr/mi)	0.178

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed * 1.5)*

emfac at idle speed (gr/mi)	0.261
Emfac (gr/mi)	0.392

Source: California Department of Transportation, 1989. Division of New Technology and Research. Caline4 – A Dispersion Model for Predicting Air Pollution Concentrations Near Roadways (Revised). FHWA/CA/TL-84/15.

Emission Factor Profile Worksheet
Chronic Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year

2015	0.024349	0.017100	0.005530	0.003850	0.001310

TOG Emisson Rate - gr/mi

Speed (MPH)	Acceleration	0.231
	Deceleration	0.737
	65	0.151

Toxic Emission Rate - gr/mi	Acceleration	0.012044
Speed (MPH)	Deceleration	0.038427
	65	0.007873

Weight Fraction / Speciation

Benzene	0.467
Formaldehyde	0.328
1,3-Butadiene	0.106
Acetaldehyde	0.074
Acrolein	0.025

Emission Factor Profile Worksheet
Chronic Exposure

Diesel Particulate Emissions - PM10

PM10 Emission Rate - gr/mi	Acceleration	0.178
Speed (MPH)	Deceleration	0.392
	65	0.113

Source: TOG/toxic fractions from UC Davis-Caltrans Air Quality Project, *Estimating Mobile Source Air Toxic Emissions: A Step-by-Step Project Analysis Methodology*. Task Order No. 61.

Emission Factor Profile Worksheet
Acute Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year

2015	0.024349	0.017100	0.005530	0.003850	0.001310

TOG Emisson Rate - gr/mi

Speed (MPH)	Acceleration	0.231
	Deceleration	0.737
	65	0.151

Toxic Emission Rate - gr/mi	Acceleration	0.012044
Speed (MPH)	Deceleration	0.038427
	65	0.007873

Weight Fraction / Speciation

Benzene	0.467
Formaldehyde	0.328
1,3-Butadiene	0.106
Acetaldehyde	0.074
Acrolein	0.025

Emission Factor Profile Worksheet
Acute Exposure

TOG -Toxic Emissions

Diesel/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.020009	0.147133	0.001900	0.073526	0
2005	0.020009	0.147133	0.001900	0.073526	0
2006	0.020009	0.147133	0.001900	0.073526	0
2007	0.020009	0.147133	0.001900	0.073526	0
2008	0.020009	0.147133	0.001900	0.073526	0
2009	0.020009	0.147133	0.001900	0.073526	0
2010	0.020009	0.147133	0.001900	0.073526	0
2011	0.020009	0.147133	0.001900	0.073526	0
2012	0.020009	0.147133	0.001900	0.073526	0
2013	0.020009	0.147133	0.001900	0.073526	0
2014	0.020009	0.147133	0.001900	0.073526	0
2015	0.020009	0.147133	0.001900	0.073526	0
2016	0.020009	0.147133	0.001900	0.073526	0
2017	0.020009	0.147133	0.001900	0.073526	0
2018	0.020009	0.147133	0.001900	0.073526	0
2019	0.020009	0.147133	0.001900	0.073526	0
2020	0.020009	0.147133	0.001900	0.073526	0
2021	0.020009	0.147133	0.001900	0.073526	0
2022	0.020009	0.147133	0.001900	0.073526	0
2023	0.020009	0.147133	0.001900	0.073526	0
2024	0.020009	0.147133	0.001900	0.073526	0
2025	0.020009	0.147133	0.001900	0.073526	0
2026	0.020009	0.147133	0.001900	0.073526	0
2027	0.020009	0.147133	0.001900	0.073526	0
2028	0.020009	0.147133	0.001900	0.073526	0
2029	0.020009	0.147133	0.001900	0.073526	0
2030	0.020009	0.147133	0.001900	0.073526	0

Analysis Year

2015	0.020009	0.147133	0.001900	0.073526	0

TOG Emisson Rate - gr/mi

Speed (MPH)	Acceleration	0.423
	Deceleration	3.156
	65	0.161

Toxic Emission Rate - gr/mi	Acceleration	0.102606
Speed (MPH)	Deceleration	0.765545
	65	0.039053

Weight Fraction / Speciation

Benzene	0.082
Formaldehyde	0.607
1,3-Butadiene	0.008
Acetaldehyde	0.303
Acrolein	0.000

Route 134 (Sources M_1 to M_23)

CO Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	9500.0
Pollutant Mass Emission Rate (gr/mi)	2.463

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	3.95476
Pollutant Emission Rate (gr/sec/source)	1.72E-01

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

CO Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	462.5
Pollutant Mass Emission Rate (gr/mi)	4.462

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.05771
Pollutant Emission Rate (gr/sec/source)	3.85E-03

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

CO Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	350.0
Pollutant Mass Emission Rate (gr/mi)	6.555

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.07271
Pollutant Emission Rate (gr/sec/source)	4.28E-03

WB ON / Central Avenue (Sources R3_1 to R3_22)

CO Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	691.7
Pollutant Mass Emission Rate (gr/mi)	4.462

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.12658
Pollutant Emission Rate (gr/sec/source)	5.75E-03

EB OFF / Central Avenue (Sources R4_1 to R4_20)

CO Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	683.3
Pollutant Mass Emission Rate (gr/mi)	6.555

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.18555
Pollutant Emission Rate (gr/sec/source)	9.28E-03

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

CO Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	737.5
Pollutant Mass Emission Rate (gr/mi)	4.462

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.11042
Pollutant Emission Rate (gr/sec/source)	6.13E-03

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

CO Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	729.2
Pollutant Mass Emission Rate (gr/mi)	6.555

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.15841
Pollutant Emission Rate (gr/sec/source)	9.90E-03

Route 134 (Sources M_1 to M_23)

NOx Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	9500.0
Pollutant Mass Emission Rate (gr/mi)	0.391

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.62782
Pollutant Emission Rate (gr/sec/source)	2.73E-02

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

NOx Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	462.5
Pollutant Mass Emission Rate (gr/mi)	0.785

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.01015
Pollutant Emission Rate (gr/sec/source)	6.77E-04

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

NOx Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	350.0
Pollutant Mass Emission Rate (gr/mi)	1.065

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.01181
Pollutant Emission Rate (gr/sec/source)	6.95E-04

WB ON / Central Avenue (Sources R3_1 to R3_22)

NOx Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	691.7
Pollutant Mass Emission Rate (gr/mi)	0.785

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.02227
Pollutant Emission Rate (gr/sec/source)	1.01E-03

EB OFF / Central Avenue (Sources R4_1 to R4_20)

NOx Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	683.3
Pollutant Mass Emission Rate (gr/mi)	1.065

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.03015
Pollutant Emission Rate (gr/sec/source)	1.51E-03

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

NOx Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	737.5
Pollutant Mass Emission Rate (gr/mi)	0.785

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.01943
Pollutant Emission Rate (gr/sec/source)	1.08E-03

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

NOx Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	729.2
Pollutant Mass Emission Rate (gr/mi)	1.065

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.02574
Pollutant Emission Rate (gr/sec/source)	1.61E-03

Route 134 (Sources M_1 to M_23)

PM10 Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	9500.0
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.130

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.209267
PM10 Reentrainment Emission Rate (gr/sec/source)	9.10E-03

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

PM10 Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	462.5
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.135

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001750
PM10 Reentrainment Emission Rate (gr/sec/source)	1.17E-04

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

PM10 Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	350.0
Particle Size Multiplier (g/mi)	1.0

Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.029
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.154

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001712
PM10 Reentrainment Emission Rate (gr/sec/source)	1.01E-04

WB ON / Central Avenue (Sources R3_1 to R3_22)

PM10 Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	691.7
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.135

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.003839
PM10 Reentrainment Emission Rate (gr/sec/source)	1.75E-04

EB OFF / Central Avenue (Sources R4_1 to R4_20)

PM10 Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	683.3
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.029
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.154

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.004369
PM10 Reentrainment Emission Rate (gr/sec/source)	2.18E-04

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

PM10 Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	737.5
Particle Size Multiplier (g/mi)	1.00
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.135

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.003349
PM10 Reentrainment Emission Rate (gr/sec/source)	1.86E-04

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

PM10 Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	729.2
Particle Size Multiplier (g/mi)	1.00
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.029
Emfac2011 Emissions TW/BW (g/mi)	0.047
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.154

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.003730
PM10 Reentrainment Emission Rate (gr/sec/source)	2.33E-04

Route 134 (Sources M_1 to M_23)

PM2.5 Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	9500.0
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.004
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.043

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.068373
PM10 Reentrainment Emission Rate (gr/sec/source)	2.97E-03

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

PM2.5 Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	462.5
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.046

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000590
PM10 Reentrainment Emission Rate (gr/sec/source)	3.93E-05

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

PM2.5 Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	350.0
Particle Size Multiplier (g/mi)	0.25

Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.027
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.066

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.000727
PM10 Reentrainment Emission Rate (gr/sec/source)	4.28E-05

WB ON / Central Avenue (Sources R3_1 to R3_22)

PM2.5 Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	691.7
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.046

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001293
PM10 Reentrainment Emission Rate (gr/sec/source)	5.88E-05

EB OFF / Central Avenue (Sources R4_1 to R4_20)

PM2.5 Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	683.3
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.027
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.066

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001856
PM10 Reentrainment Emission Rate (gr/sec/source)	9.28E-05

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

PM2.5 Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	737.5
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.007
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.046

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001128
PM10 Reentrainment Emission Rate (gr/sec/source)	6.27E-05

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

PM2.5 Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	729.2
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.027
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.066

For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)$^{0.91}$ x (Gross Vehicle Weight)$^{1.02}$) + (Emfac2011 Emissions)
Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

PM10 Reentrainment Emission Rate (gr/sec)	0.001585
PM10 Reentrainment Emission Rate (gr/sec/source)	9.91E-05

Route 134 (Sources M_1 to M_23)

TOG GAS Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	9242.5
Pollutant Mass Emission Rate (gr/mi)	0.007873

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.01230
Pollutant Emission Rate (gr/sec/source)	5.35E-04

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

TOG GAS Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	450.0
Pollutant Mass Emission Rate (gr/mi)	0.012044

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00015
Pollutant Emission Rate (gr/sec/source)	1.01E-05

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

TOG GAS Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	340.5
Pollutant Mass Emission Rate (gr/mi)	0.038427

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00041
Pollutant Emission Rate (gr/sec/source)	2.44E-05

WB ON / Central Avenue (Sources R3_1 to R3_22)

TOG GAS Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	672.9
Pollutant Mass Emission Rate (gr/mi)	0.012044

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00033
Pollutant Emission Rate (gr/sec/source)	1.51E-05

EB OFF / Central Avenue (Sources R4_1 to R4_20)

TOG GAS Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	664.8
Pollutant Mass Emission Rate (gr/mi)	0.038427

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00106
Pollutant Emission Rate (gr/sec/source)	5.29E-05

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

TOG GAS Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	717.5
Pollutant Mass Emission Rate (gr/mi)	0.012044

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00029
Pollutant Emission Rate (gr/sec/source)	1.61E-05

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

TOG GAS Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	709.4
Pollutant Mass Emission Rate (gr/mi)	0.038427

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00090
Pollutant Emission Rate (gr/sec/source)	5.65E-05

Route 134 (Sources M_1 to M_23)

TOG DSL Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	257.5
Pollutant Mass Emission Rate (gr/mi)	0.039053

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00170
Pollutant Emission Rate (gr/sec/source)	7.39E-05

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

TOG DSL Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	12.5
Pollutant Mass Emission Rate (gr/mi)	0.102606

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00004
Pollutant Emission Rate (gr/sec/source)	2.39E-06

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

TOG DSL Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	9.5
Pollutant Mass Emission Rate (gr/mi)	0.765545

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00023
Pollutant Emission Rate (gr/sec/source)	1.36E-05

WB ON / Central Avenue (Sources R3_1 to R3_22)

TOG DSL Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	18.7
Pollutant Mass Emission Rate (gr/mi)	0.102606

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00008
Pollutant Emission Rate (gr/sec/source)	3.58E-06

EB OFF / Central Avenue (Sources R4_1 to R4_20)

TOG DSL Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	18.5
Pollutant Mass Emission Rate (gr/mi)	0.765545

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00059
Pollutant Emission Rate (gr/sec/source)	2.93E-05

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

TOG DSL Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	20.0
Pollutant Mass Emission Rate (gr/mi)	0.102606

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00007
Pollutant Emission Rate (gr/sec/source)	3.83E-06

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

TOG DSL Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	19.8
Pollutant Mass Emission Rate (gr/mi)	0.765545

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00050
Pollutant Emission Rate (gr/sec/source)	3.14E-05

Route 134 (Sources M_1 to M_23)

DSL Particulate Emissions

Number of Sources	23
Link Length (meters)	979.2
Volume/Baseline (VPH)	257.5
Pollutant Mass Emission Rate (gr/mi)	0.113

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00492
Pollutant Emission Rate (gr/sec/source)	2.14E-04

EB ON / Pacific Avenue (Sources R1_1 to R1_15)

DSL Particulate Emissions

Number of Sources	15
Link Length (meters)	162.0
Volume/Baseline (VPH)	12.5
Pollutant Mass Emission Rate (gr/mi)	0.178

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00006
Pollutant Emission Rate (gr/sec/source)	4.15E-06

WB OFF / Pacific Avenue (Sources R2_1 to R2_17)

DSL Particulate Emissions

Number of Sources	17
Link Length (meters)	183.6
Volume/Baseline (VPH)	9.5
Pollutant Mass Emission Rate (gr/mi)	0.392

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00012
Pollutant Emission Rate (gr/sec/source)	6.94E-06

WB ON / Central Avenue (Sources R3_1 to R3_22)

DSL Particulate Emissions

Number of Sources	22
Link Length (meters)	237.6
Volume/Baseline (VPH)	18.7
Pollutant Mass Emission Rate (gr/mi)	0.178

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00014
Pollutant Emission Rate (gr/sec/source)	6.21E-06

EB OFF / Central Avenue (Sources R4_1 to R4_20)

DSL Particulate Emissions

Number of Sources	20
Link Length (meters)	240.0
Volume/Baseline (VPH)	18.5
Pollutant Mass Emission Rate (gr/mi)	0.392

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00030
Pollutant Emission Rate (gr/sec/source)	1.50E-05

EB ON / Brand Boulevard (Sources R5_1 to R5_18)

DSL Particulate Emissions

Number of Sources	18
Link Length (meters)	194.4
Volume/Baseline (VPH)	20.0
Pollutant Mass Emission Rate (gr/mi)	0.178

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00012
Pollutant Emission Rate (gr/sec/source)	6.64E-06

WB OFF / Brand Boulevard (Sources R6_1 to R6_16)

DSL Particulate Emissions

Number of Sources	16
Link Length (meters)	192.0
Volume/Baseline (VPH)	19.8
Pollutant Mass Emission Rate (gr/mi)	0.392

Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)

Pollutant Emission Rate (gr/sec)	0.00026
Pollutant Emission Rate (gr/sec/source)	1.61E-05

APPENDIX C

Dispersion Model Input Summary Table

Dispersion Model Input Summary Table

Volume Sources

	X	Y	ZS	RH	SY	SZ	CO	NOx	PM10	PM2.5	TOG GAS	TOG DSL	DSL PM
M_1	383555.8	3780204.8	0	0	19.8	6.81	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_2	383598.4	3780204.8	0	0	19.8	6.62	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_3	383641.0	3780204.8	0	0	19.8	6.36	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_4	383683.6	3780204.8	0	0	19.8	6.16	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_5	383726.1	3780204.8	0	0	19.8	5.89	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_6	383768.7	3780204.8	0	0	19.8	5.69	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_7	383811.3	3780204.8	0	0	19.8	5.41	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_8	383853.9	3780204.8	0	0	19.8	5.20	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_9	383896.4	3780204.8	0	0	19.8	4.92	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_10	383939.0	3780204.8	0	0	19.8	4.70	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_11	383981.6	3780204.8	0	0	19.8	4.41	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_12	384024.2	3780204.8	0	0	19.8	4.18	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_13	384066.7	3780204.8	0	0	19.8	3.95	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_14	384109.3	3780204.8	0	0	19.8	3.63	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_15	384151.9	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_16	384194.5	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_17	384237.0	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_18	384279.6	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_19	384322.2	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_20	384364.8	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_21	384407.3	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_22	384449.9	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
M_23	384492.5	3780204.8	0	0	19.8	3.54	1.72E-01	2.73E-02	9.10E-03	2.97E-03	5.35E-04	7.39E-05	2.14E-04
R1_1	383540.0	3780165.9	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_2	383550.8	3780167.3	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_3	383561.5	3780168.6	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_4	383572.2	3780170.0	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_5	383582.9	3780171.3	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_6	383593.6	3780172.7	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_7	383604.3	3780174.0	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_8	383615.1	3780175.3	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_9	383625.8	3780176.7	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_10	383636.5	3780178.0	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_11	383647.2	3780179.4	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_12	383657.9	3780180.7	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_13	383668.6	3780182.1	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_14	383679.4	3780183.4	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R1_15	383690.1	3780184.8	0	0	5.02	3.27	3.85E-03	6.77E-04	1.17E-04	3.93E-05	1.01E-05	2.39E-06	4.15E-06
R2_1	383711.3	3780224.5	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06

R2_2	383700.6	3780226.0	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_3	383689.9	3780227.4	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_4	383679.2	3780228.9	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_5	383668.5	3780230.3	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_6	383657.8	3780231.8	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_7	383647.1	3780233.2	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_8	383636.4	3780234.7	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_9	383625.7	3780236.1	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_10	383615.0	3780237.6	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_11	383604.3	3780239.0	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_12	383593.6	3780240.5	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_13	383582.9	3780241.9	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_14	383572.2	3780243.4	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_15	383561.4	3780244.8	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_16	383550.7	3780246.3	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R2_17	383540.0	3780247.7	0	0	5.02	3.27	4.28E-03	6.95E-04	1.01E-04	4.28E-05	2.44E-05	1.36E-05	6.94E-06
R3_1	384020.8	3780247.9	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_2	384010.1	3780246.8	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_3	383999.4	3780245.6	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_4	383988.6	3780244.5	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_5	383977.9	3780243.3	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_6	383967.1	3780242.2	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_7	383956.4	3780241.0	0	0	5.02	2.44	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_8	383945.7	3780239.9	0	0	5.02	2.46	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_9	383934.9	3780238.7	0	0	5.02	2.52	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_10	383924.2	3780237.6	0	0	5.02	2.60	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_11	383913.4	3780236.5	0	0	5.02	2.66	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_12	383902.7	3780235.3	0	0	5.02	2.72	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_13	383892.0	3780234.2	0	0	5.02	2.77	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_14	383881.2	3780233.0	0	0	5.02	2.83	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_15	383870.5	3780231.9	0	0	5.02	2.9	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_16	383859.8	3780230.7	0	0	5.02	2.95	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_17	383849.0	3780229.6	0	0	5.02	3.00	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_18	383838.3	3780228.5	0	0	5.02	3.05	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_19	383827.5	3780227.3	0	0	5.02	3.11	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_20	383816.8	3780226.2	0	0	5.02	3.17	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_21	383806.1	3780225.0	0	0	5.02	3.22	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R3_22	383795.3	3780223.9	0	0	5.02	3.27	5.75E-03	1.01E-03	1.75E-04	5.88E-05	1.51E-05	3.58E-06	6.21E-06
R4_1	383794.6	3780186.1	0	0	5.58	3.41	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_2	383806.5	3780185.5	0	0	5.58	3.35	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_3	383818.5	3780185.0	0	0	5.58	3.28	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_4	383830.5	3780184.4	0	0	5.58	3.20	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_5	383842.5	3780183.8	0	0	5.58	3.15	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_6	383854.5	3780183.2	0	0	5.58	3.07	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_7	383866.5	3780182.7	0	0	5.58	3.01	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_8	383878.5	3780182.1	0	0	5.58	2.93	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_9	383890.4	3780181.5	0	0	5.58	2.87	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05

R4_10	383902.4	3780180.9	0	0	5.58	2.79	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_11	383914.4	3780180.4	0	0	5.58	2.73	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_12	383926.4	3780179.8	0	0	5.58	2.64	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_13	383938.4	3780179.2	0	0	5.58	2.58	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_14	383950.4	3780178.6	0	0	5.58	2.49	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_15	383962.4	3780178.1	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_16	383974.3	3780177.5	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_17	383986.3	3780176.9	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_18	383998.3	3780176.3	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_19	384010.3	3780175.8	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R4_20	384022.3	3780175.2	0	0	5.58	2.48	9.28E-03	1.51E-03	2.18E-04	9.28E-05	5.29E-05	2.93E-05	1.50E-05
R5_1	384332.9	3780162.9	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_2	384343.7	3780163.8	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_3	384354.5	3780164.7	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_4	384365.2	3780165.6	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_5	384376.0	3780166.5	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_6	384386.8	3780167.4	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_7	384397.5	3780168.3	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_8	384408.3	3780169.2	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_9	384419.0	3780170.1	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_10	384429.8	3780171.0	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_11	384440.6	3780171.9	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_12	384451.3	3780172.8	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_13	384462.1	3780173.7	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_14	384472.9	3780174.6	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_15	384483.6	3780175.5	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_16	384494.4	3780176.4	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_17	384505.1	3780177.3	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R5_18	384515.9	3780178.2	0	0	5.02	2.44	6.13E-03	1.08E-03	1.86E-04	6.27E-05	1.61E-05	3.83E-06	6.64E-06
R6_1	384515.5	3780232.8	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_2	384503.6	3780233.9	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_3	384491.6	3780235.0	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_4	384479.7	3780236.1	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_5	384467.7	3780237.2	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_6	384455.8	3780238.3	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_7	384443.8	3780239.4	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_8	384431.9	3780240.5	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_9	384419.9	3780241.6	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_10	384408.0	3780242.7	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_11	384396.0	3780243.8	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_12	384384.1	3780244.9	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_13	384372.1	3780246.0	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_14	384360.2	3780247.1	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_15	384348.2	3780248.2	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05
R6_16	384336.3	3780249.3	0	0	5.58	2.48	9.90E-03	1.61E-03	2.33E-04	9.91E-05	5.65E-05	3.14E-05	1.61E-05

APPENDIX D

Dispersion Model Input/Output Files (Electronic Format)

APPENDIX B

Queuing Analysis

KUNZMAN ASSOCIATES, INC.
OVER 35 YEARS OF EXCELLENT SERVICE

October 22, 2013

Mr. Mark Austin
MERIDIAN CONSULTANTS, LLC
860 Hampshire Road, Suite P
Westlake Village, CA 91361

Dear Mr. Austin:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this queuing analysis for the North Central Avenue Apartments project in the City of Glendale. This queuing analysis supplements the North Central Avenue Apartments Traffic Impact Analysis (Revised) prepared by Kunzman Associates, Inc. (July 24, 2013). The purpose of this queuing analysis is to determine if the proposed project trips will affect ramp queue lengths at the Brand Boulevard at Goode Avenue/SR-134 WB Off Ramp intersection.

SUMMARY

The SR-134 WB Off Ramp at Brand Boulevard is operating and will continue to operate at acceptable Levels of Service and the 85th percentile queues are not projected to exceed the available storage nor extend to the freeway mainline.

PROJECT DESCRIPTION

The proposed North Central Avenue Apartments project consists of two independent buildings. The project Site A is located on the southwest corner of Central Avenue and Pioneer Drive and project Site B is located south of Doran Street between Central Avenue and Orange Street in the City of Glendale. The proposed Site A development consists of 315 dwelling units of apartments. The proposed Site B development consists of 192 dwelling units of apartments. The proposed development is a combined Site A and Site B development consisting of 507 dwelling units of apartments.

Project Site A is currently occupied by 59,611 square feet of medical office buildings and 20 dwelling units of apartments. Project Site B is currently occupied by 30,582 square feet of medical office buildings.

PROJECT TRIP GENERATION

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantities of land uses. Trip generation rates are predicated on the assumption that energy costs,

the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. By multiplying the trip generation rates by the land use quantities, the traffic volumes are determined. Table 2 exhibits the trip generation rates, project peak hour volumes, and project daily traffic volumes. The trip generation rates are from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.

From the July 2013 traffic study, the proposed development is projected to generate the following net trips during the peak hours:

Proposed Land Use	Quantity	Units	Morning Peak Hour		Evening Peak Hour	
			Inbound	Outbound	Inbound	Outbound
Apartment	507	DU	-122	155	104	-124

The proposed project trip generation only contributes a net inbound increase on the SR-134 WB Off Ramp during the evening peak hour. Therefore, only the evening peak hour was evaluated at the Brand Boulevard at Goode Avenue/SR-134 WB Off Ramp intersection.

EXISTING TRAFFIC CONDITIONS

Detailed turning movement traffic counts at the Brand Boulevard at Goode Avenue/SR-134 WB Off Ramp intersection were obtained from the Verdugo Gardens Project Traffic Study prepared by LL&G (August 2007) and supplied by the City of Glendale Traffic & Transportation Division staff. Kunzman Associates, Inc. staff conducted field surveys to obtain intersection lane geometric information as well as verify the traffic signal phasing operations.

The Brand Boulevard at Goode Avenue/SR-134 WB Off Ramp intersection is currently a signalized intersection. The westbound SR-134 WB Off Ramp approach at the intersection has one left turn lane, one shared through/left turn lane, and one shared through/right turn lane. The northbound Brand Boulevard approach at the intersection has two left turn lanes and three through lanes. The southbound Brand Boulevard approach at the intersection has three through lanes and a defacto right turn lane. The west leg of the intersection (Goode Avenue) has two one-way westbound lanes.

TRAFFIC AND QUEUING ANALYSIS

Utilizing the traffic volumes, the intersection lane configurations, and traffic signal timing and phasing information above, the traffic and queuing analyses were performed using the Highway Capacity Manual (HCM) 2010 methodology implemented in the Highway Capacity Software (HCS) 2010.

The results of the traffic and queuing analyses for existing and existing plus project traffic conditions are included in Appendix A. The following details and performance characteristics have been input:

- Movement group including individual lanes whose performance characteristics are being measures.
- Storage length available for each of the turning movements (in feet).
- Traffic volumes (VPH) during the evening peak hour.
- The 85th percentile queue lengths (in vehicles) during the evening peak hour for each turning movement on the ramp.
- The 85th percentile queue to storage ratio during the evening peak hour for each turning movement.
- If 85th percentile queue exceeds the storage length for each turning movement.
- Intersection delay in seconds per vehicle during the evening peak hour
- Levels of Service during the evening peak hour.

CONCLUSIONS

1. The SR-134 WB Off Ramp at Brand Boulevard is operating at an acceptable Level of Service for existing traffic conditions and the 85th percentile queues are not exceeding the available storage nor extending to the freeway mainline during the evening peak hour.

2. The SR-134 WB Off Ramp at Brand Boulevard is projected to operate at an acceptable Level of Service for existing plus project traffic conditions and the 85th percentile queues are not projected to exceed the available storage nor extend to the freeway mainline during the evening peak hour.

It has been a pleasure to serve your needs on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES , INC.

Carl Ballard, LEED GA
Principal Associate

#5312b

KUNZMAN ASSOCIATES, INC.

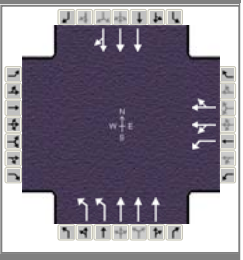
William Kunzman, P.E.
Principal

APPENDIX A

HCS QUEUING ANALYSIS WORKSHEETS

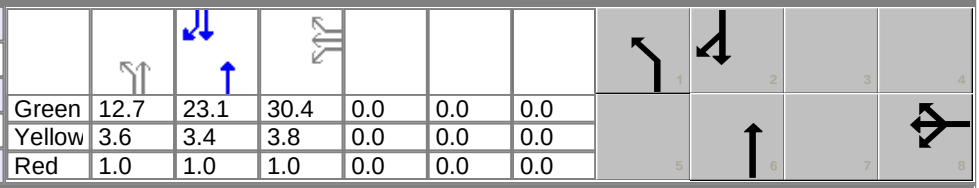
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	1.00
Analyst	Chris Pylant	Analysis Date	10/21/2013	Area Type	Other
Jurisdiction	Caltrans	Time Period	PM Peak Hour	PHF	1.00
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name					
Project Description	PME				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				633	353	397	458	446			1128	279

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.7	23.1	30.4	0.0	0.0	0.0						
Yellow	3.6	3.4	3.8	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

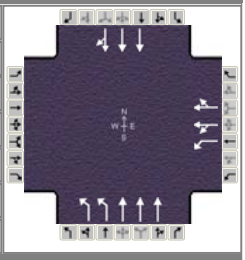
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8	1	6		2
Case Number				10.0	2.0	4.0		8.3
Phase Duration, s				35.2	17.3	44.8		27.5
Change Period, ($Y+R_c$), s				4.8	4.6	4.6		4.6
Max Allow Headway (*MAH*), s				3.2	3.1	0.0		0.0
Queue Clearance Time (g_s), s				28.7	12.1			
Green Extension Time (g_e), s				1.7	0.6	0.0		0.0
Phase Call Probability				1.00	1.00			
Max Out Probability				0.74	0.23			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	1	6			2	12
Adjusted Flow Rate (*v*), veh/h				633	353	397	458	446			971	436
Adjusted Saturation Flow Rate (*s*), veh/h/ln				1810	1900	1610	1757	1725			1900	1704
Queue Service Time (g_s), s				26.7	11.3	16.2	10.1	3.8			20.6	19.6
Cycle Queue Clearance Time (g_c), s				26.7	11.3	16.2	10.1	3.8			20.6	19.6
Green Ratio (*g/C*)				0.38	0.38	0.38	0.16	0.50			0.29	0.29
Capacity (*c*), veh/h				687	721	611	557	2603			1090	489
Volume-to-Capacity Ratio (*X*)				0.921	0.489	0.649	0.822	0.171			0.892	0.892
Available Capacity (c_a), veh/h				751	789	668	757	2603			1090	489
Back of Queue (*Q*), veh/ln (85th percentile)				18.0	6.9	8.4	6.6	2.4			13.6	14.5
Queue Storage Ratio (*RQ*) (85th percentile)				0.89	0.74	0.89	0.00	0.00			0.00	0.00
Uniform Delay (d_1), s/veh				23.7	18.9	20.4	32.6	10.8			27.3	27.3
Incremental Delay (d_2), s/veh				19.2	0.2	1.4	4.0	0.1			12.7	26.7
Initial Queue Delay (d_3), s/veh				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh				42.9	19.1	21.8	36.6	11.0			40.1	54.0
Level of Service (LOS)				D	B	C	D	B			D	D
Approach Delay, s/veh / LOS	0.0			30.8	C		23.9	C		44.4	D	
Intersection Delay, s/veh / LOS	34.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

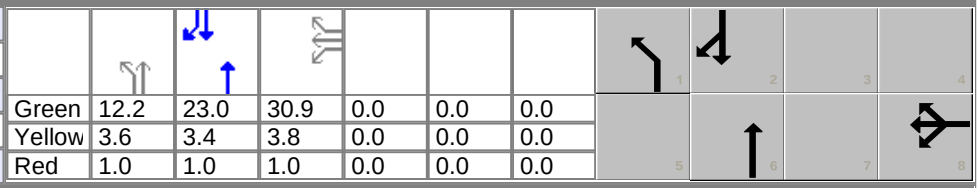
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	1.00
Analyst	Chris Pylant	Analysis Date	10/21/2013	Area Type	Other
Jurisdiction	Caltrans	Time Period	PM Peak Hour	PHF	1.00
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name					
Project Description	PM Existing + Project				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h				649	353	397	439	440			1133	279

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.2	23.0	30.9	0.0	0.0	0.0						
Yellow	3.6	3.4	3.8	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8	1	6		2
Case Number				10.0	2.0	4.0		8.3
Phase Duration, s				35.7	16.8	44.3		27.4
Change Period, ($Y+R_c$), s				4.8	4.6	4.6		4.6
Max Allow Headway (*MAH*), s				3.2	3.1	0.0		0.0
Queue Clearance Time (g_s), s				29.4	11.7			
Green Extension Time (g_e), s				1.5	0.6	0.0		0.0
Phase Call Probability				1.00	1.00			
Max Out Probability				0.88	0.25			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	1	6			2	12
Adjusted Flow Rate (*v*), veh/h				649	353	397	439	440			975	437
Adjusted Saturation Flow Rate (*s*), veh/h/ln				1810	1900	1610	1757	1725			1900	1704
Queue Service Time (g_s), s				27.4	11.2	16.1	9.7	3.7			20.7	19.7
Cycle Queue Clearance Time (g_c), s				27.4	11.2	16.1	9.7	3.7			20.7	19.7
Green Ratio (*g/C*)				0.39	0.39	0.39	0.15	0.50			0.29	0.29
Capacity (*c*), veh/h				700	735	623	537	2566			1085	486
Volume-to-Capacity Ratio (*X*)				0.928	0.480	0.638	0.817	0.171			0.899	0.899
Available Capacity (c_a), veh/h				751	789	668	732	2566			1085	486
Back of Queue (*Q*), veh/ln (85th percentile)				18.8	6.8	8.3	6.4	2.4			13.8	14.8
Queue Storage Ratio (*RQ*) (85th percentile)				0.92	0.73	0.89	0.00	0.00			0.00	0.00
Uniform Delay (d_1), s/veh				23.5	18.5	20.0	32.8	11.1			27.5	27.5
Incremental Delay (d_2), s/veh				21.3	0.2	1.3	3.9	0.1			13.7	28.4
Initial Queue Delay (d_3), s/veh				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh				44.7	18.7	21.3	36.7	11.3			41.2	55.9
Level of Service (LOS)				D	B	C	D	B			D	E
Approach Delay, s/veh / LOS	0.0			31.5	C		24.0	C		45.7	D	
Intersection Delay, s/veh / LOS	35.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								